

Vol. 6

2nd ICA Training Course for Strengthening Management of
Agricultural Cooperatives in Asia : 26 Oct 1987 - 10 May 1988

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PROJECT PAPERS

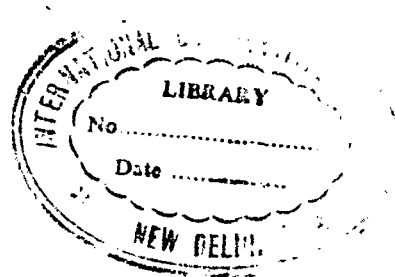
Projects prepared by participants

1. Gazipur Upazila Coop Rice Mills Ltd
by Mr. Abdul Mannaf Mir (Bangladesh).
2. Integrated Chicken Breeding Farm
by Mrs. He Lanchai (China).
3. Xianggu Development Project
by Mr. Shi Yue-Jin (China).
- Comments made by the participants on the
above three projects.
4. Production and Marketing of Fresh Oranges in
Sikkim through Cooperative by Mr. T.P. Bhutia (India)
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by Mr. Rajiv I.D. Mehta (India).
6. Potato Marketing and Processing
by Mr. G.P. Nema (India)
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7. Feedlot Fattening of F.H Calf in KUD Cepogo
by Mr. Yoyok Sunaryo (Indonesia).
8. Establishing a Unit of Feed Mill Plant
by Mr. Maharsi Adi Sucipto (Indonesia).

Second ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia

NEW DELHI, BANGKOK, TOKYO, SEOUL

October 26, 1987—May 10, 1988



Project Prepared During Home Country Assignment

Project Title : Gazipur Upazila Co-operative Rice Mills Ltd.

Country : Bangladesh

Prepared by : Abdul Mannaf Mir, Chief Officer,
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**Funded by the Government of Japan
and**

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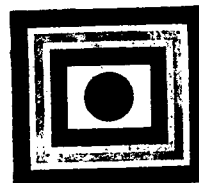
ICA Management Training Project for Agricultural Cooperatives in Asia



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(i)
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C H A P T E R - 1

SUMMARY

1. Name and address of the project : GAZIPUR UPAZILA COOPERATIVE RICE MILLS LIMITED.
Village - Bahadurpur,
Post Office - Bhawal Mirzapur,
Upazila & District - Gazipur,
BANGLADESH.
2. Project area : Gazipur Upazila, Bangladesh.
3. Total estimated project cost : Tk. 1,52,92,210/-
4. Total initial investment : Tk. 1,43,47,000/-
(Foreign Currency Tk. 41,31,000/-
Local currency Tk.1,02,16,000/-)
5. Sources of fund : Bank Loan Tk. 93,26,000/- (@ 14% interest)
Equity Tk. 50,21,000/-
(to be collected from 13,289 members as
share @ Tk. 400/- each.)
6. Debt Equity Ratio : 65 : 35
7. Installed capacity : 9,600 Tonnes/Year
8. Expected capacity utilisation : 1st year - 75%
2nd year - 85%
3rd year - 95%
(and onward)
9. Product & by-product : Product - Head Rice
By-product - Chipped Rice, Bran & Husk.
10. Implementation period: 18 months.
11. Organisational Management : Board of Directors (18 members)

-: 2 :-

12. Operational Management : Manager & Staff (37)
13. Origin of machinery : India
14. Economic life of the project : 15 years.
15. Source of raw materials : Local
16. Target group : Farmer - Members (Coop) of Gazipur Upazila, Bangladesh.

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BACKGROUND

2.1 Present System of Processing of Paddy:

According to the report of Task Force on Rice processing and By-product utilisation in Bangladesh 60-70% of Paddy is processed by women in household and also milled in the house through the use of Dheki, a foot operated pastle and mortar.

About 25-30% of production of paddy is milled either for subsistence or on a petty trading business in rural steel huller mills (custom mill) disproportionately scattered all over the country. Only a few mills have developed their own system of premilling processing of rice. These mills also renders their services to rice marchants and the government. Between 5-10% of the production of paddy is milled in commercial size mills. As for the command area, i.e. the Upazila of Gazipur there is no authomatic rice mills within a radius of 200 Kilometres. The existing 12 huller rice mills in operation in the area have a very negligible coverage. Besides, modern automatic rice mills have qualitative superiority over the custom mills on grounds of higher yield, least content of broken rice, possibility of Bran Oil extraction, lesser cost of transportation and management, better quality of rice etc.

2.2 Overall situation of the project area:

The overall situation of the project area is given below :-

- Area of Gazipur Upazila	:	157'6 Sq.miles (40,836 ha)
- Total Population	:	2,16,193
- Cultivable land	:	29,971 ha
- Un-cultivable land	:	1,902 ha

- Forest	:	1,334 ha
- Paddy cultivable land	:	29,288 ha
(a) One-crop	:	6,805 ha
(b) Two-crop	:	18,030 ha
(c) Three-crop	:	4,453 ha
- Total production(1986-87)	:	1,09,310 tonnes
- Farmer household	:	30,660 Nos.
- Land under irrigation	:	6,469 ha
- No. of River	:	2
- No. of Canal	:	4
- No. of DTW	:	331
- No. of STW	:	219
- No. of Power Pump	:	331
- No. of Hand Pump	:	20
- No. of Cooperative House- hold (farmers)	:	13,289
- No. of Cooperative Societies(Agriculture)	:	261
- Paddy Production (86-87) (Cooperative farmers)	:	36,428 tonnes
- Rainfall	:	Normal

The entire Gazipur Upazila is mainly a Paddy growing area. The other crops are Fruits & Vegetables. The area is supported by different Govt. institutions particularly in respect of paddy production.

2.3 Availability of Paddy:

The Upazila of Gazipur has been experiencing surplus in respect of Paddy production. The production, requirement of paddy as food & seed and surplus over consumption for the last 5 years are reflected over-leaf.

	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>	<u>1985-86</u>	<u>1986-87</u>
1. Production of paddy in tonne	95,278	1,00,153	1,03,242	1,05,534	1,09,310
2. Wastage & requirement of seed (10% of prodn.)	9,528	10,015	10,324	10,553	10,931
3. Available for consumption as food	85,750	90,138	92,918	94,981	98,379
4. Total population (No.)	1,88,471	1,96,324	2,03,797	2,10,100	2,16,193
5. Infant(11%)	20,731	21,595	22,417	23,111	23,781
6. Population requiring full mills	167,740	1,74,729	1,81,380	1,86,989	1,92,412
7. Requirement @500 grams/person/day	30,612	31,888	33,102	34,125	35,115
8. Surplus over consumption	55,138	58,250	59,816	60,856	63,264

Source: Office of the Director General, Ministry of Food.

4. Procurement of Paddy by Govt.

The extent of procurement of paddy by the Government depends on availability of fund, production of paddy, difference between market price and procurement price and storage facilities. Paddy procured from Gazipur Upazila by the Govt. vis-a-vis, the availability of storage facilities over the period of last 5 years is shown below:-

	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>	<u>1985-86</u>	<u>1986-87</u>
a) No.of Godown	2	3	5	5	7
b) Storage capacity in tonnes	1000	1500	2500	2500	3500
c) Paddy procured by Govt.	1900	2248	4225	4113	5342

According to the District Controller of Food procurement target for 1987-88 has been fixed at 6000 tonnes.

2.5 Paddy handled by Paddy Dealers:

It is collected from the District Controller of Food that there are 15 licenced paddy dealers in the Upazila. It is generally believed that on an average these paddy dealers handle about 200 tonnes of Paddy per annum. The existing hullur rice mills in the area have milled only 18326 tonnes of Paddy last year (1986-87).

2.6 Existing Cooperatives, membership, house-hold and Paddy Production:

At present there are 261 (Agriculture) primary cooperative societies in the Gazipur Upazila total membership of which is 13,289. Annual paddy production under these house-hold is 36,428 tonnes. Paddy required for food, seed and wastage has been estimated at 17,094 tonnes leaving a surplus of 19,334 tonnes.

2.7 Area of project:

The project will cover the total area of Gazipur Upazila. At the initial stage the existing 13,289 members of 261 co-operative societies will be owner-members of the project. The mill will be situated almost at the middle of the Upazila which is well connected by Pucca and Katcha Roads as well as rail and waterways with different parts of the Upazila.

2.8 Problems faced by farmers:

The existing cooperative societies are mainly providing the credit support to the farmers. Very often, the volume of such loan is not upto the actual requirement. They are also not undertaking any sort of processing or marketing activities. So the farmers are not getting any remunerative price of their produce. Very often, they are exploited by the private traders resulting to decrease

in their income which also causes non-repayment of their loans.

2.9 Need and Justification for the project:

For the betterment of the economic condition of the grower-farmers facilities for processing & marketing of their produce are badly needed. The proposed project is expected to meet this demand by ensuring remunerative price for the produce. This will save the farmers from exploitation by private traders, give them incentive price and create in them the sense of cooperative ownership. Besides, by linking the credit with marketing through the existing cooperatives, the project will ensure timely recovery of cooperative loans which will increase credit worthiness of the members.

The project will benefit not only the cooperative members, but also there would be an indirect effect on the economy of the total area as a whole. This will encourage the people to come under the fold of cooperatives to increase their income by undertaking various types of cooperative activities.

From different analysis it has been observed that the proposed project is the only way by which the cooperative farmers of the area can be served best. Hence, the project is quite need-based and justified.

-: 8 :-
C H A P T E R - 3

P R O J E C T

3.1 Objectives:

The main objective of the project is to increase the income of its farmer-members by processing and marketing of their produce. In detail, at present the paddy growers of the area of operation of the project do not have remunerative price for their paddy as there is no proper processing and marketing facilities. The project will procure the paddy from the members at remunerative price, mill and market them properly and distribute the profit among the members by way of dividend and bonus which will add greatly to the income of the farmers.

The other objectives of the project are as follows :-

1. To provide necessary guidelines to the members in respect of increased production.
2. To strengthen the cooperative movement in the area by linking the credit with marketing through the existing cooperatives.

3.2 Area of operation:

Paddy will be supplied by the member-farmers of the Gazipur Upazila which will be milled & marketed to the nearby whole sale market centres details of which is given below :-

<u>Sl.No.</u>	<u>Name of markets</u>	<u>Distance from the mill</u>
1.	Gazipur	2 Km
2.	Tongi	5 Km
3.	Mirzapur	4 Km
4.	Dhaka (Capital City)	30 Km

3.3 By-products utilisation:

The by-products of rice mills are bran, husk and broken-rice. The mill will sell out the broken rice & husk. As for bran there are two alternatives. One is to extract bran-oil by a separate processing unit and other is to export to foreign countries which is being done by the Government since 1985.

As at present there is no suitable market in Bangladesh for bran-oil it is suggested to export the bran which also brings good price. In future, installation of a separate unit for extraction of bran-oil can be thought of considering availability of required quantum of bran from other mills, its technology and market.

A market investigation reveals that the price of bran and chipped rice varies from Tk. 2900 to Tk. 3100 and from Tk.4400 to Tk.4675 per tonne respectively.

3.4 Project components:

There are 3 (three) major components of the project, namely, procurement of raw materials (Paddy), processing (Clearing, Soaking & Par-boiling, Husking and Polishing & Grading) and marketing.

3.4.1 Procurement of Paddy:

The total membership will be divided into 261 groups in accordance with the area of existing 261 primary farmer cooperative societies and each group will have one group leader who will ensure procurement of paddy from the member-farmers of his group and supply to the mill. The group-leader will be provided extra benefit @ Tk.100/- per tonne. Price of paddy will be paid above the market rate and carrying cost @ Tk.100/- per tonne will be paid to the members.

3.4.2 Processing:

Processing will include cleaning of paddy, soaking and par-boiling, husking/milling and polishing & grading.

3.4.3 Marketing:

The head-rice will be packed in 100 kg gunny bags which after being trade-marked will be carried to the whole-sale market centres. Provision for carrying cost @ Tk.100/- per tonne has been provided. Marketing will be controlled by the marketing section of the project.

DETAILS OF OPERATION:

4.1 The unit under consideration:

The unit under consideration will have effective processing and milling capacity of only 9,600 tonnes of paddy per annum. On the other hand the surplus quantum of paddy of the cooperative farmers is about 19,324. Thus, it is expected that it might not face problems regarding availability of paddy and may operate very satisfactorily even if the minimum level of production is taken into account. The project envisages setting up of an automatic rice milling unit with cleaning, soaking, par-boiling, drying and milling facilities. Annual rated milling capacity of the project on the basis of double shift operation of 8 hours each and 300 working days in a year has been estimated at 9,600 tonnes. The project will require qualified, experienced, skilled and unskilled personnel for smooth running.

The project will consist of two tonnes/hr rice milling-cum-mechanical drier and par-boiling unit including boiler etc. The total cost of the project has been estimated at Tk.1,52,92,210/- the details of which have been shown in Annexure-I.

4.2 Product, Product-mix and Production capacity:

Major product will be head rice. By product will be chipped/broken rice, bran and husk. Estimated annual output at rated capacity is shown overleaf.

from it is advised that the automatic rice mill will be used by people who are ill or are hulkers.

<u>Product & by-product:</u>	<u>% of recovery</u>	<u>Quantity</u>
1. Head Rice	66%	6,336 tonnes
2. Chipped/Broken rice	1%	96 "
3. Bran	9%	864 "
4. Husk	24%	2,304 "
	<u>100%</u>	<u>9,600 tonnes</u>
	=====	=====

4.3 Technology & Process:

Technology: Paddy is milled either without boiling or after boiling and drying. Rice obtained by milling raw paddy is termed as 'ATAP' rice while the rice obtained by milling par-boiled paddy is known as par-boiled rice. The people of Bangladesh are by and large in the habit of consuming par-boiled rice. Apart from this par-boiled method of milling has the following advantages over raw milling process :-

- (a) Increased yield of head rice.
- (b) Better storage life.
- (c) Higher retention of nutrition value of rice, i.e. mineral, vitamins etc.
- (d) Bran is obtained as by-product.
- (e) Production can be operated round the year irrespective of weather condition.

There are two types of milling machinery, namely, Rubber Roll-Sheller type and Disc under Rubber Emery Sheller type. The former is more efficient and has added advantages over the later. Par-boiled paddy contains 33-35 percent moisture which can be brought down to 14-15 percent by sun-drying and mechanical drier.

Process:

Process for milling of par-boiled paddy involves mainly the following operations :-

- (a) Cleaning of paddy.
- (b) Soaking and par-boiling.
- (c) Husking/milling.
- (d) Polishing and grading.

(a) Cleaning of paddy:-

Raw paddy is first cleaned through siever and magnetic separator to remove foreign particles and iron parts.

(b) Soaking and par-boiling:

The operation consists of soaking paddy in water and then subjecting it to steam for about 15-20 minutes per bath.

(c) Drying:

The moisture content of par-boiled paddy is around 33-35 percent. This is reduced to about 14-15 percent by mechanical drier.

(d) Husking/milling:

The dried paddy, after being cooled, is husked, i.e. the outer shell is removed in Rubber Roll Sheller from which brown rice and husk are obtained.

(e) Polishing and grading:

Polishing is done in polisher. Cleaned white rice is separated from husk and bran by cyclone separator and then graded and filled in Gunny bags. The flow diagram is presented in Annexure-II.

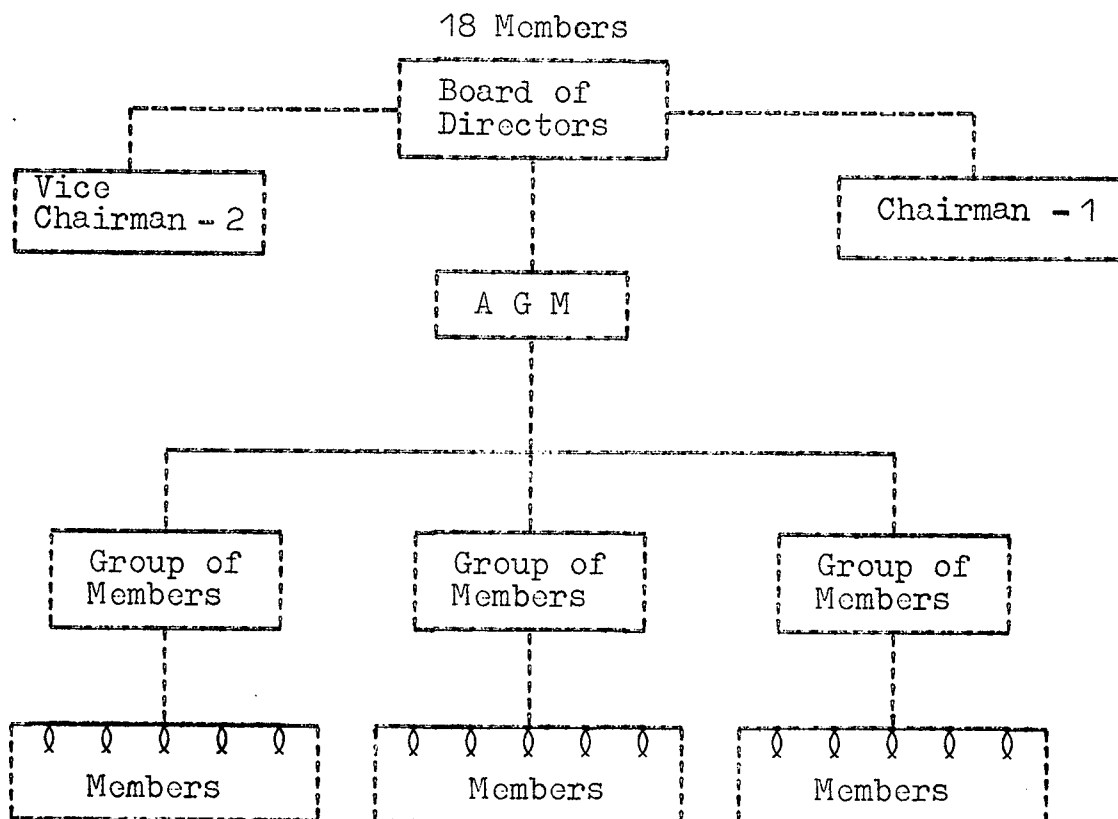
C H A P T E R - 5

ORGANISATION & MANAGEMENT.

5.1 Corporate form of Board of Directors:

Each of the 261 groups of farmers will have one vote in the Annual General Meeting for electing the members of the Board of Directors of the mill. The total number of members of the Board of Directors will be 18 who will again elect from among themselves 1 Chairman & 2 Vice-Chairmen. The Manager of the unit will work as the Secretary to the Board of Directors.

Organisation chart is given below :-



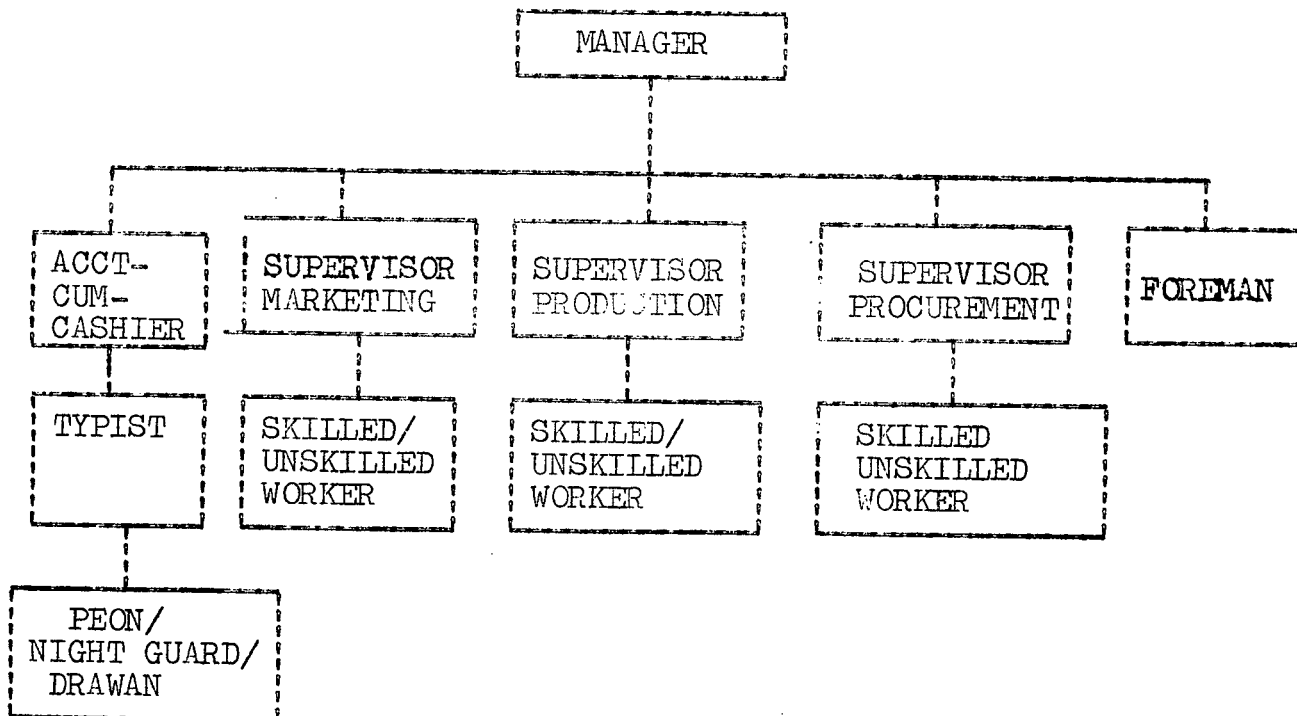
One-third members of the Board of Directors will retire every year & the same number of members will be elected by the AGM.

Note: Retirement of the members after 1st & 2nd year may be determined on the basis of ^{lottery or} number of votes casted in thir favour. The lesser the number of votes the earlier may be the retirement.

The overall management of the mills 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 look after the day to day affairs and other logistic support of the mills. He will be assisted by the staff.

2 Operational Management:

The whole operation of the project will be managed by the following staff under the guidance of the Board of Directors :-



-: 16 :-

(a)	Manager	-	1
(b)	Acctt-cum- Cashier	-	1
(c)	Foreman	-	2
(d)	Supervisor	-	4
(e)	Typist	-	1
(f)	Skilled/ Unskilled worker	-	24
(g)	Peon	-	1
(h)	Night Guard	-	1
(i)	Darwan (Watchman)	-	2
	Total:-		<u>37</u>

Details of qualification, experience and salary is shown in Annexure - VII.

FINANCIAL ANALYSIS

6.1 Details of project cost components:

6.1.1 Land: The cost of land measuring 0.61 ha has been taken to be Tk. 2,75,000/- as per prevailing selling rate around the area. The land will have to be developed upto a height of about 2' and provision has been made for an estimated amount of Taka 40,000/- for the purpose. The location is considered suitable and the area of the land adequate for implementing the proposed project.

6.1.2 Building and Construction:

The construction will include milling house, raw and finished products godowns, par-boiling house, boiler and drying house, office, store and guard room etc. Milling section would be accommodated in a building of 60' x 40' size. The godown for raw materials and finished products will be 3936 sft and the office, store and guard room will be 1440 sft. The cost of the construction including electrification and sanitation is estimated at Tk. 16,61,600/-. Details of the construction with specification has been shown in Annexure - III. About 18 months will be required for completion of construction from the date of opening Letter of Credit (L/C) for imported machinery. Provision for 10% contingency of the cost of construction has been made.

6.1.3 Machinery and Equipments:

Machineries consisting of a rice milling unit having milling capacity of 2 tonnes/hr with par-boiled paddy drier (mechanical), boiler, par-boiling unit etc. will be procured from M/s. Grain Storing and Processing Industries, Calcutta, India the

C&F cost of which is Indian Rs. 15,29,000/- equivalent to Taka 36,70,000/-. Details of machinery have been shown in Annexure-IV.

6.1.4 Technical service & quality control:

The installation of the machinery will be done by the technicians to be provided by the suppliers. Their air ticket and other local expenses will be borne by the Mill. Local technical personnel will be trained up under their guidance. An estimated amount of Tk. 3,74,000/- will be required for erection/installation of the machinery including power connection and above charges. Quality control will be maintained by the local personnel.

6.1.5 Utilities:

(a) Water:- Estimated water requirement is 8,000 gallons per day. The project will need a lifting pump with motor etc. for supply of water from Shallow Tube Well to be sunk at site. One 5,000 gallon capacity overhead water tank and an underground water reservoir of 8,000 gallon capacity will be required (construction cost Tk. 60,000/- and machineries Tk. 40,000/-).

(b) Power:- Connected load will be 105 Kw. The maximum requirement is 95 Kw which will be available from local power supply of Bangladesh Power Development Board through a transformer of 200 KVA to be installed at the factory site. The transformer and substation equipments will be procured from M/s. Albs Engineering Com., Calcutta, India which will cost Indian Rs. 1,92,000/- equivalent to Tk. 4,61,000/-.

(c) Safety provision: Necessary fire fighting equipment will be procured locally for which an amount of Tk. 15,000/- has been estimated.

(d) Spares & Stores and Repairs & maintenance: The cost of spares & stores has been estimated at Tk.10,000/- in the 1st year, Tk. 1,00,000/- in the 2nd year and Tk. 1,25,000/- from 3rd year onwards while for repairs and maintenance the cost has been estimated at 0.5 percent of the cost of machinery and equipments for the 1st 4 years of operation. The cost for maintenance of building will be 0.5 percent of the building cost every year.

6.2 Working capital requirement : Tk. 72,07,000/-
(based on 75% capacity utilisation) Annexure - V.

6.3 Initial total investment : Tk. 1,43,47,000/-
(Annexure - I.)

6.4 Financial Exp. : Tk. 9,45,210/- (Annexure - I)
(Interest during the construction period).

6.5 Construction schedule: The project is expected to be completed and ready for production within 18 months from the date of opening L/C. Detail schedule is given in Annexure - VI.

6.6 Financial Analysis: Details of financial analysis have been shown in Annexure - VIII to XXI.

C H A P T E R - 7

RECOMMENDATIONS

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

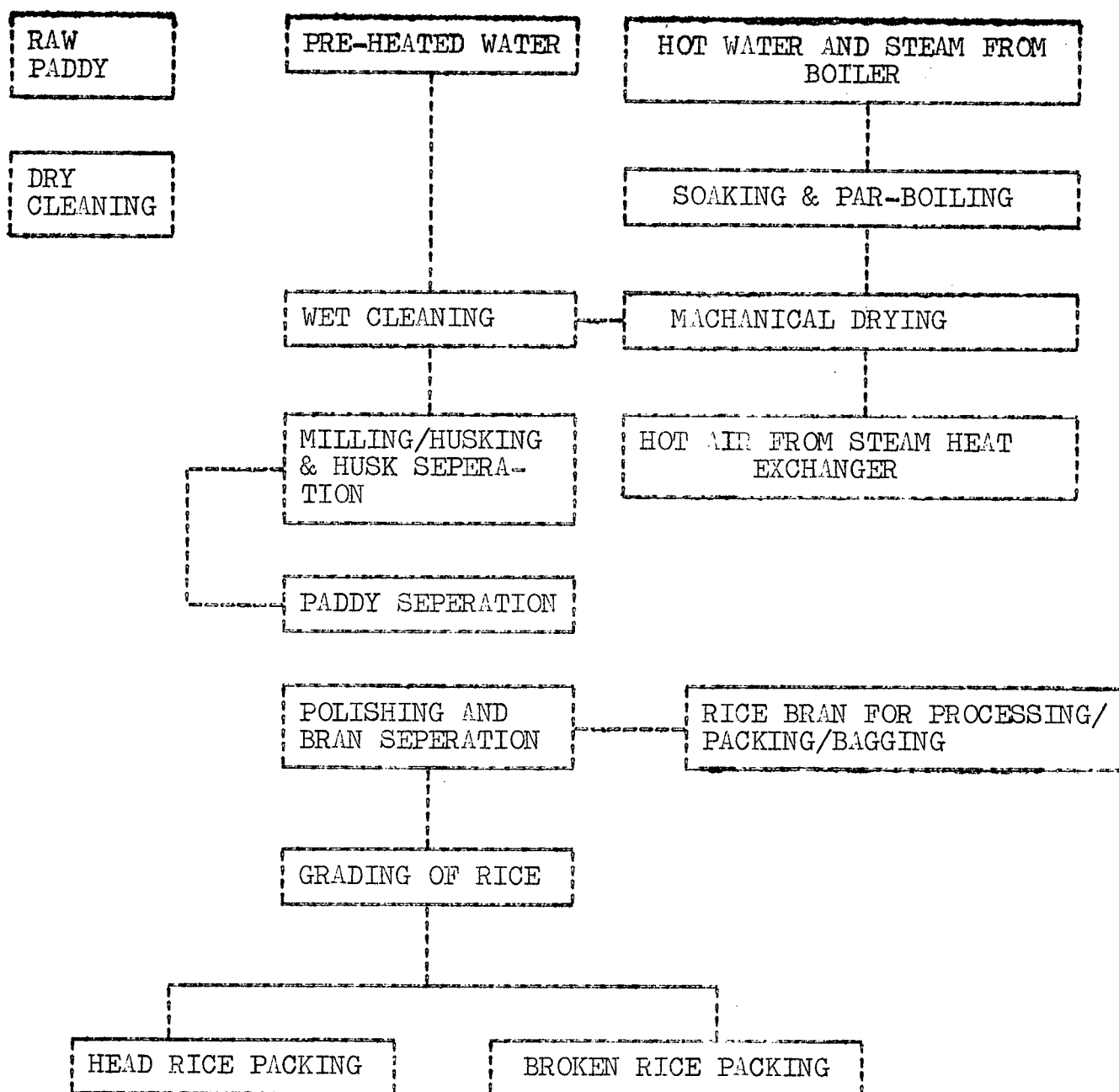
The project, after implementation, will save loss in food grains now being witnessed in the conventional huller units and contribute greatly to the income of the farmer-members.

Therefore, the project may be implemented.

COST OF THE PROJECT

LAND	:	Tk.	3,15,000/-
CIVIL CONSTRUCTIONS (including 10% contingency)	:	Tk.	16,61,000/-
PLANT & MACHINERY	:	Tk.	45,01,000/-
INSTALLATION & ERECTION	:	Tk.	2,00,000/-
POWER CONNECTION	:	Tk.	1,74,000/-
WATER (SHALLOW TUBE WELL + PUMP)	:	Tk.	40,000/-
FURNITURE & FIXTURE	:	Tk.	35,000/-
SAFELY PROVISIONS	:	Tk.	15,000/-
PRE-INVESTMENT EXPENSES (CONS. FEES)	:	Tk.	10,000/-
PRE-OPERATING EXPENSES	:	Tk.	1,89,000/-
TOTAL INITIAL FIXED INVESTMENT:		Tk.	<u>71,40,000/-</u>
WORKING CAPITAL REQUIRED	:	Tk.	<u>72,07,000/-</u>
INITIAL TOTAL INVESTMENT REQUIRED		Tk.	<u>1,43,47,000/-</u>
INTT.DURING THE CONSTRUCTION PERIOD		Tk.	<u>9,45,210/-</u>
TOTAL COST OF PROJECT	:	Tk.	<u>1,52,92,210/-</u> =====

FLOW DIAGRAM OF THE PLANT



Details of Buildings and Construction

Sl. No.	Items	Specification	Size & Area	Rate Tk/sft	Estimated Total cost	Remark
1	2	3	4	5	6	7
1.	Godown	5" brick wall 10"x10" & 15"x15" brick pillar alternately 5' apart C.I. sheet roof over iron truss bitumin floor over c.c. work ceiling height 16'	96'x41'	=3936 sft 150/-	5,90,400/-	
2.	Office, Store & Guard Room	5" brick wall, brick pillar, rcc column C.I. sheet roof over iron truss, brick soiling floor 10' ht.	40'x36'	=1440 sft 120/-	1,72,800/-	
3.	Milling house	10" brick wall, rcc column cc floor plastering, C.I. sheet roof over iron truss, height 22'	60'x40'	=2400 sft 170/-	4,08,000/-	
4.	Par-boiling & Drying house	Lump- sum			50,000/-	
5.	Boiler room with furnace	10" brick wall, rcc column cc floor plastering, C.I. sheet room over iron truss, height 16'	20'x20'	=400 sft 160/-	64,000/-	
6.	Water tank	One 5,000 gallons capacity over head water tank of rcc custer One 8,000 gallons capacity under ground reservoir made of 15" wall with cement plastering	5000 gln. 8000 "		Lump-sum 60,000/-	
7.	Electrical sub-station room	10" brick wall, rcc lintal roof, cc floor height 12'	12'x10'	= 120 sft 170/-	20,400/-	
8.	Boundry Wall	5" brick wall with 10"x10" pillar & 7' height	1000 rft	70/-	70,000/-	
9.	Toilet	Lump - sum			5,000/-	
10.	Electrification and sanitation	Lump - sum			50,000/-	
11.	Other Renovation works	Lump - sump			20,000/-	
					15,10,600/-	
		10% contingency		=	1,51,000/-	
				Total=	16,61,600/-	

List of Machinery & Equipment to be imported

Name & address of suppliers: M/s. Grain Storing & Processing Industry,
29, Stand Road, Calcutta, India.

Sl. No.	Name & Major specification of machine / equipment.	No. of unit required	Unit price in F/C	Total cost in F/C
1	2	3	4	5
1.	<u>Pre-cleaner unit:</u> Pre-cleaner unit 3/3½ ton capacity per hr to clean raw paddy complete with wooden Elevator with 6" bucket & 7" belting chalna, dust blowing fan, steel super structure 5 H.P. motor starter & mains.	1	I.Rs.40,000	I.Rs.40,000
2.	<u>Par-boiling plant:</u> Automatic par-boiling plant pressure par-boiling cum soaking type 2 ton capacity per hr. complete with 3 Nos. par-boiling tanks(each tank 4 ton capacity) 2 Nos x 2½ centrifugal pump, overhead paddy storage bucket, steel casing elevator hot water tank and its steel superstitution 2 Nos Motors (8.H.P.) starters and main switches.	1	" 1,98,000	" 1,98,000
3.	<u>Dryer Plant:</u> Automatic par-boiling paddy dryer plant (2 ton par hr.) complete with elevator with 10" Coveyor 9" bucket, drying chamber, holding bin big fan ductin, heat-exchangor; steel super structure including total 24 H.P. Motor starter and main switches.	1	" 2,55,000	" 2,55,000
4.	<u>Rice Milling Plant:</u> Rice milling plant (2 ton capacity) per milling hr.complete with rubber Roll, Steel paddy cleaning chalna, Paddy seperator, husk seperator, 2 No. 40" Polisher with Cooling fan aspirator, elevator, steel and complete with 7 Nos. Motors (total 60/67 H.P.) starters and main switches.	1	" 3,10,000	" 3,10,000

1	2	3	4	5
5.	<u>Husk handling equipment:</u> Automatic husk disposal equipment complete husk with cyclone fan, pipe line, drying unit handling and its steel structure including 5 HP Motor starter & main switches.	1	I.Rs.40,000	I.Rs.40,000
6.	<u>Husk Furnace & Boiler Accessories:</u> Supply of all C.I. Husk furnace material M.S. furnace door, husk feeding valve, elevator feeding hopper, feed valve, fan, steam coaster lining - valve etc.	1	" 1,46,000	" 1,46,000
7.	<u>Boiler</u> Tex maco make new boiler of 7' dia & 19' length having 700 rating with 150 Psi, suitable for above par-boiling and drier plant with steam heat - exchangor.	1	" 4,19,000	" 4,19,000
8.	Spare parts for the above units except boiler	1	" 1,21,000	" 1,21,000
			I.Rs. 15,29,000	
			=====	
	# <u>Equivalent to BD Tk.36,70,000/-</u>			<i>Take 36,70,000</i>

Working Capital (Based on 1st year)75% capacity utilisation:

Inventories	- 45 days	=	Tk. 70,47,000/-
a) Raw materials	- 30 days		
b) Work in process	- 5 "		
c) Finished products	-10 "		
Salaries & Wages	- 1 month	=	Tk. 51,300/-
Power & Fuel	- 1 month	=	Tk. 70,000/-
Other expenses	- 1 month	=	Tk. 38,700/-
			<u>Tk. 72,07,000/-</u>
			=====

ANNEXURE - VI.Project construction time

1. Land acquisition	=	2nd month
2. Site development start	=	2nd month
3. Site development complete	=	3rd month
4. Building construction start	=	3rd month
5. 50% " complete	=	8th month
6. 100% " complete	=	14th month
7. Establishment of L/C	=	1st month
8. Arrival of machinery at port	=	10th month
9. Arrival of machinery at site	=	10th - 15th month
10. Machinery installation complete	=	15th month
11. Electrification & Sanitation complete	=	15 - 16th month
12. Unforeseen delay upto	=	17th month
13. Trial Run	=	17th month
14. Normal operation started	=	18th month

Managerial, Technical & Labour:

<u>Category</u>	<u>Qualification</u>	<u>Number</u>
<u>A. Managerial/Administrative:</u>		
Manager (Production & Marketing).	Degree in Mechanical Engineering with 5 years experience or Diploma in Mechanical Engineering with 10 years experience.	1
Accountant-cum-Cashier.	B. Com (2nd class) with 5 years experience.	1
Typist-cum-clerk	H.S.C.(2nd Division) with typing speed of 50 W.P.M. in English & 30 W.P.M. in Bengali.	1
Peon	Class - VIII (Passed)	1
<u>B. Technical:</u>		
Foreman	S.S.C. with 2 years experience	2
Supervisor	--do--	4
Skilled Labour	Class VIII with experience	8
<u>C. Labour:</u>		
Un-skilled labour	-----	16
Night Guard	-----	2
Gate Keeper/Darwan	-----	1
		----- 37 -----

Calculation of sale proceeds
(1st year - 75% of rated capacity)

Head Rice	-	66%	=	4752 x 9625	=	4,57,38,000
Broken Rice	-	1%	=	72 x 4540	=	3,26,880
Bran	-	9%	=	648] x 3000	=
Husk	-	24%	=	1728		
						<u>71,28,800</u>
						<u>5,31,93,680</u>
						=====

(2nd year - 85% of rated capacity)

Head Rice	-	66%	=	5386 x 9625	=	5,18,40,250
Broken Rice	-	1%	=	81 x 4540	=	3,67,740
Bran	-	9%	=	735] x 3000	=
Husk	-	24%	=	1958		
						<u>80,79,000</u>
						<u>6,02,86,990</u>
						=====

(3rd year & onward - 95% of rated capacity)

Head Rice	-	66%	=	6020 x 9625	=	5,79,42,500
Broken Rice	-	1%	=	91 x 4540	=	4,13,140
Bran	-	9%	=	821] x 3000	=
Husk	-	24%	=	2188		
						<u>90,27,000</u>
						<u>6,73,82,640</u>
						=====

Raw Materials Requirement

(1st year - 75% of rated capacity = 7,200 tonnes)

Cost of Paddy	=	7200 tons	x	6325	=	4,55,40,000
Carrying cost	=	7200 "	x	100	=	7,20,000
Commission to group leaders	=	7200 "	x	100	=	7,20,000
						<u>4,69,80,000</u>
						=====

(2nd year - 85% of rated capacity = 8160 tonnes)

Cost of Paddy	=	8160 tons	x	6325	=	5,16,12,000
Carrying cost	=	8160 "	x	100	=	8,16,000
Commission to group leaders	=	8160 "	x	100	=	8,16,000
						<u>5,32,44,000</u>
						=====

(3rd year & onward - 95% of rated capacity = 9120 tonnes)

Cost of Paddy	=	9120 tons	x	6325	=	5,76,74,000
Carrying cost	=	9120 "	x	100	=	9,12,000
Commission to group leaders	=	9120 "	x	100	=	9,12,000
						<u>5,94,98,000</u>
						=====

ANNEXURE - X

D E P R E C I A T I O N

<u>Assets</u>	<u>Value</u>	<u>Rate</u>	<u>Depreciation</u>
Building	16,61,000	2.5%	41,525
Machinery	47,01,000	10%	4,70,100
Logistics etc.	4,63,000	10%	46,300
			<u>5,57,925</u>
<u>Salvage Value:</u>			
Working capital	- (100%)	=	72,07,000
Land	- (100%)	=	3,15,000
Buildings	- (62.5%)	=	10,38,125
			<u>85,60,125</u>

THE COST OF SALES

Particulars	Year - 1	Year - 2	Year - 3	Year - 4
Direct Raw Materials	4,69,80,000	5,32,44,000	5,94,98,000	5,94,98,000
Wages	4,17,600	4,38,480	4,60,404	4,83,424
Stores & Spares	10,000	1,00,000	1,25,000	1,25,000
Power & fuel	8,36,800	8,78,640	9,22,571	9,22,571
Repairs & Maintenance	30,000	40,000	50,000	50,000
Rent & Insurance	60,000	60,000	60,000	60,000
Salaries	1,98,000	2,07,900	2,18,300	2,29,215
Administration exp.	93,800	97,725	1,02,300	1,03,400
Selling expenses	9,68,000	10,96,000	12,24,000	12,24,000
Misc. expenses	7,500	7,500	7,500	7,500
Depreciation	5,57,925	5,57,925	5,57,925	5,57,925
Interest	19,72,600	11,89,600	10,59,200	9,28,800
	<u>5,21,32,225</u>	<u>5,79,17,770</u>	<u>6,42,85,200</u>	<u>6,41,89,835</u>

Income Statement

Particulars	Year - 1	Year - 2	Year - 3	Year - 4
Sales proceeds	5,31,93,680	6,02,86,990	6,73,82,640	6,73,82,640
Less: Cost of goods sold.	4,88,92,325	5,53,19,045	6,16,73,900	6,16,96,920
Gross Profit	43,01,355	49,67,945	57,08,740	56,85,720
Less: Administrative & selling exp.	12,67,300	14,09,125	15,52,100	15,64,115
Operating profit(EBIT)	30,34,055	35,58,820	41,56,640	41,21,605
Less: Interest	19,72,600	11,89,600	10,59,200	9,28,800
Net Profit before tax	10,61,455	23,69,220	30,97,440	31,92,805
Less: Tax	---	---	---	---
Net Profit	10,61,455	23,69,220	30,97,440	31,92,805

Ratios: %

a) Gross profit to sales	8.08	8.24	8.47	8.43
b) Operating profit margin	5.70	5.90	6.16	6.11
c) Net profit to sales	2.00	3.92	4.59	4.73
d) Return on capital	21.1	24.3	29.0	28.7
e) Return on equity	21.1	47.2	61.7	63.6

Calculation of net present value

Year	Net cash flow	Discount factor at 14%	Net present value
0	- 71,40,000	1	- 71,40,000
1	- 36,15,020	.8772	- 31,71,095
2	41,16,745	.7695	31,67,835
3	47,14,565	.6750	31,82,331
4-15	46,79,530	3.8206	1,78,78,612
16	86,60,125	.1229	10,64,329
			<u>1,49,82,012</u>

ANNEXURE - XIV

Calculation of pay back period

<u>Cash Flow</u>			
1st year	- Tk. 35,91,980	Total cash flow	- 1,52,92,210
2nd year	- Tk. 41,16,745	3 years "	"(-) 1,24,23,290
3rd year	- Tk. 47,14,565	4th year	28,68,920
			<u>=====</u>
			Tk. 1,24,23,290
4th year	- Tk. 46,79,530		

That is, pay back period is 3 years 7 months.

Calculation of Internal rate of Return

Year	Net cash flow	Discount factor at 34%	Net present value	Discount factor at 35%	Net present value
0	- 71,40,000	1	- 71,40,000	1	- 71,40,000
1	- 36,15,020	.7462	- 26,97,528	.7407	- 26,77,645
2	41,16,745	.5571	22,93,439	.5486	22,58,446
3	47,14,565	.4156	19,59,373	.4064	19,15,999
4-15	46,79,530	1.1854	55,47,115	1.1179	52,31,246
16	86,60,125	.009	77,941	.0082	71,013
			40,340		- 3,40,941

$$\begin{aligned}
 \text{IRR} &= 34 + \frac{40340}{40340 + 3,40,941} \times 1 \\
 &= 34 + \frac{40340}{3,81,281} \\
 &= 34.10\%
 \end{aligned}$$

ANNEXURE - XVI

Break - Even Analysis

Sales		Tk. 6,73,82,640
<u>Variable costs</u>		
Raw materials	- 5,94,98,000	
Wages	- 4,83,424	
Stores & Spares	- 1,25,000	
Power & Fuel	- 9,22,571	
Repairs & Maintenance	<u>50,000</u>	Tk. 6,10,78,995
		<u>Tk. 63,03,645</u>
<u>Fixed costs:</u>		
Salaries	- 2,29,215	
Rent & insurance	- 60,000	
Administration exp.	- 1,03,400	
Misc. expenses	- 7,500	
Depreciation	- 5,57,920	
Intt. on loan	- <u>19,72,600</u>	Tk. 29,30,635

-: 35 :-

$$\begin{aligned} \text{Break Even pint} &= \frac{\text{Fixed cost}}{\text{Sales} - \text{variable cost}} \\ &= \frac{29,30,635}{63,03,045} = 46.49\% \end{aligned}$$

$$\begin{aligned} \text{Break Even sales} &= \frac{\text{Fixed cost}}{\frac{\text{Sales} - \text{Variable cost}}{\text{Sales}}} \\ &= \frac{29,30,635}{.0935} = \text{Tk. } 3,13,43,689 \end{aligned}$$

of ANNEXURE - XVII
Calculation/Debt - Service Coverage Ratio

Particulars	Year - 1	Year - 2	Year - 3	Year -4
Net profit	10,61,455	23,69,220	30,97,440	31,92,805
Add: Interest	19,72,600	11,89,600	10,59,200	9,28,800
" Depreciation	5,57,925	5,57,925	5,57,925	5,57,925
Total:-	35,91,980	41,16,745	47,14,565	46,79,530
Instalment to be paid yearly	9,32,600	9,32,600	9,32,600	9,32,600
Add: Interest	19,72,600	11,89,600	10,59,200	9,28,800
Total:-	29,05,200	21,22,200	19,91,800	18,61,400
Debt - Service (Fixed charges) Coverage Ratio (Times)	1.23	1.93	2.36	2.51

PROJECTED BALANCE SHEET

Particulars	Construction period	Year - 1	Year - 2	Year - 3	Year - 4
<u>ASSETS:</u>					
<u>Current Assets:</u>					
Cash	---	8,77,143	8,57,851	9,47,792	10,52,033
Inventory	---	70,47,000	70,47,000	70,47,000	70,47,000
Total current assets:	---	79,24,143	79,04,851	79,94,792	80,99,038
<u>Fixed Assets:</u>					
Cost	71,40,000	71,40,000	65,82,075	60,24,150	54,66,225
Depreciation (accumulated)	---	5,57,925	5,57,925	5,57,925	5,57,925
Net value	71,40,000	65,82,075	60,24,150	54,66,225	49,08,300
TOTAL ASSETS:	71,40,000	1,45,06,218	1,39,29,001	1,34,61,017	1,30,07,338
=====					
<u>EQUITY & LIABILITY:</u>					
Current liability	---	---	---	---	---
Longterm "	46,41,000	93,26,000	83,93,400	74,60,800	65,28,200
TOTAL LIABILITY:	46,41,000	93,26,000	83,93,400	74,60,800	65,28,200
=====					
Equity	24,99,000	51,80,218	55,35,601	60,00,217	64,79,138
Net equity	24,99,000	51,80,218	55,35,601	60,00,217	64,79,138
TOTAL EQUITY & LIABILITY	71,40,000	1,45,06,218	1,39,29,001	1,34,61,017	1,30,07,338
=====					

Repayment of loan and payment of interest:

Loan will be repaid in 20 half-yearly instalments. The individual instalments will be rounded up to the nearest thousand and the fractional amount will be adjusted in the last instalment. Instalment thus calculated comes to Tk. 9,32,600/-.

Interest accrued during the construction period will be paid in equal instalments with the loan instalments and usual interest to be accrued from time to time.

Profit Distribution:

15% of the net profit will be kept as reserve fund, 12% will be distributed as dividend and the rest 73% will be distributed as bonus to the farmer-members in accordance with the quantum of paddy supplied by them.

Accordingly bonus per tonne of paddy is calculated as follows :-

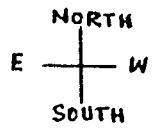
<u>1st year</u>	<u>2nd year</u>	<u>3rd year</u>	<u>4th year</u>
Tk.108/-	Tk.211/-	Tk.248/-	Tk.256/-

Value addition (per tonne of paddy):

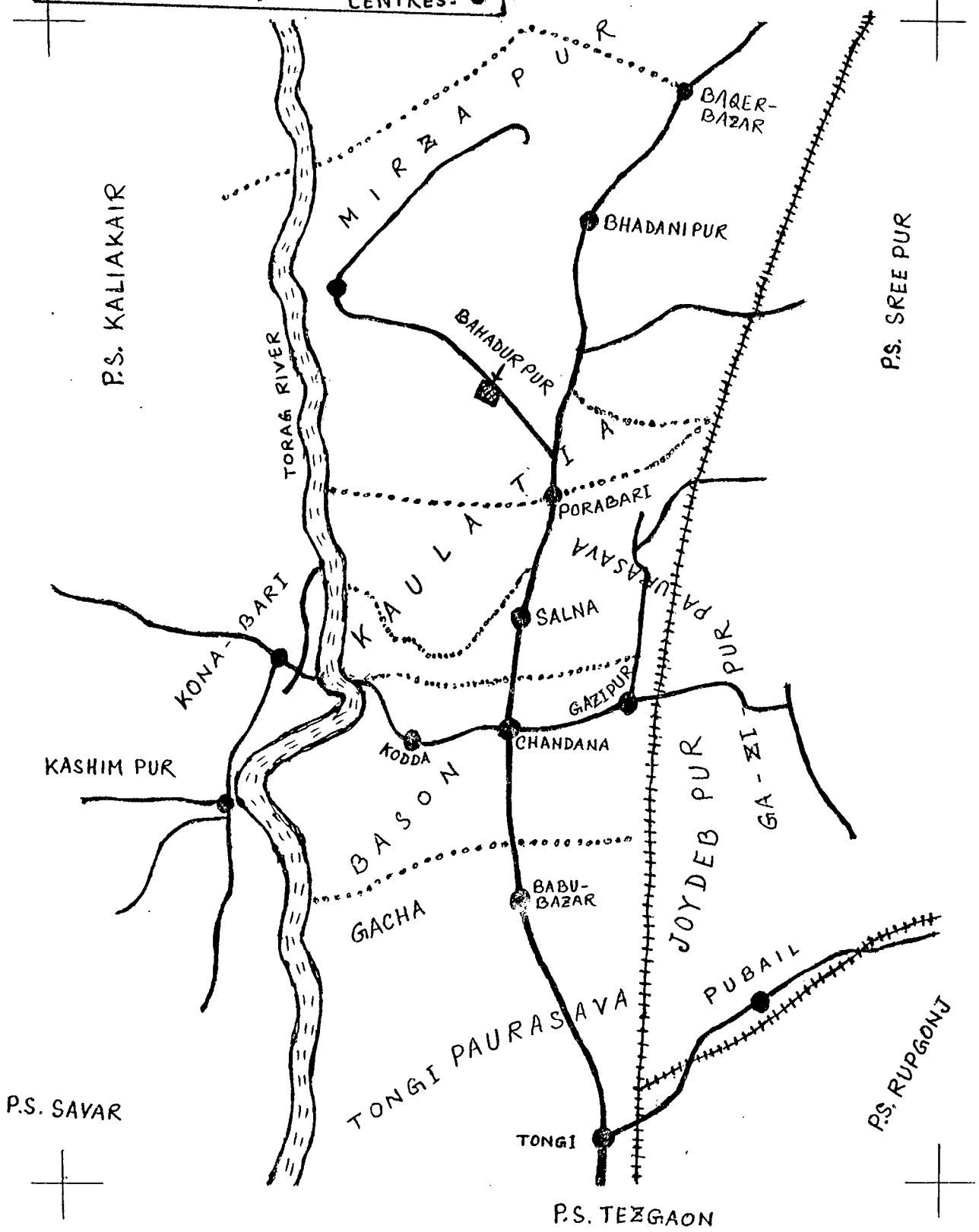
<u>1st year</u>	<u>2nd year</u>	<u>3rd year</u>	<u>4th year</u>
Tk.863/-	Tk.863.11	Tk.864.54	Tk.864.54

GAZIPUR SADAR UPAZILA.
DIST. GAZIPUR.

REFERENCES:-	
1. PUCCA ROADS :-	—————
2. KUTCHA " :-
3. RAILWAY :-	+++++
4. RIVER :-	~~~~~
5. PROJECT-SITE :-	▣
6. MARKET-CENTRES :-	●



SCALE:- 1" = 2 1/2 MILES



Second ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia

NEW DELHI, BANGKOK, TOKYO, SEOUL

October 26, 1987—May 10, 1988

Project Prepared During Home Country Assignment

Project Title : Integrated Chicken Breeding Farm

Country : China

Prepared by : He Lanchai

Funded by the Government of Japan

and

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

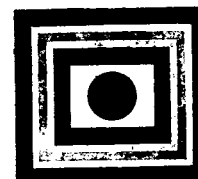
ICA Management Training Project for Agricultural Cooperatives in Asia



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CHAPTER ONE

SUMMARY

1.1 The project of "Integrated Chicken Breeding Farm" is located in Sanhe County of Hebei Province, about 50 Kms to the east of Beijing and will be implemented by Sanhe County Supply and Marketing Cooperative Union.

1.2 The project will provide chicken raising farmers with forward and backward integrated systems by supplying inputs such as young chicks and chicken feedstuffs and organizing better marketing opportunities. The final products will be marketed to Beijing under the contracts signed between Sanhe County Cooperative Union and Beijing Food Company through the cooperative society.

1.3 The project will have 6000 egg laying breeders and 4000 broiler breeders to provide 792000 young chicks to the farmers for egg and meat production. A chicken feed plant with a daily capacity of 120 tons will be set up in order to assure the supply of chicken feed at favourable price for the farmers. In the third year, a slaughtering house will be built as a follow-up project with a capacity of slaughtering 3000 broilers and 500 pigs per day. As a consequence, the farmers' income will raise from 540 to 840 yuan, an increase of 64%.

Increase calculated on both chicken + pig?

1.4 At present, greater demand of chicken meat and eggs is over than supply because of high production cost resulted from unreasonable prices. Being located nearby Beijing, Sanhe County has some responsibilities to supply the above products to the Beijing market.

But nowadays, there are only 900000 laying hens on land being raised by 72000 households which is the total number household living in this area. At average, the egg production per household per year is 50 Kgs that is just enough for self consumption. This project is set up at such a time and surely will get support from the governments.

1.5 The total investment will be 4.63 million yuan (1 US dollar = 3.72 yuan) consisting members' share capital, contribution from the overhead cooperative organizations and loans from the banks for purchasing land, construction and facilities.

The total cost will be met by the followings:

Sources	Amount	(Yuan in 000)
Members' share capital as equity	634	
contribution from Provincial and national cooperative federations	1000	
Medium term loans from the Agricultural Banks	3000	
Total	4634	

1.6 The construction for the two units(the hatchery and chicken feed processing plant) will take two years. Initially , the project will operate at 50% of the capacity for one year and will reach 100% from the second year to tenth year. In the second or third year of the operation, a slaughtering house will be constructed for processing boilers collected from the chicken raising farmers. Ten years after, the whole project may need to expand further more.

1.7 According to the financial analysis, the benefit cost ratio will be **1.424 %**.

The profit of the project before tax will be ^{1286.59} yuan.

The B/P will be **23%**.

1.8 The Sanhe County Cooperative Union will hold a member meeting to discuss about these plans and from the meeting, a Management Committee will be organized if it is approved. The Management Committee will appoint some persons who have rich experiences to be executive managers for this project.

1.9 The implementation of the project will supplement the market supply for eggs and chickens with 8.4 million KGs and 480 tons respectively every year. The benefits gained by the farmers will encourage them towards commodity production as well as increase their net income by about 65%.

CHAPTER TWO

BACKGROUND

2.1 Sanhe County covers 24 communities with total population of 330000, out which 30000 with 80000 households are engaged in agriculture (see table 2.1). The total cultivated land area is about 5000000 mu (one hectre =15). Wheat, maize, grams and cotton are the major crops grown in this area. The annual average production output is around 190.65 million KGs (see table 2.2). The annual average income per capita is about 540 yuan (see table 2.3). It is ranked as middle-lower level area as far as income is concerned.

2.2 For diversified economy, poultry raising is a main income earner for the farmers, but it is a small production scale. The amount of pigs and chickens on hand in the whole area is about 215000 and 900000 heads respectively which produce 9409 tons of pork, 106 tons of chicken meat and 3884 tons of eggs (see table 2.4). After the local consumption, there are little marketable products. The main reasons for small production are resulted from the following problems faced by the farmers:

1). Lack of funds. At present, the farmers have a few chickens on hand raised in a scatter manner. If they expand the poultry production, they need some facilities and chicken feeds as initial investment. But it is very difficult for them to get financial resources from banks because there is no reliable guarantee.

2). Lack of technical knowledge. Nowadays, these farmers who have special education or technical skills can find technical jobs or engage in business in towns or cities for better income. So most

of the farmers who are working in the fields have little education, but chicken raising needs technical know-how and management education.

3). High cost. The price of chicken feeds particularly concentrated feeds in the open market is about 0.80 yuan/KG. One egg laying hen consumes about 40 KGs of concentrated feeds in the whole life and lays about 12 KGs of eggs. The price of one KG of eggs is 3.00 yuan. Sometimes even lower. So it is quite clear to see that the production cost for scattering raising is too high.

4). Market price is not stable. The price for such products always changes in the variable seasons. Between April and October, the egg laying season, the price of eggs are always going down and sometimes dropped too low to cover the cost.

Because of the above mentioned problems, the farmers don't want to raise large number chickens. Instead, they just do it for self-consumption or pocket money. So now, the income of the most the farmers is only combined to the crops. While in the market as a whole, the egg and chicken supply is highly demanded. Therefore, the development of these products is badly urgent.

2.3 It is important that an organized marketing systems for chicken raising households shall be developed so that the raising farmers can be assured of reliable young chicks, high quality feeds, necessary services and market of products at favourable prices. Furthermore, such a project can provide the members with backward and forward linkages to increase their income. Hence, the Sanhe County Cooperative Union feels necessary to take a chance for the project with objectives of decreasing the farmers' production cost and increasing their income.

2.4 To develop this project, the priorities in this area are as the

followings:

1). Maiz, the main ingredients for making chicken feeds, is one of the major crops with annual output of 100 million KGs. For one million of chickens, a task given by the local government, will consume 2.5 million KGs. So the raw materials for feeding is self-sufficient within the area.

2). As it is mentioned before, there are 300000 farmers in this area with average cultivated land of about 1.75 mu per person. It means that there are enough surplus labour forces who can be organized with technical and materials supplies and training chances.

3). The investment is low. Some available conditions can be put into use. almost in every farmer's home, there is an old house which is no longer used by the family members, but can be utilized for chicken raising. If one household has 200-500 chickens, it doesn't need to build a special house. They just repair it with a very little cost. Besides, the farmers have feeding materials such as maiz and wheat-bran. They only buy some concentrated feeds made of maiz, bean-cakes, fish or bone powder, animal fat and mineral elements.

4). Chicken raising business can make quick benefits. Broilers will grow 2 KGs as a standardized weight in 56 days. While laying hens will lay eggs at age of 140 days. One chicken produces 33 KGs of dry waste. It is a kind of high quality fertilizer for manuring the fields. So we can see from the above, this area is very favourable for the development of this project.

2.5 Except the priorities among the farmers in the area, there are some advances in the cooperative organizations and personal resources as well as environmental conditions that can be summed up in to the

followings:

1). The land for this project is already available, totalling about 70 mu. In the Cooperative Union, there are one deputy Manager and two technicians who have worked on the chicken raising guidance and consultancy and training work for many years. They have gained some experience and like to contribute more for this project.

2). The local government shows great interests and concern to the project. So far, they promised to pay the interest rate for the loans to the cooperative project. The local government also agrees to help the project form a poultry medical team according to the agreement signed between the two sides.

2.6 During the implementation of the project, the income of the farmers members can be increased through the integrated linkages of the chicken breeding project.

MANAGED PROJECT
PROJECT

3.1 Objectives of the project

The objectives of the project is to increase net income of the farmers through integrated marketing systems as the followings:

- 1). To provide technical and managerial guidance, in addition supply such as credit, raw materials and facilities.
- 2). To provide reliable chicks and high quality feedstuffs for maximum production.
- 3). To assure stable and good market opportunities for the products and protect the members' interests.
- 4). To provide extension services in order to reduce the raising cost to a minimum limitation for the farmers.
- 5). To motivate the members to actively participate in the cooperative activities.

3.2 Area of operation

The project is located about 3 kms away from the headquarters of Jiamne County Cooperative Union. The project work will provide young chicks and feeds to the chicken raising members in 100 villages and 8 estate farms of primary cooperative societies.

The project areas are located along the road extending from Beijing to Harbin, a big city in the northeast of China and to the south, there is a railway line linking Beijing and Yinkang Island, one of the free economic zones in the southwest of China. These conditions will contribute so much convenience for the transportation and market for the project. The distance between the villages and the project area is about two kms.

3.3 Project Components

The project will consist of the following components:

1). A Chicken Hatchery with 6000 egg laying breeders and 4000 broiler breeders. By the artificial incubation as the breeding method for both kinds of chickens, the yearly hatching capacity will be 304500 chicks in the first trial year and will reach 729000 when the operation rate is 100%. It will cover an area of about 30 mu. The estimation of the investment cost is 1.38 million yuan. (See table 3.1)

2). A Chicken Feed Processing Plant. The daily processing capacity is 120 tons. The raw materials are maiz, fish or bone powder, wheat bran, bean-cakes and vitamins. The formula of the products looks like the followings

Ingredients	Content %	Cost/100gms (yuan)	Content Cost (yan)
Maiz	40	36.00	14.00
Wheat bran	30	40.00	12.00
bean cake	25	80.00	20.00
fish meal	4	260.00	10.40
Mineral Element	1	3.00	0.03
Total	100		56.83

Raw materials cost fo feed is 56.83 yuan / 100 kgs. The estimated investment cost is 3228650 yuan (See table 3.1).

3). At the second or third year of the project operation, a slaughtering house with processing capacity 500 pigs and 3000 chickens per day will be built. But before this construction, the broilers raised by the members will be sent to Beijing Food Company according to the contracts.

CHAPTER FOUR

DETAILS OF PROJECT OPERATION

4.1 Chicken Breeding Hatchery

1). Implementation: The project will be implemented by Sanku County Cooperative Union (the lay-out is shown in chart 1). The main tasks of the project are to provide the chicken raising households with backward linkages—broiler chicks and egg laying hen chicks, extension services and transportation conveniences. Now, 600 special households have been chosen among the farmers and 8 chicken farms are under construction as primary cooperative societies.

The minimum chickens on hand will be available

Number of Households	Quantity of Chickens	Amount Total
400	200	80000
200	400	80000
8 (Chicken farms)	40000	320000
Total		480000

Now, Sanku Cooperative Union has signed contracts with some farmers. The contracts describes the quality of chicks and chicken feeds that the cooperative shall execute and the quality of the products especially broilers that the chicken raising farmers shall follow. The chickens provided by the cooperative hatchery shall be healthy and the fecundity rate of the egg laying hens shall be more than 95%. The chicken feed shall be processed according to the fixed composition scientifically. The eggs and broilers from the farmers shall be standardized.

2). Capacity: As it is mentioned earlier, the project will

have 6000 egg laying breeders and 4000 broilers breeders.

a). 6000 egg laying breeders:

Egg production is 4000 pieces per day. The Survival rate is 70 % and sex rate is 50 %. The incubation period is 21 days. So the annual female chick production will be 504,000 (4000 * 360 * 70% * 50%) for 360 working days. The selling price for one chick is 1.40 yuan. The male chick production is also 504,000 sold at unit price of 0.10 yuan.

b). 4000 broiler breeders:

Egg production is 2000 pieces per day. The survival rate is 40% and the incubation period is 21 days. So the annual chick production will be 288,000 sold at 2.40 yuan per head.

With the supply of 504,000 egg laying chicks and 288,000 broiler chicks, the output of egg production and chicken meat production yearly will be more than 5040000 kgs and 575,000 kgs respectively.

In 5 years, the annual egg production will reach 15 million kgs.

3). Marketing and Requirement of Technology:

Young chickens are mainly supplied to the special members and cooperative chicken farms at favorable price. With the forward linkages the cooperative will collect eggs and broilers and send these products to the Beijing market. The transportation cost will be born by the cooperative unit. The prices for the products are 20% higher than the open market.

In order to assure the maximum level of chick survival rate and good quality of inputs, techniques in the processing shall be well executed. The process is simple but needs precise operation techniques and high standard careness. The Hatchery machines include 6 hatchers.

Each one will contain 10,000 eggs.

By the standard feeding method and with the feed provided by the feed processing plant, the broilers will grow 2 kgs minimum weight for the market chickens within 56 days and hens will start laying eggs from 140 days. One hen will produce 140 pieces of eggs, equivalent to 10 kgs. The cooperative will send transportation means to collect eggs and broilers from every household regularly and send to the Beijing market according to the contract. The payment is done once a month. The prices can be seen in the below: (Price in yuan)

Product	open price	Contracted price
Egg	2.60-3.50	3.00-3.40
Broiler	3.0	3.40

4). Processing:

The eggs for both kinds will be bought from Beijing Breeding Farm that is especially engaged in chicken breeding business by importing eggs from Italy. The buying price is 3.00 yuan per egg. Later on, the chickens are regarded as breeders. Initially, for 10,000 breeders, 25,000 eggs are needed.

a). First, the hatching containers are cleanly washed and dried. Then the eggs are placed into hatching containers and the temperature and moisture inside are kept around 30°C and 98% respectively. The hatching process takes 21 days. During the process, inspection shall be conducted to look after the machines, the temperature and moisture as well as the development inside the containers. After chicks are hatched, the male and female chicks are identified within 24 hours.

b). Out of the 25,000 eggs (Survival rate is 80% and sex ratio is 50%), 10,000 will be female chicks. After 36 hours, they began to be fed with high quality feedstuffs. Normally, they start to lay eggs

from the 140th day. The total egg production for these egg laying breeders will be 4,000 pieces and 2,000 pieces by the broiler breeders per day.

c). About 7 months later, large scale hatching production can start with capacity of hatching 150,000 eggs per incubation period. The hatching process is the same as it is described earlier. As soon as the male and female chicks are separated, they are ready to deliver to the chicken raising farmers who are informed to come to the farm at the fixed time. The delivery price can be seen from the followings:

Item	Delivery price (yuan/head)
Egg Laying Hen Chick	1.40
Broiler Chick	2.40
Male Chick	0.10

d). Operation Period : For hatching process, it takes 21 days per period. But normally 2-5 days more are needed to clean and inspect the equipment. During the first year of the operation, production rate is 50%. There will be 7 times of hatching with the output of about 245,000 egg laying hen chicks and 240,000 broiler chicks and 245,000 male chicks. The sale revenue from this year will be 703,000 yuan. The operation rate will be 100% at the second year and there will be 14 periods of hatching. The yearly output will be 490,000 laying hen chicks and 290,000 broiler chicks as well as 490,000 male chicks. The sale revenue will reach about 1.407 million yuan.

4.2 Chicken Feed processing:

1). Location and Capacity:

The chicken feed processing plant will be located 2 kms from the chicken hatchery. The site is chosen with a consideration of the transportation convenience for the farmers who come to the project

to get chicks and feeds at the same time and of the separation of these two units so that the hatchery unit can be kept cleanly (the layout of the plant can be seen in the chart 2). It will cover an area of 40 ha with building area of 1000m² and 1,000 m² as outdoors.

Based on the amount of the chickens that are required to raise its capacity of the plant shall be 120 tons per day when the operation rate reaches 100%. But in the first year, its operation is only around 50%. So the estimated production per day will be nearly 60 tons. According to the plans, the construction shall be completed in two years.

2). Raw Materials and Marketing:

The raw materials for making chicken feeds are maize, wheat bran, bean-cake, fish or bone meal and mineral elements. Maize is obtained from the both government--grain procurement station and the cooperative members. The rest of the ingredients are bought from the market.

Composition and Price of the raw materials

Ingredient	Percentage (%)	Buying Price (Yuan/100kg)
Maize	40	36.00
Wheat bran	30	40.00
Bean-cake	25	80.00
Fish or Bone Meal	4	260.00
Mineral Element	1	3.00
Total	100	

According to the percentage of the ingredients and prices, the estimated price for finished products is 56.33yuan per 100 kgs of raw materials. The amount of required raw materials for the annual capacity of 43,200 tons will be seen in the below based on 360 working days:

Raw Material	Required Quantity (ton)	Required Cost (yuan in 000)
Maiz	17280	6220.8
Wheat bran	12960	5184
Bean-cake	10800	8640
Fish Meal	1728	4492.8
Mineral Element	432	12.96
Total	43200	24.55 million

The feed product will be sold to the chicken raising farmers at the price of 700 yuan per ton which is 100 yuan lower than the free market. If the farmers have no money at the time of buying, the payment can be done 3 months later.

3) Processing:

a). Grinding and Mixing

The raw materials such as maiz and bean cake are ground into fine powder and then are fed into a stirring container for mixing together with wheat bran and fish meal and minerals according to the formula composition fixed.

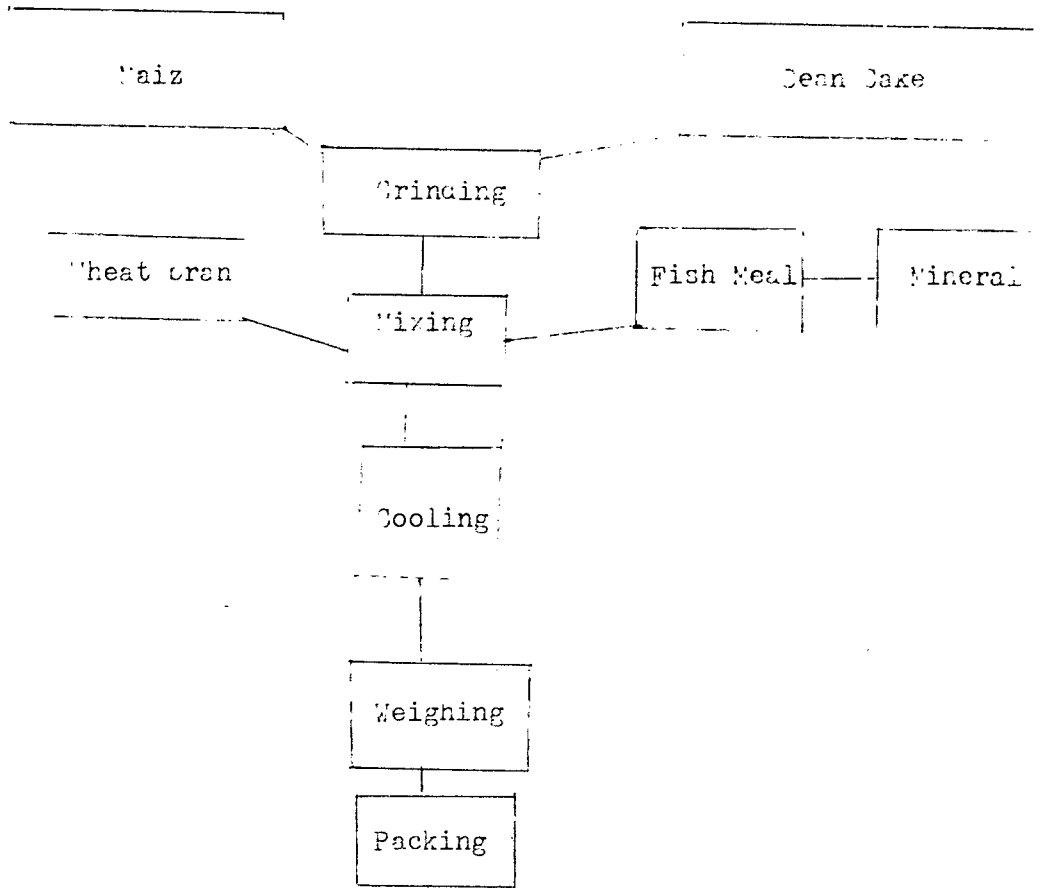
b). Stirring and Cooling

The raw materials in the stirring process are well mixed and stirred and then the mixed ground materials are fed into a long belt for cooling.

c). The feeding powder are then filled into poeothene bags of 50 kgs each and ready to deliver.

The processing chart for making feed is as shown below:

Flowing Diagram of Chicken Feed Processing



Machine equipment required are as the following table:

Name of Equipment	Quantity
Grinding machine	3
Mixing Machine	3
Cooling Belt	1
Electronic weighing equipment	3
generator	1

The total estimated price for these equipments will be 200,000 yuan.

4.3 The Whole Operation of the Project

1). Preparation of the Project:

At present, the society is conducting feasibility studies and will submit a project report with designs and the feasibility studies to the local government and overhead cooperative organizations and try to get approval by the middle of this year. The civil works, installation of the plant will be completed in two years. At the same time, managers, staffs and contracts for finished products as well as some necessary agreements shall be finished. One or two years after the operation, another project of slaughtering house will start in order to supplement the whole integrated linkages of the marketing systems. The second part of the project investment is assumed at 5.3 million yuan. It will cover a land area of 30 mu. The investment of the first project is estimated to cover at the end of the 3rd year of operation.

2). Operation of the Project:

	(Chicken Hatchery) (head)	(Feed Processing) (ton)
1. Annual Production	1,260,000	43,200
2. Trial Operation Rate	630,000	21,600
	50%	
3. Annual Operating days	360	360

3). Subsidiary Materials Required for Both Units: (yuan in 000)

a). Chicken Hatchery (for 10000 breeders)

Item	Price (yuan)	Daily		Yearly	
		Consumption (ton)	Amount	Consumption (ton)	Amount

a). Chicken Hatchery (for 10000 breeders)

Item	Price (yuan)	Daily		Yearly	
		Consumption (ton)	Amount	Consumption (ton)	Amount
Feed	700/ton	1.5	1.05	540	378
Diesel Oil	1.5/litre	100 litres	0.15	36000 litres	54
Coal (for 5 months)					1.5
Total			1.15		433.5

b). Feed Processing Unit with a Capacity of 120 tons a day

Item	Price (yuan)	Daily		Yearly	
		Consumption	Amount	Consumption	Amount
Polythene Bag	10/case	240	2.4	88400	884
Diesel Oil	1.50/litre	400	0.6	144,000	216
Total			3.		1080

The total cost for submaterials is 1513500 yuan.

4). Training Program:

The training courses will be organized for the chicken raising farmers. Each course will last one week participated by about 50 members each time. During the training programs, field visits and lectures are provided. As a result, participants shall gain basic knowledge on the chicken raising techniques and management.

CHAPTER FIVE
ORGANIZATION AND MANAGEMENT

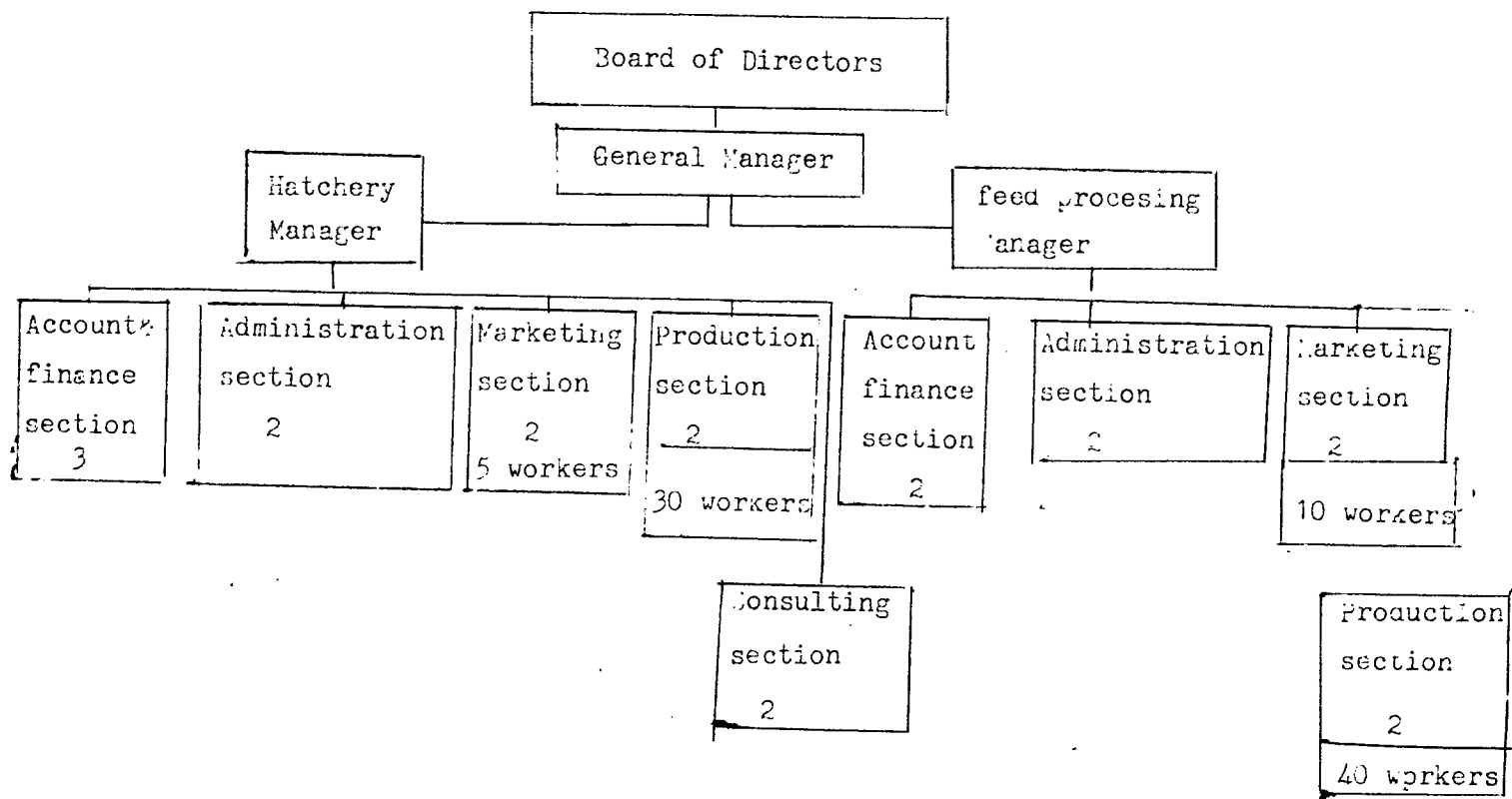
At present, the project is sponsored by Sanhe County Supply and Marketing Cooperative Union. Like other agricultural cooperative organizations with backward, forward and horizontal linkages integrated marketing systems in China, this union is responsible for the farm inputs and consuming goods supply, procuring and marketing agricultural produce for the farmers. But nowadays, in order to increase the farmer members' income, the cooperative union organizes the members to develop a diversified economy. The chicken breeding project is one of the activities that the cooperative union is to carry out.

5.1 To achieve the objectives of the project, a special management committee will be set up. It will consist of ⁵ representatives elected from the 600 chicken raising farmers and 2 from the 8 chicken farms owned by primary cooperatives. Chairman will be elected among these 7 members. The management committee will play their functions according to the by-laws of Sanhe County Cooperative Union.

5.2 The Management of the project is shown in the followings:

- 1) Management
- 2) Account and Finance
- 3) Administration
- 4) Marketing and selling
- 5) Production/Processing
- 6) Consulting

The Structure of the whole organization is shown in the following chart.



5.3 The functions of the management at each level is classified as it follows:

1). The general manager will see to it that the overall project is executed in proper way, plan the whole process of the project implementation, implement the decisions made by the Board of Directors, make report to the Board of Directors regularly, deals with all the problems that appear in the project.

2). The two managers will assist the general manager to achieve the objectives of the project. In practice, each manager will look after production of each part of the project---hatchery and feed processing unit, and deals with day-to-day jobs.

3). The account and finance section is to plan financial arrangements, to arrange administration and accounting of the project's

finance, to arrange expenditure and payment, to calculate the cost funding conditions of the project.

4). Administration section will be in charge of all the matters relating to personnel, welfare treatment, environment of the plant, legal provisions and supplementary jobs to help the managers.

5). Marketing and selling section will be responsible for delivery of chickens and feeds, finding market of the finished products for the farmers. It also shall determine the selling price of the inputs and quality standard and payment method to the members who supply their products to the markets as well as to take stock management of the products such as feed materials.

6). Production/Processing section's functions include :

- a) to plan the task related to the project,
- b) to obtain raw materials for processing chicken feeds,
- c) to make studies in order to improve production efficiency and quality,
- d) to take care of the machines and
- c) to solve all the problems that are concerning the production.

7). Consulting section is very important to the chicken raising farmers. It provides marketing and technical information and technical advices on the chicken raising and egg production, introduces new methods and new trends for raising techniques and gives guidance to the farmers to protect poultry from diseases, solves problems met by the farmers.

All the sections mentioned above shall cooperate well with managing persons and coordinate with each other. They shall make regular reports to the managers.

The total salary of the project of the employees will be 132,700 yuan ever year.

The personal expenses are seen in table 5.1 and 5.2

Table 5.1 Personal payment of Chicken hatchery plant

Position	Number	Monthly salary (yuan/person)	Monthly total (yuan)	Yearly total (yuan)
General manager	1	150.00	150.00	1,800.00
Manager	2	130.00	260.00	1,560.00
Finance officer	3	80.00	240.00	2,880.00
Administration officer	2	80.00	160.00	1,920.00
Marketing officer	2	80.00	160.00	1,920.00
Production officer	2	80.00	160.00	1,920.00
Consultance	2	80.00	180.00	2,160.00
workers	35	70.00	<u>2,450.00</u>	<u>29,400.00</u>
Sub-total	43		363.0.00	43,560.00
Bonus	One month salary			3030.00
Contingency				15,000.00
total				<u>62,190.00</u>

Table 5.2 Personal payment of chicken feed processing plant

Position	Number	Monthly Salary (yuan/person)	Monthly Total (yuan)	Yearly Total (yuan)
Manager	1	130.00	130.00	1,560.00
Finance officer	2	80.00	160.00	1,920.00
Administration officer	2	80.00	160.00	1,920.00
Marketing officer	2	80.00	160.00	1,920.00
Production officer	2	80.00	160.00	1,920.00
Workers	50	70.00	3,500.00	4,200.00
Sub-total	59		4,270.00	51,240.00
Bonus	One month salary			4,270.00
Contingency				15,000.00
Total				70,510.00

CHAPTER SIX

FINANCIAL AND ECONOMIC ANALYSIS

6.1 Investment cost estimation

The total cost of investment of the whole project is assumed at 4.63 million yuan. Its calculation is shown in the followings (yuan in 000)

a. Land and buildings	2,080
b. Machines	650
c. Office equipment	340
d. Trucks and infrastructure	800
e. Initial working capital	764.41
Total	<u>4,634.41</u>

Details are shown in the following tables 3.1 and 6.4.

6.2 Depreciation cost of fixed assets

The depreciation cost is calculated according to the traditional estimation method. The annual cost is around 288,000 yuan. It can be seen in the below:

Item	Cost (yuan in 000)	Depreciation rate %	Value (yuan in 000)
a. Buildings	1,380	5	69
b. Machines	650	10	65
c. Office equipment	340	10	34
d. Trucks and infrastructure	<u>800</u>	15	<u>120</u>
Total	3,170		288

Details are shown in the following tables 6.5

6.3 Finance resource and payment

The total investment will be met by loans, donation and equity capital.

1). The loans amounting 3 million yuan will be borrowed from the agricultural banks as medium term loans and will be payed in 5 years starting from the 3ed year of the project operation. The interest rate is 7%.

2). The project won't pay income tax and neither to pay sales tax which shall be payed by the cooperative union of Sanhe County. The production tax is 5%. So, 1,582,350 yuan will be payed every year when the operation rate is 100%.

6.4 Annual sales revenue

It is calculated under the following table: (yuan in 000)

Item	Unit price (yuan)	Operation rate (50%)		Operation rate (100%)	
		Quantity	Value	Quantity	Value
1.Chickens	head	630,000	703.5	1,260,000	1,407
2.Chickenfeed	700/ton	26,600	15,120	43,200	30,240
Total			15,823.5		31,647

Details are seen in table 6.1

6.5. The production cost

Total annual production cost is estimated on the basis of 100% of operation rate during the normal years.

The estimation is 30,360,410 yuan.

Details are shown in the following tables 6.2, 6.3, 6.4 and 6.6

6.6 Profit estimation of the project

1). Profit value before tax (yuan in 000)

Annual sales revenue - annual production cost = profit value before tax

$$31,647 - 30,360.41 = 1,286.59$$

Details are seen in the following table 6.6

2). Profit ratio of capital before tax (yuan in 000)

Profit value

$$\frac{\text{Profit value}}{\text{Total invest. cost}} \cdot 100\% = \text{Profit ratio of capital}$$

Total invest. cost

$$\frac{1,286.59}{4,634.41} \cdot 100\% = 27.999\% = 30\%$$

$$\frac{1,286.59}{4,634.41} \cdot 100\% = 27.999\% = 30\%$$

$$4,634.41$$

3). Benefit cost ratio before tax

Profit value

$$\frac{\text{Profit value}}{\text{Total cost}} \cdot 100\% = \text{Benefit cost ratio}$$

Total cost

$$\frac{1,286.59}{30,360.41} \cdot 100\% = 4.24\%$$

$$\frac{1,286.59}{30,360.41} \cdot 100\% = 4.24\%$$

$$30,360.41$$

4). Net profit ratio before tax

Profit value 1,586.59

$$\frac{\text{Profit value}}{\text{Sales revenue}} \cdot 100\% = \frac{1,586.59}{31,647} \cdot 100\% = 5.01\%$$

Sales revenue 31,647

6.7 Break even Point

$$\text{BEP} = \frac{\text{Annual fixed cost}}{\text{Sales revenue}-\text{VC}} \quad 100\% = \frac{386.41}{31647-29974} \quad 100\% = 23\%$$

This is the percentage of the production capacity. If the project reaches 23% of the capacity, the project will have no loss.



6.8 Internal rate of return

The FIRR is assumed to be 13.37%. It is higher than 10% , the discounting rate. so if the project even pay 13,37% as interest rate, still the project has break even point. (net cash flow is shown in the flowing table 6.9).

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1 This project will involve more than 600 farm households and increase their income by 65%. But, there are about 80,000 households in this area. If this project is successful, it will be attractive to more farmers to join in and to further increase the role of the integrated systems.

Therefore, expanding scheme is necessary.

7.2 The followup project of slaughtering house shall be realized so that the value of the products can be added by 70%.

7.3 The project has great potential. But the designers shall be cautious of the marketing capacities in future.

7.4 The products are highly perishable and also there is high risk such as infectious disease which is very dangerous for chicken raising. So the extension services shall be well coordinated and executed.

7.5 The products shall be marked with the name of the project so that they can be known to the consumers.

7.6 From the analysis, this project will be feasible and reliable.

But the consequence will depend on the implementation. Therefore, managers shall be well chosen and competent and expert as well.

Finally, I hope this project will be put into progressing making process. The local government shall be concerned and give some financial assistance to it.

Table 2.1 Population of Sanhe County

Community	House hold number			Population		
	total	agri.household	non agri holds	total	agri.population	non agri.
Cheng Guan	8626	5516	3110	34871	23222	11649
Zhao Hegou	3969	3952	17	17417	17201	216
Liqizhang	3214	3181	33	14437	13756	681
Fuxing	2551	2529	22	11209	10911	298
Quigezhang	1623	1595	28	6630	6409	221
Yangzhang	3149	3119	30	13081	12823	258
Huangzhang	3688	3636	52	16009	15407	602
Xidingfu	1315	1256	59	5745	5585	160
Gexinzhang	3726	3603	123	16316	16044	272
Niantou	3596	3504	82	15455	15171	284
Xinji	5024	4989	35	22157	21737	420
Duanling	4167	3754	413	15670	14974	696
Huangznan	3048	3028	20	13027	12786	241
Lingshan	4111	4076	35	17609	17260	349
Houshan	951	938	13	3687	3620	67
Gaolou	3257	3179	78	13588	12822	766
XiaoZhang	2699	2674	25	11085	10779	306
Xiaofu	3045	2927	118	12599	12096	503
Quising	2952	1648	1304	9082	6908	2174
Hushan	2036	2017	19	8375	8175	200
YanJao	8444	4582	3862	33408	17977	1543
Maqifan	3321	3272	49	13507	13109	398
Zhongpu	3982	3758	44	15914	15385	529
Total	82484	72732	9752	340878	304157	36721

Source: 1987's statistics

Table 2.2 Output of agricultural produce(mu,kg, kgin 0000)

Community	Total output			wheat				maize			
	Total area	yield	output	total	area	yield	output	total	area	yield	output
Chengguan	43390	264	1146.15	18600	274	509.5	20717	279.5	578.7		
Zhaohegou	35333	296	1046.75	15000	275	462.5	15280	328	501.25		
Liquizhang	30500	280.5	855.55	14500	235	340.75	12942	351.5	455.4		
Guigezhang	20716	259	536.5	8784	252.5	214.2	9177	316.5	290.7		
Fuxinzhang	24519	228.5	560.4	10830	241.5	235.2	11789	253.5	298.85		
Yangznang	31578	259.5	820	13750	247	389.4	14310	298	426.05		
Huangzhang	32900	253.5	833.35	16200	249	403.4	13899	284.5	395.7		
Xidingfu	13030	277.5	361.65	5000	221	110.55	5986	369	221		
Gexin	41966	262.5	1102.55	18000	228.5	411.3	19021	326	620.55		
Niantou	31000	252.5	782.6	14000	261.5	352.2	10925	327.5	367.7		
Xinji	48017	304.5	1462.95	21500	255	548.4	21617	381.5	824.55		
Duanlian	29861	306	914.05	12000	236.5	283.75	13240	382	505.7		
Huangtu	32263	335.5	1083	11870	255.1	303.35	15246	382.5	582.9		
Lingshan	23772	214.5	509.65	11416	201	229.5	9630	235.5	226.7		
Houshan	4133	297	122.65				2394	374	89.55		
Gaolou	40916	270	1004.5	15580	204.5	318.4	19536	3.8	699.9		
Xiaozhang	31921	280.5	895.8	13000	212	275.7	15789	3.9	567.1		
Xiaofu	41862	265.5	1110.5	15780	250	394.5	21130	306	646.3		
Qixinzhang	19501	267	520.75	8073	215	173.55	9214	3.9	330.3		
Hushan	20500	236.5	485	9000	224	201.7	9140	280.5	256.55		
Maqifan	37572	256.5	963	12210	195	238.1	19164	344	637.85		
Zhongpu	37815	216.5	818.55	13100	151	197.5	18553	296.5	568.65		
Yanjiao	42143	244	1025.35	16500	207.5	342.4	20072	303.5	608.95		
Total	715258	266.5	19064.2	294393	232	6835.9	328771	325	1091.4		

Source: 1987' statistics

Table 2.3 Farmers' income of Sanhe County (0000: yuan)

Community	total net income	net income per capita
Chengguan	1511.9	651.1
Zhaohegou	1019.7	592.8
Liqizhang	795	577.9
Qigezhang	404	630.4
Fusinzhang	538	493.1
YangZhang	862	672.2
Huangzhang	889	577
Sidingfu	312.4	559.4
Gesinzhang	333.3	519.2
Hiantao	870	673.5
Sinji	1579.1	726.5
Duanlian	1297	866.2
Huangtuzhang	926.7	724.8
Lingshan	1126	652.4
Houshan	331.4	95.5
Gaolou	691	538.9
XiaoZhan	618.1	573.4
Xiaofu	617	510.1
Quisin	337	487.8
Hushan	392	479.5
Yanjao	1123	627.5
Macifan	677	516.4
Zhengpu	786	510.9
Total	18541.3	609.6

Source: 1987' statistics

Table 2.4 Annual poultry production of Sanhe County (head, ton)

Community	total pigs on hand	Por production	Poultry on hand	meet production	egg pro.
Chengguan	11381	455	51556	7	207
Zhaohegou	16937	735.8	86945	1.7	369.2
Licizhang	7090	17.4	339.7	34	115.2
Quigezhang	4250	195.3	20055	1	64.5
Fuxinzhang	7233	353	39604	2	160.2
Yang zhang	10690	425.9	44425	2	307.6
Huanzhang	9590	434.5	76900	2	177
Xidingfu	3411	172	12365	2	43.3
Gexinzhang	11704	528	55330	1	223.7
Miantou	7200	440	36720	1	147
Linji	1835	300.8	117500	21.7	469.3
Dunjing	9132	310	31170	2.6	124.7
Huangzhanf	9345	468	38725	4.7	193.6
Lingshan	7444	287	43152	0.1	167.9
Houshan	3029	1400	11020	1	450
Gaolou	11310	422.1	36877	1.7	134
Xiaozhang	13430	645.6	39827	13.7	153.5
Xiaofu	9492	328.5	35749	2.8	99.9
Qixing	4006	136.4	20555	0.5	8.25
Hushan	5409	308	57703	1.7	94
Yanjao	10448	308	57703	0.2	211.3
Maqifan	6800	257.3	24345	1.0	96.4
Zhongpu	16245	738.4	53395	0.4	192.5
Coop Farm	350	13			
Total	215620	9409	992819	106	3684

Source: 1987 statistics

Table 3.1 The investment cost of fixed assets of the project

a. Chicken Hatchery:

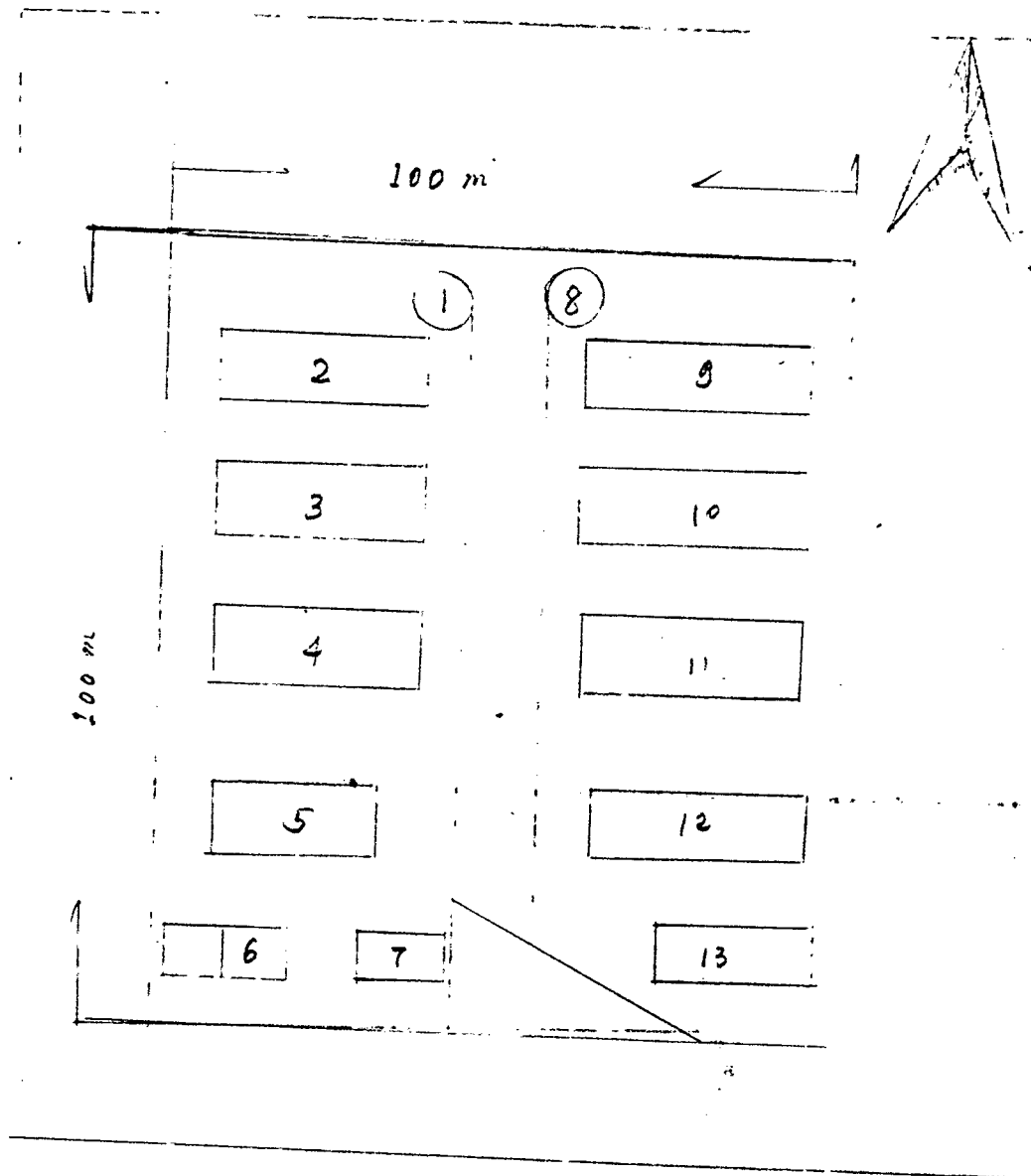
Item	Amount (yuan in 000)
1. Land and Buildings	900
2. Machinery	200
3. Office Equipment	160
4. Truck	100
5. Initial Working Capital	27.76
Sub-total	<u>1,387.76</u>

b. Chicken feed processing plant:

Item	Amount (yuan in 000)
1. Land and Buildings	1180
2. Machinery	450
3. Office equipment	180
4. Truck	400
5. Infrastructure	300
6. Initial working capital	736.65
Sub-total	3,246.65

The total cost for the basic investment will be 4,634,410.00 yuan

Chart 1. Layout of Hatchery



Road

- | | |
|--|--------------------------|
| 1). 8) = Water container | 7) Safety guard room |
| 2). 3) = rooms for egg laying hen breeders | 9) Hatching room |
| 4). 5) = rooms for broiler breeders | 10) Generating room |
| 6) bath room | 11) Office |
| | 12) Ware house for feeds |

Table 6.1 Sales of the products of the two units (yuan in 000)

a. Chicken hatchery unit

Item	Unit	Price (yuan)	One period (21 days)		Yearly (14 Periods)		
			Quantity	Value (Yuan in 000)	Quantity	Value (yuan in 000)	
1. Laying hen chicks	Head	1.40	35,000	49	490,000	686	
2. Broiler chicks	Head	2.40	20,000	48	280,000	672	
3. Male chicks		0.10	35,000	3.5	490,000	49	
Sub-total			90,000	100.5	1,260,000	1,407	30,0001, 07

b. Chicken feed processing unit

Item	Unit	Price (yuan)	Monthly		Yearly	
			Quantity	Value	Quantity	Value
Concentrated feed	ton	700.00	3,600	2,520	43,200	30,240

The annual sales revenue of the products totally will be 31,647,000 yuan.

Table 6.2 Annual total production cost of the project (yuan in 000)

Item	Amount
1. Raw materials	25,915.6
2. Subsidiries	1,513.5
3. Personal saleries	132.7
4. Repairing and mainenance of machinery	11.25
5. Administration cost	31
6. Overhead cost	36
7. Sales expense	197.2
8. Interest of working capital	20.16
8. Production tax	2215
9. Depreciation	288

Total	30,360.41

Table 4-3 Actual production cost of the two units

Item	Amount (yuan in 000)	Remarks
I. Fishery		
1. Expenses Maintenance		
1. Expenses of machinery	5	2.5% of machinery cost
2. Administration cost	20	(meetings, communication etc.)
3. Personnel	24	(Trainings, insurance, welfare etc.)
4. Depreciation	7.035	(0.5% of annual sales)
2. Interest working		
capital	1.510	(interest rate is 7%)
Sub-total	<u>57.547</u>	
II. Feed Processing plant		
1. Expenses Maintenance		
of machinery	11.25	(2.5% of machinery cost)
2. Administration cost	11	(Communication, meetings, etc.)
3. Personnel	12	(training, welfare, etc.)
4. Depreciation	151.2	(0.5% of sales)
5. Interest working		
capital	50.3	(interest rate is 7%)
Sub-total	<u>235.75</u>	

Table 6.4 The working capital required for two units (yuan in 100)

Item	Amount in value
a. Chicken hatchery	
1. feed for breeders	10.5
2. subsidiaries	1.83
3. Personal expenses	5.18
4. Administration and overhead cost	3.17
5. Depreciation cost	6.75
Sub-total	<u>27.76</u>
b. Feed processing plant	
1. raw materials	681.6
2. Subsidiaries	30
3. Personal expenses	5.88
4. Administration and overhead cost	1.92
5. Depreciation cost	17.25
Sub-total	<u>738.65</u>

The total working capital will be 766.410 yuan if the calculation is based on 10 days for raw and sub materials and one month for the other cases.

Table 6.5 Annual depreciation cost of the fixed assets of the two units

Item	cost (yuan in 000)	Depreciation rate %	value (yuan in 000)
a. Chicken hatchery			
1. Buildings	600	5	30
2. Machinery	200	10	20
3. Office equipment	160	10	16
4. Truck	100	15	15
Sub-total			81
b. Feed processing plant			
1. Buildings	780	5	39
2. Machinery	450	10	45
3. Office equipment	180	10	18
4. truck	400	15	60
5. infrastructure	300	15	45
Sub-total			207

The total depreciation cost is estimated at 288,000 yuan

Table 6.7 Variable cost of the production (yuan in 000)

Item	Amount
1. raw materials	25,915.6
2. Subsidiries	1,513.5
3. Personal salery	132.7
4. Sales expense	197.2
5. Production tax	2215
Total	<u>29,974</u>

Table 6.8 Fixed cost of the production (yuan in 000)

Item	Amount
1. Maintenance	11.25
2. Interest of working capital	20.16
3. Overhead and administration	67
4. Depreciation	<u>288</u>
Total	386.41

period of investment return = $6 + \frac{131.35}{1296.59} = 6.1 \text{ year}$

Production period	6	7	8	9	10	TOTAL
%	100%	100%	100%	100	100%	
	31647	31647	31647	31647	31647	237352.5
0.41	30360.41	30360.41	30360.41	30360.41	30360.41	227030.8
0.41	30360.41	30360.41	30360.41	30360.41	30360.41	232337.49
0.59	1286.59	1296.59	1286.59	1286.59	1286.59	5015.01
0.94	-131.35	1155.24	2441.83	3728.42	5015.01	
1	0.565	0.513	0.467	0.424	0.386	
97	726.92	660.02	660.84	545.51	496.62	1215.21
0	0.507	0.452	0.404	0.361	0.322	
	652.30	581.65	519.78	464.46	414.28	704.53
	0.456	0.400	0.350	0.308	0.270	
4	586.69	514.64	450.31	396.27	347.38	323.41

Table 6.9 Total net cash flow statement (yuan)

Item	Construction		3	4	
	1	2			
Operation rate	50%	100%	100%	100%	
1. Net cash in flow					
Sales revenue			15823.5	31647	3
2. Cash outflow					
a. Investment cost	2500	2134.41			
b. Production cost			15180.21	30360.41	3
Sub total	2500	2134.41	15180.21	30360.41	3
3. Net cash flow	-2500	-2134.21	643.29	1286.59	1
4. Total net cash flow	-2500	-4634.41	-3991.12	-2704.53	-1
5. Present value in 10 years					
i = 10%	0.909	0.826	0.751	0.683	0
Net present value	-2272.5	-1763.02	483.11	878.74	7
6. FIRR					
i = 12%	0.893	0.797	0.712	0.636	0
Net present value	-2232.5	-1701.12	458.02	818.27	7
i = 14%	0.877	0.770	0.675	-0.592	0
Net present value	-2192	-1643.5	434.22	761.66	6

$$FIRR = 12\% \times \frac{704.53 \times (14\% - 12\%)}{12\% - 14\%} = 13.37\%$$

Second ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia

NEW DELHI, BANGKOK, TOKYO, SEOUL

October 26, 1987—May 10, 1988

Project Prepared During Home Country Assignment

Project Title : Xianggu Development Project in Fujing County

Country : China

Prepared by : Shi Yue-Jin

Funded by the Government of Japan

and

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

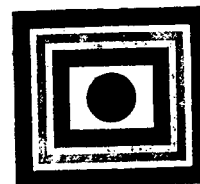
ICA Management Training Project for Agricultural Cooperatives in Asia



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DECLARATION

The T.S.A. (Secord) training course "Strengthening Management of Agricultural Cooperative" are launched from Oct. 26, 1987 to May 10, 1988 ^{at} ~~25~~ New Delhi, Bangkok, Tokyo and Seoul. I have the opportunity to participate and to learn various aspects regarding the strengthening of the Cooperative Management. To formulate and implement an Integrated Project in promoting the marketing and production and increasing the income of the farmers is one of most important technique I have earned from this training course. This Project on "Fuyang County Xianggu Mushroom Development" is my practise in use those knowledge.

I am grateful to Shri H.V. Malano, Project Co-ordinator, I. T.S.A. New Delhi, Prof. Laxar V.R. Gaidhad and Prof. B.K. Gupta, and their colleagues of I.I.I. Ahmedabad, who make great contribution in making this Project possible.

I take this opportunity to extend my gratitude to the committee of Zhongyuan Provincial Committee of Supply and Marketing Cooperative for providing me as a participant to this training programme and giving me all the support and cooperation in completion of this Project.

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APPENDICES

Chapter I

Summary

- 0.1 This project focuses on design and rationale of integrated marketing of Xianggu Mushroom combined with its processing and production aspects in Fuyang County of Hangzhou city in Zhejiang Province.
- 0.2 The Project envisages great potential for Xianggu selling, both dried. Xianggu and fresh ones. Overseas markets are taken into consideration. The Fresh Xianggu will be sold to hotels, restaurants and food markets by the FMRI (Fuyang Mushroom Research Institute) with 0.5 kg plastic package. The fresh Xianggu will be dried on the Solar Energy Facility by FMRI and then sold to the market. The high quality dried Xianggu will be exported both ^{by} China Native and Animal-by-Product Import and Export Corporation, Zhejiang Branch and Zhejiang Supply and Marketing Cooperative Import and Export corporation.
- 0.3 Assuming its farm gate price is RMB 3.80 per Kilo the fresh Xianggu (approximately one US dollar), will be purchased by the Branch of Primary Supply and Marketing Cooperative on commission basis.
- 0.4 The period from December to April next year is Xianggu growing season, which is just wheat growing season.

Note: ¥3.72 = 1\$

After that, farmers can grow another two paddies :

Paddy season		Wheat season	Xianggu season	Income(RMBY)
2	+	1		350
2	+		1	1618

0.5 As a kind of subsidy for Xianggu, forty-five percent of the capital will be provided by the County Government under the category of Poor Mountain Area Relief Fund the very beginning with its annual interest rate of 3.6%. Another part of the credit will be get from the County Agricultural Bank with the interest rate of 7.2% per year. All the credit will be covered immediately after the marketing of fresh Xianggu by the farmers.

0.6 The Production Procuring Capital will be available by the WPI and SMC (Branch of Primary of supply and Marketing Cooperative with the marketing margin of 4% and 8%. This Profit will be realized in not more than three days during the fresh Xianggu harvest season.

0.7 The fresh Xianggu will be dried on the solar Energy facilities with the selling price of processed production Y46 per 1000. The total cost of one construction line of the facility is Y 112500 with the annual processing capacity 50 tons. Next year, it will begin to construct another line of Solar Energy

Facility with the same capacity at the cost of 115000.

0.8 As the Xianggu season ends in April the facilities will continue to work with other products such as small green bean and Pin Mushroom this year. The facilities will work all year round with average working days 50. The Maximum drying capacity 100000 will be achieved the next year. 2

0.9 It has been envisaged that in 5 years. The total production of fresh Xianggu in Fuyang County will be 840 tons. with will be sold as dried Xianggu with the selling price ¥60 per Kg. 40% will be sold as fresh Xianggu with the retail price of 44 ¥.

0.10 The benefit cost ratio of the Project comes at % and IRR more than %.

0.11 While attempting sensitivity test the benefit cost ratio comes at % and IRR %, assuming that revenue will be reduced by 7% due to decrease of price.

0.12 The Interest on ¥30,000 amount ¥ from PSERI and CEO will be 3% due to their Scientific Research Purpose. The total borrowing of ¥88000 will be paid two years and the second line of SEF will be paid two year later from next years.

Chapter II

Background

- 2.1 Xianggu Mushroom (fragrant Mushroom) is one of the mushrooms with both delicious taste and high nutrition. It has been 8 hundred years since it began to be cultivated in our country. But in the past, could only be seen in high mountainous areas. In 1987, Yookou, a small town in Fuyang, was chosen to be a best growing base by FMRI. The total production volume last year was 20 tons.(A-1)
- 2.2 Since there had been no fresh Xianggu supply in the market. People both in urban and rural areas only taste dried Xianggu in some special occasions such as Spring Festival, New Year's Day and National Day etc. The annual consumption figure of dried Xianggu last year in Fuyang was 0.01kg for one person. its price amounted to ¥52 per Kilo.
- 2.3 Fuyang county enjoys great benefits in Xianggu production. The total area can be classified into.

Total land	1829.8 square kilo.
Plain areas	32633 hectare
Among: cultivated land	23726 hect.
Among: irrigated land	21146 hect.
Mountain area	130113 hect.
river area	9767 hect. (A-2)

Large part of its total land is mountain with low economic output. The farmers cut the woods to sell to Shanghai, Hangzhou and plain area every year with the price of 160

perton. It is just for the energy resource.

2.5 Fuyang county adjacent to Hangzhou, with a distance only 46 kilometers. It is also close to Shanghai. One bus road and one big waterway are available for Transportation.

2.4 Growing of Xianggu: In early September, the pieces of man-made woods on which Xianggu grows will be made. The components detailed:

wood scrape	78%
wheat bran	20%
sugar	1%
	1%
water rate	1:1 (A-3)

After germinating the vaccine of Xianggu into it, it should be kept inside the house for two months raising. Just after the harvest of the second paddy, it will be moved its field for growing will some extent of wet. Temperature and environment, which is a house like shelf made with wood stick, bamboo pole and cogongrass should be built.

2.5 Production cost is as follows:

One piece of man-made wood germinated vaccine already

Including:

Firewood:	¥0.10
Electric	¥0.05
Vaccine:	¥0.10
Plastic film bag	¥0.10
Auxiliary material	¥0.50
High temperature sterilized	¥0.15

Technical guidance fee ¥ 0.10

The cost of construction of house like shelf including materials
¥ 0.30

Labour: One farmer can take care of at most 5000

pieces: it can be done by woman also. Since Winter
is spare time for farmers.

2.6 Land:

0.1 hect cultivated land can be used for 15000 pieces
at the sacrificed of 0.075 ton wheat with the income of
¥ 30.

2.7 Procurement

Fresh Xianggu will be procured by BPSMC with the different
grades as follows:

Grade	(RMB ¥)
A	2.25
B	2.05
C	1.95
D	1.75

One piece of man-made wood can yield 0.6kg with the percentage

A	20%
B.C	60%
D	20%

2.8 Technical Guidance:

Also FMRI has earned some successful experience in guidance
and promotion of mushroom raising. The present technician,
hired from Gutian in Fujian Province by FMRI receives a
payment of ¥ 0.00 per piece.

2.9 Processing:

Fresh Xianggu procured by BPSMC (Branch of Primary supply and Marketing Cooperative) with 4% commission fee and another 3% transportation fee and 1% for loss to Fuyang County town. Then 3.5% transportation fee was incurred by FMRI to Hangzhou for drying processing. There is no drying facility for Xianggu in Fuyang county. FMRI had paid ¥2 per kg for drying processing fee. Then, the dried Xianggu were sent back to Fuyang for grading before it were marketed into domestic as well as overseas markets

Late last year, FMRI was trying to introduce a Solar Energy Facility (SEF) which is also an experiment programme of Zhejiang Marsh Gas and Solar Energy Research Institute (ZSERI) the cost of construction is under:

1. 200m ² Solar Energy Drying System	¥ 40000
2. Auxiliary Heating System	¥ 25000
3. Testing Instrument	¥ 5000
4. Research and Testing Fee	¥ 10000
5. 200m ² Selective Heating Membrane	¥ 10000
6. Land	¥ 13000
7. Build and labour	¥9500
Total	¥112500

The construction work will be finished at the end of March This year. Then it will be processed all year around with the capacity of 50 tons or 1 ton per day . Value adding 10% net profit rate 20%.

2.10 The cost of processing:

Depreciation of facility	6%
interest rate of ¥30000	7.2%
cost of wages	¥38500
cost of supplement energy	¥ 4060

The export rate of processed Xianggu can be promoted from 50% to 80%. Its water content doesn't exceed 1.0%-1.5% so as to meet the good preserve requirement.

2.11 Marketing:

1.15 ton dried Xianggu had been marketed to wholesale merchant in the city as well as local market last year by FMRI marketing section. 9.05 ton fresh Xianggu was marketed in market. 0.4 ton high quality dried Xianggu had been exported to foreign countries through China Native and Animal-by Production Import and Export Corp. ZheJiang Branch. The sales price varied accordingly:

dried:	¥ 46.0 per kg
fresh:	¥ 4 per kg
export:(dried)	¥ 56.0 per kg

2.12 Input:

All the material required for the Xianggu growing is provided by BPSMC and FMRI with net profit rate 4% such as plastic films, cottonseed shells and chemical fertilizers.

2.13 Vaccine:

All the vaccine of Xianggu were supplied by FMRI nursery plant with the price of ¥0.95 for one bottle which can germinate 40 pieces of man-made wood. (A-4)

Justification:

- 1). Due to the great demand existing in the market. The present scale of production and amount supply is far from satisfied. It needs an integrated project to promote the marketing as well as production and processing of Xianggu Mushroom in Fuyang County.
- 2). The Export volume and should be expanded through upgrading the quality value adding and promotion activities in order to increase the income of the farmers.
- 3). By fully utilizing the firewood resources and its substitute, Xianggu production can be introduced to plain areas as well.

Chapter III

The Project

The main objective of this Project is to increase the income of the farmers through better marketing of Xianggu Mushroom combined with its efficiency in production and processing activity in Fuyang County. This objective will be achieved by the steps taken as follows:

- 1) To enlarge the production scope of Xianggu in Yaokou country based on its successful experiment and abundant firewood resource;
- 2) As the firewood can be substituted by maize core and pole, mulberry bough, Xianggu production can be developed in plain areas as well. Because these materials can be found everywhere.
- 3) Due to the fact that there is actually no modern processing facilities in Fuyang county, and Xianggu was dried in a traditional way, Solar Energy Facilities are to be used for the first time for Xianggu drying. So that, the value of quality of processed production can be improved.
- 4) A new marketing promotion campaign will be initiated in order to promote the marketing of Xianggu. More strong international market channels will be explored. Fresh Xianggu with a 0.5 kg plastic film package can be transported through the nearest airport. Fresh Xianggu will be sold by contracts with Hotel, restaurants and food markets.

Area of Operation:

This Project covers the whole Fuyang county especially in small towns or villages as Lishang, Xinpu, Wanshi, Jinqiao, Xinmin, Dongzhou, Chuanjiang. (A-5)

Project Components

3.1 Farm Guidance:

FMRI will provide more technicians to the farmers through different ways. Its own technician staff will add to 3 persons. Site demonstrator will be taught in every village. Professors from Zhejiang Agricultural University will be invited regularly to hold some seminars for the farmers. Public Spread Services such as broadcast, pamphlets etc will be used. So by the end of the season. The farmers them selves can operate independently without the help of the technicians.

3.2 Input Supply:

As this function is already taken by FMRI or BPSMC Special materials supply such as chemical fertilizer plastic membrane and cottonseed shells are guaranteed. while farmers themselves can supply some materials like wheat, bran, paddy husk. In 1988, FMRI will provide these materials at least 15 tons. 40 ton and 0.2 million kg. The supply will increase every year accordingly.

3.3 Xianggu Special Cooperative:

In order to cut the farmers' cost of production and therefore increase its competitiveness, the Xianggu Special Cooperative (ZSC) will be organized in some concentrated growing areas like

Yankou country. The supply of input and vaccine will be provided directly by The XSC. The technical training will be well organized through XSC. In order to help the farmers, BPSMC and the country Committee will participate in XSC to be a member of the Representative Committee groups are the members of XSC with membership fee of ¥10, The working capital will be funded by BPSMC and Country Committee with share dividend annually. The structure of XSC will be like this:

Committee	7	
Chairman	1	farmers
Vice Chairman	2	One employes of BPSMC , one from country committee
Accountant	1	employee of BPSMC
Marketing Managers	2	farmers
Input supply manager	1	employee of BPSMC

All input supply as well as the procurement of fresh Xianggu will be done by XSC

3.4 Marketing:

- 1) FWRI will mainly responsible for marketing Xianggu

especially for export. The Institute will contact CNPAIXCZB to export more dried Xianggu produced in Fuyang County, at least 1.5 tons this year.

- 2) The Packed fresh Xianggu will be sold to overseas markets via Hangzhou Airport according to contracts signed with foreign buyers.
- 3) By the year 1992, FMRI will procure 30 tons of fresh Xianggu which is 75% of the total production. The export figure of dried Xianggu will reach 10 tons. (A-6)
- 4) FMRI will make contract with Public Food Markets of Hangzhou and Shanghai for the marketing of 0.5 kilo plastic package Xianggu 5 ton with the retail price of ¥2.00. This kind of vegetable will be well accepted in urban areas. In 1992, 25 ton fresh Xianggu will be marketed in this manner.
- 5) FMRI will provide fresh Xianggu to the can processing plant for Xianggu can making. In 1992, it is assumed that 10 tons fresh Xianggu will be provided to Hangzhou Can Processing Plant and Jinhua Can Processing Plant.
- 6) Fresh Xianggu will be collected by BPSMC or XSC with the farm gate price at ¥3.60 per kilo paying to the farmers. In the coming two years, the farmers will not get patronage refund due to the construction cost

of SEF. After that, the farmers will get 10%-20% of total gross profit as the additional price.

3.5 Processing

- 1) Air-concentrated Heating System of Solar Energy facilities will be constructed in March this year. Solar energy and woods, Charcoal and coal can be used continuously in drying Xianogu and other products like grass raised mushroom, small green bean from May to Oct. the same year.
- 2) The processing capacity is 50 tons per year with the maximized 1 ton per day. The duration for processing will vary from 6-24 hours. After the sunset the traditional way of fire woods as energy will be used to continue the progress of drying.
- 3) The water content in fresh vegetable can be reduced from 90% to 13%, the average water content difference is not more than 1.0-1.5% a standard that is low enough for safety preservation.
- 4) The solar absorbing panel is 200m², the cost of drying will be reduced 50-80% compared with traditional drying method.

3.6 Plant and Location

The Location of the Solar Energy Facilities will be in

Fuyang County Town quite near to the FMRI office 0.5 kilometre to the center of the county Town. Transportation is within ~~easy reach~~ with bus road and waterway. The most remote base for Xianggu growing is not more than 40-50Kms away and it will easily managed by FMRI.

Another Solar Energy Facilities has been proposed to be set up to meet the fast growth of Xianggu production. The technology and technicians are available. The cost of construction will be less than that of the first one. The County Meteorological Station in the County Town wants to sell its site because of its move preference. This facilities will also be under the charge of FMRI. (A-7)

3.7 Marketing potential:

There is great potential for the production of Xianggu Mushroom in Fuyang County as it has 130,000 hectares mountain areas and abundant firewood as burning material. Furthermore there are about 1000 hectares of mulberry trees and plenty of maize that can be used as substitutes. The total production volume will increase 10-20% every year. Among there, 70-80% of the total production will be marketed by FMRI while another 20-30% will be consumed or marketed by the farmers themselves or its own Special

cooperative in the local market.

Due to the poor economic condition, the farmers need credit to grow Xianggu. At the beginning of the growing season, they need to buy well-made pieces of this kind of wood or buy materials to make it ready from local vaccine plant with the payment of processing fee. One farmer growing 4000 pieces is usually required to borrow ¥6000 with the interest rate of 7.2% annually. The money will be borrowed from the county Agricultural Bank through BPSMC or country committee as the ~~guarantee~~. The credit will be covered from the farmers at the end of the harvesting season.

3.8 Processing Potential

Compared with fresh Xianggu, the dried one can easily be preserved and sold all year round. So more than 50% of the total fresh Xianggu will be dried inevitably. The construction for the second Solar Energy Facilities will begin to build by the end of this year. The construction cost will be as under:

Items	Cost (RMB¥)
Land	25000
200m ² Solar- Energy Drying System	40000

Auxiliary Heating-	
System	25000
Testing Instrument	5000
200m ² Selective	
Heating Membrane	10000
Materials and labour	10000
total	115000

Yaokou Country transport 47 tons for fresh Xianggu drying processing. It incurs 1% loss in transportation. It needs facilities to process on the site. But so far due to small amount of Xianggu, lack of other products to process ~~and~~ the Xianggu Season, the construction of this facility will suffer a loss.

Chapter IV

Details of Project Implementation

Implementation:

4.1 This project will be implemented by Fuyang Mushroom Research Institute, which is attached to Fuyang Federation of Supply and Marketing Cooperative. The project period will be 5 year. During implementation, FMRI will provide backward as well as forward linkage such as supply of Mushroom Vaccine, others like the man-made wood needed, technical guidance processing and marketing. (A-8)

4.2 Production:

From green firewood to ready made pieces it needs some processing. By 1992, the machine needed for processing will be:

Item	amount	Cost(RMB¥)
Cutting machine	20	25000
Grinding		
machine	15	75000
Filling machine	40	14000
Sterilized		
Boiler	70	1500
Vaccine nursery	1	50000
Total		165500

These fund will be met by

Source	Amount (RMB¥)
Short term loan(50%)	82000
County Government poor relief loan (40%)	66300
Country Committee investment	16600

These machines will be located in Xianggu growing county managed by the country committee or XSC, or vaccine nursery.

4.3 Procurement:

Fresh Xianggu will be procured by BPSMC or XSC from the farmers. The buying price will be fixed by FMRI every year. If an average price of fresh Xianggu is fixed by ¥3600 per ton, A.B & C grade should be paid as under:

Grade	Diameter of Mushroom	Stem	Price(RMB¥)
A	4-8mm	1.5cm	2.15
B	4-10mm	1.5cm	1.95-2.05
C	3-12mm	2.5cm	1.75

Cost of transportation YO.00/ton.km will be borne by FHRI. FHRI will provide all the package items to the procuring agency with no additional charge.

All the fresh Xiangsu will be received by FHRI .

4.4 Processing:

To construct a drying facilities for Xiangsu is very urgent work for FHRI in order to save the cost of processing and promote the quality of processed products. So that, more interest will added to the farmers FHRI has already taken the progress from Zhejiang Marsh and Solar Energy Research Institute, and also got the permission of County Government to construct.

The process of Xiangsu drying is divided into following steps:

- Fresh Xiangsu receiving
- Putting into drying room
- Heating by Solar Energy facilities
- Forced ventilation
- Humidification Heating Air circulation

-- Temperature raised by Selectable Heating

Membrane

-- Xianggu dried (A-9)

- 1) Drying room : This is a all covered room except some entrance. Fresh Xianggu will be put in through the fresh produce door. The heating air are forced ventilating into to it through the Inlet air device. The wet air go out through the Outlet air device. This room can be kept 1 ton 1 time processing.
- 2) Fresh Xianggu putting is a labour work. All the fresh Xianggu will be carry into the drying room kept on floors seperately. After drying, the finished produces should be taken out by labour. The produce exchange need two labour one time. So it needs 2 shift per day.
- 3) Heating by Solar Energy: The absorbing area of Solar Energy is 200 m². They are 450 dk per m² per hour averagely. The SEF will heat the fresh air up to 30⁰c-35⁰c higher, then ventilating into Drying Room through pipeline. The glass of drying equipment covered with sticky Selectable Heating Membrane is for temperature raising purpose. It can be fully used in

fine dries.

- 4) Auxiliary Heating Facilities: During the night or in raining day, the SEF can't be used. It should continue working with traditional energy resource such as firewood, charcoal and coal. To dry 1 kg Xianggu needs 0.7 kg charcoal.
- 5) Ventilation: To compel the heating air into drying room needs Ventilator. The electric Ventilator push the heating air into the drying room. This Ventilator install between the SEF and drying room connected with pipeline.
- 6) After drying finished, the Xianggu will be taken out for grade, 80% of dried Xianggu with this facilities can be used for export.

This facilities was designed by installed and tested Provincial Marsh Gas and Solar Energy Scientific Research Institute combined with FMRI. The plant construction will be done by FMRI. The facilities are being built up.

In order to meet the fast growth of Xianggu produce in Wuyang County, it needs to build up another same

facilities in the nearest future, It will be saved because of the successful working experience of SEF in other county of our province. As all the technician and expert are available, the cost of second ones will be lower, costed. The initial work will begin at the end of this year.

4.6 Sales Realization:

Since wholesale market and marketing agent are readily available both for the fresh and dried ones. International market will be well explore. It has been estimated that there will be gap of 3 days for fresh Xianggu and 7-15 days for dried ones between the procuring and marketing.

4.7 1) Depreciation

Depreciation on plant has been fixed by 6% annually

2) Project Period:

The life of this plant has been estimated 5 years though the actual life of it will be more. The Project will be 5 years period.

Organization and Management.

Chapter V

5.1 This project will be implemented by Fuyang County Federation of Supply and Marketing Cooperative through its one of the branches "Fuyang Mushroom Research Institute" with the objective to promote Xianggu marketing for the farmer's income adding through providing technical guidance, input and other backward linkage as well as the forward linkage such as transportation processing and marketing. The Day to Day management are taken by one manager who was a original farmer 10 years earlier, now he had become the famous expert on Mushroom in Fuyang by his own efforts.

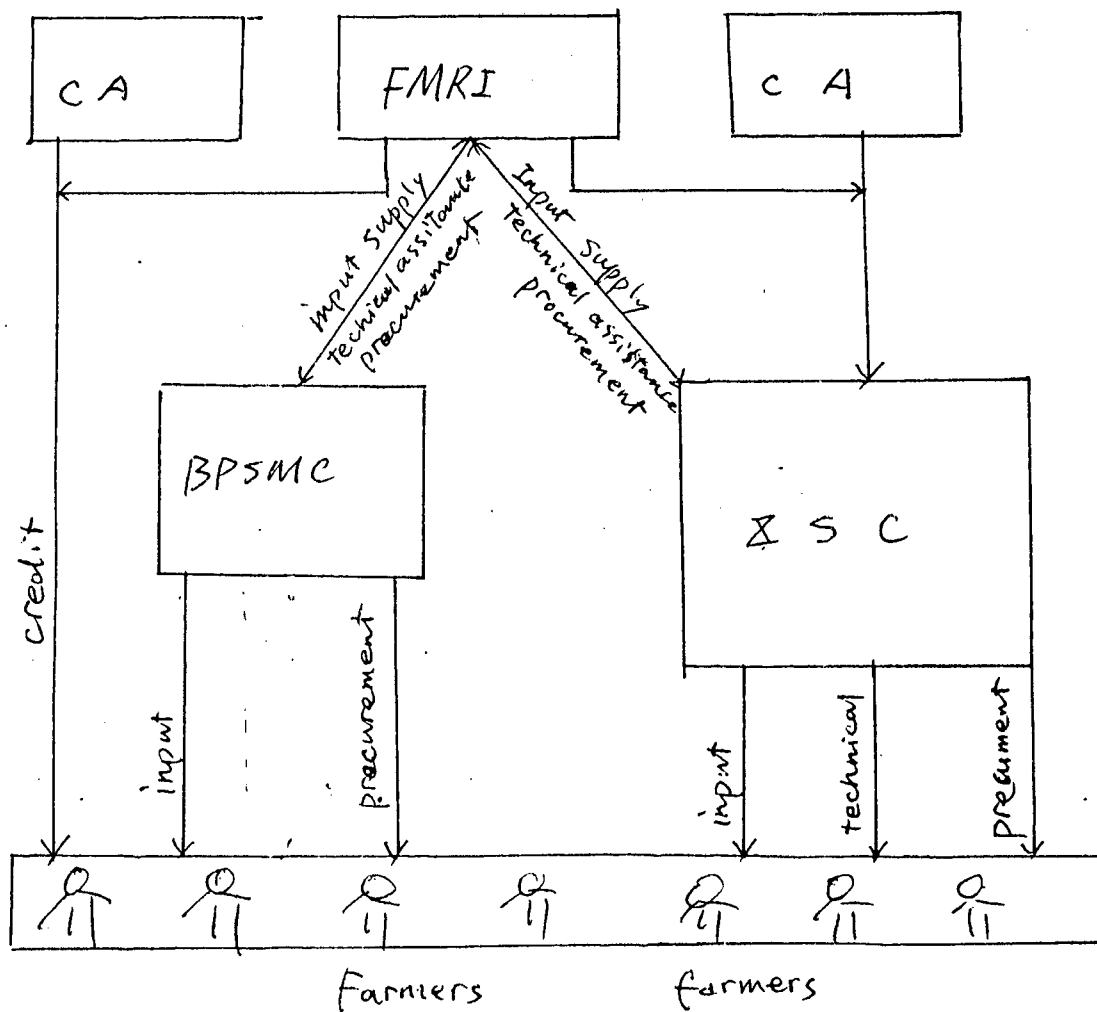
Since its main task of FMRI was to provide backward linkage especially for the technical guidance in the past, the forward linkage function will be strengthened as well be assigned. A special office and shops will be separated and 10 persons in marketing segment will be taken in.

Then BPSMC or XSC will be under as the business line. BPSMC handle by one manager assigned by Representative Committee of PSMC. The Xianggu Special

cooperative will be managed by Representative Committee which will comprised of 7 members.

All the Xianggu growing family will be the member of Xianggu Special Cooperative. One share of membership fee is ¥10 One member at least 1 share . It's not for the purpose of accumulating fund due to the farmers' poor economic situation.

The organizational chart of Xianggu growing in Fuyang County will be shown as follow:



5.2 Country Committee :

As the main task of country committee by now is to promote the local economic as well, it can play a important role in this project especially in the organizing of the farmers. As it owns strong administrative function for farmers' life. The County Government Poor Assistant Credit can be got by it.

Chapter VI

Financial Analysis

6.1 Benefits

By introducing and promoting Xianggu Mushroom in Puyang County, the farmers income will considerably increased. The farmers in mountain area sell firewoods as energy resource can only get low income as ¥60 per ton. For Xianggu growing, then price will be ¥900 per ton. If the Xianggu can get exporting through value adding will get 10-20% higher. From the grasping of technical of Xianggu growing or deal with the supply of input and procuring by themselves, the farmers will get more economic benefits. It'll be estimated that every one will get net ¥80 per year from growing Xianggu. That'll be 15% of their total income annually.

It'll greatly promote the utilization of local natural resource such as firewoods, maize core and mulberry tree branch etc. to develop the local area economic.

This will greatly add the colour in the city and countryside foods and vegetable supply market.

The farmers' winter spare time can be utilized both for man and woman. Some farmers can become the industrial employee and staff.

This would be a sample of poor area development to the area nearby.

6. Financial Analysis:

The cost of production listed below:

Component	(RMB¥)
One piece of man-made wood,	1.10
Firewood	0.10
Electric	0.05
Vaccine of Mushroom	0.10
Plastic film bag	0.10
Auxiliary component	0.50
High Temperature Sterilization	0.15
Technical guidance fee	0.10
<hr/>	
Material and labour for build raising	0.30

If growing 1000 pieces, need one labour, growing 5000 pieces also one labour.

The total cost of production is ¥1.40. the price of fresh Xianggu at least ¥1.75, the margin should be 0.35 one pieces, one labour can growing 5000 pieces, The total profit should be ¥1318, 5000 pieces should occupy 0.05 hectare cultivated land. If use this land to produce

wheat, that'll be 0.5ton wheat, with the income of ¥200. From the next two year. the technical guidance fee ¥ 0.10 perpiece should be saved, and if the average price of Xianggu increase from ¥1.90-¥2.05. one farmer can get another profit ¥1150.

At the beginning, one farmer should get credit. After selling of fresh Xianggu when six month later. the farmer pay off all the credit and can earn ¥ 1000-¥2000. And then. the farmers can produce two season of paddy again in the same field.

6.4 Processing:

The processing financial analysis has been made keeping the following factors:

- 1) The project period is 5 years.
- 2) Investment are to be made at two times:
 - a) Investment of 112500 had been made for the first new solar energy processing facilities
 - b) Investment of another ¥115000 should be made next year for the second solar energy facilities.
- 3) Among the first investment, ¥ 30000 is scientific research fee donated by Provincial Science Committee, ¥13000 is Land value used as share capital by Houzhou village Administration. it'll be refunded with dividend annually.
- 4) The Annual profit of SEF will be ¥ 100000 with the formal utilization. The investment will be paid off in less than two year.
- 5) The purchase price of fresh Kiangsu from the farmers is ¥1.75 0.5kg. FMRI pay 4% commission fee , 3% transportation fee, 1% ^{and} lost to BPSMC. The process profit is 15%. FMRI had its own circulation fund of ¥30000, no need to get credit for procurement.

6) Capacity utilization : The maximum daily capacity utilization will 1 ton per day (24 hours) with 3 shift. The facilities can be used all year round depending upon the sunshine. The sun rise and set time in Fuyang County are like: (A-10)(A-11)

summer		winter	
rise	set	rise	set
6: am	5:30 pm	7: am	5: pm

But the time of sunshine can be used for SEF would be

summer		winter	
morning	afternoon	morning	afternoon
7:-8: am	4:-5: pm	8:-9: am	3: pm

This year, the total capacity utilization can only 50% due to the lack of enough amount of produce to process off the Xiangsu season and the cost of drying in traditional way.

7) To operate one line of SEF, the staff and payment will be

staff	number (person)	annually wage (RMB¥)
Regular employee	4	8000
Part time employee	10	10000
Part time labour	5	7500
Management staff	4	8000

8) For dried Xianggu, no need special package material or machine. The cost is estimated 0.5%. The cost of transportation to Hangzhou wholesale agent is 1%.

Usually FMRI use its 0.5 ton lorry to transport dried Xianggu. The lorry depection is ~~6%~~ annually.

9) As for the production, the credit to the farmers will be got from CAB with interest rate 7.2%. Poor Assistant Relief Credit with interest rate 3%. This credit will be covered after the marketing of fresh Xianggu in no more than half year.

The return on

investment will be 50%.

In case of inflation, the price rising rate will be more high than the reduce of capital in recent three year.

6.4 On the above Assumptions :

FIRR comes to % and NPV at the end of project period comes to ¥ . The benefit cost ratio (B C R) at % comes to . It indicates that value adding is approximately per cent.

If the FIRR more than 50 cent indicates that the investment will bring returns upto per cent. But this is meaningless in present case, as in Fuyang county, there is no other opportunity where investment can be made at per cent return. Break even point of the project comes to days or % capacity utilization or Xianggu processing. The unit will break even from the year of its running.

6.5 Sensativity Analysis :

Assuming that 7 per cent reduction in revenue. BCR would be at % and the IRR would be .

6.6 Economic Analysis :

The impact of this project on national economy will not so much, but it will impact on the county economy inevitably. It will increase the earning of Foreign Currency by FCSMC through export. Modern Science and Technoledge investment on poor areas can be possible. Local labour resources can be highly utilized.

CHAPTER - VII

Budget

7.1 The Budget for five years has been given below:

(RMBY)

S. No.	Item	Y E A R				
		I	II	III	IV	V
1.	Capital Investment					
2.	Operating Costs					
3.	Revenue					
4.	Surplus					
5.	Net Revenue					
6.	Tax					
7.	Dividend					
8.	Statutory reserve					

7.2 Tax for processing first two year will not be paid, because of the Government Policy.

7.3 Surplus available for repayment will be available in Ist and IInd year, the repayment will be made.

7.4 Statutory reserves are fixed by FCSMC which including Accumulation Fund education and training to farmers fund, bad and doubtful debt fund, etc.

Recommendations.. Chapter VIII

- 8.1 In consideration of the Project implemented by FMRI, the FMRI should strengthen its organizational structure well as ^{as} its functioning, Especially in Marketing Segment. Due to its main function in Technical aspect in the past.
- 8.2 As the main task of county Administration is also in promotion the local economic, FMRI should join hand to achieve its objective .
- 8.3 As the production of Xianggu will developed rapidly, preserving the resource of woods in mountain areas should be taken great care. In case of the farmers cutting trees in mountain too fast to grow Xianggu for the money earned purpose. Tree cutting should take careful plan in order to preserve the resource for a long benefits.
- 8.4 Wuyang county Federation Supply and Marketing Cooperative should utilize its business channel to help purchase the necessary materials to grow Xianggu needed. especiall the shortage like chemical fertilizer, plastic film etc. Capital supply with coop-

erative fund will needed in this Project.

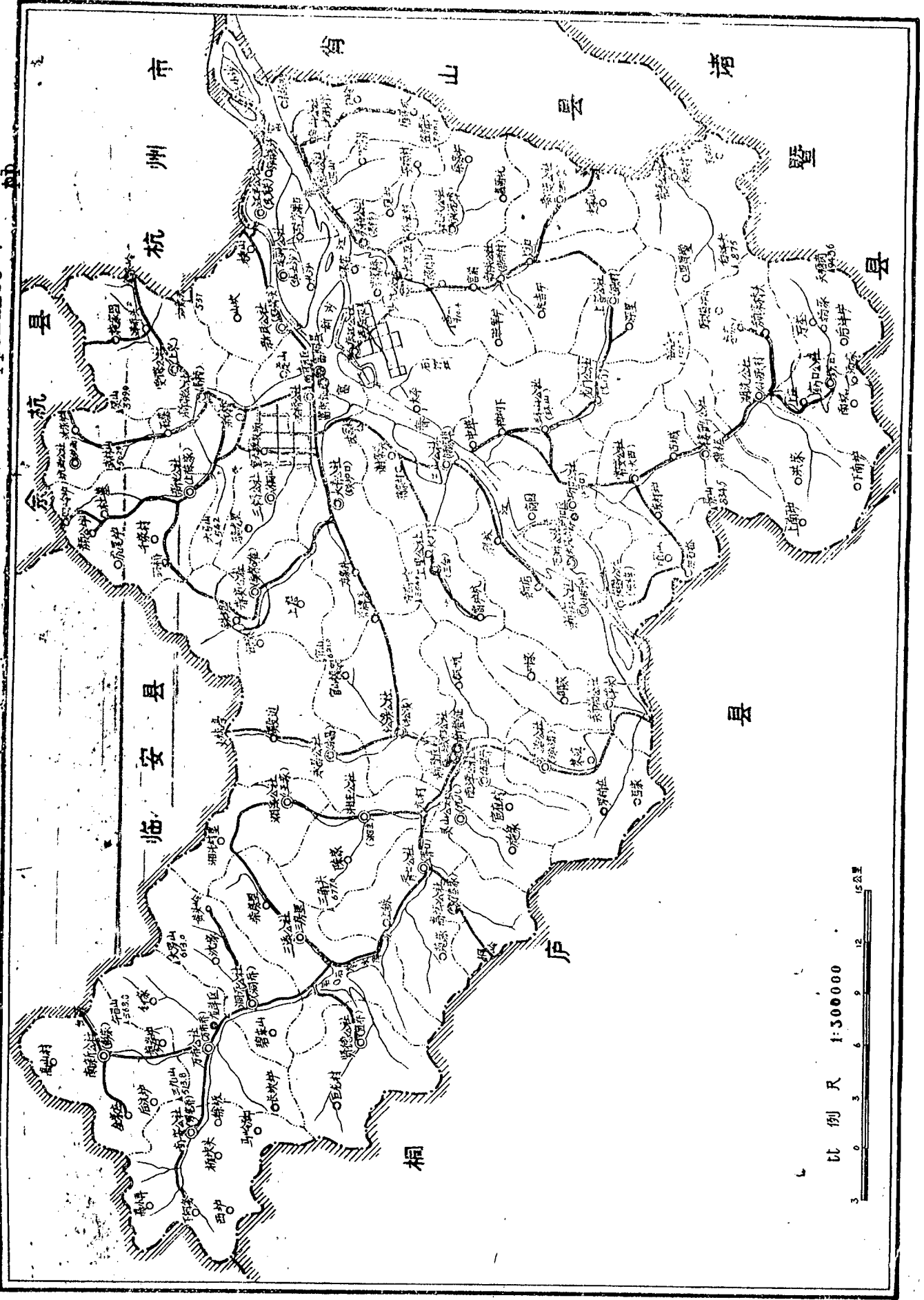
- 8.5 Fuyang County Xianggu Mushroom Developmeant Project should be listed as one of the most urgent development plan by the county Government, and to mobilized county institution concerned to support.

- 8.6 "Farmers own Xianggu Special Cooperative" in Yaokou County should be organized in a shortest time by FCSMC. So the input supply as well as procurement of fresh Xianggu will be taken by the farmers themselves. This will be well organized.

- 8.7 In some concentrated growing area, FMRI should try hard to build some small or traditional way of drying facilities processed as nearly as possible by promoting or arrange the substitute production processed. So that, the cost of transportation of fresh Xianggu can be reduced.

- 8.8 The income of the farmers should be increased through not only the price raising but also the reduce of cost for the consumer side, they can consume more Xianggu at a reasonable price.

- 8.9 For the interational marketing purpose. CHAPIXCZB shouldn't



比例尺 1:300000



Appendice-2

Land and population in Fuyang County

Total population	566.134
: Non-farmer population	55.808
Total country number	47
Total area	1829.8 square kilo
: plain area	52633 hectare
: Cultivated land	23726 hectare
: Irrigation land	21146 hectare
Mountain area	1301133 hect
Density of population per square km.	310

Appendice-4

The difference of varies kind of amine
acid content within the two kind of Xianggu
growing from man-made wood and natural wood

unit: mg/100g

	man-made wood	natural wood
1	2338.12	1247.69
2	1121.29	550.79
3	1326.52	697.22
4	4806.42	2059.70
5	1069.78	568.44
6	1543.69	842.13
7	896.73	453.05
8	1509.85	839.30
9	718.72	389.63
10	1675.91	899.62
11	526.23	304.04
12	1016.22	512.75
13	746.64	493.62
14	2040.09	1118.30
15	1314.39	691.41
16	22849.91	11667.69

note: This data was worked out by ZheJinag Provincial
Medical Science and Technoledge Service Institute

May 10, 1987.

Appendice-5

Fundamental Data of District Sub-district
 where will grow Xianggu in 1992

Ares	Household	Land (square km)	Annual income per head
Wanshi	2.254	47	500
Xinpu	1.784	32	427.35
Yushang	3.809	47	417.41
Yaokou	1.259	41	328.55
Huyuan	2.642	91	403.36
Dongzhou	3.481	19.5	592.64
Xinain	1.710	36.3	614.00
Jinjiao	4.042	32	753.97
Chunjian	2.634	40	564.36
Dagin	3.590	39	613.51

Cost of transportation. Y0.20/ton.km will be borne by FMRI. FMRI will provide all the package items to the procuring agency with no additional charge.

All the fresh Xianggu will be received by FMRI .

4.4 Processing:

To construct a drying facilities for Xianggu is very urgent word for FMRI in order to save the cost of processing and promote the quality of processed products. So that, more income will added to the famers FMRI has already taken the programe from ZheJiang Harsh and Solar Energy Resessch Institute, and also got the permission of County Government to construct.

The process of Xianggu drying is divided into following steps:

- Fresh Xinggu recieving
- Putting into drying room
- Heating by Solar Energy facilities
- Forced ventilation
- Non - saturation Heating Air . circulation

Five Years Development Plan of Xiangsu

Mushroom by T.M.T

Product	1988	1989	1990	1991	1992
Mushroom (21300g)	500000	800000	1000000	1200000	1400000
Small green bean (hect)	30	40	55.5	55.5	55.5
Gross mushroom (bags)	20000	15000	20000	30000	40000

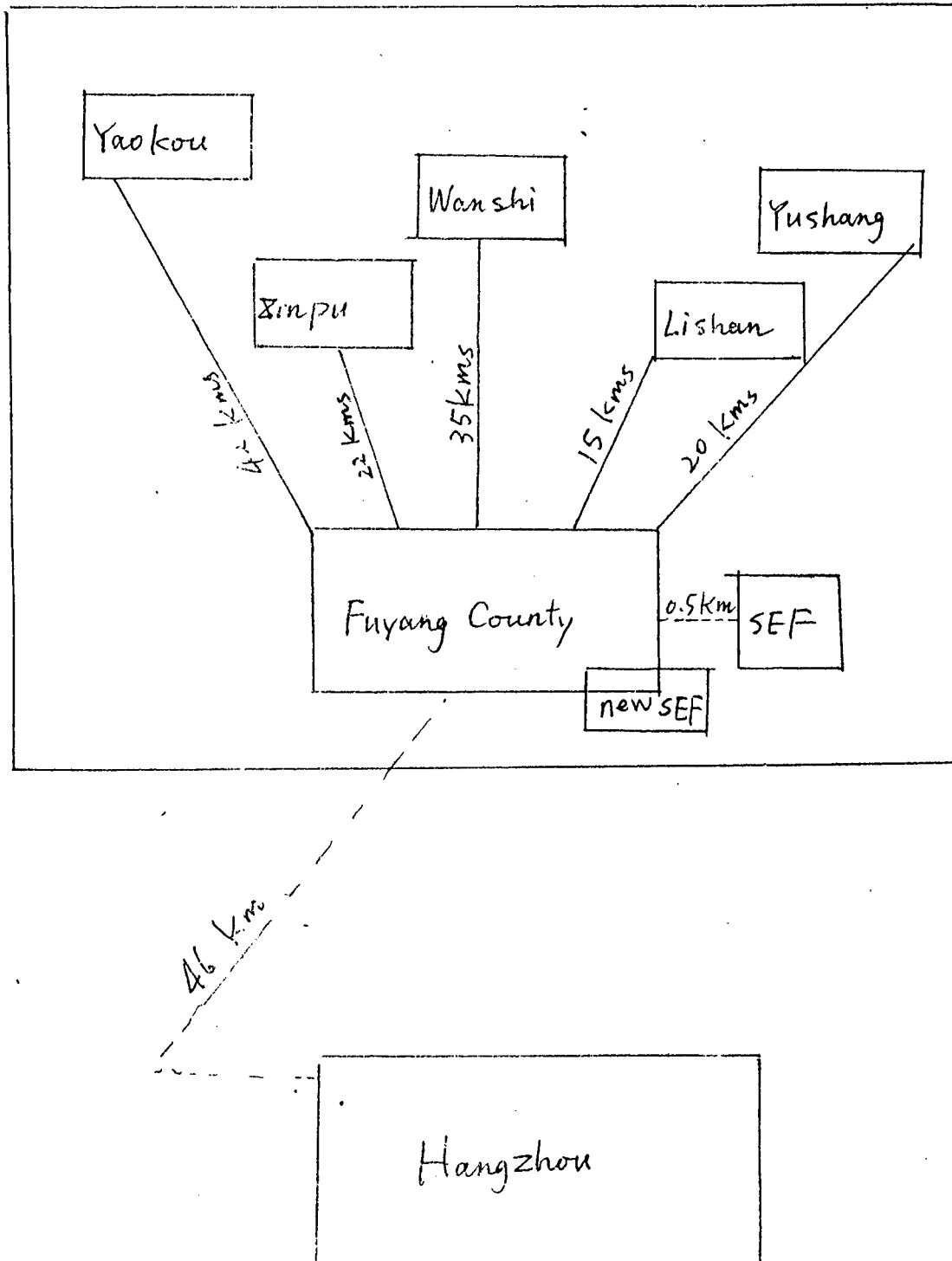
Note : 1) One piece of man-made wood can produce 0.6 kg fresh Xiangsu.

2) 1 hectare can harvest small green bean 15 - 20 ton. Its growing season begins from early summer.

3) 1 bag of raising base can produce 0.4 kg fresh Gross Mushroom.
Growing season begins from late summer.

Appendice-7

The distance and location of production base



Appendice-8

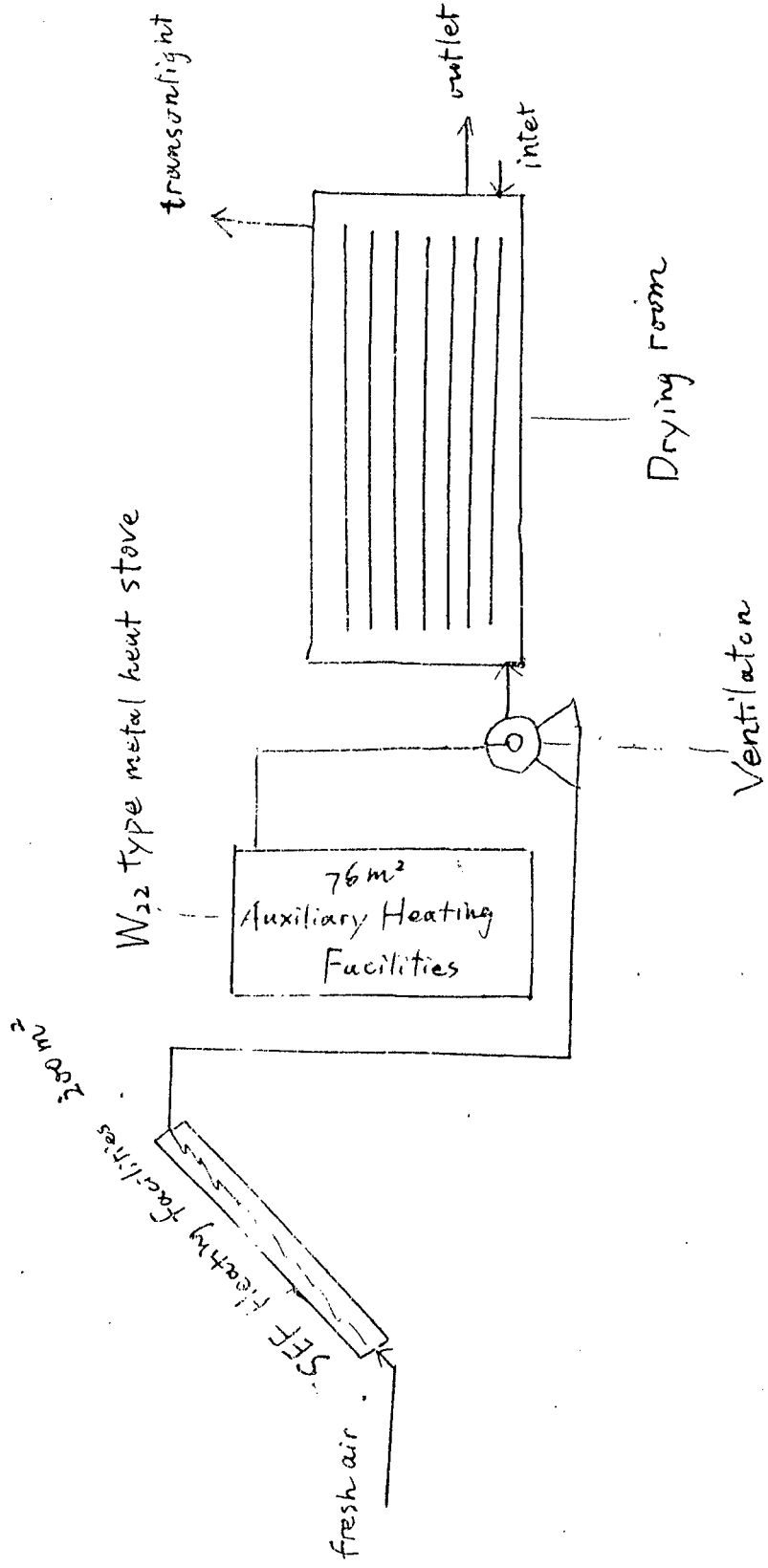
Fundamental Data of Fuyang Mushroom Research Institute

Staff	(person)
Management staff	3
Employee	25
Technical	1
Total	29
Capital	(RMBY)
Total capital	380000
Circulating Fund	30000
Fixed Fund.	350000
Facilities	(area)
One floor office building	3 (rooms)
100 M ² store-house	1
Vaccine Nursery	5300 M ²
Processing unit	310 M ²
0.5 ton lorry	1

System of Solar Energy Facilities

Appendix-9

7



Appendice-10

Rain Volume

1986

1987

month	rain volume	rainingdays	rain volume	rainingdays
Jan.	46.5	7	59.5	12
Feb.	119.1	8	48.0	11
March	145.9	17	231.1	22
April	234.0	20	265.0	16
May.	71.0	11	153.9	16
June.	128.1	16	118.9	13
July.	141.5	13	404.0	20
Aug.	86.5	11	105.2	13
Sept.	142.1	14	223.4	8
Oct.	147.0	10	107.8	14
Nov.	57.0	11	56.2	13
Dec.	19.7	7	0	nil
Total.	1439.3	145	1773.0	158

Sunshine

month	1986	1987
	total hours	total hours
Winter	401.3	414.2
Spring	471.6	414.0
Summer	522.3	496.9
Autumn	398.3	513.4

Temperature

month	1986			1987		
	average	Max.	Min.	Average (°C)	Max. (°C)	Min. (°C)
Jan	3.5°C	16.9°C	-6.5°C	5.2	17.7	-6.2
Feb	4.4°C	20.0°C	-4.2°C	6.7	27.4	-7.0
March	9.2°C	25.1°C	-3.1°C	9.3	25	-1.8
April	15.5°C	32.2°C	4.1°C	15.2	32.1	1.4
May	21.3°C	35.8°C	10.4°C	20.7	34.3	10.9
June	24.7°C	34.6°C	15.6°C	22.9	35	13.2
July	28.5°C	38.1°C	20.7°C	27.4	37	21.0
Aug.	27.2°C	37.4°C	18.3°C	28.2	36.8	21.3
Sept	22.1°C	35.3°C	12.7°C	22	33.1	9.3
Oct.	16.2°C	29.3°C	1.2°C	19.4	30.8	8.7
Dec.	11.4°C	23.1°C	0.2°C	12.8	28.8	0.3
Nov.	13°C	21.9°C	-5.6°C	4.7	24.4	-4.8
total	15.9°C	38.1°C	-6.5°C	16.2	37	-7.0

24.2.1988

REPORT OF GROUP-A

COMMENTS ON GAZIPUR UPAZILA COOP RICE MILLS LTD(Bangladesh)

1. There are about 261 coop societies in the command area. When organising a new coop rice mill it is better, to keep linkage with the existing coop societies also.
2. It is recommended to add a cash flow analysis in the report.

COMMENTS ON INTEGRATED CHICKEN BREEDING FARM (China)

1. Profit distribution has not mentioned in the report.
2. Loan repayment schedule has not been provided for which calculation of interest is confusing.

COMMENTS ON XIANGGU DEVELOPMENT PROJECT IN FUYANG COUNTY(China)

1. Project distribution : 10 - 20 per cent of the net profit has been provided for distribution among the grower members which seems to be very negligible and discouraging for increasing members participation. This should be more incentive.
2. Minimum utilisation of agricultural resources:

Total production	:	3000,000 pcs.
Utilisation	:	1666,000 "
3. Income statement is not given
Benefit of individual members cannot be ascertained.
4. All cost factors have not been mentioned clearly.

24.2.1988

REPORT OF GROUP-B

COMMENTS ON GAZIPUR UPAZILA COOP RICE MILLS LTD(Bangladesh)

Objectives : Well defined
Procurement of paddy from members. : 19,324 MT/annum
Milling capacity : 9,600 MT/annum only.
It should be more.
Storage capacity : Not defined
Membership : 13,289
Mode of payment to the members for rice. : Not defined
Board of directors : Should be either 17 or 19 so as to elect Chairman democratically.
Net increase in the income of members. : Not defined
Marketing strategy : Not defined.

COMMENTS ON INTEGRATED CHICKEN BREEDING FARM(China)

Objectives : Well defined
Membership : 600 families
Sale of female chick and eggs to members at concessional price. : No mention about the credit arrangement to the members.
Working capital : To be assessed and revised.
Price of the product : To be determined & defined (It has been shown 20% higher which is too generalised).
This will effect variable cost.

Economic and financial analysis will be revised in the above light.

COMMENTS ON XIANGGU DEVELOPMENT PROJECT IN FUYANG COUNTY(China)

Objectives : Well defined
Financial analysis should be done in a combined way by including mushroom and (green bean, grass mushrooms).
Marketing channels be defined and export quantum be defined.
Revenue generation and ploughing back to be revised.
No mention of specific variable and fixed costs.

88888

24.2.1988

REPORT OF GROUP C

COMMENTS ON GAZIPUR UPAZILA COOP RICE MILLS LTD (Bangladesh)

At the outset looking at the project document, the project appears to be viable and bankable, but to improve it looking into implementation part, following recommendations can be considered :-

1. At present 261 cooperatives are in function - one society out of it can be selected to implement this project.
2. Procurement work should be handled by the society itself and not by group leaders. It will create managerial problems.
3. Sources of funds for the project has not been specified, which financial institution will undertake the financing.
4. Detailed cash-flow statement should have been prepared, and sensitivity test should also be done.
5. Projected balance sheet is prepared, but the budget which covers more items should have been prepared.
6. Paddy purchased by the Government may be processed under this project so that Government cooperation can be availed. It will also reduce procurement cost.

COMMENTS ON INTEGRATED CHICKEN BREEDING FARM (China)

1. As per the project document, it is not viable and bankable. The cost of the project can be reduced or ~~production can be increased~~ production can be increased to make it viable. Calculation of BCR and IRR needs correction.
2. Budget for the project period is to be prepared.
3. Repayment schedule for the investment loan is to be prepared.
4. Technical operational details needs to be prepared, separately for each activities.

.....2

COMMENTS ON XIANGGU DEVELOPMENT PROJECT IN FUYANG COUNTY(China)

1. Financial calculations, such as, BCR and IRR may be mentioned in the project document, so that it can be examined.
2. The project document does not contain the budget for the project period.
3. Depreciation on plant has been fixed by 6% annually. It should be 20% since the life of the plant is given 5 years.
4. Project report needs further details on the flow of the project.
5. Sources of funds, and repayment schedule is to be prepared.
6. Project report indicates unviability after sensitivity test. Costing and other financial aspects has to be reconsidered to make its successful implementation.

sm.

Second ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia

NEW DELHI, BANGKOK, TOKYO, SEOUL

October 26, 1987—May 10, 1988

Project Prepared During Home Country Assignment
Project Title : PRODUCTION AND MARKETING OF FRESH
ORANGES IN SIKKIM STATE THROUGH
COOPERATIVE
Country : INDIA
Prepared by : THONDUP PINTSO BHUTIA

Funded by the Government of Japan

and

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

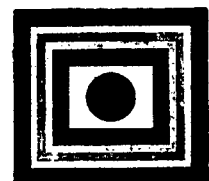
ICA Management Training Project for Agricultural Cooperatives in Asia



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P O R F W O R D

The study was sponsored by the International Cooperative Alliance (ICA) under its 2nd ICA - Training Course for strengthening Management of Agricultural Cooperatives in Asia, 1987-88.

The basic objective of the study is to examine the existing pattern of production and marketing of oranges, the second most important cash crop of Sikkim. The study is also to throw light on the cost of production, the returns currently realised by the producers, the role of various intermediaries in the marketing of this crop and on the basis of this, to suggest a possible alternate integrated cooperative marketing structure to enable the growers/members to realise a relatively higher margin of returns. The long term objective of this study would be to improve the marketing of oranges and its by-products through the standardisation, grading, packing, better transportation and processing of the commodity with an aim to substantially add value to the produce to be marketed.

The report is based partly on the primary data collected through interviews of the growers and traders engaged in this trade

and partly on the secondary data from published sources. The data thus obtained was supplemented by additional information obtained through discussions with the officers/officials of the Agriculture Department and Cooperation Department, Government of Sikkim.

I am grateful to the Departments of Cooperation and Agriculture, Government of Sikkim which helped me in conducting the study and bringing it to completion in time. I am especially thankful to Shri H.V. Madano, Programme Coordinator, ICA, New Delhi and Professor J.S. Gupta of IIM, Ahmedabad (India) who guided and took pains in completion of the project.

Further, I would also like to place on record my deep appreciation and gratitude for the enthusiastic cooperation extended to me in typing and compiling the data by Miss Tashi Phutti and Miss Binita Lama, Stenographers, Cooperation Department, Government of Sikkim.

(T. PINTSO)

HIGHLIGHTS

ORANGE

Production of oranges in Sikkim in 1986-87 was 12,100 (twelve thousand one hundred) metric tonnes.

The markets for Sikkim oranges are Calcutta and Siliguri. Total despatches of oranges to these markets in 1986-87 amounted to 8,678 (eight thousand six hundred seventy eight) metric tonnes.

Only non-institutional agencies (traders) are engaged in the marketing of oranges. The method of disposal of oranges by traders in the outside market is on a consignment basis through the Commission Agents who are also wholesale dealers.

The costs incurred and margins at different stages of marketing of oranges in 1986-87 are shown below.

	Per Centage share of the Consumer (in rupees)
Price received by grower	34.62
Market cost and charges incurred by wholesale traders within Sikkim	23.72
Marketing costs and charges incurred at Calcutta, Dume by Sikkim wholesale traders	16.26

Per Centage share
of the Commission

Margin to wholesale traders of Sikkin 15.15

Margin to retail traders 10.25
100.00

With a view to helping the grower to
secure a better price for his/her orange produce,
an alternate set up for the marketing of orange
is suggested.

SUMMARY

Oranges are grown in an area of 4,500 hectares in Sikkim. South and East Districts account for 75 per cent of the total area under oranges in the State.

As against the optimum number of 120 to 130 orange trees in an acre of land, the actual number of trees per acre in Sikkim is observed to be 90 to 95.

Only 71% of the orange trees in the State are of the fruit bearing age.

On an average, an orange tree yields 310-320 fruits per season and the production per hectare is estimated at 6 (six) metric tonnes.

The average annual production during 1986-87 was 12,100 metric tonnes and the value of the annual output of orange is estimated at Rs. 2.42 crores at the rate of Rs. 2/- per kilogram.

Jerethang (South Sikkim) and Singtam (East Sikkim) are the principal markets in the State.

A unit of thousand oranges costs Rs. 76/- to the grower in 1986-87 of which 62% was incurred on labour.

Oranges are disposed of by the growers
mostly through a system of pre-harvest sale.
The present study reveals 63% of the orange
growers resorted to this method of sale.

78% of the total production of oranges
arrives in the two principal markets of Jorethang
and Singtam.

There are 15 licensed orange traders
in Sikkim who control the entire purchase and
sale of oranges within and outside the State.

The entire quantity of oranges excluding
personal consumption at farm level and a small
volume of retail sales is disposed of in bulk.

72% of the production is sent to Calcutta
and Siliguri markets.

Traders dispatch oranges on consignment
basis and rely on commission agents for disposal
of their oranges in outside markets.

The Commission agents charge 10% on the
value of sales as their fees and dispose of the
products to the traders through a system of
auctions.

All charges incurred by the commission
agents in connection with the sale in the out-
side markets is borne by the principals.

The net return to the grower amounted to 5% of the cost of production in 1986-87. The average cost of a case of orange in 1986-87 in Calcutta market was Rs. 175/- (containing 450 fruits).

The margin to the Sikkim Traders worked out to 20.31% of the final price by the consumer.

CHAPTER-I
INTRODUCTION

Sikkim, the 22nd State of India, is a beautiful hill State and lies in the Eastern Himalayas. Sikkim has a geographical area of 7,299 square kilometres and is shaped like a rectangle of 113 kilometres length and 64 kilometres width. It occupies a strategic position being bounded by Bhutan on the East, Tibet (China) on the North, Nepal on the West and Darjeeling District of West Bengal forms the Southern boundary of this State. Being a hill State in the Himalayan range, there is hardly any plain/level ground and the elevation ranges from 700 feet to 28,000 feet. The area of this State consists mostly of mountainous slopes. The perpetual snow-line begins at an altitude of 16,000 feet. Habitation is generally sparse and scattered in hamlets, located on slopes up-to 7,000 feet altitude. The diversity in altitude of the areas in the State has resulted in a variety of climatic conditions and vegetation. Rainfall, for example, ranges from 1,250 mm to 3,500 mm per annum and in some parts, it is even more. The three broad categories of vegetation that occur in the State are : The Tropical (0 - to 5,000 feet) ; The Temperate (5,000 - 13,000 ft) and the Alpine (13,000 - 19,000 ft).

The State has been divided into four administrative districts, the East (Gangtok), North (Mangan), West (Gyalching) and the South (Nanchi). The population of Sikkim is 3.15 lakhs approximately as per 1981 census and is predominantly rural. Less than 10 per cent of Sikkimese live in the eight urban areas of the State. Agriculture is the principal occupation of the people and 81 per cent of the total working force are engaged in cultivation and another 3.8 per cent are labourers.

LAND CLASSIFICATION

The pattern of land utilization in Sikkim is presented in Table 1.

TABLE - 1
PATTERN OF LAND USE IN SIKKIM

Classification	Area ('000 Acres)	Per centage to Total
Area under forests	647.47	36.21
Barron & uncultivable	505.86	28.29
Permanent pastures	252.93	14.14
Land under miscellaneous tree crops and groves	9.88	0.55
Cultivable land	207.63	11.61
Others	164.39	9.20
T O T A L	1,788.16	100.00

Source : Government of India, Ministry of Agriculture and Irrigation (February, 1976) - Report of the Study Group on Institutional Arrangements for Agricultural Credit in Sikkim.

Total area is 17.88 lakh acres. Thus, out of a total landed area of 17.88 lakh acres, only about two lakh acres is available for cultivation. The forest in the State are deep and dense.

The land in Sikkim has been classified into 5 main categories. They are wet fields (paddy), dry fields, cardamom fields, barren land and Khannahal (Government land). The district-wise distribution of cultivable land on the basis of available data is shown in Table-2.

TABLE - 2
DISTRICTWISE DISTRIBUTION OF CULTIVABLE
LAND
(ACRES)

TYPE	NORTH	SOUTH	EAST	WEST	TOTAL
Wet Fields	2,226.61	116.42	15,402.71	11,000.00	28,745.74
Dry Fields	10,247.65	56,449.19	40,703.99	41,883.57	149,284.20
Cardamom Fields	7,855.22	3,554.00	4,491.80	2,200.98	18,100.00
Orange Fields	801.00	4,321.00	3,833.00	2,245.00	11,200.00
Total	21,130.48	64,440.61	64,431.50	57,329.55	207,332.14

Source : Government of Sikkim, Planning and Development Department (1975) : Composite Project for Small Farmers, Marginal Farmers and Agricultural Labour in Sikkim.

CROPPING PATTERN

Total area under different crops in Sikkim is estimated to be of the order of 2.07 lakh acres. Although the cropping pattern in the State is susceptible to minor yearly variations, some broad indication of land distribution of land under different crops can be had from the data presented in Table-3.

TABLE - 3
CROPPING PATTERN IN SIKKIM

(ACRES)		
CROP	AREA	PER CENT
MAIZE	1,10,000	53.04
PADDY	30,000	14.47
CARDAMOM	18,000	8.68
WHEAT	10,000	4.83
MILLETS	8,000	3.86
BUCK WHEAT	6,130	2.96
POTATO	5,000	2.41
PEAS, BEANS & PULSES	5,000	2.41
ORANGE	11,200	5.42
SOYABEAN	1,000	0.48
GINGER	2,000	0.96
APPLE, PINEAPPLE AND BANANA	1,000	0.48
T O T A L	2,07,530	100.00

SOURCE : Government of Sikkim, Planning and Development Department (1975).

COMPOSITE PROJECT FOR SMALL FARMERS,
MARGINAL FARMERS AND AGRICULTURAL
LABOUR IN SIKKIM

Of the commercial crops, the second most important is orange grown over 5.42 per cent of the area in the State. The local consumption is around 12% and the remaining quantity of orange is exported to other States.

INFRASTRUCTURAL FACILITIES

The State is economically backward. Other infrastructural facilities, such as, power, transport and technical manpower in the State are adequate.

Road transport is the only means of communication in the State. However, there is a Helicopter service between Gangtok and Bagdogra (West Bengal) for transporting passenger traffic. In the interior areas, mule tracks and village roads are used by villagers to carry their agricultural produce. Transport system in Sikkim has been nationalised and the Sikkim Nationalised Transport (SNT) caters to both passenger and goods traffic.

The industrial units in Sikkim today are Sikkim Mining Corporation, Sikkim Distilleries Limited, Government Fruit Preservation Factory (now under vicennial lease - private sector), Sikkim Tinc Corporation Limited, Sikkim Jewels Limited, Yukson Breweries Limited, Sikkim Tannery, a number of

CHAPTER-IIESTIMATE OF AREA, PRODUCTION AND COSTS OF CULTI-
VATION OF ORANGES IN SIKKIM

The climate and the hilly terrain of Sikkim offer excellent scope for cultivation of oranges in this State. The State abounds in mandarin variety of oranges and the value of annual output of oranges is estimated at Rs. 2.42 crores.

Orange trees are generally grown amidst maize fields at an altitude ranging from 2500 to 5000 feet. The plant requires good amount of manure, fertilizer and plant protection materials. The normal practice of raising an orange orchard is to plant approximately 100 saplings in an acre of land. The land is treated with 2 tonnes of manure before the saplings are planted. The saplings which are 3 to 4 years old and have a height of about 4 feet are generally obtained from nurseries. After the planting of the saplings in the farm, about fifty kilograms of chemical fertilizers are applied. Periodical irrigation is necessary in the early stages. By the second year of planting, i.e. when the plant is 5 to 6 years old, the young trees obtain a height of seven feet. The first commercial harvest can be expected by

ESTIMATE OF AREA

The estimate of the area under orange orchard in the State was 4,500/hectares in 1986-87. The figure was made available by the Agriculture Department, Government of Sikkim. However, there is some reduction in the number of fruit bearing trees due to incidence of diseases, such as, citrus greening, tracheia, powdery mildew, foot rot, citrus canker, sooty mould and pests, such as, leaf miner, root borer, mealybugs and aphids. Replantation schemes have been undertaken. The district-wise break-up of area under oranges at present may be had from Table-4.

TABLE - 4ESTIMATE OF AREA UNDER ORANGES IN SIKKIM (1986-87)

District	Area (Acres)	Per Centage to Total
North	708	7
South	4,215	58
East	3,937	35
West	2,200	20
State	11,200	100

Important orange growing areas in the different districts of Sikkim are given in Table - 5.

TABLE - 5PRINCIPAL ORANGE GROWING AREAS IN SIKKIM

North	South	East	West
Sakyong	Denchuang	Dhalapchon	Chakyong
Sangtok	Fabong	Fatuk	Kaluk
Sandong	Sangho	Makha	Cyalohing
Singhik	Ben	Tsalanthang	Lingchun
Dikehu	Nampruk	Nasitan	Marten
	Lingmoo	Sang	Rinchenpong
	Toni	Sumin	Rechi
	Poklok	Phongyong	Tikjok
	Kowsing	Byang	Tashiding
	Bornick	Pakyong	
	Nanthang	Dikling	
	Molli	Duga	
	Yangang		

A map showing the orange growing belt is reproduced at the end of this report.

ESTIMATE OF PRODUCTION

The figures of production obtained from the Agriculture Department, Government of Sikkim for the last three years is given in Table-6.

TABLE - 6ESTIMATE OF PRODUCTION OF ORANGES IN SIKKIM DURING 1984-85 TO 1986-87

Year	Area under the Crop (Acres)	Estimated Production (Metric Tonnes)
1984-85	10,000	9,400
1985-86	10,625	10,600
1986-87	11,250	12,100

In terms of weight, the average annual production of oranges in Sikkim for the period 1984-85 to 1986-87 is of the order of 10,767 metric tonnes (rounded off). (Weight of 12,000 Sikkim oranges is equivalent to one tonne).

COST OF CULTIVATION

The item-wise details of cost of cultivation of one hectare of new orange orchard is presented in Annexure-I. Thus, it may be observed that per hectare initial investment cost of establishing a new orange orchard which takes 7 years to reach the plant to a fruit bearing stage is estimated to be Rs. 17,223/-. This is as per the published report of the Agriculture Department, Government of Sikkim.

ECONOMICS OF THE SCHEME

The anticipated yield based on minimum average per tree per hectare from the 7th year up-to 12th year when the trees are expected to reach the full bearing stage is indicated in Annexure-II.

The loan carries an interest of 10% per annum and the interest for the first five years is met by the Government. The repayment of the principal loan and the interest accrued thereon starts from the seventh year coinciding with the sales of the first crop of the new garden. No harvesting cost has been taken into account. This has been done so assuming that perhaps the fruits are sold in the garden itself

and all the harvesting costs are borne by the purchaser. The rate per kilogram of the fruit at the garden has been taken at Rs. 2/- per kilogram containing 12 fruits approximately.

Based on these details, the loanee grower would get a surplus of Rs. 4,500/- and Rs. 6,150/- in the 11th and 12th years respectively after fully repaying the loans with interest. For details, Annexure-III be referred to. From the 13th year onwards, the grower will get an yearly regular assured income of Rs. 12,500/- for about 50/60 years.

PRODUCTION COST

From the 7th year onwards, a regular yearly recurring maintenance cost of only Rs. 2,500/- on account of fencing, interculture, manure, fertiliser, liming, micro nutrient and cost of pesticides and labour is estimated to be spent for upkeeping the garden in a healthy and good condition. In addition to this, a total harvesting cost of Rs. 3,187.50 as per details indicated in Annexure-IV would be required to be spent in case the growers themselves harvest and market the fruits. Thus, therefore, the production cost of one hectare of orange garden containing about 75,000 fruits comes to Rs. 5,687.50 i.e. Rs. 76/- per 1000 unit fruits.

IRR OF ONE HECTARE ORANGE CULTIVATION AND ITS
SENSITIVITY

It would be of interest to know the economic worth of orange cultivation. For this, we have computed the IRR of growing oranges on a hectare of land. For this purpose, Annexure - V and Annexure - VI be referred to.

In order to examine the sensitivity of IRR to the yield, we have computed IRR on two different sets of assumptions :

- (a) the first set, which is based on conservative estimate of the yield which are given in Annexure-V ; and
- (b) the second set, which is based on reasonable estimate of the yield which are provided in Annexure-VI.

Thus, the IRR on conservative estimate comes to 16.54% and that on reasonable estimate of yield comes to 25.14%. It should be noted that IRR is gross of the interest cost. Thus, at the interest rate of 10%, the rate of profit on conservative estimate comes to 6.54% while that on reasonable estimate comes to 15.14%. These are fairly attractive rates of return and hence, orange cultivation should be encourage.

The calculations are provided hereunder

in Table-7 and Table-8.

TABLE - 7

<u>Discount Rate</u>	<u>N P V</u>
10%	Rs. 15,081/-
16%	Rs. 530/-
18%	Rs. 1,434/-

$$.434 + 530 = 1,964$$

Change in NPV = 1964. If change in discount rate is 2%,

Therefore for NPV to change by 530,

Discount rate must change by

$$\frac{2 \times 530}{1964} = 0.54$$

∴ Internal Rate of Return (IRR) = 16.54%

TABLE - 8

SENSITIVITY TABLE

<u>Discount Rate (i)</u>	<u>N P V</u>
20	+ 6,260
24	+ 1,384

The N P V declined by 4876 (6260 - 1384)

when (i) increased by 4%.

∴ NPV would decline by 1384, if (i) increased by

$$\frac{4876}{4} \times \frac{1}{1384} = 1.14$$

$$\begin{aligned} \text{IRR} &= 24 + 1.14 \\ &= 25.14\% \end{aligned}$$

CHAPTER - IIIEXISTING MARKETING SYSTEM

The perishable nature of oranges necessitate quicker marketing of these fruits. The trade is seasonal and confined to four months in an year - November to February. Oranges are grown in interior areas generally not accessible. A peculiar feature in the marketing of oranges in Sikkim is the existence of a system of pre-harvest sale whereby the orange trader purchases the produce well in advance of the ripening stage of the fruits. The situation is similar to that of an annual lease of the garden by the traders who undertake all the expenses in connection with the harvest, transport and selling. 63% of the growers resort to this system of pre-harvest sale.

The principal centres for assembling and marketing of oranges in Sikkim are the mandis located in Jorethang and Singtam. Other less important wholesale markets are located at Rangpo, East Sikkim and Melli, South Sikkim.

The entire production of oranges (excluding consumption at farm level) are brought generally on head loads and by trucks to the various assembling markets. An estimate of the quantity of oranges which arrive in the various assembling markets is presented vide Table-9. The total arrival is 10,661 Metric Tonnes.

TABLE - 9ESTIMATE OF ORANGE ARRIVALS IN 1986-87

<u>Assembling market</u>	<u>Orange arrivals (Tonnes)</u>	<u>Per Centage to Total</u>
Singtam	4,046	37.95
Jerothang	4,207	39.45
Holli	758	7.11
Rangpo	1,062	9.96
Dikohu	588	5.52
Total	10,661	100.00

The marketing structure of oranges within Sikkim consists only of non-institutional agencies operating in the various assembling markets.

Traders :- The Department of Local Self Government, Government of Sikkim grants licenses for anyone wishing to enter into this trade on payment of renewable annual fee of Rs. 245/-. As on date, there are 18 licensed orange traders in Sikkim.

There are a number of retail vendors of oranges in and around the market centres but statistics relating to their number and volume of transactions are not available since registration is not compulsory.

The normal practice of the orange traders is to negotiate with the illiterate growers the price of oranges in his garden much in advance of the plucking season. In quoting the price, the traders take into account the likely yield, wastage,

interest on capital and fluctuations in the price. Once the price is settled, cash payment is made either in full or in part and the deal is concluded. Generally, the yield of one or two trees are earmarked for personal consumption of the grower. Casual labour is employed for plucking. Payment of wages for plucking are based on the number of fruits plucked. Transportation of the fruits are done, both on head load and trucks and payments are made on the basis of weight and distance just as the local orange trader operating in Sikkim, traders from Calcutta also negotiate at times pre-harvest purchase of orange gardens through the local agents.

After arrival in the assembling markets, the oranges are sorted out to remove unripe, over-ripe, under-ripe and rotten fruits. They are then graded into three categories - big, medium and small sizes. Fruits which are slightly damaged while plucking are marketed as "second" quality and sold separately. The graded fruits are wrapped in waste paper and packed in wooden cases weighing about 35 to 40 kilograms each and are ready for despatch. Transportation up-to Siliguri is done by Sikkim Nationalised Transport and thereafter transhipped by private road transport carriers to the wholesale market in Calcutta. All the despatches of oranges out of Sikkim are on consignment basis and the trader in the State bears all the expenses.

The bulk consumers within Sikkim are the Government Fruit Preservation Factory, Sikkim Distilleries Limited and the Defence Services. Details of disposal of oranges in 1986-87 has been shown in Table 10.

TABLE - 10
DISPOSAL OF ORANGES IN 1986-87

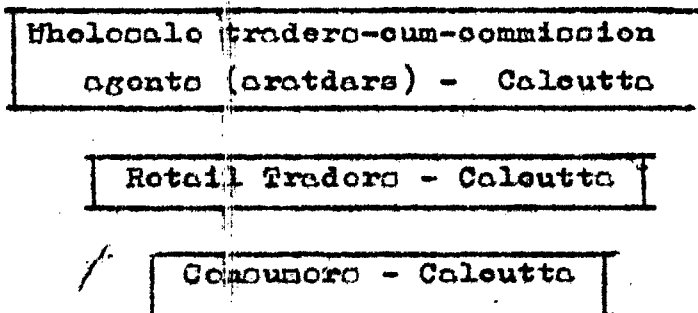
<u>Nature of disposal</u>	<u>Quantity</u> <u>(Tonnes)</u>	<u>Per Centage</u>
1. <u>Within Sikkim</u>		
I. Consumption at farm level and retail sale	1439	11.89
II. Sales to Government Fruit Preservation Factory	376	3.11
III. Sales to Densong Cooperative Society for the consumption of defence forces.	306	2.53
IV. Sales to Sikkim Distilleries Limited, Rangpo	50	0.41
2. <u>Outside Sikkim</u>		
I. Despatches to Calcutta and Siliguri.	8678	71.72
3. <u>Wastage.</u>	1251	10.34
	<u>12,100</u>	<u>100.00</u>

CHAPTER - IV

MARKETING STRUCTURE OUTSIDE SIKKIM

The wholesale traders-cum-commission agents (aratdars) handle the marketing of oranges. The main distribution centre for oranges is the wholesale fruit market (Phalmandi) located in Calcutta. In Calcutta, the demand is for fresh orange fruits and the traders cater to the consumer demand in greater Calcutta, Burdwan and Kharagpur. Siliguri traders cater to the consumer demand in Malda, Asansol and some of the markets in Bihar and Uttar Pradesh. Sikkim oranges are in great demand because this mandarin variety is harvested in November and reaches the Calcutta market thereafter. This is the only variety available in the market during this period.

The trade in Sikkim orange is monopolised by the Aratdar in Calcutta. The diagram below indicates the 2 tier set-up for marketing of oranges.



CHAPTER - VPRICE MECHANISM AND FINANCIAL SYSTEM

The average price realised by the growers in Sikkim for 1000 fruits is estimated to be Rs. 140, Rs. 145 and Rs. 150 for the years 1985-86, 1986-87 and 1987-88 respectively.

A comparison of the cost of cultivation with the price realised indicates that the margin which accrues to the growers work out to about Rs. 0.07 per fruit. Table-11 be referred to.

TABLE - 11MARGIN TO GROWER OF ORANGES

(Rs. per '000 fruits)

<u>Year</u>	<u>Average price realised</u>	<u>Average cost of cultivation</u>	<u>Margin</u>
1984-85	140	74.00	66.00
1985-86	145	75.00	70.00
1986-87	<u>150</u>	<u>76.00</u>	74.00
	<u>435</u>	<u>225.00</u>	

The cost of production is about 51% of the price realised in 1986-87.

The net margin to the grower in 1986-87 works out to 97% of the cost of production. This rate of return appears to be very attractive.

MARKETING COSTS

Marketing costs include all the expenses incurred in the two stages of disposal of oranges within and outside Sikkim. The trader bears all the expenses. Expenses in the first stage are - watch and ward of the Garden, plucking of the fruits, transportation from orchard to mandi, sorting, grading, packing, godown rent, khassana, banar tax, transport charges from Sikkim to Siliguri.

The second stage - marketing charges incurred by the Commission Agent in the disposal of the oranges are commission, handling charges, charity, stationery, postal and bank charges and are debited to the account of the Sikkim orange consignor. The details is given in Annexure-VIII.

FINANCING SYSTEM

The existence of a well organized financing system is a primary requisite for any economic activity particularly agricultural marketing in a State like Sikkim. A farmer needs financial assistance to meet operating expenses in agriculture and also to tide over his consumption expenses till the harvest of his crops.

In the absence of a well organized strong financial institution, the farmers depend

mostly on the non-institutional finance and are compelled to continue with the pre-harvest sale.

The traders are long established. By combining a variety of services like selling of feed grains, cloth, ration commodities and household goods, etc. with buying of the agricultural produce, they maintain very close relationship with the farmers. Most of the traders are found to offer non-productive consumption loans in cash and kind to farmers during lean months against the promise to tender agricultural produce. More often than not, the traders are found to sell their goods at high prices and buy the produce at much lower prices against which, until now the farmers have no remedy.

CHAPTER-VI

NEED AND JUSTIFICATION FOR A COOPERATIVE MARKETING
STRUCTURE

The primary reason for the relatively low return to the orange grower is the prevalence of pre-harvest sale. The prospects of getting more remunerative prices may solve serve as an incentive not only for extending the area under the crop but also for taking better care of the fruit bearing trees with a view to increasing the yield rate. Any alternative marketing structure for realising a more remunerative price for the grower should be to start with gradual replacement of the existing system of pre-harvest sale. It should ensure the grower's access to finance, both in cash and kind.

The existing price spread to the percentage share of the consumers price shows that :

(a) Grower's share is	-	34.60%
(b) Marketing costs and charges is	-	39.98%
(c) Margin of the trader is	-	<u>25.40%</u>
Total	-	<u>100%</u>

This examination indicates a fairly good ground and scope for increasing the price of the growers by reducing the existing cost and margin

per centage on the business. A more effective and efficient arrangement of marketing system perhaps would undoubtedly improve the position further.

The cooperatives in the State, although their set goals are to help their member farmers in their economic development through various economic activities, are yet to involve in the marketing of the orange produce of the farmer members, which is the main important cash crop of the members residing in the orange belt areas. In order, therefore, to save the growers from further exploitation by the middlemen and with a view to assure remunerative price to the growers of their produce, it is the prime importance of the time that the Cooperatives should group together and make effort to organize a cooperative marketing system for marketing fresh orange of the members for their best advantage as an alternative arrangement. Such an effort would not only ensure better returns to the farmers by providing them appropriate marketing avenue but will also provide backward and forward linkages to further increase their income by increasing their productivity and may also act as a check in checking the present monopoly and practices of the private contractors in this business.

On the basis of the above facts and consideration, the existing Sikkim State Co-Operative Supply and Marketing Federation Limited (SIMFED) at the top and the affiliated 19 Primary Multipurpose Cooperative Societies functioning in the orange belt areas should enter into this venture forthwith. There are already more than 2,000 orange grower members in these 19 Primary Cooperative Societies.

The objective of the Cooperative is not to maximise profits at the cost of growers or the consumers. Its main objective is to ensure remunerative return to the orange growers and providing quality goods at reasonable rates to the consumers.

CHAPTER - VII

THE PROJECT

"OBJECTIVES"

The basic objective of this proposed Project is to increase the income of the Farmers of the State by promoting the following :-

1. To provide adequate institutional finance to the growers to meet their marketing and consumption needs.
2. To provide extension services through appropriate institutional and Departmental agencies so as to improve productivity.
3. To create a channel for undertaking marketing of oranges both within and outside the State controlled by the growers.
4. To provide remunerative price to the growers by minimising the marketing costs and margins.
5. To provide processing facilities for value addition returns.
6. To make effort for gradual replacement of the pre-harvest sale.
7. To motivate orange growers through interaction and involvement to develop local leadership for developing the economic and social activities.
8. To provide market intelligence to the growers.

(b) AREA OF OPERATION

The area of operation of the Society will be the State of Sikkim as a whole.

(c) PROJECT COMPONENTS

The following are the project components :-

1. Target

To begin with, a target to market 2,000 metric tonnes of oranges has been fixed for the first year of the programme. Thereafter, it may be increased as per the schedule of targets given hereunder :

YEAR	QUANTITY (M.T)	PER CENTAGE OF HANDLING TO TOTAL PRODUCTION	WORKING CAPITAL REQUIREMENT
1ST	2,000	17 %	Rs. 40 lakhs
2ND	2,500	21 %	Rs. 10 lakhs
3RD	3,000	25 %	Rs. 10 lakhs
4TH	3,500	29 %	Rs. 10 lakhs
5TH	4,000	33 %	Rs. 10 lakhs
6TH	4,500	37 %	Rs. 10 lakhs
7TH	5,000	41 %	Rs. 10 lakhs
8TH	5,500	45 %	Rs. 10 lakhs
9TH	6,000	50 %	Rs. 10 lakhs
10TH	7,000	58 %	<u>Rs. 20 lakhs</u>
			Rs. 140 lakhs

A modest target has been suggested. By the end of the tenth year, the Cooperatives would reach a procurement and marketing level of about 50 per cent of the total production handling thereby a total quantity of 7,000 metric tonnes.

Based on the year-wise physical target fixed, the working capital requirement is estimated to be Rs. 1.40 crores (at the rate of Rs. 2/- per kilogram). As it is proposed to advance only 70% of the value of the fruits as loan to the growers in advance, the actual working capital requirement therefore, comes to Rs. 98.00 lakhs excluding fund required for meeting the operational costs. A sum of Rs. 28.00 lakhs would be required in the first year. The total fund requirement would be met by the Sikkim Cooperative Supply & Marketing Federation Limited (SIMFED) from its own fund as it has already a huge unutilised fund at its disposal. In case, more fund is required, then it may be raised from the National Cooperative Development Corporation which has such financing provision for funding the marketing programme at an interest rate of $8\frac{3}{4}\%$ on State Government guarantee or can be raised through the Commercial Banks. The Commercial Bank's rate of interest is $13\frac{1}{2}\%$ which is very much higher than that of National Cooperative Development Corporation.

FINANCING PATTERN

The loan requirement of the members of the Cooperative Societies should be made available through the respective Cooperative Societies located at orange growing areas. SIMFED should place the fund at the disposal of the respective Cooperatives on receipt of the demand and commitments of supply of fruits. The Cooperative should advance loan to its members preferably in two instalments both in cash and kind for meeting their consumption, production, marketing and harvesting expenses. The first part of the loan be released in the month of June/July which is the lean period for the cultivators.

HARVESTING AND TRANSPORTATION

A detailed plucking schedule need to be worked out carefully. This part of the function be done by the respective Societies with the help of the Circle Cooperative Inspectors. The members themselves will pluck the fruits. Transportation arrangement be made accordingly so that the fruits reach the assembling centres of the SIMFED within four to five hours after plucking. The transport arrangement be organised by the respective Cooperative Societies with the help of SIMFED.

MARKETING

The Sikkim State Cooperative Supply & Marketing Federation Limited will open assembling centres at important assembling centres at Jorothang and Singtam. Depending upon the need, additional sub-centres may be opened at convenient places. Since SIMFED is already running a branch office-cum-fruit yard at Siliguri, West Bengal, fruit mandi, and has arrangement with National Agricultural Marketing Federation of India Limited (NAPED) at Calcutta and Delhi, all sales be channelised through these points.

FARM GUIDANCE AND INPUT SUPPLIES

The Agriculture Department, Government of Sikkim has 11 Regional Centres, 12 Regional Sub-Centres and 127 V.D.W. Centres functioning in the various parts of the State. All these Centres are located in the heart of the villages. All extension works including distribution of fertiliser, pesticides and other services like supply of seeds, sapplings, implements required by the farmers in the project area are presently made available directly through these Centres. Hence, there is no need at this stage to suggest for adding additional technical staff both at the Primary Cooperative Society and State Federation level for providing farm guidance

to the members. The Agriculture Department has arrangement to supply good orange seedlings raised on scientific lines to the members at subsidised rate through these Centres. A proper coordinated arrangement would be quite enough and for which, the Cooperatives and the Circle Cooperative Inspectors should remain in regular touch with these Centres for all their requirements.

ORGANISATION AND MANAGEMENT

The project will be implemented by the Sikkim State Cooperative Supply & Marketing Federation Limited (SIMFED) through the 19 (nineteen) Multipurpose Cooperative Societies affiliated to it. The Circle Cooperative Inspectors posted in the fields and the Branch Offices of SIMFED will organise and coordinate the whole activities. The organisation and management chart of SIMFED is indicated in Annexure-VIII. There are 12 officers and 3 middle level officers already with the organisation which seemed to be adequate enough for implementing the scheme.

All the Multipurpose Cooperative Societies have shop-cum-office-cum-godown buildings and full time paid Secretaries supported by other staff. The existing staff available with the Multipurpose Cooperative Societies also seemed to be quite enough for implementing the project. Assuming this, no additional staff and fund requirement at both the levels is suggested.

PROCESSING UNIT

There is one Government Fruit Preservation Factory at Singtam, East Sikkim, with a processing capacity of 30 (thirty) Metric Tonnes per day on three shifts basis, manufacturing jam, juice, squashes, jellies, orange segments, marmalades, etc. The capacity utilisation of this Factory has been only about 50%. Owing to the continuous running of the unit into losses, this unit has now been given on vicennial lease to private sector. The reasons attributable for the loss was that of tough competition put up by such other units working outside the State.

This project, therefore, envisages to market fresh orange fruits to begin with. In course of time and with the gaining of experience, subject to availability of fruits in bulk left over after marketing, efforts may be made to put up a small processing unit by SIMFED.

The unit may be set up at Rothak in the West District of Sikkim in the Industrial Area on Government land which is presently lying vacant. This area is very suitable for setting up such a unit as there are all the facilities, such as, power, road, water, raw materials within its easy reach.

The term loan required for putting up the unit may have to be raised from the National Cooperative Development Corporation which has

:39-

provision for financing such unit under its programme at concessional rate of interest. With regard to the working capital requirement, the State Bank of India would be prepared to make available such requirements. Interest rate on term loan of the Sikkim Industrial Development & Investment Corporation Limited is B. 12.5% per annum.

The project for putting up a processing unit at this stage is, therefore, not envisaged immediately and may be prepared and put up at a later date in case need arises.

CHAPTER-VIII

ECONOMICS OF MARKETING 2000 M.T. OF ORANGES

An attempt has been made to examine the economies of marketing 2,000 metric tonnes of oranges in the following paragraphs :-

1. A sum of Rs. 28.00 lakhs would be required for advancing loans to the growers at the rate of 70% of the value of the committed fruits. Assuming the rate of interest to be 10% per annum and the time, period of the loan to be 6 months, the interest thereon would be Rs. 1,40,000/-.

2. Marketing charges for marketing one case of orange containing 40 oranges is estimated to be Rs. 77.96. 2,000 metric tonnes of orange contains 2.40 crores of fruits requiring 53,333 cases. Marketing charge @ Rs. 77.96 per case for 53,333 cases, therefore, is estimated to be Rs. 41.58 lakhs. This total amount would not be required to be spent at one stretch of time. Rather, it is the requirement of 3 months for 2,000 M.T. oranges estimated to be marketed within a time period of three months. Hence, the actual requirement of working capital on account of this works out to be Rs. 41.58 \times 3 = Rs. 13.86 lakhs. The interest on this Rs. 13.86 lakhs for three months at the rate of 10% per annum works out to Rs. 34,650/-.

3. Unforeseen charges like T.A./D.A., etc for meeting other expenditure @ 5% on Rs. 13.86 lakhs for 3 months comes to Rs. 2,07,900/-.

Therefore, the total fund requirement for meeting the marketing cost comes to
 Rs. 1,40,000 + Rs. 24,650 + Rs. 2,07,900 =
 Rs. 3,82,500.

Assuming the margin per case is Rs. 15.15 for 53,333 cases estimated to be Rs. 8,07,994.95 assuming that the Calcutta retail sales expenditure including wastage could be met within the margin of 10.15% .

PROFIT AND LOSS

Basing on the above figures, the profit and loss account runs as follows :-

EXPENDITURE	INCOME
1. Variable Cost as per Para (1), (2) and (3) 3,82,550.00	Margin receipts @ Rs. 15.15 per case for 53,333 cases
Not Surplus 4,25,444.95	8,07,994.95
TOTAL 8,07,994.95	8,07,994.95

Assuming that the total profits would be distributed as under :-

- (i) 50% to the growers
- (ii) 25% to the Federation and
- (iii) 25% to the Societies

B E N E F I T S

The members' share would be Rs. 2,12,722.47. The member would get $\text{Rs. } 2,12,722.47 \div 53,333 \text{ cases} = 3.99$ which means Rs. 8.87 per thousand oranges more. This is excluding the savings made on the marketing charges and commission. It is expected that there would be much savings on marketing charges and commissions when the sales are channelised through the Branch Offices and NAFED which is not accounted for here.

CHAPTER-IX

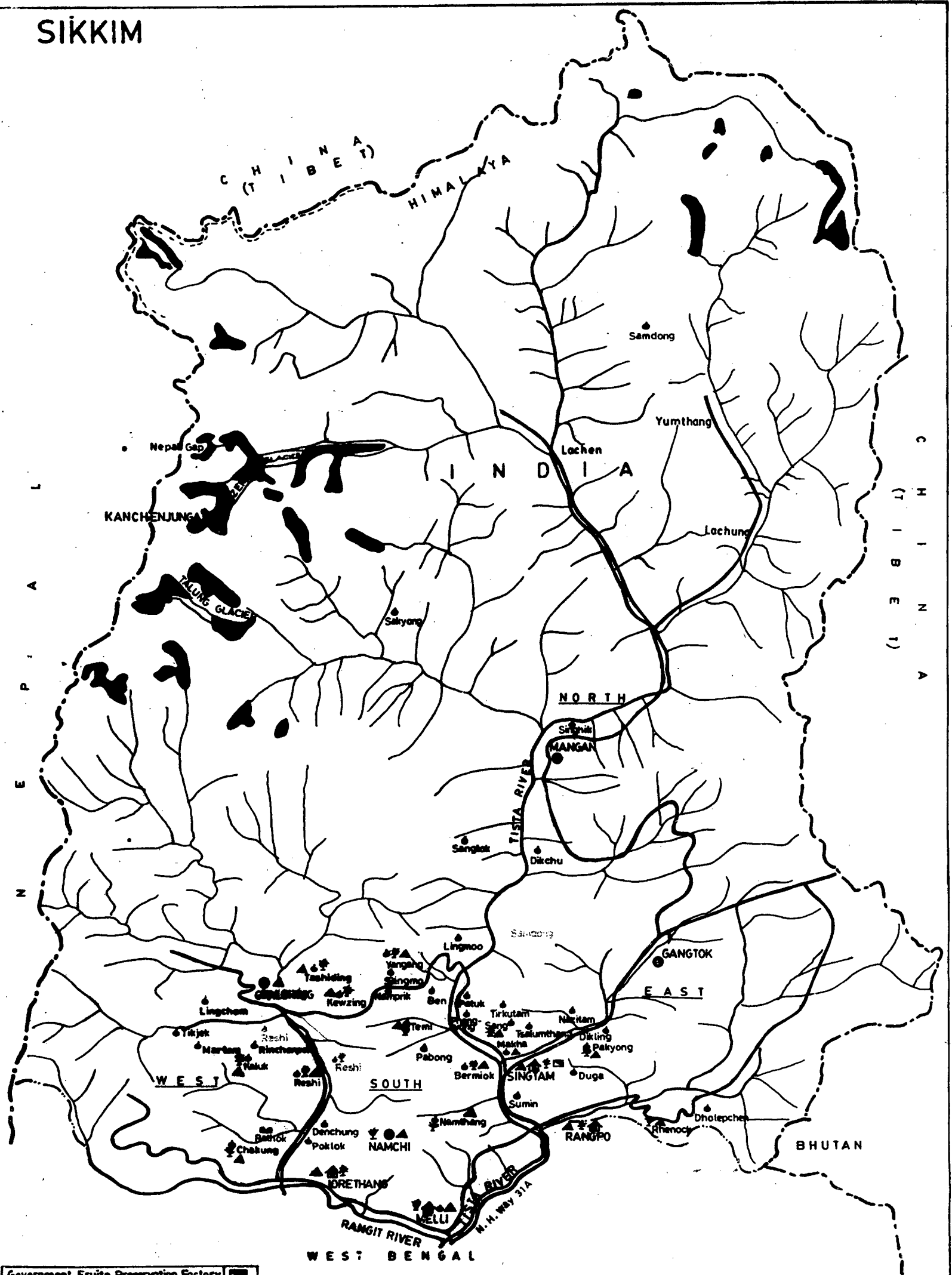
RECOMMENDATIONS

1. Considering the growth of orange plantation in the project area, it is the prime need of the hour to organise and arrange marketing in a systematic manner so that the growers are assured of a reasonable price for their produce.
2. By strengthening the "growers own marketing institution", it can be possible to provide a better alternative of marketing and exploitation of the farmers by the contractors will be eliminated.
3. The input requirements of the members of the Cooperatives be arranged well in time by coordinating the activities with the field level officers of the Agriculture Department, Government of Sikkim, by the Circle Cooperative Inspectors and Secretaries of the Cooperative Societies.
4. The Cooperatives should capture the maximum share of orange produce and also try to increase the yield per acre.
5. The Secretaries of the Cooperative Societies and the Managing Committee should be given training in the marketing of fruits.
6. The Cooperatives should tie up marketing strategy with the other Federations outside the State, in marketing the products.

7. The State Government should allot required land to SIMFED in case SIMFED establishes a processing unit at the Rothak Industrial area in the West District of the State.

8. State Government guarantee be made available to SIMFED in case SIMFED raises term and working capital loans for setting up the unit and marketing of the fruits.

SIKKIM



Government Fruite Preservation Factory	
Principal Orange Marketing Centres	
Orange Belt Area	
MPCS in Orange Growing Area	
District Head Quarter	
M.P.C.S	
Industrial Area	

International Boundary	
State Boundary	
Rivers	
Road	
National Highway	

COST OF CULTIVATION PER HECTRE UNTILL FRUITATION
(Capital Cost)

ANNEXURE I

SL. NO.	PURPOSE	1ST YEAR	2ND YEAR	3RD YEAR	4TH YEAR	5TH YEAR	6TH YEAR
1.	Land Preparation/ digging of pits etc.	1250/-	-	-	-	-	-
2.	Fencing	1250/-	125/-	125/-	125/-	125/-	125/-
3.	Cost of Planting Material	560/-	212/-	-	-	-	-
4.	Cost of Planting	325/-	-	-	-	-	-
5.	Interculture/ Weeding/Pruning	500/-	500/-	500/-	500/-	500/-	500/-
6.	Manures and fertili- zer & liming	625/-	500/-	625/-	750/-	875/-	1000/-
7.	Micro Nutrient	-	187/-	250/-	312/-	187/-	187/-
8.	Plant Protection:						
a)	Cost of equipment	1125/-	-	-	-	-	-
b)	Cost of pesticides & laboures	125/-	238/-	375/-	625/-	875/-	875/-

TOTAL 6025/- 1762/- 1875/- 2312/- 2562/- 2687/- Total: 17200/-

ORANGE YIELD DETAILS AFTER 6TH YEAR TILL 12TH YEAR

(ANNEXURE - II)

YEAR OF FRUITING	PERCENTAGE OF YIELD	NO MINIMUM AVERAGE YIELD FRUITS PER HACTRE	VALUE @ RS: 2/- KG..
7TH YEAR	10%	625 KG.	1250
8TH YEAR	20%	1250 KG.	2500
9TH YEAR	30%	1875 KG.	3750
10TH YEAR	50%	3125 KG.	6270
11TH YEAR	70%	4375 KG.	8770
12TH YEAR	90%	5625 KG.	11270
13TH YEAR	100%	6250 KG.	12500

NOTE: (I) 12000 fruits is equal to 1 tonne

Average (II) 1200 fruits is equal to 1 Qtl.

(III) 12 fruits is equal to 1 kg.

(IV) 1 hactre yield is equal to 75000 fruits.

INCOME AND EXPENDITURE ON ONE HECTARE OF ORANGE PLANTATION

YEAR	LOAN DISBURSEMENT	LOAN COST	INCOME OF SALES OF PRODUCE	INTEREST ON LOAN	PRINCIPAL OF LOAN	INTEREST @ 10% P.A.	TOTAL INCOME & R. PAYMENT	NET PROFIT
	(Rs)	(Rs)	(Rs)	(-)	(Rs)	(Rs)	(Rs)	(Rs)
1st Year	6,025/-	6,025/-	-	-	-	603/-	603/- (-)	603/-
2nd "	1,762/-	7,787/-	-	-	-	779/-	779/- (-)	779/-
3rd "	1,875/-	9,662/-	-	-	-	967/-	967/- (-)	967/-
4th "	2,312/-	11,947/-	-	-	-	1,199/-	1,199/- (-)	1,199/-
5th "	2,562/-	14,536/-	-	-	-	1,454/-	1,454/- (-)	1,454/-
6th "	Bearing 10% 2,687/-	17,223/-	1,225/-	-	223/-	1,750/-	1,946/- (-)	721/-
7th "	20% -	17,000/-	2,500/-	-	2,000/-	1,700/-	6,200/- (-)	3,750/-
8th "	30% -	15,000/-	3,675/-	-	2,000/-	1,500/-	6,000/- (-)	5,250/-
9th "	50% -	13,000/-	6,225/-	-	3,000/-	1,300/-	6,800/- (-)	578/-
10th "	70% -	10,000/-	8,757/-	-	3,000/-	1,000/-	6,500/- (-)	2,077/-
11th "	90% -	7,500/-	11,250/-	-	3,500/-	750/-	6,750/- (+)	4,500/-
12th "	100% -	3,500/-	12,500/-	-	3,500/-	350/-	6,350/- (+)	6,150/-
	17,223/-		45,950/-	15,000/-		13,304/-		

NOTE: Approx. 6,25/- kgs. per hectare fruits yield @ 10% yield rate @ Rs. 2.00 per kg.

RECURRING EXPENDITURE DETAILS OF MAINTENANCE, HARVESTING
AND TRANSPORTATION AFTER 6TH YEAR

1.	Plucking & Carriage upto road level for 75000 fruits @ Rs. 2.50/- 100 fruits.	Rs. 1875/-
2.	75000 fruits- loading unloading and transportation cost of 17 K M. Rs. 17/- per 1000 fruits.	Rs. 1275/-
3.	Maintenance cost.	Rs. 2500/-
4.	Toll tax @ 0.50 per 1000 fruits for 75000 fruits.	Rs. 37/50

Total Rs. 5687/50

ANNEXURE - V

CASH FLOW PER HECTARE AND COMPUTATION OF NPV / IRR
(Assumption)

(CONSERVATIVE ESTIMATE)

Year	Capital Cost (Rs)	Operating Maintenance Cost (fixed) (Rs)	Variable Cost (Rs)	Sales (Rs)	Subsidy (Rs)	Net Cash Inflow = +5-1-6 (Rs)	(i) 225 Trees, Fruit/Tree- 333.33			Price-Rs. 2/- per Kg. 12 oranges = 1 Kg. Present Value at		
							10%	16%	18%	10% (6x7)	16% (6x8)	18% (6x9)
1	6025	0	0	0	602.5	-5422.5	0.9091	0.8621	0.8475	-4930	-4675	-4595
2	1762	0	0	0	778.7	-983.3	0.8264	0.7432	0.7182	-813	-731	-706
3	1875	0	0	0	966.2	-908.8	0.7513	0.6407	0.6086	-683	-582	-553
4	2312	0	0	0	1194.7	-1117.3	0.6830	0.5523	0.5158	-763	-617	-576
5	2562	0	0	0	1453.6	-1108.4	0.6209	0.4761	0.4371	-688	-528	-484
6	2687	0	0	0	0	-2687	0.5645	0.4104	0.3704	-1517	-1103	-995
7	0	2500	318.75	1250	0	-1568.75	0.5132	0.3538	0.3139	-805	-555	-492
8	0	2500	637.50	2500	0	-637.5	0.4665	0.3050	0.2660	-297	-194	-170
9	0	2500	956.25	3750	0	+293.75	0.4241	0.2630	0.2255	+125	+77	+66
10	0	2500	1593.75	6270	0	+2176.25	0.3855	0.2267	0.1911	+839	+493	+416
11	0	2500	2231.25	8770	0	+4038.75	0.3505	0.1954	0.1619	+1416	+789	+654
12	0	2500	2868.75	11,270	0	+5901.25	0.3186	0.1685	0.1372	+1880	+994	+810
13 - 50	0	2500	3187.50	12,500	0	+6812.50	3.1011	1.0492	0.7609	+21,126	+7148	+5184
50th Year Average Value				22,500		+22,500	0.0085	0.0006	0.0003	+191	+14	+7
										+15081	+530	-1,434

Note :- (1) Variable cost is Rs. 42.50 per one thousand oranges.

(ii) Salvage value is assumed to be Rs. 100 per tree and there are 225 trees per hectare.

Therefore IRR = 16.54%

ANNEXURE - VI

(REASCHABLE ESPINATE)

CASH FLOW PER HECTARE AND CONTRIBUTION OF M P V/IRR

(Assumption : (a) 300 trees, (b) 500 fruits/tree, (c) Irrec- Rr. 2/- per Tc and (d) 12 cm: Cos = 1Kg.)

Year	Capital Cost	Operation- Maintenance Cost	Variable Cost	Sales	Subsidy	Net Cash Inflow	Discount Factor at 20%	Present Value at 20%	Net Value at 24%
1	6025	0	0	0	602.5	-5422.5	0.8333	-4519	-4373
2	1762	0	0	0	778.7	-983.3	0.6944	-683	-640
3	1875	0	0	0	966.2	-908.8	0.5787	-526	-477
4	2312	0	0	0	1194.7	-1117.3	0.4823	-539	-473
5	2562	0	0	0	1453.6	-1108.4	0.4019	-445	-378
6	2687	0	0	0	0	-2687	0.3349	-900	-739
7	0	2500	637.5	2500	0	-637.5	0.2791	-178	-141
8	0	2500	1275	5000	0	1225	0.2326	285	219
9	0	2500	1912.50	7500	0	3087.5	0.1938	598	446
10	0	2500	3187.50	12540	0	6852.5	0.1615	1107	798
11	0	2500	4462.50	17540	0	10577.5	0.1346	1424	992
12	0	2500	5737.50	22540	0	14302.5	0.1122	1605	1083
13-50	0	2500	6375.00	25000	0	18125	0.5602	5035	5066
50th Year Salvage Value						30,000	0.0001	3	0
M P V								+6,504	+1,384

Therefore, IRR = 25.14%

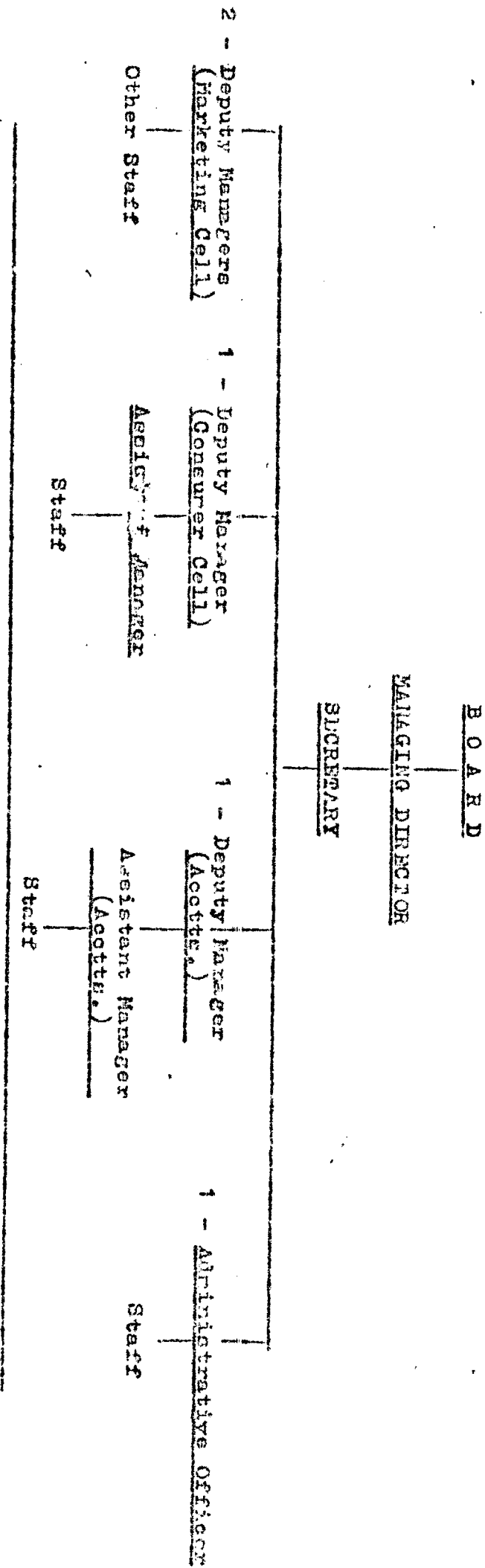
ANNEXURE VII

MARKETING COSTS AND MARGING IN THE MARKETING OF SIKKIM
ORANGES IN CALCUTTA MARKETS 86-87

ITEM	IN RUPEES PER CASE OF 450 ORANGES
1. Net amount received by grower	67.00
2. <u>Marketing costs & charges incurred by the wholesale Trader within Sikkim</u>	
Plucking -	11.25
Transport charges from orchard to mandi including loading & unloading-	6.80
Cost of packing case -	15.00
Cost of packing & packing materials-	3.00
Bazar Tax -	0.20
Orange Khazans /-	2.00
Godown Rent -	0.40
Freight charges from Sikkim to Siliguri -	6.20
Loading charges -	0.40
	46.25
3. <u>Costs incurred at Calcutta</u>	
Freight-inclusive of Labour charges-	15.00
Toll Tax -	00.16
Handling Charges -	00.50
Commission -	15.00
Charity @	00.40
Postal & Banking charges -	00.15
Mandi charges -	00.45
Miscellaneous charges -	00.05
	31.71
Total charges incurred by Sikkim Orange Wholesale Trader -	77.96
4. Cost of one case of Orange -	145.46
5. Selling price of one case of orange to retail Traders -	175.00
6. Margin of Sikkim Orange wholesale Trader (20.31%) -	29.54
7. Retail Traders cost & margin including wastage	20.00
8. Price paid by Consumer (@ Rs.5.20 P per dozen) -	195.00

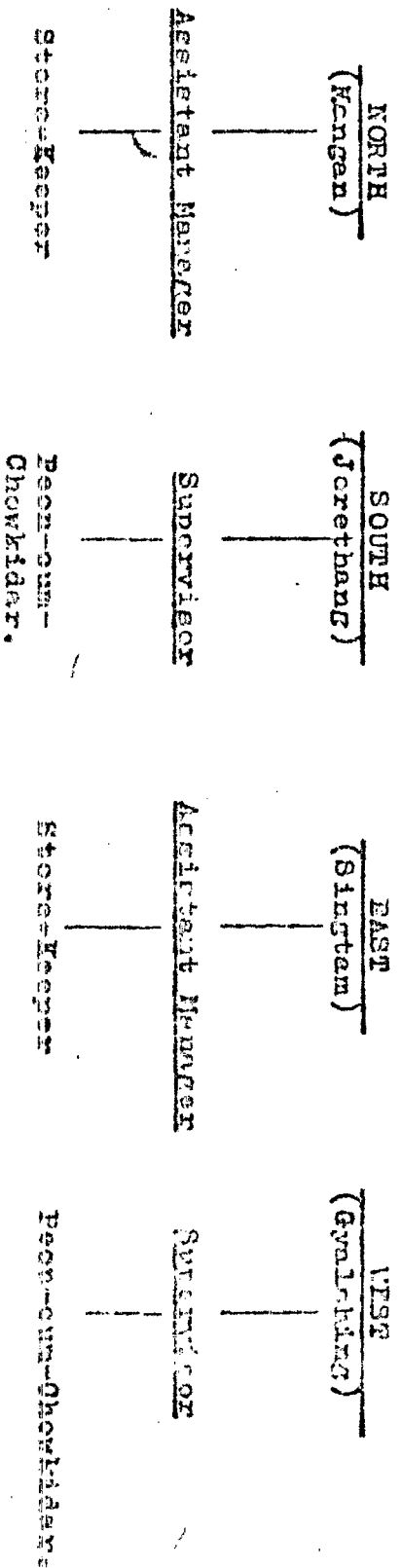
ANNEXURE-VIII

SIKKIM STATE COOPERATIVE SUPPLY & MARKETING FEDERATION LIMITED'S MANAGEMENT STRUCTURE
AT THE HEADQUARTER



ANNEXURE - VIII

STRUCTURE AT THE DISTRICT/PRINCIPAL LEVEL



STAFF POSITION AT THE PRINCIPAL AND VICE-PRINCIPAL LEVELS (WEST DISTRICT)

1. Assistant Manager - 1
2. Supervisor - 1

TOTAL STAFF

- a) Officers - 12 Nos.
- b) Middle Level Officers - 3 Nos.

SECOND ICA TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OR
AGRICULTURAL COOPERATIVES IN ASIA
NEW DELHI, BANGKOK, TOKYO, SEOUL
October 26, 1987-May 10, 1988 .

Project Prepared During Home Country Assignment
Project Title : Sheep and Wool Marketing in Dungarpur, Raj.
Country : INDIA
Prepared by: Rajiv. I. D. Mehta

FOUNDED BY THE GOVERNMENT OF JAPAN

AND

EXECUTED BY THE ICA IN COLLABORATION WITH ITS MEMBER
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OF KOREA

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It gives me a great pleasure to present the project report on sheep and wool cooperative marketing in the South-West tribal belt of Rajasthan, India. The project has been prepared in the light of AMSAC approach and is being placed open for the discussions in the second half of the II I.C.A. training course on "Strengthening Management of Agricultural Cooperatives" at Tokyo, Japan.

I am grateful to the Management of I.C.A. and the Project Director of the course Shri M.V.Madane to have accorded me the opportunity to learn various key aspects of Agricultural Cooperative Management through the association of worthy Professors of I.I.M. Ahmedabad, representatives from the Governments of India, Thailand, Japan and South Korea.

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(RAJIV I.D. MEHTA)

CHAPTER - I

SUMMARY

1. The Project has been focused to organise marketing of sheep wool and onfoot sheep in the southern west belt of Rajasthan State.
2. The project envisages a better marketing alternative for shepherds by organising their own co-operative institution which will ultimately cover 50% of the total shepherds population.
3. Marketing activities will be carried with the help of The State Co-operative Sheep & Wool Marketing Federation Ltd., Jaipur.
4. The project envisages almost 5 times more price for wool and 50% more price for animal as against the present trend.
5. Capital investment to establishment the society will come from the Rajasthan State Co-operative Land Development Bank Ltd. under NCDC plan and the working capital will be provided by the Rajasthan State Co-operative Bank Ltd. The rate of interest on capital investment will be 12.50% and that on working capital 15.00%.

6. A capital investment of Rs. 25.55 lacs is envisaged for necessary infrastructure for the society, which will be raised as equity from State Govt., share capital from members and medium term loan from RSLDB.

<u>Sources</u>	<u>Amount (Rs. in lacs)</u>
Members share 7½%	1.92
State Govt.'s share 32½%	8.30
Medium Term Loan	15.33
	<u>25.55</u>

7. The benefit cost ratio comes at 1.166 and IRR more than 60%.
8. Repayment of loan for investment capital will be made in 5 years.
9. The project will motivate the shepherds for better up keeping of sheep and increase the flock size to take the activity on business scale.
10. Initial coverage of population has been kept at 30% which will go up to 50% by 10th year.
11. The membership eligibility is minimum flock size 15. Membership fee will be Rs.51/- per member & share money Rs.51/- per share.

CHAPTER II

BACKGROUND :

2.1. INTRODUCTION :- Sheep rearing is the main occupation of the villagers in the desert and barren hilly areas as agricultural and rural industry based activities are less predominant because of scanty rainfall. Sheep is a low grazing animal and its rearing is best suited in dry climate as sheep remains healthy where only grasses grow. Damp climate on the contrary causes low vitality and high mortality. Rajasthan State of the country has a compact border of desert and dry hilly terrain extending over 0.2 M Sq km covering eleven districts of the state as shown in the map enclosed. The total sheep population of the state in 1983 had been 13.4 million which was 35% of total population of sheep in India. The sheep population in the southern tribal belt of the state was 9.17 lacs in 1983. The sheep population has been increasing over the years. In 1972, it was only 6.15 lacs in this belt of the state.

2.2 PROFILE OF THE PROJECT AREA

Project area is spread in all the blocks of Dungarpur Distt., three block of Udaipur Distt. and one block of Banswara District. Selection of such a scattered area has

been made on the basis of sheep flocks. Dungarpur is a district situated in the southern west part of the Rajasthan State in India. It is located on southern border of the state between the parallel of $23^{\circ}.20'$ to $23^{\circ}.30'$ north latitudes and $74^{\circ}.09'$ to $75^{\circ}.12'$ east longitudes. The area of the district is 0.38 million hectares surrounded by small rocky hills. The area under cultivation is only 31% of the total area and the average size of the land holding is 1.5 ha. The average annual rainfall in the area is 58 cms and the climate is dry althrough the year. Temperature varies from 42°C in summers to 8°C in winters. Sheep rearing is one of the most common subsidiary occupations of the tribals in the area which constitutes 70% of the total pupulation in the district. There are 25000 shepherds in the area and the average flock size is 11, that is considered to be uneconomic. The main reason of small flock size has been poor economic returns to the shepherds and also lack of an organised set up in the area.

The administrative boundaries have classified the area into five smaller administrative units called Panchayat Samities. The Panchayat Samity wise sheep population in 1982 was as under :-

Name of the Panchayat Samity (Block)	No. of sheep	No. of shephards
<u>DUNGARPUR DISTRICT</u>		
1. Aspur	40786	4531
2. Bichhiwara	57448	6454
3. Dungarpur	41034	4460
4. Sagwara	37905	3445
5. Simalwara	51185	5687
<u>UDAIPUR DISTRICT</u>		
6. Khairwara	36835	2455
7. Salumbar	41984	3816
8. Saraada	40998	3420
<u>BANSWARA DISTRICT</u>		
9. Garhi	16614	1265
Grand Total	<u>364789</u>	<u>35542</u>

The breed of sheep in the area is sonadi with well built body, light brown face, large flat and drooping ears, long thin tail and body weight 38 kgs. in male and 22 kgs. in female. The average wool production is 750 gms per year. Though, wool is of inferior quality but is extensively used in the manufacture of felts (Namdass). Various research studies have revealed that the quality of wool and the weight of the lambs can be improved to a significant level by crossing the sonadi ewes with an exotic ram. Pursuant to the findings of such research studies the state Govt. of Rajasthan has very recently approved opening of 4 Govt. cross breeding centres in the area to improve the quality of the native breed.

2.3 AVAILABILITY OF PRODUCE :

As per the objectives of the project the main emphasis has been laid on the marketing of wool and on foot animals in an organised way through institutional marketing channel. At present the sheep population in the area is 3.50 lacs of which 98% are females & out of the females 60% are breedable ewes. The possibility of conceiving the female remains 70% and successful delivery rate 50% of the breedable ewes. On the basis of the above trend, population of sheep in future

years has been worked out. The year wise break up of population has been shown in the annexure 4 enclosed.

2.4 LABOUR :- There is no dirth of labour in the area because the land holding per family is very less and other employment generation activities are negligible. Hence, there is an immense scope of promoting sheep rearing in the area. The district population is women dominated and local female labour can be deployed for wool shearing activities and also preliminary grading of wool.

2.5 BREED IMPROVEMENT PROGRAMMES

It has been established by the test studies that the hybrids of sonadi breed have better quality of wool and also better quality of the animal. This happens due to better milking of ewes which makes the lambs healthier and also facilitates earlier puberty. At present no organised work is being done to promote sheep breeding in the area. However, during the ensuring year the Govt. proposes to distribute 1000 exotic rams in the project area and maintain minimum 25% blood level in the progeny. Necessary preparations are in full swing to take up the task on priority and sincerely. The essential assistance regarding health care, feed etc. will be provided by the state Govt.

2.6 EXISTING MARKETING SYSTEM :-

As stated earlier despite adequate sheep population in the district the average flock size is small indicating the sporadic and scattered pattern of sheep breeding. The local traders are taking advantage of this situation because when the average flock size is small, sheep breeders can not prevail upon the traders and it remains buyers market at grass root level. The returns to poor shepherds for the wool are negligible i.e. Rs 1 to Rs. 1.50 per sheep. The shearing is done by the trader himself. There are two shearing seasons i.e. October, November and March, April. These traders visit the houses of the sheep breeders with prior intimation to them and after negotiating the price, the sheep is brought to the trader for shearing. Similarly, onfoot animals are sold after negotiation and the price offered remains around Rs.100 for ram and Rs. 75 for lambs and ewes. The price depends upon festivals, season and also need of the shepherds. Thus, the sheep breeders are exploited to a great extent by the private traders. Here it is worth while to mention that unlike the sheep breeders of western part of the state, the flocks are non-migratory because of the easy availability of natural pastures and forests. The project area falls in the migration

track of the sheep from western belt of the state to adjoining Gujrat & M.P. states of the country. The sheep and wool cooperative marketing federation of the state has now started buying sheep from this area through some of the extension offices of the Govt. but the percentage of the animals purchased is quite small. The federation is very keen to have a primary cooperative society in the project area for the procurement of wool and on foot animals for domestic as well as export market. The federation is prepared to buy on foot animals and medium fine wool. It will also bear entire transportation cost (internal and external both). It will also ensure that the primary society does not suffer in want of funds and accounts will be settled with in a week of purchase.

2.7 TRANSPORTATION FACILITY :-

The project area is situated on National Highway No. 8 i.e. Delhi-Bombay Road. Very shortly it is going to be connected by Dahod-Nasirabad proposed state highway. Besides, it has good interior road conditions. Ahmedabad one of the major cities of India is only 175 km. from Dungarpur. It is also connected by rail to Ahmedabad.

2.8 SHEEP AND WOOL COOPERATIVE SOCIETY :-

At present there is no sheep and wool cooperative society in the project area. Some of the voluntary agencies like S.W.R.C.* (Kharwara and Mada) and Rajasthan Seva Sangh have taken up the task of breed improvement in the area to supplement Govt. efforts in breed improvement, development of pasture lands etc. But there are no efforts being made by any of above agencies for the marketing of sheep & wool.

2.9 ADVANTAGES OF SHEEP FARMING :-

There are certain advantages connected with sheep farming and these are ;

- (i) Sheep require little concentrate feed as compared to cattle. On an average sheep get 80 to 90 percent of their protein from forages as against the cattle which get about 60 to 65 percent.
- (ii) Sheep are an economical converter of grass into meat and wool. In fact, on the mountain and hilly pastures such as the alpine pastures in Kashmir and Himachal Pradesh and in the arid areas of Rajasthan the sheep is the only domestic animal which can convert pastures into meat and wool.

* Social work Research Centre.

(iii) At certain times grass fields are required to be grazed completely, sheep are capable of grazing more closely to the ground than other stock and are therefore an excellent cleaner of pastures, removing any surplus growth that is not required.

iv) Sheep spread their dung very evenly over the ground and consequently, when the grass land or arable land on which they have been running is ploughed up, the land is not only enriched but its increased fertility is evenly distributed.

v) Sheep are the best animals that can be raised on stubbles as well as on grasses and other plants growing between the stubbles.

In fact there is no substitute for sheep as a class of livestock for utilizing waste lands or woods from the field.

vi) Sheep do not damage the trees unlike goats.

vii) Sheep require less labour than other kinds of livestock and get along well with low cost housing and equipment.

CHAPTER - III
THE PROJECT

OBJECTIVES :

3.1 The basic objective of the project is to increase the income of poor sheep rearers of the Tribal sub-plan Area by making the breeding as main subsidiary occupation of the small farmers and land-loss labourers by following promotional activities :

- a) To provide a strong and sound alternative co-operative marketing channel for wool and onfoot sheep.
- b) To improve the quality of wool and the animal by promoting cross breeding techniques extensively.
- c) To provide extension services for the better health of native breed and also to refine rearing skills of the shepherds.
- d) To extend all possible support to State Govt. efforts to improve the living conditions of the shepherds & the sheep flocks.
- e) To provide market information to sheep breeders.
- f) To preserve natural pastures for grazing and to prevent exodus of sheep population.

3.2 AREA OF OPERATION :-

Sheep are being reared on uneconomic scale throughout the Dungarpur District and other selected areas of the southern belt of Rajasthan State. The Dungarpur District is proposed

as nodal area of the project because it has all pre-requisites for sheep development and the marketing of wool and on foot animals. As explained before it is well connected by rail and road which will facilitate better market of the animal wealth.

3.3 MANAGEMENT GUIDANCE :-

The district has 2 sheep and wool extension officers, 9 Assistant Extension officer and 4 shepherds belonging to Sheep and Wool Office of the state Govt. Very recently, the state Govt. has decided to open four more such centres in the district to promote and preserve sheep rearing in the area. But, despite better health coverage, non-migratory style of shepherd's life they continue to be exploited by local traders in the absence of an organised marketing infrastructure. It is, therefore, necessary to have a marketing society which restricts the exploitative trade practices of the private traders and provide better marketing alternatives to the sheep breeders through cooperative venture.

3.4 WORKING STRATEGY :-

The society will have vertical linkages with the State Sheep and Wool Co-operative Marketing Federation for getting the benefit of existing marketing channels for domestic and export market in the interest of sheep breeders. It will also supplement and coordinate the efforts of state Govt., the Federation & other welfare agencies by organising training

programme and live demonstrations.

It will also provide market information to the sheep breeders through its sub-centers to be located at the block level.

3.5 NEED FOR THE PROJECT :-

The following points remained focus of consideration to style the project :

- i) Lack of organised efforts to undertake marketing of sheep and wool for the benefit of poor shepherds.
- ii) Exploitation of the shepherds by the middle man and private traders.
- iii) Tremendous potential of the native breed to respond quickly to cross breeding with 50% exotic breed which improves the animal health as well as the wool quality thereby adding value to it.
- iv) Good scope of involving more population in the area in sheep rearing activity on a business scale.
- v) No dirth of market for healthy sheep and fine wool.

3.6 SUPPLY OF IMPROVED BREED :-

The State Govt. in the year 1984-85 had supplied 250 Rams of exotic(Russian)breed to improve the genetic composition of native broed so as to have better phenotypes and in the year 1985-86 the Govt. had supplied 400 rams which in 1986-87 rose to 500. The exotic rams introduced had 50% blood level and

brought excellent results. In some of the traits even the true to type breed has not delivered the results such as medullation percentage and staple length of wool. The progeny of the cross breed with native mother was found more hardy with comparatively very less mortality rate. As explained earlier the hybrids(ewes) had better milking which resulted in faster growth of lambs thereby improving the marketability to a great extent. Now the State Govt. has decided to concentrate on the project area in a big way through a novel scheme of disseminating the cross breed sheep population rapidly and more effectively. It has been envisaged to distribute 1000 fifty percent cross bred rams per year to the shepherds from the cross breeding centre to be developed in the district. These rams will be insured by the state Govt. and will be used only for breeding purposes. All rams will be maintained by the breeders but will remain the property of the Govt. The State Govt. has already arranged for the supply of concentrate to these rams. Health care and feed supply will however be taken care of by the Sheep and Wool Deptt. of the State Govt.

3.7 AVAILABILITY OF PASTURE LANDS AND FODDER :-

At present there is no scarcity of pasture land in the district. 64% area of the district has uneven topography and has 55933 hectares area under forest. The area is rich in some perennial grasses such as cynodan dactylon, Dichanthium

annulathm and Eremopogen foveolatus. Some of the annual grasses such as A abscrsionis, A Hystricula and A hystrix are also in abundance. These grasses form major feed of the sheep and help maintaining better health & resistance against common epidemics.

3.8 CONSTRAINTS :

The project has been confined to marketing activities only because this is the only viable media to achieve value addition in the commodity. Major constraints to launch the processing units for wool & Mutton are summarised below-

a) For Wool Processing :

As mentioned earlier, the quality of wool from Sonadi breed is of medium fine range, which has a sufficient scope in raw carpet industries only. The yarn of this quality of wool is not suitable for the textile and powerloom industry. Moreover, the spinning of this wool fibre becomes uneconomic as the price offered is comparatively lesser and doesnot cover the cost incurred.

b) For Mutton Processing :

No doubt, there is a big export market for processed frozen mutton but again it is a buyer's market because there is no dirth of meat & mutton in International Market. In India, the mutton market is available in Defence services only which is a captive market. Most of the mutton plants (approx 75%) run

in loss because the processed mutton has many disadvantages of which the religious types are most common. But, there is no dearth of onfoot animal market, which is in every way more profitable and viable with a great scope.

FUTURE PLANS.

Although, the project is based on trading of wool & onfoot animals for ten years but it is subject to the experience gainedⁱⁿ the initial two years which will decide about the processing units for mutton production/ wool spinning to be set up for further value addition and extensive area development.

CHAPTER-IV

DETAILS OF PROJECT IMPLEMENTATION

4.1 IMPLEMENTATION AND EXTENSION :-

The project implementation agency will be Dungarpur sheep and wool cooperative society ltd.(SHEEPCO). The project period will be 10 years. During implementation and post implementation phase the society will take care of backward linkages by coordinating effectively with the Govt. Agencies to supplement government and voluntary agencies' efforts in improving breed quality in the area, health care of the animals and also supply of feed concentrate during breeding season, supplied free of cost throughout the state by the sheep & wool deptt. The society will also provide transport of sick animals to the nearest veterinary dispensary for which no cost will be charged from the members. Society will also take effective steps to win the confidence of the shepherds in the area by feeding them with the informations relating to animal health care, wool clipping, market trends and also inter cross techniques to improve the quality of native breed. Society will tie up with the State Sheep & Wool Marketing Federation in drawing the schedule for the collection of wool & also sale of on foot animals.

Animal fairs will be organised at the sub-centres in every quarter of the year which will enable the society to select

the best animal lot for export and also see the overall health of the flocks. The veterinary assistant of the society will always participate in such fairs and will extend all necessary guidance to the members with the help of extension officer at the sub centers to solve all sorts of problems relating to animal health.

4.2 PROCUREMENT & MARKETING :-

The main objective of the society will be to arrange marketing of wool & onfoot animals with the help of Rajasthan State Cooperative Sheep & Wool Marketing Federation Ltd. for which membership fee of Rs. 105/- will be paid by the society.

Main season of wool clipping falls in March April and October-November. The society will make special efforts during this period to see that quality of wool is preserved while clipping. As per the practice prevailing in the area clipping is done 3 times in a year which spoils the staple length of the wool fibre. Such practices will be discouraged with the involvement of extension officers. As regards the sale of animal on foot, advance schedule will be worked out and will be circulated among all the members. The shepherds will be paid price of the wool & animals on the spot on their bringing the wool and animal to the sub-centres. The sale of animals & wool will be made to Federation as per mutual agreement.

The federation will charge 2% commission on the total sales.

4.3 TRAINING :-

Two types of trainings have been proposed i.e. training to shepherds to clip the wool and its periodicity and also the economic importance of cross breeding in sheep. For this, members will be taken to Hvikanagar Govt. farm for live demonstrations of sheep rearing. Also the members will be given training on cooperative principles through cooperative extension officers posted at Dungarpur.

CHAPTER -V

ORGANISATION AND MANAGEMENT

5.1 BOARD OF MANAGEMENT :-

The project will be implemented by SHEEPCO established under Rajasthan Co-operative Societies Act with the objectives of providing better marketing alternative to the shepherds for fetching better price of wool and the animal. The society will also have very important task of providing backward linkages including guidance to the shepherds. The overall management policies will be regulated by a Management Committee.

Management Committee will comprise of 13 members, out of which 9 members will be from every sub-centre area. The manager of the society shall work as member secretary of the Committee. Other three members will be nominated as under :-

1. Representative of State Co-operative marketing federation for sheep and wool.
2. Representative of the Rajasthan State Co-operative Land Development Bank.
3. District Sheep and Wool Officer of the State Govt.

Chairman will be elected out of the shepherd members of the Managing Committee. By-laws of the marketing society will be framed in accordance with the State Co-operative Act.

Chairman will also form sub-centre, sub-committees with one elected member of the Board and three block level representatives for better extension work and area coverage.

5.2 ORGANISATIONAL STRUCTURE :-

The organisational set-up of the society is broadly classified as follows :-

1. Manager
2. Assistant Manager
3. Extension Officers
4. Veterinary Assistant
5. Accountant
6. Clerk cum Typist
Clerk cum Godown-keepers
7. Shepherds (labours) at sub centres

5.3 JOB CHART :-

MANAGER :

Powers of the day-to day management and project execution will be vested with the Manager of the society, who will work as per the policies and directions given by the management committee from time to time. The Manager will be assisted by various officers as indicated below :-

ASSISTANT MANAGER :

The Assistant Manager will be responsible for the time schedules to be framed in consultation with state co-operative sheep and wool marketing federation for the sale of animals on-foot and also the wool. He will also be the incharge of general administration and establishment.

VETERINARY ASSISTANT :

He will be a qualified diploma holder in veterinary Science and will be vested with the responsibility of animals health care in the area which includes timely vaccination by the Govt. agencies, disease control and also the breeding activities. He will also guide extension officers at the sub-centres for the selection of animals for sale and various technical know how required to rear the animal.

EXTENSION OFFICERS :

There will be 9 extension officers at all the sub-centres to develop rapport with the members of the society and act as the main agent of the society in the expansion of the membership and business coverage. He will also maintain the records of per day wool collection and animal inflow at sub-centres for sale. He will be responsible for maintaining the books of accounts with the help of a clerk at sub centres.

ACCOUNTANT :

He will be the incharge of Accounts and Finances of the society. He will perform all the duties required to be maintained for better financial management.

5.4 RECRUITMENT POLICIES :

Selection of the Board of Management will be made in the true democratic style. The members of the Board will elect the chairman who will be a shepherd and member of the society.

The selection of Manager will be done by the board of directors. The Manager must be a graduate with 10 years experience in the field of cooperative management.

Assistant Manager will also be a graduate with 5 years minimum experience in the field of cooperative management.

Accountant will be a commerce graduate with 5 years experience in the maintenance of books and accounts.

As regards Veterinary Assistant, he will be a diploma holder in vet science with minimum 5 years on the job-experience.

The Extension Officers will be preferably local candidates with minimum graduation degree and experience in sheep rearing.

CHAPTER VI

6.1 BENEFITS :

The project will definitely watch and take care of the interests of its members by paying them initial price of Rs. 150/- each for rams and Rs. 125/- each for ewes against the present price of Rs. 100/- and Rs. 75/- being paid by the private traders. Besides, the profits of the marketing society will start ploughing back from 4th year in the form of dividends in proportion to the animals wool sold to society. As the profit of the society will increase, the amount of dividend will also increase proportionately. As regards prize of wool it will be Rs.8/- & Rs.3/- per kg. for medium fine & coarse wool respectively. Since the project is being located in a tribal belt which is one of the MOST backward belts in the country, Government already has enough budgetary provisions to subsidize heavily the establishment cost & extension service cost of the society but it has not been mentioned to avoid any exaggeration.

The area coverage will be 30% initially and will increase to 50% by 10th year. This smaller area coverage has been fixed keeping in view the psychology of the tribes, who happened to be ignorant of the trade skills. But with the joint demonstrative efforts of the coop. society/Govt. & Voluntary agencies it is believed to cross the targetted percentage by 10th year.

Involvement of cooperative sector in the area will change the market trend in favour of the shepherds and will motivate them to increase sheep population to a minimum economic scale of 30 + 1 (30 ewes + 1 ram).

Overall the project will certainly contribute to the upliftment of general economy of the area.

6.2 Financial Analysis :

It has been estimated that the loss of first year will be recovered in 3 years and from 4th year onwards the ploughing back of profits to the members will begin @ 25% of the profits. The appropriation of the profits will be done meticulously so as to benefit the members to the best possible extent within permissible limits. The Benefit cost ratio (BCR) at 15% comes to 1.156 which ofcourse doesn't speak of higher rate of value addition but does depict the positive sign. The value addition in case of the selected breed will be at desirable rate only after 10 years when the total genotypes and phenotypes are blended with exotic breeds. This will reflect in the form of finer wool from the animal fit for spinning and powerloom industry and also higher price of anfoot animal.

Internal Rate of Return (IRR) is more than 60% which indicates that the investment will bring returns upto atleast 60%. But, in case of the Dungarpur Shepherds there is no other opportunity where investment can be made at 60%.

Break even point will be 51.8% coverage of the population proposed to be covered in the area.

6.3 Repayment Schedule and Bankability :

The instalment of the loan will be repaid in 5 years as per the details shown in annexure 14.

6.4 Economic Analysis :

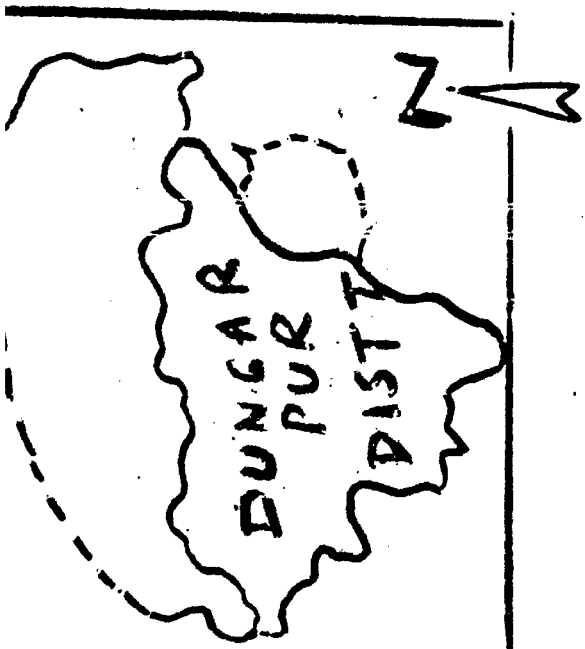
In this kind of project, where capital investment is low and area of operation limited, it is very difficult to measure the impact on National Economy or society as a whole. However, following direct and indirect benefits can be enumerated-

Direct Benefits :

- a) Reduce in Mortality Rate
- b) Better quality of animal in respect of better quality of wool and mutton.
- c) Better resistance of animal.
- d) Better condition of lambs and also higher rate of growth of animal as well as the sheep population due to early puberty.

Indirect Benefits :

- a) Living standards of the shepherds will increase.
- b) Sheep rearing will be improved by better extension work and guidance.
- c) The activity of sheep rearing may become main subsidiary occupation of the tribal population; which is the need of the hour to utilize additional man power.



ANNEXURE-1

Statement showing rainfall in m.m.
during last 10 years, Dungarpur

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<u>S.No.</u>	<u>Year</u>	<u>Rainfall in m.m.</u>
1.	1978	1291.5
2.	1979	743.8
3.	1980	831.1
4.	1981	802.3
5.	1982	962.8
6.	1983	796.8
7.	1984	892.9
8.	1985	401.2
9.	1986	557.7
10.	1987	697.5

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ANNEXURE - 2

DISTRICT WISE SHEEP POPULATION IN RAJASTHAN

(In Lacs)

District	1951	1956	1961	1966	1972	1977	1983
2	3	4	5	6	7	8	9
1. Jaipur	2.79	4.37	4.89	4.87	5.55	5.32	7.75
2. Alwar	0.69	0.99	0.99	1.19	0.91	0.92	1.53
3. Banswara	0.27	0.25	0.24	0.26	0.20	0.22	0.28
4. Barmer	4.33	4.71	5.86	7.92	5.68	8.47	11.57
5. Bharatpur	0.40	0.62	0.68	0.78	0.52	0.54	1.04
6. Bhilwara	3.12	5.08	6.96	7.36	7.80	7.21	9.55
7. Bikaner	2.53	4.00	4.30	5.34	4.02	7.97	10.80
8. Bundi	0.44	0.70	0.78	0.86	0.97	0.95	1.24
10. Chittorgarh	1.01	1.37	1.67	2.15	2.03	1.89	2.07
11. Churu	1.13	3.39	2.90	3.62	4.21	4.57	6.93
12. Dungarpur	0.59	0.75	0.91	0.90	1.27	1.25	2.28
13. Ganganagar	2.20	3.23	2.87	3.34	2.83	3.30	6.14
14. Jaipur	4.93	3.37	3.63	3.82	3.69	3.07	5.21
15. Jaisalmer	2.26	3.95	4.67	5.91	3.13	6.78	8.75
16. Jalore	3.19	4.37	4.06	5.16	4.53	4.30	5.34
17. Jhalawar	0.63	0.17	0.21	0.29	0.25	0.25	0.26
18. Jhunjhunu	1.89	1.69	2.18	1.76	2.11	1.79	2.36
19. Jodhpur	5.53	5.78	4.85	6.63	6.83	10.15	11.48
20. Kota	0.50	0.53	0.50	0.62	0.43	0.46	0.53
21. Nagaur	3.27	6.72	3.98	5.90	0.02	8.47	12.15
22. Pali	4.75	6.53	4.93	6.60	6.27	7.52	7.61
23. S. Madhopur	0.98	0.65	0.95	1.01	0.86	0.86	1.70
24. Sikar	1.29	2.32	2.93	3.25	3.97	2.94	4.17
25. Sirohi	0.60	1.47	1.48	1.64	1.77	1.90	0.90
26. Tonk	1.31	1.62	2.33	2.76	3.03	2.63	4.40
27. Udaipur	3.29	3.47	3.85	4.12	4.68	4.95	6.61
28. Dholpur	-	-	-	-	-	-	0-15
TOTAL	53.87	73.73	73.60	88.66	85.56	99.33	133.89

ANNEXURE - 3

SHEEP POPULATION OF THE PROJECT AREA AT THE END OF 1985-86

S.No.	Name of the blocks	TOTAL POPULATION		Population to be covered under the project.	
		No. of sheep	No. of families	No. of sheep	No. of families
1	2	3	4	5	6
1.	Aspur	40789	4531	8400	268
2.	Bichhiwara	57448	6454	14740	680
3.	Dungarpur	41034	4460	20460	856
4.	Sagwara	37905	3445	11820	574
5.	Simalwara	51185	5687	14290	661
6.	Khairwara	36835	2455	20551	817
7.	Salumber	41984	3816	8010	447
8.	Sarada	40998	3420	6130	393
9.	Garhi	16614	1265	6893	406
TOTAL		364789	35542	111294	5289

ANNEXURE-4

STATEMENT SHOWING BLOCK WISE POPULATION GROWTH OF SHEEP DURING PROJECT PERIOD

Particular	IYF	IIYF	IIIF	IVYF	VYF	VIF	VIXF	VIIYF	VIIIF	IXF	XIF
1. Aspur											
a) Ewes	3000	3400	3720	9440	10560	12400	15600	19600	23200	27600	27600
b) Male Lamb	2000	1600	1760	1920	2000	2240	2400	2560	2720	2880	2880
c) Culling	400	400	400	400	480	480	480	430	560	560	560
d) Mortality	1120	880	816	1040	1120	1200	1280	1360	1440	1520	1520
2. Bichhiwara											
a) Ewes	1400	14700	15260	16520	18480	21700	27300	34300	40600	48300	48300
b) Male Lamb	3500	2300	3080	3360	3640	3920	4200	4480	4760	5040	5040
c) Culling	700	700	700	700	840	840	840	840	980	980	980
d) Mortality	1960	1540	1680	1820	1960	2100	2240	2380	2520	2660	2660
3. Dungarpur											
a) Ewes	20000	21000	21000	23600	26400	31000	39000	49000	58000	69000	69000
b) Male Lamb	5000	4000	4400	4800	5200	5600	6000	6400	6800	7200	7200
c) Culling	1000	1000	1000	1000	1200	1200	1200	1200	1400	1400	1400
d) Mortality	2800	2200	2400	2600	2800	3000	3200	3400	3600	3800	3800

Condt.....

----- 1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10 -----

4. Saowara

a) Ewes	12000	12600	13080	14160	15840	18600	23400	29400	34800	41400
b) Male Lambs	3000	2400	2640	2880	3120	3360	3600	3840	4080	4320
c) Culling	600	600	600	600	720	720	720	720	840	840
d) Mortality	1680	1320	1440	1560	1680	1800	1920	2040	2160	2280

5. Simalwara

a) Ewes	14000	14700	15260	16520	18480	21700	27300	34300	40600	48300
b) Male Lambs	3500	2800	3080	3360	3640	3920	4200	4480	4760	5040
c) Culling	700	700	700	700	840	840	840	840	980	980
d) Mortality	1960	1540	1680	1820	1960	2100	2240	2380	2520	2660

6. Khairwara

a) Ewes	20000	21000	21800	23600	26400	31000	39000	49000	58000	69000
b) Male Lambs	5000	4000	4400	4800	5200	5600	6000	6400	6800	7200
c) Culling	1000	1000	1000	1000	1200	1200	1200	1200	1400	1400
d) Mortality	2800	2200	2400	2600	2800	3000	3200	3400	3600	3800

	1	2	3	4	5	6	7	8	9	10
--	---	---	---	---	---	---	---	---	---	----

7. Salumber

a) Ewes	2000	8400	8720	9440	10560	12400	15600	19600	23200	27600
b) Male Lambs	2000	1600	1750	1920	2080	2240	2400	2560	2720	2880
c) Culling	400	400	400	400	400	400	400	400	560	560
d) Mortality	1120	500	815	1040	1120	1200	1280	1360	1440	1520

8. Saranda

a) Ewes	5000	6300	6540	7050	7920	9300	11700	14700	17400	20700
b) Male Lambs	1500	1200	1320	1440	1560	1680	1800	1920	2040	2160
c) Culling	300	300	300	300	360	360	360	360	420	420
d) Mortality	640	650	720	780	840	900	960	1020	1080	1140

9. Garhi

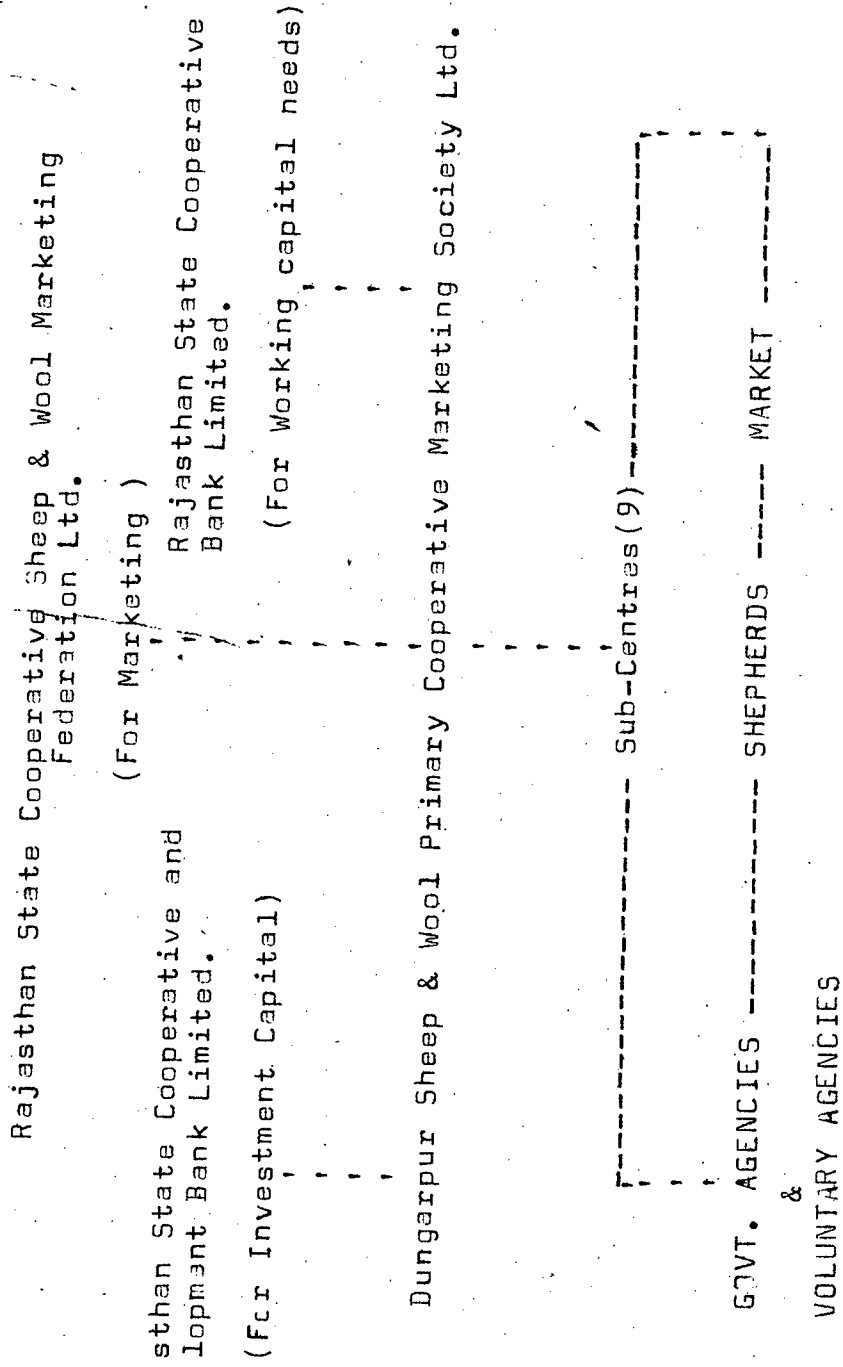
a) Ewes	7000	7350	7630	8280	9240	10950	13550	17150	20300	24150
b) Male Lambs	1750	1400	1540	1680	1820	1960	2100	2240	2380	2520
c) Culling	350	350	350	350	420	420	420	420	490	490
d) Mortality	980	770	840	910	980	1050	1120	1190	1260	1330

Contd...

	1	2	3	4	5	6	7	8	9	10
TOTAL	199000	113450	110810	126180	143880	160950	212550	257503	316190	376050
a) Ewes	8488									
b) Male Lambs	27250	21800	23980	26160	28340	30520	32700	34880	37060	39240
c) Culling	5450	5450	5450	5450	5450	5450	5450	6540	7630	7630
d) Mortality	15260	5990	12792	14170	15260	16350	17440	18530	19620	20710

.....

ORGANISATIONAL LINKAGE CHART



FIXED COST-MARKETING SOCIETY

No. Particulars	Amount in lacs of ruppees
<u>LAND & BUILDINGS</u>	
1. <u>Land -</u>	
(1.5 hectares for main office)	0.50
(0.25 hectares for each sub centres)	0.80
2. <u>Office building -</u>	
(Main office 6170 sq.ft @ Rs.100/Sq.ft)	6.17
(400 sq.ft, 8 Subcentres)	4.00
3. Animal yard 5000 sq.ft. (@ Rs.5/sq.ft)	0.25
4. Fencing	0.10
	<u>11.32</u>
<u>MACHINERY, IMPLEMENTS & VEHICLES</u>	
1. Jeep-1	1.25
2. Matador - 1	1.75
3. Weighing machines - 9	0.90
4. Furniture & Fixture	0.50
5. Telephones	0.01
6. Miscellaneous	0.10
	<u>4.51</u>
<u>TRAINING COST</u>	
1. Rs. 200/shepherd (500 shepherds in a year)	1.00
	<u>1.00</u>
<u>ESTABLISHMENT COST</u>	
1. Manager-1	0.30
2. Assistant Manager-1	0.24
3. Veterinary Assistant -1	0.18
4. Extension Officers -9	2.16
5. Accountant -1	0.18
6. Clerk-Cum-Typists -13 and Godownkeepers	1.87
7. Labours at Sub-centres (2 at each centre) (6 at Main office)	1.44
8. Drivers -2	0.24
9. Peons -2	0.17
10. Chowkidars -9 (Guards)	0.43
	<u>7.21</u>

ANNEXURE - 8

VARIABLE COST - MARKETING SOCIETY

S.No.	Particulars	Amount in lacs of rupees.
1.	Payment of Wool to Shepherds - a) Medium fine wool @ Rs. 8/Kg. b) Coarse wool @ Rs. 3/Kg.	Yearwise details are being given on separate sheet.
2.	Payment of on foot animals a) Male lamb of 1 year @ Rs.150 b) Ewes @ Rs. 125	-do-
3.	Packing charges for wool @ Rs. 10/M.Y.	-do-
4.	Packing material @ Rs. 100/ M.T.	-do-
5.	TA/DA (per annum)	1.00
6.	Insurance (25 MT of wool) 500 animals	0.05
7.	Jeep & Matador (Fuel & Maintenance)	0.50

YEAR WISE DETAILS OF FIXED COST

(Rs. in lacs.)

Particulars	IYR	IIYR	IIIYR	IVYR	VYR	VIYR	VIIYR	VIIIYR	IXYR	XYR
1. Land & Buildings	11.32	-	-	-	-	-	-	-	-	-
2. Fixture, Furniture & Vehicles	4.51	-	-	-	-	-	-	-	-	-
3. Establishment & Training (5% increase every year)	0.21	0.62	9.05	9.50	9.97	10.47	10.99	11.54	12.11	12.71
4. Miscellaneous TA-D.A, Vehicles	1.51	1.57	1.65	1.73	1.81	1.90	1.99	2.09	2.19	2.30
TOTAL	25.55	10.19	10.70	11.23	11.78	12.37	12.98	13.63	14.30	15.02

ANNEXURE-10

YEAR WISE DETAILS OF VARIABLE COST

Particulars	(Rs. in lacs)									
	I Yr	IIYr	IIIIYr	IVYr	VYr	VIYr	VIIYr	VIIIIYr	IXYr	Xyr
1. Cost of Raw Wool										
a) Medium fine @ Rs. 8000/MT	5.12	5.14	5.42	5.85	6.48	7.61	9.49	11.65	13.68	16.14
b) Coarse wool @ Rs. 3000/MT	0.73	0.74	0.70	0.84	0.94	1.10	1.37	1.40	2.00	2.37
2. On foot animals										
a) Male lambs @ Rs. 150	40.07	32.70	35.97	39.24	42.51	45.78	49.05	52.32	55.59	58.86
b) Ewes @ Rs. 125	6.81	6.81	6.81	6.81	8.17	8.17	8.17	8.17	9.53	9.53
3. Packing charges @ Rs. 10/MT	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
4. Packing material @ Rs. 100/MT	0.08	0.09	0.09	0.10	0.11	0.13	0.16	0.19	0.23	0.28
5. Insurance of wool & animals	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
6. Interest on working capital @ 15% for one month	0.67	0.57	0.61	0.66	0.73	0.79	0.85	0.92	1.01	1.09
7. Depreciation @ 5% on building, furniture and fixture	0.79	0.75	0.71	0.68	0.65	0.61	0.58	0.55	0.53	0.50
8. Commission @ 2% to State Coop. Mktg. Fed.	1.56	1.31	1.43	1.56	1.70	1.88	2.07	2.27	2.50	2.73
Total	56.69	48.17	51.88	55.80	61.35	65.74	71.82	77.55	84.15	91.61

Statement showing yearwise Population growth of sheep and availability of wool
and on foot-animal in the Project Area

Particulars	IYr	IIYr	IIIYr	IVYr	VYr	VIYr	VIIYr	VIIIIYr	IXYr	XYr
Ewes	109000	113450	118810	128080	143880	168950	212550	267050	316100	376050
Male lambs for sale	27250	21800	23980	26160	28340	30520	32700	34880	37060	39240
60% Domestic	16350	13080	14388	15696	17004	18312	19620	20928	22236	23544
40% Export	10900	8720	9592	10464	11336	12208	13080	13952	14824	15696
Female culled	5450	5450	5450	5450	6540	6540	6540	6540	7630	7630
Mortality	15260	9990	12792	14170	15260	16350	17440	18530	19620	20710
Medium fine wool (in M.T.)	54.50	56.72	59.40	64.04	71.94	84.47	106.27	133.52	150.05	180.02
@ 500gms/adult	9.53	7.63	8.39	9.15	9.19	10.68	11.44	12.20	12.97	13.73
Total M.F. Wool	64.03	64.35	67.79	73.19	81.03	95.15	118.71	145.72	171.02	201.75
Coarse wool (in M.T.)	21.80	22.68	23.76	25.60	28.76	33.78	42.50	43.40	63.22	75.20
@ 200gms/adult	2.72	2.18	2.39	2.61	2.83	3.05	3.27	3.40	3.70	3.92
Total Coarse wool	24.52	24.86	26.15	28.21	31.59	36.83	45.77	46.88	66.92	79.12
Total wool	88.55	89.21	93.94	101.40	112.62	131.90	164.48	192.60	237.94	280.87

(Rs. in lacs)

DETAILS OF YEAR WISE REVENUE GENERATION

(Rs. in lacs)

Particulars	IYF	IIYF	IIIIYF	IVYF	VYF	VIYF	VIIYF	VIIIIYF	IXYF	XYF
1. Sale of wool										
a) Medium fine @ Rs.18000/MT	11.52	11.58	12.20	13.17	14.58	17.12	21.36	26.23	30.70	36.31
b) Coarse Wool @ Rs.3000/MT	1.96	1.99	2.09	2.25	2.52	2.94	3.66	3.75	5.35	6.32
2. Sale of Animals										
A) Domestic @ Rs. 200/animal	32.70	26.16	28.77	31.39	34.00	36.62	39.24	41.85	44.47	47.08
b) Export @ Rs. 300/animal	32.70	26.16	28.77	31.39	34.00	36.62	39.24	41.85	44.47	47.08
TOTAL	78.88	65.09	71.83	79.20	95.10	94.30	103.60	113.60	125.07	136.79

FINANCIAL ANALYSIS

ANNEXURE-13

Particulars	(Rs. in laos)										
	I Yr	II Yr	III Yr	IV Yr	V Yr	VI Yr	VII Yr	VIII Yr	IX Yr	X Yr	
1. Total revenue	78.9	65.9	71.8	78.2	85.1	94.3	103.6	106.6	113.7	125.1	147.8
2. Total Cost	81.4	57.7	61.9	66.4	72.5	77.5	84.2	90.6	98.0	106.1	
3. Net Income	(2.5)	8.2	9.9	11.8	12.6	16.8	19.4	23.1	27.1	41.7	
4. D.F @ 15%	0.87	0.75	0.65	0.57	0.49	0.43	0.37	0.37	0.37	0.28	0.24
5. D.(N I)	(2.1)	6.1	6.4	6.7	6.1	7.2	7.2	8.5	7.6	10.0	
6. Discounted Total revenue @ 15%	68.7	49.8	47.3	44.7	42.3	40.7	38.9	37.2	35.5	36.5	
7. Discounted Total Cost @ 15%	70.8	43.3	40.2	37.8	35.5	33.3	31.2	33.5	27.4	25.5	

NPV = 63.7

IRR = very high i.e. infinite

$$BCR = \frac{441.6}{378.5} = 1.166$$

$$B.E.P. = \frac{155.23}{299.64} \times 100 = 51.8\% \text{ (Salvage value of fixed assets has been included in the revenue)}$$

REPAYMENT SCHEDULE

Total capital requirement -	25.55 lacs
Statutory requirements -	
Share capital 7.5 % - (@ Rs.51/member)	1.92 lacs
Long Term Govt. Assistance 32.5% -	8.30 lacs
	<u>10.22</u>
Debt requirement -	15.33 lacs

(loan will be provided by Rajasthan
State Cooperative Land Development
Bank Ltd, under NCDC Scheme)

Term of the loan - 5 years

Repayment Schedule

Year	Loan Out- standing	Intrest @ 15%	Principal	Loan Instal- ment
1.	15.33	1.91	3.06	4.97
2.	12.27	1.53	3.06	4.59
3.	9.21	1.15	3.06	4.21
4.	6.15	0.77	3.06	3.83
5.	3.09	0.38	3.09	3.47

ANNEXURE -15

Net Benefits to the Society after appropriation of the Profits
(Rs. in lacs)

Particulars	IYr	IIYr	IIIYr	IVYr	VYr	VIYr	VIIYr	VIIIIYr	IXYr	X Yr
I. Net Income	(3.36)	7.53	9.31	11.17	12.07	16.19	18.80	22.50	26.62	30.16
2. Loan Instalment.	4.97	4.59	4.21	3.83	3.47	-	-	-	-	-
3. Net Benefits after payment of Loan instalment and repayment of interest.	(8.33)	2.94	4.80	7.34	8.60	15.19	16.80	22.50	26.62	30.16
4. 25% Ploughing back the profits.	-	-	-	-	2.15	4.04	4.70	5.62	6.65	7.54

Second ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia

NEW DELHI, BANGKOK, TOKYO, SEOUL

October 26, 1987—May 10, 1988

Project Prepared During Home Country Assignment

Project Title : POTATO MARKETING AND PROCESSING

Country : INDIA

Prepared by : GANESH PRASAD NEMA

**Funded by the Government of Japan
and**

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

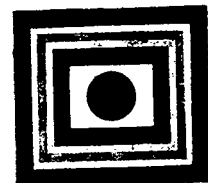
ICA Management Training Project for Agricultural Cooperatives in Asia



INTERNATIONAL COOPERATIVE ALLIANCE

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C O N T E N T S

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A C K N O W L E D G E M E N T

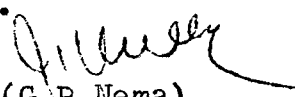
The II I.C.A. training course for " Strengthening Management of Agricultural Cooperative in Asia" organised from 26-10-87 to 10-5-88 has provided me with an opportunity to understand various aspects regarding the Agriculture Coop. Management and also the technique of formulation and implimentation of Project related to Agricultural Commodity. "The Project on Potato Marketing Processing in Mhow Block by Ambika Alu Utpadak Vipran Awam Prakiya Sahkari Samiti" is prepared under this training programme.

I am highly greatful to Shri M.V.Madane Project Director I.C.A. New Delhi and Professor Dr. J.S.Gupta Indian Institute of Management Ahmadabad, who has given the guidelines for preparation of project.

I take this opportunity to extend my gratitude to Shri C.P.Arora, Managing Director, M.P.State Coop.Land Development Bank Ltd. Bhopal(M.P.) for nominating me to this training programme.

I feel obliged to Shri N.K.Vishawkarma Development Manager of my Bank for extending me all the support and cooperation.

I am greatful to Shri R.C. Upadhaya Deputy Manager M.P. S.L.D.B, Shri B.S.Yadav, Branch Manager and Shri R.S.Patidar Valuer, Distt. Coop.L.D.B. Indore, Branch Mhow who rendered all valuable services in bringing out this project report.


(G.P.Nema)
Credit Expert
M.P.State Coop. Land
Development Bank, Ltd. Branch
Indore (M.P.)

CHAPTER - I

S U M M E R Y

- (1) The Project Area is Mhow block of Indore Distt. in Madhya Pradesh having 176 Villages in its area of operation. The Project area is leading Potato growing area of the District.
- (2) The Project will be implimented by Ambika Alu Utpadak Vipran Awam Prakiya Sahkari Samiti Gavali palasia, whose area of operation is Mhow Block.
- (3) The main object of the Project is to arrange marketing and Processing of Potato so as to fatch remunerative prices to the potato growers.
- (4) Project envisages a minimum price of Rs. 1400/- per ton to the grower members at their farm gate in the first year. From Second year an increase by Rs. 100/- per ton will be provided to the growers.
- (5) Bagging, Packing and Transport charges shall also be borne by the Society.
- (6) The Project area was surveyed and the position of the existing society was examined and some of the Potato Growers in village Gavalipalasia were contacted and the President, Secretary, Additional Manager were interviewed. Also experts from Agriculture College, Indore, Deputy Director Horticulture, Indore were interviewed . At national level N.C.D.C. was also consulted. Necessary datas were collected from the office of the Deputy Director

Horticulture Indore, KrishiUpaj Mandi Indore and Block Development Office Mhow.

- (7) At present the implimenting society is having about 1.5 hectors of land and Building. The existing value is Rs. 17.83 Lacs. The society is also having a cold storage of 5600 tonns capacity and a Godown of 500 MT Capacity. The value of the existing assets are around Rs. 26 Lacs. Detail financial position and present Profit and loss position of the society is given in Annexure No. 13 and 14.
- (8) The society will have a wafers (Crisps) (Deep fat fried) manufacturing Automatic Machine having the capacity of 3 M.T. finished produce production per day, The society will process 900 MT Potatos and will get 225 MT wafers in the first year of the project working for 75 days.
- (9) The investment proposed in the project is around Rs. 83 Lacs.
- (10) The proposed investment in the Project will be met by Share Capital contribution by grower members and long term loans from M.P. State Coop. Bank Ltd. Bhopal (M.P.)
- (11) The Project will distribute 15% dividend to share holders and will plough back Rs. 50/- per ton net profit to Potato growers as Bonus,
- (12) The working capital need of the Project will be met by Indore Premiur Coop. Bank Ltd. Indore.
- (13) The B.C.R. of the Project comes to 1.207.
- (14) The I.R.R. of the Project is more than 50%
- (15) Break even point for the wafer unit comes out to be 56 MT Per year.

CHAPTER - II
BACKGROUND AND JUSTIFICATION

- (1) The Potato is a crop which has always been the "Poor man's Friend" besides energy it supplies nitrogen and high quality protein necessary for healthy growth of body. It has been established that the Potato was introduced in India in the early 17th Century, only about 40 years after its first introduction in Europe. In India Potato breeding work was initiated in 1935 with the establishment of the Potato Breeding Station at Simla. During the last 53 years of its work a number of new varieties have been developed. Potato is grown in M.P. Approximately in the area of 30,000 Hectors which is 3.5 % area under Potato of the country. District wise Area and Production of Potato in Madhya Pradesh is given in Annexure 2.
- (2) In Madhya Pradesh, Indore District is leading Potato growing District. In Indore District 5117 hectors area is under the cultivation of Potato and total production is 1,02,340 MTS.

Block wise position is as under:-

Name of the Block	Total Area Under Cultivation (In Hectors)	Area under Potato. (Hectors)	Percentage with total Area
1. Mhow	46564	3263	7%
2. Depalpur	83959	164	0.19%
3. Indore	65023	1546	2.37%
4. Sawer	63444	144	0.22%

- (3) It may be seen from the above details that the Mhow Block is leading Potato growing block in Indore District, 64% of the total production of the District is produced only in this block. The cost of cultivation for Potato crop worked out at Rs.8715 per hector. The income out of Potato Production per Hect. is Rs. 16,000/-. The input output ratio is 1.83. Details of cost of cultivation and income is given in Annexure 5.
- (4) Area under Potato Crop in different States of India is given in Annexure 3 Area, Production and yield of Potato in Mhow Block for the last 8 years are given in Annexure 4.
- (5) Total Area of Indore District is 1479 Sq.Miles, having the rural population 5.26 Lacs and Urban Population 10.57 lacs. The details of area, working population, irrigated area of Mhow block is given in Annexure I.
- (6) The mixed cropping pattern of 3 to 4 crops in a year is adopted by most of the farmers in this area. The main crops in the project Area are Potato, wheat, Sugar can, Soyabin, Maize. The production wise position of the Crops during 86-87 in respect of Project Area was:-

S.No.	Crop	Area under Cultivation (In Hector)	Total Production (M.T.)
1.	Potato	3263	65260
2.	Wheat	7887	157740
3.	Maize	2738	41077
4.	Soyabin	18614	223368
5.	Ginzer	78	390
6.	Sugar Can	1241	99280
7.	Lahsun	881	30835

!! !! !!

(7) Main Varieties of Potato grown in the area are :-

- | | |
|-------------------|-----|
| (1) Jyoti | 80% |
| (2) Chandri Mukhi | 15% |
| (3) Lal | 5% |

(8) The Crop loan need of the formers in the area is met by 13 primary agriculture Coop. Societies, and commercial Banks working in the area of operation. Per Hecture Rs. 8900/- Crop loan is given by the Coop.Societies and Commercial Banks.

PROBLEM FACED BY THE FORMERS.

1. Potato crop is harvested during the month of January, Feb. and March which causes rush in the market. The Potato is being a perishable vegetable cannot be stored for a longer period, mostly farmers want immediate returns as soon as the crop is ready. The Private Traders exploit and do not provide remunerative price to the farmers.
2. The Private Traders creat such condition that the Potato produce of the farmers, can purchase on throw away price, and earn high profits.
3. The private traders do not advance pledge loan, consequently the farmers are not in position to wait for better price.
4. At present the healthy seed of potato is a problem for the formers . There is no proper and sufficient arrangements for soil testing before cropping.

5. There is no institutional processing or value adding facilities in this area, even in the entire state, there is no institutional processing plant. Consequently the remunerative price of Potato is a problem. This is a leading Potato growing area, but there is no institutional marketing arrangement.

NEED FOR THE PROJECT :-

1. The Ambika(Potato)Alu Utpadak, Vipran Awam Prakiya Sahkari Samiti, in Indore District head quartered at Gavalipalasia, having the area of operation of Mnow Block. This Coop.Society was organised in 1969 with an objective of marketing and processing of Potato Crop, but so far it has not undertaken marketing of Potatos and its processing. The society is having a cold storage of 5600 Tons Capacity and doing the business of Storage of Potatos in its cold storage on rental basis.
2. At present the farmers are selling their produce to local private dealers and at Indore Mandi. Annexure 6 indicates the month wise arrival, minimum and maximum mandi rates .In these months rates available in the mandi is as follows:-

<u>Month</u>	<u>Minimum Rate(M.T.)</u>	<u>Maximum Rates Per M.T.</u>	<u>Average PerM.T.</u>
Jan. 87	Rs. 900	Rs. 1100	Rs. 1000
Feb. 87	Rs. 875	Rs. 1000	Rs. 987
March 87	Rs. 900	Rs. 1000	Rs. 950

Thus the farmers get price around Rs. 1000/- Per M.T. These Private businessman, after buying here sale the Potatos to Kolhapur ,Nasik,Pune and Dhulia Mandi, where they get the price of Rs. 1400/- to Rs. 1500/- per M.T. at present.

3. At present in Mhew Block in the Area of 3263 Hectors 65260 M.T. Potatos are produced, and remarkable growth in the Production is also anticipated. It is essential that existing Cooperative institution should be involved to assure marketing of the Potato produce, and also exploit the potential for value adding of Potato Crop by establishing a Automatic processing unit for wafers (Crisps).
4. The implimentation of the project of marketing and processing of potato crop is not aimed to maximise the profit of existing cooperative, at the cost of growers, or the consumers, Its main objective is to ensure remunerative return to the growers and fair price to the consumers.
5. There is a good scope of employing labour in marketing related activities and processing business in this area.
6. With the implimentation of project, a better alternative for Potato Marketing will be possible and the monopoly of private traders will be restricted.
7. To obtain healthy seed is a problem. There is a good scope to develop healthy seed distribution and growing system.

- (8) There is a urgent need for soil testing and farm guidance, by implimentation of the project the farmers will get farm guidance and protection from diseases.

CHAPTER -3

PROJECT

(1) OBJECTIVES:-

The basic objective is to increase the Income of Potato growers in Mhow Block of Indore District. This objective will be achieved by promoting the following.

(A) To provide a strong marketing channel through Ambika Alu Utpadak Vipran Awam Prakiya Sahakari Samiti, which is a Cooperative Organisation and will be run and controlled by the grower members them selves.

(B) To help the Potato growers in increasing per Hecter yield and reduce wastage.

(C) To enable the grower to retain the stock of Potato produce and sell at an oportune time, so as to get remunerative price.

(D) To Procurre and market the Potatos of the Member growers.

(E) To promote the economic interests of the members by under taking value adding activity to potato produce .

- (F) To provide healthy seed to the members.
 (G) To protect the Potato crop from fungal, Virus and brown rot diseases.

2. AREA OF OPERATION OF THE SOCIETY :-

The Ambika Alu Utpadak Vipran Awam Prakiya Sahakari Samiti Ltd. Gavalipalasia was registered on 30-9-69. There are 176 villages in the area of operation. The maximum distance of the last village from the head quarter is 50 K.M. The village Gavalipalasia is on the metalled road. The nearest Rly Station are Mhow and Indore at a distance of 5 Km. 28 Km. respectively. The district head quarter (Indore) is at a distance of 27 Km. and connected by metalled road.

The total population in the area of operation of the society is 1,93,828 out of which 1,09,911 are rural. The present membership of the Society and holding wise agriculture family in the area is as under:-

S.No.	Land holding	No. of Cultivators.	Holding Area.	Membership		%
				No.	Holding Area.	
1.	0 - to 1 Hect.	1929	947	161	141	7%
2.	1 - to 2 Hect.	2080	3068	98	190	4%
3.	2 - to 4 Hect.	2646	7554	98	310	3%
4.	4 - to 10 Hect.	2070	17858	130	801	4%
5.	10 - to Above	1123	20979	41	680	4%
		10648	50402	528	2222	5%

It means at present membership coverage is only 5% out of total cultivators in the area of operation.

3. PROJECT COMPONENTS :-

The following are the project components:-

(A) INPUT SUPPLY :-

The crop loan needed by the growers will be met by the Primary Agricultural Cooperatives, For supply of Potato Seed, it is proposed that the society will grow Potato seeds in his own 0.5 Hector land. The society will also procure Potato seed from out side and will supply to grower members.

(B) FARM GUIDANCE :-

The Project Area has 5 Agriculture and horticulture development officers and 21 Rural horticulture and agriculture extension staff posted by the State Government. The Society will also appoint a farm Supervisor, who will coordinate through above Govt. staff to educate the growers, arrange soil taste and arrange protection practices from fungal, virus and brown rot diseases.

(C) COLD STORAGE :-

The society is having a cold storage of 5600 Tons Capacity. It will be utilized fully. First year 1000 M.T. Potato seed, 1600 MT. procured potato and 3000 MT Potato of grower members, will be kept on rental basis. Five years capacity utilization programme is given in Annexure 8.

(D) PROCESSING UNIT :-

The processing unit will undertake value adding activity to begin with 900 tons potatoes will be processed into wafers (Crisps) in the first year.

(E) MARKETING:-

The society will make a start by procuring 7875 MT produce which is 12% of the total produce in the area. The traders will also perform a useful function in the area by collecting surplus and selling the same to the consumer. The purpose of cooperative is not to eliminate the traders completely but to regulate marketing practices and set a healthy trend. Potato Procurement and marketing programme is given in Annexure 7.

C H A P T E R - I V
DETAILS OF OPERATIONS

The Project implementation agency will be Ambika Alu Utpadak Vijnan Awam Prakriya Sahakari Samiti Gavalipalasia. The Project period will be 10 years. During implementation the society will provide package of services. It will provide backward linkages such as potato seed, extension, transport service etc. and will provide forward linkages such as processing and marketing.

A. PROCESSING:-

It has been proposed that the society would commission a automatic processing plant of wafers(Crisps) capacity of 12 Ton Potatos per day and would get 3 Mt finsihed wafers. First year the plant will work for 75 days and will process 900 Ton Potato and manufacture 225 tons wafers (Crisps)It is proposed that first five yearsprogramme will be as follows:-

<u>Year</u>	<u>Potato Requirement MT</u>	<u>Price</u>	<u>Workingday</u>	<u>Wafers Processee Mt.</u>
I.	900	1400	75	225
II.	1200	1500	100	300
III.	1500	1700	125	375
IV.	1800	1900	150	450
V.	2100	2100	175	525

It is estimated that 4 Kg raw Potato is required to manufacturer 1 Kg. finished wafers. It is also estimated that 400 Kg. refined ground nut oil will be required

to manufacture 1 MT finished wafers. Production cost rate for the items required in processing is given in Annexure 11. Wafers is a good food item, which is readymade to eat. They will be packed in consumer packs of different sizes. The potatoes are graded, washed, peeled, sliced, dewatered, and deep fat fried and then packed. The major steps involved in manufacturing are as follows:-

- (A) GRADING:- For Wafers bigger size potatoes give better appearance of round, uniform size and also good to the texture and crispness. The grading will be done automatically in automatic continuous plants. The separation is done by specifically designed separators.
- (B) WASHING:- Potato has soil when harvested from the fields. It carries lot of micro organisms, which is undesirable for the food product. The adhering soil dirt etc will be washed in continuous lines. The washing is done by jets under pressure in continuous perforated belts.
- (C) PEELING:- This is a process of peel removal by abrasive peeling, Outer skin of potatoes will be removed. The removal of outer skin improves taste of wafers. The microbes and other dirt present in outer surface also get removed in this process. Flushing with water is done which takes away the peeled skin. The peeled potatoes are washed and goes for cutting slice.
- (D) SLICING :- Potatoes will be cut into slices having thickness of $\frac{1}{4}$ " to $\frac{1}{8}$ " depending upon the variety of the potatoes horizontal and vertical cutters will cut the potato into desirable slice thickness. Cut slices will be washed two to three times to remove starch present.

- (E) DEWATERING :- Excess water present in slices is removed by centrifugation in slow speed centrifuge. This help in frying the products.
- (F) FRYING :- Dewatered slices will be fried in refined ground nut oil. The oil has temperature of 250 to 260 centigrates. Slices are passed through the boiling oil. It will be done in oven having thermostate and arrangements for heating. The conveyer belt carrying slices will pass through the oil. The speed conveyer belt carrying slices will be adjusted depending on frying time required.
- (G) DECILING, SALTING SPICING :- After frying slices will pass through conveyer belt to remove excess oil, special salter and spicer will be fixed on continues line for the salting and spicing .
- (H) PACKING :- Automatic farmfill and seal machines will be made available for automatic filling into different size packing.
- (3) The location of the processing plant would be in the head quarter of the society, which is located at Gavalipalasia. Gavalipalasia is well connected by Rail and Road. Most of the Potato growing villages are within 30 Kms.
- The society will send the finished product directly to consumer federation, other private dealers, Hotels and defence services etc. Since Mhow is a miltry Head Quarter keeping population of 1 Lack miltry persons.

- (4) It is proposed that the Society will sale its finished wafers produce for the first 5 year as follows:-

Year	State Coop. Consumer Fed.	Defence Service	Tourism Dept.	Other Dealers.	Total M.T.
1stYr.	100	20	25	80	225
2nd Yr.	160	25	25	90	300
3rd Yr.	165	30	25	105	375
4th Yr.	180	30	25	215	450
5th Yr.	225	30	45	225	525

- (5) The Project cost would be as under :-

Capacity of Plant - 3 Mts finished wafers Per day.
(Rs. in Lacs)

1.	Cost of the land	0.00
2.	Construction of shed 8000 Sq.feet at the rate of 200 Per Sq.feet.	16.00
3.	Automatic Plant,greading,washing Peeling, cutting,frying and salting arrangements,	50.00
4.	Automatic formfill and seal machine	10.00
5.	Pipe Fitting water line etc.	2.00
6.	Electrical fittings	3.00
7.	Installation commission exp.	<u>2.00</u>

Total : 83.00

NOTE:- The land cost is ignored here because the society possess its own land which is lying unutilized. The society has no plan to dispose it of or rent it out . In other words the land has no opportunity cost.

(6)	The funds for this plant would be raised as under:-	(Rs. in Lacs)
(1)	Members contribution towards shares	9-00
(2)	LongTerm Loan	74-00
		<u>83-00</u>

(B) PROCUREMENT AND MARKETING :-

(1) At present 65620 MT Potato is produced in the area of the society. It will procure potatoes from growers with the approach of providing reasonable price. The Price will be fixed by the working committee keeping in view the market trend. Society will procure produce from the farm gate of the members. Transport bagging, packing and grading cost will be born by the society. The farmers will be getting Rs. 1400/- per MT as compared to the present price of Rs. 1000/- ton, It has been envisaged that up to five years, the society will procure potatoes as following :-

Year	Procurement in MT	Price PerTon	Price Increase.
I Yr.	7875	1400	-
2ndYr.	8875	1500	100
3rd Yr.	9875	1525	25
4th Yr.	10875	1550	25
5th Yr.	11875	1550	-

(2) Out of the above procurement the Potato procured for processing Unit will be of big size better

quality and late harvested. Procurement and price for the five years are proposed as follows:-

Year	Procurement(MT)	Price (Rs.in Lacs)
I Yr.	900	1400
II yr.	1200	1500
III Yr.	1500	1700
IV. Yr.	1800	1900
V. Yr.	2100	2100

Transport, bagging, grading and labour charges for the potatoes procured for processing unit is estimated Rs. 50/-Per Ton.

- (3) The Society will also procure healthy seed from Punjab, for the supply of members. The members will also produce Potato seed with the extension of farm Supervisor. The Procurement of seed for the first five years will be as follows:-

<u>Year</u>	<u>Procurement M.T.</u>	<u>Price Per M.T.</u>
I Yr.	1050	2275
II Yr.	1050	2300
III Yr.	1050	2300
IV Yr.	1050	2300
V. Yr.	1050	2300

The above price includes grading, packing, bagging, and transport charges.

- (4) After grading and bagging the Potatos will be transported to Pune, Sangli, Kolhapur, Nagpur, Nasik and Dhulia Mandies. Packing ,bagging,transportation and other labour charges up to sale point is estimated Rs. 500/-Per M.T. in the first year. These expenses are estimated Rs. 525 second year, Rs. 550/- third year, Rs.575 fourth year and Rs. 600 per ton in the fifth year.

It has been envisaged that upto first 5 years, the potato marketing immediately after procurement will be as follows:-

<u>Year</u>	<u>Quantity</u>	<u>Price PerTon</u>
I Yr.	5000	2400
II Yr.	4650	2500
IIIYr.	4800	2525
IV Yr.	4950	2550
V Yr.	5100	2550

- (5) After selling the Potatos in the above markets, the balance Potato will be kept in cold storage, and will be sold at apportune price in the season when the potatos are not harvested, The programme of five years will be as follows:-

<u>Year</u>	<u>Quantity</u>	<u>Price Per Ton</u>
I yr.	1600	2500
II Yr.	2600	2900
IIIYr.	3100	3000
IV Yr.	3600	3000
V Yr.	4100	3050

- (6) The cold storage having the capacity of 5600 MT. will be utilized fully by keeping in some portion, the potatoes on rental basis. This facility can be availed by the Grower members. These members will get pledge loan from Indore Premier Coop. Bank Ltd. Indore and will sale their produce at apportune time. The project envisaged that upto 5 yrs. the society will do this rental business as follows. The society will charge the rent Rs. 250 Per Ton. From the third year the rent will be increased by Rs. 50 Per ton.

<u>Year</u>	<u>Quantity(M.T.)</u>	<u>RENT(Per Ton)</u>
I Yr.	3000	250
II Yr.	2000	250
III Yr.	1500	300
IV Yr.	1000	300
V Yr.	500	300

The capicity utilization of cold storage for the first five year is given in Annexure '8.

- (7) WORKING CAPITAL REQUIREMENT:- In the first year, the society will undertake the marketing business worth Rs. 154-33 lacs and processing variable cost 72 lacs. Society will need the working capital of Rs. 80 Lacs.

The working capital will be arranged from I.P.C. Bank at the interest rate of 15%.

1. Pledge loan	50-00
2. Cash Credit Limit	20-00
3. Over draft limit for Weafers factory	<u>10-00</u>
	<u>80-00</u>

C H A P T E R - V

ORGANISATION AND MANAGEMENT

The Project will be implimented by " AAUVSS" registered under Madhya Pradesh Cooperative Society Act on 30-9-69, with the following objectives in its byelaws.

1. To preserve the Potato crops in cold storage .
2. Grading the Potato and arrange the marketing of member produce.
3. To provide backward linkages including guidance services and supply inputs. .
4. To undertake potato processing activity for value addition of members increased production.
5. To provide pledge loan to member farmers.

The overall management policy is regulated by the Board of Directors . The Board of Directors is comprise of 11 members, out of which 6 members are elected from the Potato growers . One is elected out of the member primary agriculture Cooperative Societies. One member is nominated by the Indore Premiur Coop. Bank Ltd. Indore and 3 members are nominated by the State Government.

The President is elected by the Board out of elected Directors . The President is having overall control in the affairs of the society.

The Board of Director also constitutes a working committee of 5 members as follows:-

:: 21 ::

1. President of the Society.
2. Two elected members.
3. One Representative of Indore Premier.
Coop. Bank Ltd. Indore.
4. One Representative of the Registrar Coop. Societies.

The working committee is responsible for issuing direction regarding marketing, Control over processing unit.

Powers of the day today management and project execution will be vested with the secretary of the society, who will discharge his duties as per the policy and direction given by the Board of Directors and working Committee time to time.

The Management of the society is broadly classified as follows:-

1. Secretary :- Administration.
2. Additional Manager:- Incharge of Marketing and Cold Storage.
3. Account Section
4. Processing Plant Section
5. Extension Service Section.

SECRETARY :-

The Society is already having a officer on deputation from State Govt.. He is incharge of General Administration overall financial control, and management.

ADDITIONAL MANAGER:- The Society is already having a Additional Manager , a officer of the society itself.

|| || ||

It is proposed that procuring and marketing business will be looked after by him.

CHIEF OPERATOR :- He is incharge and responsible for the maintaince of cold storage. He will look into the job of storing potato seed, procurred potato and potatos on rental basis . He is assisted by 3 Assistant operators.

ACCOUNT SECTION:- The maintaince of Accounts, reqards, and payment by Cheuques and Cash will be looked into by the Accountant and Cashier.

PROCESSING UNIT SECTION:- It is proposed that processing unit will be maintained by the Processing Plant Officer .Maintaince of finished goods and arrangements for its supply will be looked after by "Sales Manager". Account will be maintained by the Assistant Accountant, The Typing and correspondence work will be done by the Clerk and Typist. The macnic will look after the machines of the plant. The security guard will be responsible for security arrangements.

EXTENSION SERVICE SECTION:- The Society will appoint a agriculture graduate as a farm Supervisor . The Supervisor will arrange to educate modern technic of Potato production, and necessary arrangements for soil testing and control over fungal, virus and brown rot diseases. He will coordinate his activities with the extension staff of horticulture department. The chart showing the organisation of the society is as below:-

GENERAL BODY
 BOARD OF DIRECTOR
 WORKING COMMITTEE

SECRETARY

Marketing & Cold Storage	Processing Plant Unit.	Extension Service
Additional Manager	Processing Plant Officer	Farm Supervisor.
Chief Operator	Sales Manager	
Assistant Accountant	Assistant Accountant	
Godown Keeper	Machnic	
Chowkidar	Clerk And Typist	
	Security Guard.	

Cost of Establishment :- At Present the cost of establishment is 1.68 lacs. It is proposed to undertake marketing processing and extension services. The Society will have to appoint a processing plant officer, Sales Manager, Assistant Accountant, Machnic, Clerk and Typist, and a farm supervisor, It is estimated that total cost of establishment will be Rs. 3.37 lacs in the first year of the project.

CHAPTER - VI

FINANCIAL ANALYSIS

1. In the first year the project will under take Marketing Business of Rs. 196-50 lacs and will sell finished wafers of Rs. 90/- Lacs. The total Income will be Rs. 286.50 Lacs.

The cost on marketing business will be Rs. 179.99 Lacs and on processing unit will be Rs. 146-81 Lacs .The total cost will be Rs. 326-80 Lacs, and the project will not return any surplus in the first year.

2. It is proposed that project will distribute 15% dividend amounting to Rs. 2.79 lacs. It will also plough back profit to growers at the rate of Rs. 50 Per Ton amounting to Rs. 3.93 lacs.

3. 10% excise tax and 4% sales Tax will also be paid to Govt. amounting to Rs. 10.80 Lacs .After making these allocationsthe project will deliver surplus of Rs. 26.11 lacs.

The cost, Revenue and Surplus statement for 10 years is given in Annexure -9.

4. It is proposed that Reserve Fund of Rs.6.53 Lacs Risk fund of Rs. 10 lacs, Training and education fund for members of Rs. 3 lacs and other funds of Rs. 6.58 lacs will be created in the first year. Creation of funds for the first five years are allocated in the budget provision of first five years.

- (5) Procurement, Marketing and processing business for the 5 years is given in Annexure 15.
- (6) Production Cost rate for the finished wafers are taken as per Annexure 11.
- (7) For processing plant Rs. 74 lacs loan will be obtained from M.P.State Coop.Bank under the N.C.D.C. Scheme at 12% rate of interest. Remaining amount of Rs. 9 lacs will be raised from grower members towards their share capital contribution.
- (8) BREAK EVEN OUTPUT :-
The break even output for the wafer unit comes out to be 56 MT per year detailed calculations are given in Annexure-16. It will also be seen from the Annexure that the margin over the average variable cost (Per unit contribution to fix cost).stands at Rs. 14950 Per M.T. This means the Society will reap the profit of Rs. 14950/- per MT over all the production excess of 56 MT. production.
- (9) BENEFIT COST RATIO :-
On the basis of cash flow Chart for the 10 years (Annexure 15) the B.C.R. at 15% comes to 1.207. It indicates that value addition is more than sufficient in the project.
- (10) The I.R.R. of the Project is more than 50%

11. SENSITIVITY ANALYSIS :-

Assuming that distribution of dividend, Bonus to potato growing members and taxes are included in the cost of operation and entire cost is increased by 10 % but the benefit remains the same. The I.R.R. of the project would be 33.02%.

12. REPAYMENT SCHEDULE AND BANKABILITY :-

It is proposed that the 12% simple interest on Rs. 74 Lacs will be paid out of operational cost. The instalment of the principal will be paid out of surplus as per Annexure -10.

13. ECONOMIC ANALYSIS :-

Proposed project is having limited area of operation and investment is also not very heavy. It is very difficult to measure the impact on national economy or a society as a whole, however following direct and indirect economic benefit can be enumerated.

(A) Because of the intensive efforts of farm guidance wing, per hectore productivity of the Potato crop will be increased.

B. Due to better marketing practices and processing, the grower farmers will automatically get more return. The pressure on the market and monopoly of private traders will be reduced. It will result in increasing the income of the farmer community of the project area.

- C. Due to processing Unit the additional employment will be generated in the working season of the processing plant
- (D) Due to production and sale in the processing unit the Government will get the revenue of Rs. 227.58 lacs as taxes during the project period. This amount is available for Public welfare.
- (E) The project implementation will result in planned and continuity in supply of potatoes, due to processing of wafers, the consumer will get good quality and reasonable price.
- (F) At present farmers are using simple dug well irrigation system through channels. It results in wastage of water. Sprinkler irrigation system can be better and will save irrigation water to the extent of 20 percent. Thus the water so saved can be used in bringing more area under irrigation.

C H A P T E R - 7 - B U D G E T F O R T H E 5 Y E A R S .

(Rs. in Lacs)

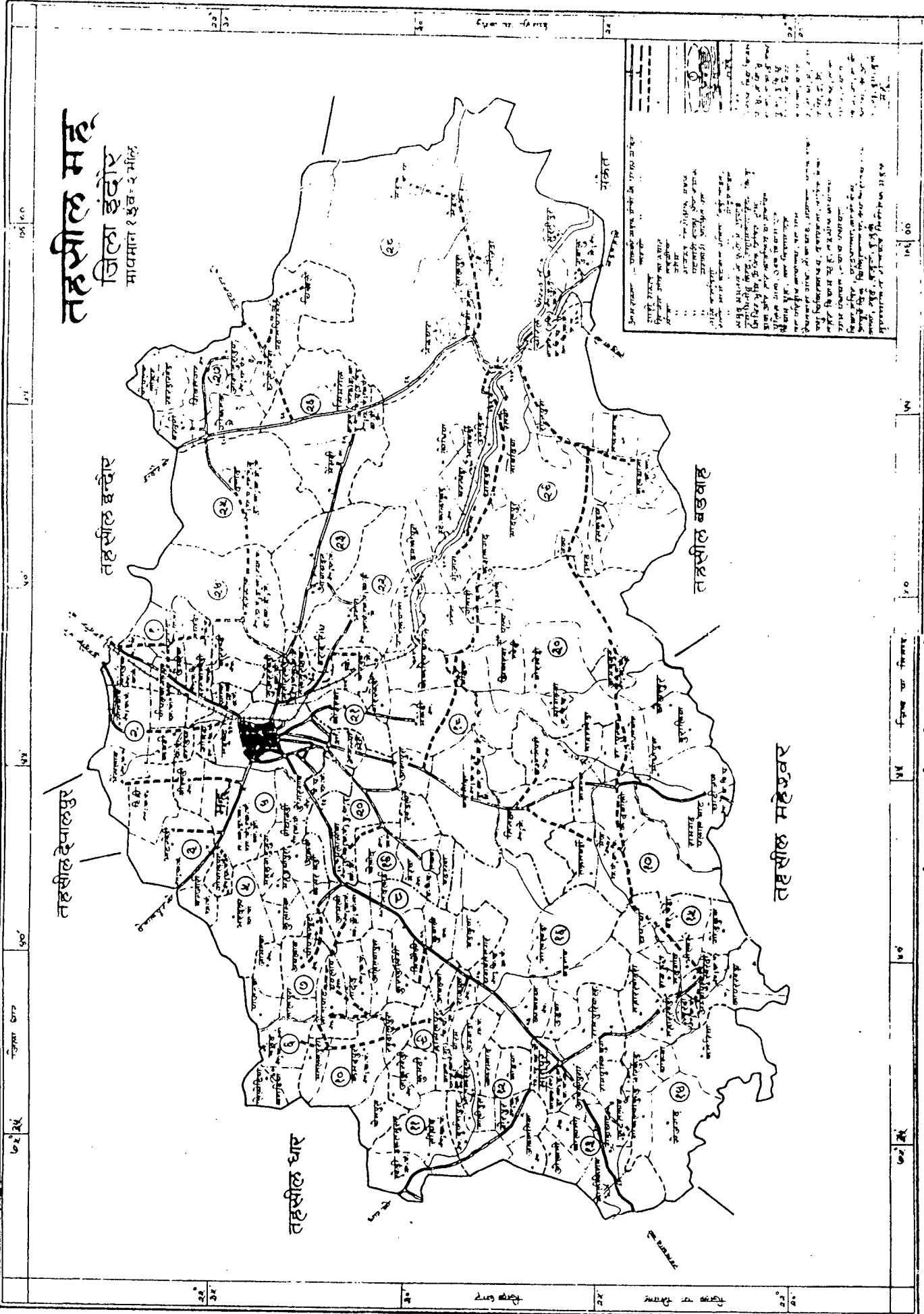
<u>S.No.</u>	<u>ITEM</u>	<u>I.Yr.</u>	<u>II.Yr.</u>	<u>IIIrdYr.</u>	<u>IV.Yr.</u>	<u>Vth Yr.</u>
1.	Capital Investment	83.00	-	-	-	-
2.	Operating Cost.	235.50	280.36	322.35	367.00	411.59
3.	Revenue	286.50	351.90	412.95	470.77	537.85
4.	Depriciation	8.30	8.30	8.30	8.30	8.30
5.	Surplus	42.70	63.24	82.30	95.47	117.96
6.	Bonus to grower Members.	3.93	4.44	4.93	5.44	5.93
7.	Taxes	10.80	14.45	18.32	22.31	26.95
8.	Dividends to members	1.86	2.79	2.79	2.79	2.79
..	9. Net Revenue	26.11	41.56	56.26	64.93	82.29
..	10. Reserve Fund 25%	6.53	10.39	14.06	16.23	20.57
..	11. Risk Fund	10.00	15.00	20.00	25.00	30.00
..	12. Training and Edu.	3.00	3.50	4.00	5.00	5.00
..	13. Other fund	6.58	12.68	18.20	18.70	26.27

CHAPTER -8
RECOMMENDATIONS
AND
PRECAUTIONS

- (1) After the procurement of the potatoes the society should arrange proper grading bagging and transport to Pune, Sangli, Kolhapur, Nagpur, Nasik, Dhulia, Mandies to fetch attractive prices.
- (2) Wastage of the potatoes at storage and transportation level is more with comparison to other countries. It is therefore desirable that suitable steps should be taken to reduce wastage.
- (3) The Horticulture Department should provide all necessary inputs, technical guidance to the growers in coordination with the farm supervisor under the project, There is a great need for protection practices from fungal, virus and brown rot diseases. The Agriculture University should take up research programme to provide latest technology to the growers.
- (4) The Horticulture Department of the State Government should coordinate its activities with the Central Potato research institute Gwalior (M.P.) to provide healthy seed to the farmers.
- (5) The marketing wing has to undertake procurement of Potatoes from the farmers field. All necessary arrangements for transport should be completed in the phased manner so that the wastage can be reduced.

- (6) The State Government should also contribute to the share Capital and Subsidy for the processing unit, and also guarantee the long term investment loan to the financing Bank.
- (7) Automatic Plant for wafers processing is a quite new Idea. The society may take consultant from "Golden Crisps" and "PARAM SNAKES" New Delhi, who are already having Automatic Plant at New Delhi. The Machines can be purchased and installed with their consultation.
- (8) At present the membership coverage of Potato growers in the project area of the society is very less. The Society should enroll sufficient potato growers as their members to develop its marketing activities.
- (9) The society with the help of Registrar Cooperative Societies M.P. should tie-up marketing strategy of finished wafers with the institutions like state cooperative consumer federation, defence service canteen, and Tourism Department of the State Government.

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तहसील मह
जिला इंदौर
 मापमान १ इंच = २ मील

तहसील इन्दौर

तहसील बडवाह

तहसील महेंदुर

तहसील धार

तहसील देवालपुर

अ.म.सं.सं. - राजकीय जमीन अथवा १९५७ साल तक
 सार्वजनिक जमीन
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जिला इंदौर

जिला इंदौर

जिला इंदौर

ANNEXURE I

GENERAL INFORMATION OF THE PROJECT AREA

(1) Area of the Indore District	1479 Sq.Miles
(2) Population Rural	5.26 Lacs.
(3) Urban Population	<u>10.57</u> ,, <u>15.83</u> Lacs
(4) <u>Total Area of the Mhow Block:-</u>	804 Sq.Km.
(5) <u>Working Population in Mhow Block:-</u>	
a. Agriculturist	20786
b. Agriculture labour	18050
c. Cottage Industry	1071
d. Others	6193
e. Part time employment	2750
d. Unemployment	61167
(6) Denisity of the Population	241 Per Sq.Km.
(7) Irrigated Area	Hect.
By Canal	790
Tanks	292
Tube wells	1792
Dug Wells	10984
Other source	409
	<hr/>
	14267

Source: Block Development Office Mhow.

ANNEXURE - II

AREA AND PRODUCTION OF POTATO IN M.P.
DURING 86-87 AND PROJECTION for 87-88

<u>S.No.</u>	<u>Distt.</u>	<u>Area in Hect.</u>	<u>Projection of 87-88 in Hect.</u>
1.	Durg	23	30
2.	Rajnadgoan	18	30
3.	Raipur	286	290
4.	Baster	77	90
5.	Bilaspur	541	600
6.	Rajgarh	1282	1350
7.	Surguja	3303	3500
8.	Jabalpur	855	900
9.	Balaghat	290	330
10.	Chhindwara	2368	2500
11.	Narsinghpur	775	830
12.	Seoni	423	440
13.	Mandla	208	250
14.	Sagar	911	1000
15.	Damoh	420	450
16.	Tikamgarh	999	1090
17,	Chhatarpur	441	470
18.	Panna	317	350
19.	Rewa	876	920
20.	Sdhi	1020	1100
21.	Satha	1090	1200
22,	Sahdol	453	520
23.	Gwalior	1309	1360
24.	Shivpuri	295	350

25.	Guna	167	200
26.	Marena	486	510
27.	Datia	67	100
28.	Bhind	410	460
29.	Indore	5117	5250
30.	Dhar	196	250
31.	Jhabua	6	20
32.	Khargone	64	100
33.	Khandwa	24	50
34.	Ujjain	336	400
35.	Ratlam	155	300
36.	Mandsour	36	50
37.	Dewas	633	670
38.	Shajapur	277	300
39.	Bhopal	21	100
40.	Sihore	75	100
41.	Raisen	98	120
42.	Vidisha	99	120
43.	Betul	889	980
44.	Raigarh	122	150
45.	Hoshangabad	183	215
		23031	30335

Source:- National Co-operative Development Corporation
New Delhi .

ANNEXURE - III

AREA UNDER POTATO CROP IN INDIA

<u>State</u>	<u>Area Under Potato Hect.</u>	<u>Percentage of the Total Area under Potato Crop. in India</u>
1. U.P.	3,40,000	40%
2. West Bengal	1,50,000	18%
3. Bihar	1,40,000	17%
4. Punjab	30,000	3.5%
5. Madhya Pradesh	30,000	3.5%
6. Other States	1,60,000	18%
<hr/>		
TOTAL INDIA	8,50,000	100%
<hr/>		

Source:- Agriculture University Indore.

ANNEXURE #4

AREA , PRODUCTION AND YIELD OF POTATO
IN MHCW BLOCK

<u>Year</u>	<u>Area (Hect)</u>	<u>Production (M.T.)</u>	<u>Yield MT.</u>
1979-80	1978	35604	18
1980-81	2118	33124	18
1981-82	2321	44099	19
1982-83	2550	48450	19
1983-84	2660	53200	20
1984-85	2841	56820	20
1985-86	2942	61782	20
1986-87	3263	65260	20

Source:- Block Development Office Mhow.

CGST OF CULTIVATION OF POTATO (PER HECT)

<u>Item.</u>	<u>Rs.</u>
<u>DIRECT COST</u>	
1. Seed	3750-00
2. Fertilizer, Manure, insecticides & Pesticides.	2400-00
3. Preparation of land	300-00
4. Sowing	300-00
5. Irrigation	400-00
6. Hoeing and earthing	500-00
7. Digging and loading	350-00
8. Misc.	150-00
<u>INDIRECT COST :-</u>	
9. Rent of the land	15-00
10. Int. on Capital	500-00
11. Dep. charges	50-00
	<u>8715-00</u>
Total Cost	<u>8715-00</u>
Income:- Yield 20 MT @ 800/- Per M.T.	= 16000-00
Net Income:-	7285-00
<u>Source:-</u>	Deputy Director Horticulture Indore.

MONTHWISE ARRIVAL AND MINIMUM MAXIMUM MARKET
RATES OF POTATO IN MARKET YARD INDORE (M.P.)

<u>Month</u>	<u>Arrival In Quintal</u>	<u>Minimum Rate. per Qtl.</u>	<u>Maximum Rate. per Qtl.</u>	<u>Average. per Per Qtl.</u>
May 86	9503	75	225	150
June 86	3246	100	150	125
July 86	11891	87.5	175	131.25
August 86	17630	75-00	175-00	125-00
Sept. 86	12618	100-00	200.00	150-00
Oct. 86	40448	95.00	162.5	128.75
Nov. 86	23565	112.50	225.00	168.75
Dec. 86	18056	75-00	200.00	137.5
Jan 87	18613	90-00	110.00	100-00
Feb, 87	15961	87.5	100.00	94.00
March 87	38544	90.00	100.00	95.00
April 87	46579	95.00	162.50	128.75
May 87	27519	100.00	200.00	150.00
June 87	21510	150.00	187.50	168.75
July 87	19145	100-00	200.00	150.00
Aug. 87	24665	125.00	212.5	168.75
Sept. 87	40235	125	180.00	152.5
Oct. 87	55380	227.50	302.5	265.00
Nov. 87	67455	100.00	225.00	162.5
Dec. 87	55544	90.00	275.00	187.5

SCURCE:- Kirshi Upaj Mandi Samiti Indore.

ANNEXURE -7

PROCUREMENT OF POTATO

Year.	Seed Procure.	Potato forMKT.	For Pro-cessing.	Total	Wastage	Seed to members	Available for Mkt.	Available for Coll storage
1. Quantity	1050	6975	900	8925	425	1000	5000	1600
Rate	2275/-	1400/-	1400/-	-	-	2900/-	2400/-	2500/-
2. Quantity	1050	7675	1200	9925	475	1000	4650	2600
Rate	2300/-	1500/-	1500/-	-	-	2925/-	2500/-	2900/-
3. quantity	1050	8375	1500	10925	525	1000	4800	3100
Rate	2300/-	1525/-	1700/-	-	-	2925/-	2525/-	3000/-
4. Quantity	1050	9075	1800	11925	575	1000	4950	3600
Rate	2300/-	1550/-	1900/-	-	-	2925/-	2550/-	3050/-
5. Quantity	1050	9775	2100	12925	625	1000	5100	4100
Rate	2300/-	155/-	2100/-	-	-	2925/-	2550/-	3050/-

ANNEXURE '8'

CAPACITY UTILIZATION OF COLD STORAGE

<u>Year</u>	<u>Seed for Members. MT.</u>	<u>ColdStored for Marketing MT</u>	<u>Coldstored on rental MT</u>	<u>Total MT</u>
1.	1000	1600	3000	5600
2.	1000	2600	2000	5600
3.	1000	3100	1500	5600
4.	1000	3600	1000	5600
5.	1000	4100	500	5600

ANNEXURE

CCST, REVENUE AND SURPLUS STATEMENT (Rs. in Lakhs)

<u>Year</u>	<u>Cost</u>	<u>Revenue</u>	<u>Surplus</u>	<u>Dividend</u>	<u>Bonus to grower</u>	<u>Tax</u>	<u>Surpl Available</u>
1	243.80	286.50	42.70	1.86	3.94	10.80	26.1
2.	288.66	351.90	63.24	2.79	4.44	14.45	41.50
3.	330.65	412.95	82.30	2.79	4.93	18.32	56.20
4.	375.30	470.77	95.47	2.79	5.44	22.31	64.90
5.	419.89	537.85	117.96	2.79	5.93	26.95	82.20
6.	419.01	537.85	118.84	2.79	5.93	26.95	83.10
7.	418.12	537.85	119.73	2.79	5.93	26.95	84.00
8.	417.23	537.85	120.62	2.79	5.93	26.95	84.90
9.	416.37	537.85	121.51	2.79	5.93	26.95	85.80
10.	415.45	537.85	122.40	2.79	5.93	26.95	86.70

REPAYMENT SCHEDULE OF LOAN OF RS. 74 Lacs.

<u>Year.</u>	<u>Surplus</u>	<u>Repayment</u>	<u>Balance of Loan.</u>	<u>Net Surplus.</u>
1	26-11	7-40	66.60	18.71 3.71
2.	41.56	7.40	59.20	34.16
3.	56.26	7.40	51.80	48.86
4.	64.33	7.40	44.40	56.93
5.	82.91	7.40	37.40	75.51
6.	82.91	7.40	29.60	75.51
7.	82.91	7.40	22.20	75.51
8.	82.91	7.40	14.80	75.51
9.	82.91	7.40	7.40	75.51
10.	82.91	7.40	-	75.51

PRODUCTION COST RATE FOR FINISHED WAFERS PER MT

Item.	Qty.	Rate				
		I	II	III	IV	V
1. Potato	4 MT.	1400	1500	1700	1900	2100
2. Oil	400 Kg	30000	32000	30000	34000	35000
3. Salt Spices etc.		250				
4. Packing Material		2500				
5. Cost of Fuel		2000				
6. Labour		750				
7. Utilities Water		500				
8. Administrative Cost.		500				
9. Selling Commission 10%		3130				
10. Selling Cost of Wafers.		40000	42000	44000	45000	48000

ANNEXURE 12

(Rs. in Lacs)

BALANCE SHEET OF THE SOCIETY AS ON 3-6-87

<u>LIABILITIES</u>		<u>AMOUNT</u>	<u>ASSETS</u>	<u>AMOUNT</u>
1.	<u>SHARE CAPITAL:-</u>		1. Bank and Cash	0.22
	Individual Members	4.90	2. Fixed Deposit	1.63
	Co-operative Society	0.07	3. Investment	0.15
	Government	<u>4.68</u>	4. Land & Building	17.83
2.	Govt. Loan for Cold Storage	7.30	5. Cold Storage Machine	4.27
3.	Int. to be paid Cold Storage Godown.	7.11 0.56	6. Insulator for Cold Storage	2.71
4.	Sundry Creditors	2.41	7. Godown	1.56
5.	Pledge Loan from I.P.C. Bank	11.01	8, Pledge loan to members	12.16
6.	Working Capital loan from I.P.C. Bank	3.06	9. Rent Outstanding from Members.	10.06
7.	Deposits for Members	0.87	10. Interest Accrued to members	1.13
8.	Booking Advance	1.31	11. Sundry Debtors.	1.93
9.	Security Deposit from Labour Contractor.	0.17		
10.	Godown loan	1.59		
11.	Accumulated Profit	8.82		
		<u>53.95</u>	TOTAL	<u>53.95</u>
		=====		=====

ANNEXURE -13

PROFIT & LOSS A/C AS ON 30-6-87

(Rs. in Lacs)

<u>Expenditure</u>	<u>Amount.</u>	<u>Income</u>	<u>Amount</u>
1. Establishment	1.68	1. Cold storage rent from members.	13.00
2. Electricity	6.10		
3. Int.on loan	1.94	2. Interest.	1.37
4. Insurance Premium	0.67	3. Misc. Income	0.58
5. Depreciation	1.66		
6. Labour Charges	0.94		
7. Repairs	0.38		
8. Sundry Exp.	1.06		
9. Pfofit	1.02		
	<hr/>		<hr/>
TOTAL:	14.95	TOTAL:	14.95
	=====		=====

ANNEXURE 14

ESTABLISHMENT COST

Processing Unit:

	<u>Name of the Post</u>		<u>Annual Cost.</u>
1.	Processing Plant Officer	1	24,000-00
2.	Sales Manager	1	24,000-00
3.	Assistant Accountant	1	18,000-00
4.	Machnic	1	18,000-00
5.	Clerk Cum Typist	1	15,000-00
6.	Security Gard	1	8,000-00
7.	Peon	1	5,000-00
	Total		<u>1,12,000-00</u>

MARKETING AND COLD STORAGE UNIT :-

1.	Secretary	1	30,000-00
2.	Additional Manager	1	24,000-00
3.	Accountant	1	20,000-00
4.	Cashier	2	29,000-00
5.	Assistant	2	18,000-00
6.	Godown Keeper	1	15,000-00
7.	Chief Operator	1	22,000-00
8.	Assistant Operator	3	37,000-00
9.	Chowkidar	1	9,000-00
10.	Farm Supervisor	1	21,000-00
	Total:		<u>2,25,000-00</u>

GRAND TOTAL:- 3,37,000-00

<u>E. Cost Wafers</u>											
Capital Cost	83.00	-	-	-	-	-	-	-	-	-	-
Repairs Maint.	-	1.00	1.25	1.50	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Potato Cost	12.60	18.00	25.50	34.20	44.10	44.10	44.10	44.10	44.10	44.10	44.10
Transport	0.45	0.60	0.75	0.90	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Refine Groundnut Oil.	27.00	38.40	49.50	61.20	73.50	73.50	73.50	73.50	73.50	73.50	73.50
Salt, etc. @ 250/- Per Ton.	00.56	0.75	0.94	1.12	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Packing Material	5.62	7.50	9.37	11.25	13.12	13.12	13.12	13.12	13.12	13.12	13.12
Heating Charges 2000/- Per M.T.	4.50	6.00	7.50	9.00	10.50	10.50	10.50	10.50	10.50	10.50	10.50
Labour Charges @ 750/- Per M.T.	1.68	2.25	2.81	3.37	3.93	3.93	3.93	3.93	3.93	3.93	3.93
Utilities water Power @ 500/-PerMT	1.12	1.50	1.87	2.25	2.62	2.62	2.62	2.62	2.62	2.62	2.62
Establishment	1.12	1.50	1.87	2.25	2.62	2.62	2.62	2.62	2.62	2.62	2.62
Interest on Working Capital	0.28	0.37	0.47	0.56	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Int. on laon	8.88	7.99	7.10	6.21	5.32	4.44	3.55	2.66	1.77	0.88	0.88
TOTAL	146.81	85-86	108.93	133.81	160.47	159.59	153.70	157.81	156.92	156.03	156.03
TOTAL of (D) & (E)	326.80	288.66	330.65	375.30	419.89	419.01	418.12	417.23	416.34	415.45	415.45

"P" INCOME

Sale of Potato	120.00	116.25	121.20	126.22	130.05	130.05	130.05	130.05	130.05	130.05	130.05	130.05
Sale of Seed	29.00	29.25	29.25	29.25	29.25	29.25	29.25	29.25	29.25	29.25	29.25	29.25
Sale of Potato After Storage	40.00	75.40	93.00	109.80	125.05	125.05	125.05	125.05	125.05	125.05	125.05	125.05
Income of Rent	7.50	5.00	4.50	3.00	1.50	1.59	1.50	1.50	1.50	1.50	1.50	1.50

196.50 225.90 247.95 263.27 285.85 285.85 285.85 285.85 285.85 285.85 285.85 285.85

Sale of Finished Wafers.

	90.00	126.00	165.00	202.50	252.00	252.00	252.00	252.00	252.00	252.00	252.00	252.00
Total Income	286.50	351.90	412.95	470.77	537.85	537.85	537.85	537.85	537.85	537.85	537.85	537.85

NET BENEFIT

	- 40.30	63.24	82.30	95.47	117.96	118.84	119.73	120.62	121.51	122.40
N.P.W. 15% of cost	- 284.32	218.23	217.57	214.67	208.68	181.01	157.21	136.43	118.24	102.62
N.P.W. 15% of Benefit.	249.25	266.04	271.72	269.28	267.31	232.35	202.23	175.88	152.75	132.85

B.C.R.	=	N.P.W. of Benefit	=	2219.66	=	1.207
		N.P.W. of Cost.		1838.98		

; 6 :: CALCULATION OF SENSITIVITY TEST

Total Cost.	365.91	337.00	339.75	443.37	497.54	496.53	495.60	495.51	495.42	495.33
Benefit	286.50	351.90	412.95	470.77	537.85	537.85	537.85	537.85	537.85	537.85
Net Benefit	(79.41)	14.90	23.20	27.40	40.31	41.27	42.25	42.34	42.25	42.14
N.P.W at 15%	(69.09)	11.26	15.27	15.67	20.03	17.83	15.89	13.85	12.00	10.41
	(69.09)	132.21	= +	<u>63.12</u>						

D.F. 35%	.741	.549	.406	.301	.223	.165	.122	.090	.067	.049
N.P.W. 35%	(58.84)	8.18	9.42	8.25	8.99	6.81	5.15	3.81	2.83	2.06
	(58.84)	54.79	=	(4.05)						

I.R.R. = $30 + 5 \left(\frac{6.20}{10.25} \right)$
 = $30 + 5 (.604)$

= $30 + 3.02 = \underline{33.02\%}$

D.F. 30%	.769	.591	.455	.350	.269	.207	.159	.122	.094	.073
N.P.W. 30%	(61.07)	8.81	10.56	9.59	10.84	8.54	6.72	5.16	3.97	3.08
	(61.07)	67.27	= +	<u>6.20</u>						

ANNEXURE 16

BREAK EVEN POINT FOR THE WAFER UNIT

$$P = \frac{\text{Total Sales}}{\text{Total Manufacture}} = \frac{2095}{4500\text{MT}} = 0.4655$$

$$\text{AVC} = \frac{\text{Total Variable Cost}}{\text{Total Manufactured Quantity}} = \frac{1422}{4500 \text{ MT}} = 0.3160$$

$$\text{B.E. POINT} = \frac{\text{Total Fixed Cost}}{P - \text{Average Variable Cost.}}$$

$$= \frac{83 \text{ Lacs}}{0.4655 - 0.3160}$$

$$= \frac{83}{0.1495}$$

$$= 555.2 \text{ MT Over 10 Years}$$

56 MT. Per year,

25.2.1988

REPORT OF GROUP-A

PRODUCTION & MARKETING OF FRESH ORANGES IN SIKKIM
STATE THROUGH COOPERATIVE (India).

Objective is quite clear and project was well prepared.

As this project will be implemented by the Sikkim State Coop Supply and Marketing Federation, we should have given more detailed structure of SIMFED - what is their privilege and number of employees they will add and what is the marketing cost they will be borne, if they participate in this business, since it is a new field for them.

SHEEP AND WOOL MARKETING IN DUNGARPUR, RAJASTHAN (India).

1. Well defined.
2. Summary (4) ; 5 TIMES of existing price of wool and 1.5 times of price of animal has been envisaged to be given to the members which seem to be quite impracticable.
3. Total cost of the project has been estimated at Rs.25,55,000, but no details of the project cost have been given. This should be clarified.
4. Inclusion of members from government and other institutions in the board of management hampers the democratic trend of cooperatives. The cooperative should be managed by the cooperators themselves. Other institutions may provide logistic support.
5. No cash flow statement has been provided. This is very important for different analysis.
6. From bankability point of view project period should be ascertained which is lacking in the report. This should be included.
7. Details of calculation of IRR have not been given. It has simply been mentioned that the IRR is very high, i.e. infinite (Annex-13). It has been verbally explained that one professor has encouraged such an IRR. But from banker's point of view this may be confusing. It should be clearly explained in the report.

8. Projected Balance Sheet has not been prepared and provided in the report to ascertain the accuracy of different calculations of assets and liabilities which is a must from accounting point of view. This should be prepared and incorporated in the report.
9. Annex-XIII : Net present value has been shown at Rs.637,000, but details of calculation has not been given covering the life of the project and also showing the percentage of discount factor in absence of which the project cannot be evaluated. This should be done.
10. Marketing, i.e. local and foreign demand, supply of produce, mode of payment, transportation etc. are the most important aspects of a project. But nothing about marketing arrangements has been clearly mentioned in the report only excepting showing a simple linkage with the marketing federation.
11. Annex-6 : It has been mentioned that working capital requirement would be met by Rajasthan State Cooperative Bank, but the actual requirement of working capital and turnovers thereof have not been ascertained in the report and details thereof have not been given. This has direct impact on other financial analysis. This should be incorporated in the report.
12. In the loan repayment schedule (Annex-14) first year's instalment has been shown at Rs.497,000, but the amount can not be repaid as the cooperative will run at a loss of Rs.336,000 (Annex-15). Hence, the position of outstanding loan shown in the 2nd year is not correct which is also misleading to calculation of interest for subsequent years. Rather, in the 2nd year two loan instalments amounting to Rs.956,000 shall be due for repayment, whereas, net income before repayment of loan comes to Rs.753,000 causing a deficit of Rs.203,000. So, the amount of interest showed to be accrued in subsequent years must not be correct which is bound to affect almost all the financial analysis including profit and loss account. This should be checked and revised.
13. At page 27 it has been mentioned that value addition will reach its desirable rate only after 10 years without mentioning the life of the project, whereas, every project should have a definite life time. If the project life is taken to be 10 years desirable value addition can be achieved only when project life is over which cannot at all be encouraging.

14. Annex-III : Total membership has been shown as 5,289 and Rs.52 has been estimated to be collected from each member as share money and admission fee which comes to Rs.275,000. But share from members has been shown at Rs.192,000 only (PAGE-3) for which loan requirement has been increased to some extent causing higher volume of interest liability. Minimisation of interest bearing loan can be thought of.

15. Annex-15 : Net benefit of the society after appropriation of the profits has been shown. But details of profit appropriation have not been provided in the report.

In the 5th year ploughing back of profit to the members has been estimated at Rs.215,000. If the number of members remains the same, i.e. 5,289 even after 5 years, average per head profit would be Rs.40/- only which is very negligible. And if the membership increases as per estimated ratio per head yearly profit will be Rs.30/- only. Even in the 10th year of operation per head yearly income stands at Rs.85/- only. This is not at all encouraging.

16. Interest on long term loan has been calculated at 12.5 per cent, but it has been shown in Annex-14 that the interest rate is 15%. This should be corrected.

We think, all the information, clarification, modification and incorporation as mentioned above to have been lacking in the report are badly needed for proper appraisal of the project.

POTATO MARKETING AND PROCESSING (India)

1. Marketing

There is no marketing linkage with the other coop societies. So we would like to suggest as a coop society, if they can keep linkages with the other coop organisations, will be better.

2. Procurement and processing

In the first year of processing, the project required 900 MT with the price of 1,400 Rupees/Ton on 75 working days. The 5th year the project required 2,100 MT with 175 working days.

According to price increase ment of the project in 1st year from 1000 - 1400 Rupees, more members should be joined to the coop. So we would like to suggest to increase the processing plants working days at least 250 days per year or two shifts a day.

25.2.88

REPORT OF GROUP-B

PRODUCTION & MARKETING OF FRESH ORANGES IN SIKKIM
STATE THROUGH COOPERATIVE (India).

1. Product handling and marketing operations may be more clearly spelled out.
2. Aspects of revenue generation in total may be enclosed so as to make appraisal easier.

SHEEP AND WOOL MARKETING IN DUNGARPUR, RAJASTHAN (India)

1. Margin on the product, retained by society is very high. May be explained.

POTATO MARKETING AND PROCESSING (India).

1. Capacity utilisation of the processing plant is low. Why?

sm.

REPORT OF GROUP-C

PRODUCTION & MARKETING OF FRESH ORANGES IN SIKKIM (India)

1. The project is meant only for the marketing of oranges and not production.
2. Budget was not mentioned in the report.
3. Source of capital was not clearly defined.
4. The project implementor and flow is not clear.

SHEEP & WOOL MARKETING IN DUNGARPUR, RAJASTHAN (India)

1. Objective of the project is clearly defined.
2. The marketing strategy is not well spelt out on how it will be operated. The project did mention the term "with the help of the State Federation".
3. The project report suggested for the formation of a new society. But it is doubtful that the members share of Rs.1.92 lakhs can be collected in the first year itself since the area is backward and the population is poor.
4. It was not mentioned in the report how local leadership be created to form the new cooperative.
5. How the net benefit will be utilised is not given. Surplus utilisation statement is required.
6. Budget not given.
7. Fixed cost has been added to operating cost total for 10 years. Therefore net profit has been decreased annually.
8. Capital cost was not calculated in the inflow statement.

POTATO MARKETING AND PROCESSING (India)

1. Objectives well defined.
2. Marketing strategy has been clearly laid out. The society will market the produce on its own.
3. In the cash flow presented, the total capital cost of 83 lakhs Rupees was not calculated in the inflow. Therefore, net profit should be increased by 83 lakhs Rupees.
4. The calculation of IRR, interest and depreciation should be added.
5. Calculation of dividend and bonus should be made after tax. This will provide more profit.

Second ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia

NEW DELHI, BANGKOK, TOKYO, SEOUL

October 26, 1987—May 10, 1988

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Country : I N D O N E S I A

Prepared by : YOYOK SUNARYO

Funded by the Government of Japan

and

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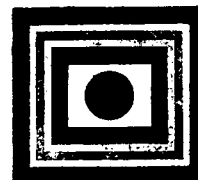
ICA Management Training Project for Agricultural Cooperatives in Asia



INTERNATIONAL COOPERATIVE ALLIANCE

**Headquarters :
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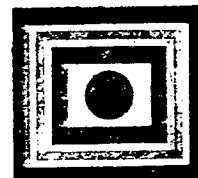
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P R E F A C E

This paper is prepared to finish of the duty that be given in the frame work of Project Prepared During Home Country Assignment , as the stipulation /terms to follow from the ICA TRAINNING COURSE FOR STRENGTHENING MANAGEMENT OF AGRICULTURAL COOPERATIVES IN ASIA PART II , to be presented in Idaca Japan during ICA trainning Course part II I am gratefull to Mr. Madane on his suggestion to ~~making~~ this paper , and also to Proféssor Oza who has arrived in Indonesia ~~win~~ giving away the correction also on his suggestion in composing this paper .

May be able to useful to increasing of my ability and could be used for the development of cooperative an general way . May be still meet any default and mistaken in its composition , therefore I ask and apologize on its correction .

Yoyok Sunaryo .

CHAPTER I

SUMARRY .

This paper as an axart program of KUD " Cepogo " in Boyolali regency , of Central Java .

Whereas the purpose of this project for increase income of farmer as entrustor from fattening unit Of KUD Cepogo area, that formerly found 15% from c ow's sales only, on cow's sales receive more than $15\% \times \text{Rp } 800,000.- = \text{Rp } 120,000,-$ per year , equivalent Rp 333.33 per day . This will be increased to Rp 3,090.65 per day .

This project will increase of new unit (Fattening unit) and also to increase of Cooperative activity , and will lighten of the milch cow farmer responsibility , because as a sourche of calf commodity from dairy farm . So this will lighten of maintenance responsibility from milch cow farm , whereas for executing (handling) of the project above need an investment more than Rp 150,000,000.- .

To coincide with the analisys result of finance , there fore to be expected in order to Cooperative is able to supply 202 heads of male F.E calf to its members per year. Caused follow the BEQ analicy need 202 heads . Whereas the minimum sales price Rp 364,854 per head , to coincide with BEP calculation . For supply its fund / investment need Bank loan Rp 150,000,000.-

Fit with pay back calculation in 4 year period .
Whereas the calculation of NPV result with discount rate 25% find the positive result (geproject) . IRR calculation with interpolation its result 26.95% and its payback period is 5 year, rentability 24.29%
Its ~~mean~~ is rentable if be comparred with Bank loan 18%,
Whereas rate of return is 19.55 % .

CHAPTER II

BACK GROUND .

On this ten years period the Government of Indonesia begin to encourage in the Agriculture sector, to intend for Savings in Foreign Exchange or for increasing non Gasolene export, considering nowadays the main commodity to support the National Economy is Oil and Natural Gas that its price no constant, and up to now no indicate a good sympton yet .

Therefore this has been moment for increasing the efforts in the Agriculture sector in general ways , and its sub sector that is the Livestock service , in this sector still under target , as well as in supply of milk commodity also in supply of meat commodity . In the milk sector of Indonesia still import skim milk powder from Eropas Countries the year of 1985 total 700,000 tons /year. Whereas in meat commodity , Indonesia still require import too, that its quality is satisfactory . As well as that be consumed by Hotel and Restaurant , considering the import value of meat special above is year of 1985 total 2,987,000 kg. (data of the Director of Livestock Service).

To attentive of the reason above , therefore on beginning of 1978 , start to encourage of Livestock Service , efforts for

savings in Foreign Exchange , because to import of skim milk powder from foreign country.

Whereas begin import Frisian Holstain Milch cow from foreign countries (New Zealand and Australia , the reality be credited by Premarry Cooperative and to be breded by dairy farmer , besides to savings in foreign Exchange also to intend to increasing income/liveli - hood level of small holder farmer and also as other - way to give away of spreading of income (see table of milch cow import in every shipment).

Untill the last of this year the development of import Frisian Holstain milch cow are satisfactory , because after establishing Milk Cooperative/Milk Unit of KUD therefore the pure fresh milk marked already guaranteed/ fluent for Government wisdrom .

So the farmer people cattle breeding of milch cow to in crease satisfactory .

Once of the Province that found a chance for increa sing of the people cattle breeding is Central Jawa . This Province is very potential for developing milch - cow also its fattening cow .

If we are attentive the development of milch cow of Cen tral Java until the last of 1986/1987 , trend of of deve- lopment is at full speed .

The whole total of increasing also the development of its calfs . Caused Indonesia still import meat of cow special for Hotel and Restaurant consumption in grand - style () shown on the Director General of Livestock Service , therefore this has been moment for auto activity to supply special meat (superior quality, or from meat of young cow).

Caused to supply a qualified meat no actioned as intensive as possible on the whole a fattening cow was actioned , still in traditional system , because :

- . In fact , the efficient of its bringing up to be brought up until old age , caused for saving, on one moment is required being sold .
- . So its meat is tough (tendernis) then do not able to clasificated to a good quality meat .
- . For local consumption only .

Therefore this project according to bring up of calf that be breeded by farmer the members of Cooperative that be increased / credited to the other farmer that they have not female milch cow and also be coordinated by Cooperative that to assume the shape of new credit in Cooperative above , that is Feedlot Fatten unit .

The use of this project :

- . To lighten of milch cow farmer in bringing up their cows , actually in the young age , cow does not given a heavy duty .
- . Savings in foreign Exchange , because this calfs be prepared to be a good quality meat for Hotel / Restaurant consumption , and also to decrease of qualified meat .
- . Opening of new employment opportunities in the vil- lage level.
- . To increasing of the fattening farmer income .

Chapter III .

Project .

It has been mentioned that this project will find two deferrence uses . Its object are , in one party will lighten of Milch Cow farmer , and the other party will increase of the fattening farmer earning , which the earn of the Fattening milk cow farmer will be received in every three months. Because the sales of cow from the fattening unit in rotati- on ways of calf that be received before , on the second year of the same month to be sold in the time before , with the earn in every sold of calf more than ...

This case already satisfied , because on the whole the farmer of fattening unit in Central Java region , and espe - cially in Boyolali regency , the fattening farm is the entrustor that its result depended to the cows owner , when thw cow already performed of benefit for sell oh this cow , therefore the entrustor farm just receive the money from the sold of cow result :

The resulting of cows sales devided in to :

- Cow owner = 85 percent .
- Entrustor = 15 percent .

Area of Operation .

The operation programme from this project is in Cooperative of "CEPOGO" , Cepogo District , Boyolali Regency of Central Java Region , that the secundair figure that was carry bellow, would give away the endorsement , that's - all : Population of qccupation 47,000 persons, from this po pulation , 57 percents is farmer .

Whereas dry field area that under used more than 2,639.6485 Hectare . , that be expected could be used , for feeding of cow plant (grass) .

Boyo l a l i .

1. Region position ; 110.22 - 110.50 east line .
7.36 - 7.71 south star line.

2. Side border ; - nort side Grobogan regency
- east side Karanganyar, Su-
koharjo regency.
- South side Klaten regency.
- West side Magelang regency.

3. Hight 100 - 500 metres:
Banyudono, Teras, Sawit,
Karanggede, Wonosegoro,
Simo, Juwangi . . .
401 - 500 metres :
Boyolali, Mojosongo, Ampel
Musuk, Cepogo.
701 - 1,700 metres :
Ampel, Cepogo, Musuk, Selo

4. Rainy Expression : 1,800 - 2,650 mili metres per year with
more than 2,212 mm during
114 days rain fall .

5. Deviding of Boyolali regency :

Consisting og 19 Civil district and 267 Head villages.

Wide of regency :

- Rice field	=	23.6 %
- Dry field	=	31.0 %
- Housing	=	25,0 %
- Others	=	20.4 %
- Sherd field	=	22.4 %

5. Daily income :

- Farm	=	60.9 %
- Tehnicy, Salesmen	=	33.3 %
- Industry and Building labour	=	3.4 %
- Government worker and army	=	2.4 %

Monografy .

C e p o g o .

1. Occupation total ; 47,000 persons

Devided into :

- . Farm ; 57%
- . Trade man ; 0,8%
- . Government worker ; 1,5%
- . Employers ; 0,3%
- . Labour ; 15 %
- . Others ; 25%

2. A r e a :

Areas wide = 5,326.3846 Ha.

Devided in to :

- . Dry field ; 2,639.6845 Ha.
- . Rice field ; 55.800 Ha.
- . Housing ; 2,009.900 Ha.
- . Forest ; 265.000 Ha.
- . Others ; 356.000 Ha.

3. Climatology :

- . Average temperature ; 22^oC.
- . High position regency ; 400 - 1250 m
- . Rainy expression average 2,917 mm.
- . Seasons :
 - Wet season = 6 months .
 - Dry season = 3,3 months.
 - Snow = 2,7 months.

4. Animals :

- . Dairy cattle = 2,850 heads .
- . meat cattle = 12,725 heads.
- . Rasse poultry = 4,532 heads.
- . Buras poultry = 151,425 heads.
- . Goat / sheep = 20,335 heads.

Working Operation .

The fattening Unit of Cooperative "Cepogo" in the first year is an investment stage and the beginning of construction to the fattening unit farm, for changing of the traditional maintenance system, by the way to the modern maintenance system, because the traditional maintenance system do not use the livestock service technology yet.

This effort will increase of the Cooperative of "Cepogo" activities, with the extra unit of Fattening. From the fattening Unit above would make the farmer group, in every group in every year to receive 20 heads of male calf, to be allocated to the 5 group, every group has 5 persons of farmer.

So in farmer found 4 heads of male F.H calf, whereas the receiving from the fourth calfs, is not in the same time to be shown bellow:

Whereas the average of the fattening farmer income will be shown on appendix I.

Appendix I .

MECHANISM DISTRIBUTION MILK CALF AND SELLING IN KIND " GEPORO "

I JANUARI		I APRIL		I JULI		I OKTOBER	
Purchase 20 head/calf		Purchase 20 head/calf		Purchase 20 head/calf		Purchase 20 head/calf	
Group A : 1 head/Famer	1 head/Famer	Group A : 1 head/Famer	1 head/Famer	Group A : 1 head/Famer	1 head/Famer	Group A : 1 head/Famer	1 head/Famer
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
Group B : 1 head/Famer	1 head/Famer	Group B : 1 head/Famer	1 head/Famer	Group B : 1 head/Famer	1 head/Famer	Group B : 1 head/Famer	1 head/Famer
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
Group C : 1 head/Famer	1 head/Famer	Group C : 1 head/Famer	1 head/Famer	Group C : 1 head/Famer	1 head/Famer	Group C : 1 head/Famer	1 head/Famer
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
Group D : 1 head/Famer	1 head/Famer	Group D : 1 head/Famer	1 head/Famer	Group D : 1 head/Famer	1 head/Famer	Group D : 1 head/Famer	1 head/Famer
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
Group E : 1 head/Famer	1 head/Famer	Group E : 1 head/Famer	1 head/Famer	Group E : 1 head/Famer	1 head/Famer	Group E : 1 head/Famer	1 head/Famer
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	
1 head/Famer		1 head/Famer		1 head/Famer		1 head/Famer	

II FEBRUARY

Purchase 20 head/calf

Group F : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group G : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group H : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group J : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

II MARCH

Purchase 20 head/calf

Group F : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group G : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group H : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group J : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

II AUGUSTUS

Purchase 20 head/calf

Group F : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group G : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group H : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group J : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

II NOVEMBER

Purchase 20 head/calf

Group F : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group G : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group H : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group J : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

III MARCH

Purchase 20 head/calf

Group K : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group H : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group N : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group O : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

III YUNI

Purchase 20 head/calf

Group K : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group H : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group N : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group O : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

III SEPTEMBER

Purchase 20 head/calf

Group K : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group M : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group N : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group O : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

III DECEMBER

Purchase 20 head/calf

Group K : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group I : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group M : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group N : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

Group O : 1 head/Famer

1 head/Famer

1 head/Famer

1 head/Famer

CHAPTER IV

PROJECT SIGNIFIANCE AND OBJECTIVES

Follow The Director General of Livestock Service 1984, the meat need 251,8 million kg, in 1988 increase to 287,9 million kg . Therefore Indonesia need import added meat in every year . In The year of 1978 meat import 1,328,000 kg, in 1982 import 2,572,000 kg .

With the Fattening of Freisean Holstain male calf and the breeding are expected will give away support to the Government especially for the meat stock, lessness meat import and savings in foreign Exchange also to give away - new employment .

To be expected a good willingness meet the succes, as good as find the Government urging , so in management and handling the future does not find the trouble .

The exart. that be executed by Cooperative , is the Feedlot Fattening . The cow was selected in the Feed lot Fattening programme is the male Freisean Holstain or its the breeding , they have three months old . The Cooperative has any Farm Groups. in every a group have six persons and manage 20 Calfs.

The cows that be prossessed in the Fattening was placed in a special serd for 360 days .

In the first period and next future in this programme, the Cooperative, in every month will buy the male F.H cows that 3 months old more than 20 calves that the average weight 100 kg and Rp 125,000.- cost / calf.

The cows for this Feedlot Fattening Programme is bought from around of Central Java shown appendix II.

Cows that have been fatten will be sold based on weight (the average after finished fattening, in every calf more than 400 kg in the live weight), the sold price based on in the place of cows to be produced (place of Feedlot Fattening) Rp 2,000.- per kg by the live weight.

Sales of the product result could be serviced - carkas, steak, and general meat forms, this will be executed and be assumed with the market demand. or based on the contract purchased that to be confirmed by the price standard per kg.

The most F.H male cows and its breeding that will be Fattening process at the cooperative is be able to see on table 1. Than for Feedlot Fattening process the weight will increase (whole body weight) per day (Weight daily Gain) that to be based on from the table: 3. And then the table 4 perform the development of cows that be fatten based on the old group in the herd in every group there are 20 cows for one year account.

For reaching the final weight (sold weight) that be expected will reach average 400 kg weight per cow will need 2,040 kg concentrate and per cow per year and 4,440 kg - grass its means same with Rp 299,850.- and for 20 cows per year is be able to see table 5 and 6 .

Than for be able to know and to confirm whether the Feedlot Fattening cow from Cooperative its succes or fail be executed , this case will be calculated its finance , especially that connected with finance and alocation fee that is cash flow .

For the calculation cash flow , that connected with out cash flow , Net Cash flow and Cummulative Cash Flow is required any settlement for finance , especially for the price , sales purchase , area rent , food and maintenance cost, Bank interest , Depresiation precentation and etc that connected with cost and finance also price .

The settlement above is able to seen on Table 1

*) After one year in Fattening (360 days) the weight reach 412 kg, and on sold, the live weight calculation more than 400 kg, by the sold price Rp 2,000.00 per kg live weight.

Cow for the Feedlot Fattening start in the sherd at the first month , and the next in every month to be added 20 male F.H Cows or its breeding for fattening (table 1 and 2). After 12 months in fattening, therefore in the first sold

start and be expected at the first month in the second year has finish sale , and to be entered again 20 new of cow for Feedlot fattening . Start on the second year in first month the total of cows for fattening in the serd 240 cows constant (that be oushed and interred 20 cows). Concern the preparation of the serd area, Office, Warehouse , Carantina , material purchase , office equipment , electricity and installation , wheel made, Water pump, Water - pump ajustment , water tank ,and instalation, seed for employers and hedge made , and other case that there are connected - with the Feedlot Fattening exert, this has been finished the longest 6 months, before fattening activity, that is in the zero year from this fattening .

Any case that connected with this activity programme is be able to see on the appendix 1 . This is connected with the credit (fund) Bank taking over .

From table 7 is able to see about total cost that be required for each month from cow purchase that would be fatter from 1st Year up to 19th year .

On 20th year does not executed purchase cow, because on that year cows that there are in serd is prepared for fatten and sold only .

Than on table 8 could be seen that on the first year from this male cow fatten exert , since the first month till

12th on the first year no income from sales result . This caused on above year the group 1 of cow still being in fattening process , and finish on the 12th months. Its means the first sold just been executed on the first month on the second year .

On the second year and the next beginning first month untill 12th month performed there are receiving of income from cows sold result 20 cows with the average 400 kg weight and the price Of Rp 2,000.00 per kg. So the reseiving above same in every month for every year , beginning the second year of operation till the last year , the project to be executed (year of 20) . The amount of receiving from cows sold are - Rp 16,000,000.00 .

For to be able to exxcuted Feedlot Fattening male F.H cow from Cooperative therefore needs the capital , that its allocation based on bellow :

CHAPTER V
FINANCE ANALYSIS .

CAPITAL INVESTMENT .

1. Area hire 1 ha for 21 year @ Rp 300,00.00 .	Rp	6,300,000.00
2. Office Building Director/Adm 5 m X 7 m X Rp 55,000.00	Rp	1,925,000.00
3. Herd for 240 cows 1,5 m X 240 m X Rp 30,000.00	Rp	21,600,000.00
4. Ware house 20 X 10 X Rp 40,000.00	Rp	12,000,000.00
5. Qarantina 1,5 X 2 X 10 X Rp 30,000	Rp	900,000.00
6. Shed for employees 4 X 9 X Rp 30,000,-	Rp	1,080,000.00
7. Garage and animal weighing scale 5 X 7 X Rp 30,000,000.00 .	Rp	1,050,000.00
8. Hedge	Rp	4,500,000.00
9. Auto bobile Truck - transport	Rp	15,000,000.00
10. Animal weighing scale	Rp	5,000,000.00
11. Well + machine pump + installtion	Rp	2,000,000.00
12. Machine electricity complete with installation	Rp	2,000,000.00
13. Water carriage and office furniture and equipment .	Rp	1,000,000.00

T o t a l Rp 74,355,000.00
=====

- I . a. Male F.H calf price or its breeding that over 3 months old with the average 100 kg live weight Rp 125,000.- per head .
- b. Fattening to be executed during 1 year untill optimum weight 400 kg . (price sales).
- c. Material and feeding costing of cow consisting of concentrate and forrage (elephant grass) , t that be bought for :
 1. 3 - 4 months old , feeding price per kg of concentrate Rp 150.-
 2. 5 - 15 months old (ready for sell) the price feeding of concentrate Rp125.- per kg.
 3. Forrage (elephant grass) Rp10.- per kg.
- d. Production sales to be executed in continue ways every month , 20 heads.
- e. Sales price based on price sold standard in fattening place (Feedlot fattening) Rp 2,000.- per kg. in live weight .
- f. Cow purchase for fattening to be executed every 20 heads except on the last operational year.

II. Costing (beside cost for cow) .

- a. Area hire for 1 Ha for 21 years Rp 30,000.-
- b. Sherd built Rp 30,000.- per m² to be required for one head that be fatten $1,5 \times 2\text{m}^2 = 3 \text{m}^2$.
for 240 heads of cows = 720 m² .
- c. Quarantina for 10 heads , the size per head = $1,5 \times 2 \text{m}^2$, price Rp 30,000.- per m² .
- d. Warehouse 20 X 10 m² , costing Rp 40,000,- per m² .
- e. Director and Administration office 5 X 7m² , Rp 55,000 per m² .
- f. Sheed for employees (labour of cow and sherd maintenance) 4 X 9 m² , Rp 30,000.00 per m² .
- g. Vaccine (especially for Endo and Ekto parasit and dienfectan) Rp 2000.- per head per year .
- h. Hedge (pillar, and other cost) Rp 4,500,000.- phisic diffence 20 years .
- i. Garage and weighing scale 5 X 7m² is Rp 30,000.- per m² .

III. Equipment .

- a. Car and office equipment (stationary) stock is Rp 1000,000,-per 10 years .
- b. Auto mobile 1 unit Rp 15,000,000,- per 5 years.
- c. Weighing scale i unit Rp 5,000,000.-

- d. Working equipment and sherd equipment Rp 50,000.-
per year .
- e. Electric machine 1 unit + installation and adjustment Rp 2,000,000.- .
- f. Whell , pump machine water tank, water installation
and its adjustment Rp 2,000,000.-

IV. Wages and salaries .

- a. ~~Comitte~~ / manager 1 person Rp 175,000.-
- b. Fatteninf skill 1 person Rp 127,500.-
- c. Compound feeding skill 1 person Rp 127,500.-
- d. Finance / administration 1 person Rp 70,000.-
- e. Tiker 1 person Rp 50,000.-
- f. Driver 1 person Rp 50,000.-
- g. Labour 20 persons @ Rp 30,000.-

V. Depresiation and maintenance .

- a. Because for 20 years effort , therefore depresia-
tion cost ; Sherd, warehouse, office, building ,sheed
garage, qarantina, hedge, does not calculated , so
need not to be executed of maintenance cost pur-
chase .

Except after 20 years exert of this fattening unit
will be continued for the next 20 years period , there
fore necessary to be executed of the depresiation of
cost calculation .

The best way for the fattening exert to be on the areal of farmer own .

But for for maintenance requirement of buliding above also have been reserved 2% per year from the amount of building above , for the rehabilitation possibility .

- b. Water transportation (truck) and office equipment to be estimated 3% depresiation cost per year .
- c. Vehicle depresiation to be estimated 20% per year.
- d. Maintenance cost for ellectric machine 2,5% per year.
- e. Whell and pump machine + installation to be estimated need cosf of reparation 2.5% per year .

VI. Others Cost .

- a. Interest of Bank loan 1.5% per month.
- b. Fuel :
Premium, Oil , Lubrication and others Rp 200,000.- per month .
- c. Taxes Rp 10.- per m² area per year .
- d. Insurance 2,5% from the investment per year .
- e. Donation , tax and others Rp 1,500,000.- per year .

FIXED WORKING CAPITAL (PER MONTH)

1. Salary		
a. Director, clerk and typist and other employers	Rp	600,000.00
b. Staff - helpers 20 persons X Rp 30,000	Rp	600,000.00
2. Stationary stocks	Rp	35,000.00
3. Transport - vehicles depreciation 1.67 % X Rp 15,000,000,00	Rp	250,000.00
4. Cost taxes 8.33% X 10,000 X Rp 10.00	Rp	8,330.00
5. Insurance of investment property 2.5 % X Rp 74,355,000,00/12	Rp	154,906.25
6. Building maintenance 2% X Rp 43,035,000.00	Rp	861,100.00
8. Water carriage maintenance 3% X Rp 1,000,000.-	Rp	30,000.00
9. Machine electricity maintenance 2.5% X Rp 2,000,000.00	Rp	50,000.00
10. Well maintenance, Machine pump and installation 2.5% X Rp 2,000,000.00	Rp	50,000.00
11. Work facility - Herd facility Rp 50,000.00 / 12	Rp	4,167.00
12. Medicine and vaccine 20 X Rp 2,000.-/12	Rp	3,333.33

T o t a l	Rp	3,422,337.00

OPERATIONAL WORKING CAPITAL .

1. Cow purchase per cow Rp 125,000.- X 20 cows = Rp 2500,000.-
2. Compound feeding for cow to be fattened =
3. Repayment instalment of loan
4. Interest on Bank loan

Based on of cost allocation therefore fund that be required by Cooperative , all cost is cost for investation, Fixed working capital cost and operational cost.

For the Capital of operational cost that be required is cost for cow purchased for one year also feeding cost . Also the Fixed Working Capital cost for one year . Its mean total of fund that be required on Bank loan is Rp 74,355,000.00 + Rp 41,068,044,00 + Rp 5,997,000.00 = Rp 151,420,044,00

The amount above from the Bank Loan would be taken periodically suitable with the own share and operational work programme from the F.H male cow Feedlot Fattening project .

The repayment instalment of loan and interest purchase of Bank will be purposed and be programmed its purchased will be returned every month , beginning from the start from produce to be sold .

So its mean based on the working programme that have been arranged and prepared based on operational project and marketing , closed the first month in second year .

Then be continued at the second month in the second year and so on , untill the Bank Loan is full filled .

That based on Cash flow the loan above all the loand according its interest have been full filled on the : 9th year, as shown table 10 .

*) For one year calculation . From the second year until 20 constantly .

The first year there is no sold result yet and the 20th year do not be executed cow purchase for fatten .

From table 9 beginning first month in the second year from the result of 20 cows sold , after to be decreased fixed cost and cow purchased and its feeding compound there is rest Rp 4,080,863.00. Its mean beginning the second year in the first month have been able to be executed repayment instalment of loan or interest of Bank Rp 4,000,000.00 . Its mean every year start on second year have been able to be rested fun from the profit Rp 48,000,000.00 for repayment instalment on Bank loan .

From table 10 shown that Cooperative , have been able and success to full fill of Bank loan also its interest for 9 yars operation of the F.H male cow Feedlot fattening or its breeding . Its mean that Cooperative use the Bank service for executing of the project operation for 9 years and 6 months .

Then for understanding whether Fattening male cow project the Cooperative for operational 20 years continually this is be able to attentive to the table 12 , about Cash Flow current income fund and purchased .

Also would be calculated whether the male cow fattening project , Cooperative own is able to " go or not go project".

For easing current cost calculation and benefit for finding cash flow from the male fattening calf , for lenght then 20 years there fore table 12 shown balance sheet of total cost purchased per year for 21 years in this Feedlot Fattening exert (since opening area preparation, sherd and other, untill the last of Feedlot Fattening operation .

From table 12 above also shown that on the 10th years operation is not executed repayment purchase and Bank interest. Its mean that Cooperative in exxcuting Fattening project is able to stand own .

and also be able to investment again its activa in the same interest too .

And since this year shown that the current of purchase per year is constantly , till the final project of Feedlot Fattening be operated . (year of 10th - 20th).

Amount of purchase cost above become constant as Rp 143,032
044.00

CHAPTER VI

The Development of Cows that be Fatten
based on purchase and sales

=====												
No. Years :	1 :	2 :	3 :	4 :	5 :	6 :	7 :	8 :	9 :	10 :	20	
Sales -												
No. Month												
1	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
2	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
3	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
4	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
5	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
6	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
7	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
8	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
9	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
10	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
11	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -
12	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: 20	: -

Amount :	:240	:240	: 240	:240	:240	: 240	:240	:240	:240	:240	:240	: -

Table 3

OLD, FIRST WEIGHT, LONG OF FATTENING, ADG FINAL WEIGHT FOOD NEEDS IN EVERY COW, OR ITS MALE BREEDING THAT BE FATTEN DURING 360 DAYS

Old (Mnt) Opening Weight.	Lenght Fattening (Day).	ADG *) (kg).	Body Increase Weight (kg)	Final Weight (kg),	Cons Day (kg)	Green Feeding Day (kg)	Compound Feed per day		Total price of Compound Feeding.
							Cons	Green feed,	
3	100	0,7	21	121	2,3	5	420,-	50,-	470,-
4	121	0,7	21	142	2,3	5	420,-	50,-	470,-
5	142	0,9	27	169	4,0	7	500,-	70,-	570,-
6	169	0,9	27	196	4,0	7	500,-	70,-	570,-
7	196	0,9	27	223	5,2	10	650,-	100,-	750,-
8	223	0,9	27	250	5,2	10	650,-	100,-	750,-
9	250	0,9	27	277	6,3	15	780,50	150,-	937,50
10	277	0,9	27	304	6,3	15	780,50	150,-	937,50
11	304	0,9	27	331	7,4	17	925,-	170,-	1095,-
12	331	0,9	27	358	7,4	17	925,-	170,-	1095,-
13	358	0,9	27	385	8,3	20	1037,75	200,-	1237,75
14	385	0,9	27	412	8,3	20	1037,75	200,-	1237,75
15	412	**)	-	-	-	-	-	-	-

*) ADG and Concentrate requirement based on the table from nutrient requirements of Dairy Cattle, 3, 5 TH-ED. 1978 .NAS, Washington D.C 1978 and Tilman, A.L. ET AL. (1984) Gajah Mada University Press Fapet -UGM 1980, Mcran, J.B (:978) Comparison performance meat cow Breed of Indonesia .Proceedings Kuminansia Seminar Director Of Livestock Service, P.4.Bogor, Fapet 1PB.

***) Sales with the live weight 400kg/cow, with sold purchase Rp 2,000.00/kg live weight.

T a b l e 4

THE DEVELOPMENT OF COW THAT BE FATTEN BASED ON OLD GROUP
IN THE SHERD IN EVERY 20 COWS
(CALCULATION FOR ONE YEAR).

Sherd Group	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1	3 bl											
2	4 bl	3 bl										
3	5 bl	4 bl	5 bl									
4	6 bl	5 bl	4 bl	3 bl								
5	7 bl	6 bl	5 bl	4 bl	3 bl							
6	8 bl	7 bl	6 bl	5 bl	4 bl	3 bl						
7	9 bl	8 bl	7 bl	6 bl	5 bl	4 bl	3 bl					
8	10 bl	9 bl	8 bl	7 bl	6 bl	5 bl	4 bl	3 bl				
9	11 bl	10 bl	9 bl	8 bl	7 bl	6 bl	5 bl	4 bl	3 bl			
10	12 bl	11 bl	10 bl	9 bl	8 bl	7 bl	6 bl	5 bl	4 bl	3 bl		
11	13 bl	12 bl	11 bl	10 bl	9 bl	8 bl	7 bl	6 bl	5 bl	4 bl	3 bl	
12	14 bl	13 bl	12 bl	11 bl	10 bl	9 bl	8 bl	7 bl	6 bl	5 bl	4 bl	3 bl

The deference of old be caused deference of interval intering of cow to the Sherd that be diferences one month. Cow that have spent at in fattening process on thr 15 months old have reached 400 kg weight .

Table 5.

The requirement of Food for Cow that be fatten based on the age group in Sherd (kg), in every group 20 cows.

Group/ Sherd.	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Jlt.
Month No.	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Grass	Cons/ Co
1	: 1680/ 3000												1680/ 3000
2	: 1680/ 3000	: 1680/ 3000											3260/ 3000
3	: 2400/ 4200	: 1680/ 3000	: 1680/ 3000										5760/ 10200
4	: 2400/ 4200	: 2400/ 4200	: 1680/ 3000	: 1680/ 3000									3160/ 14400
5	: 3120/ 6000	: 2400/ 4200	: 2400/ 4200	: 1680/ 3000	: 1680/ 3000								11260/ 20400
6	: 3120/ 6000	: 3120/ 6000	: 2400/ 4200	: 2400/ 4200	: 1680/ 3000	: 1680/ 3000							14400/ 26400
7	: 3780/ 9000	: 3120/ 6000	: 3120/ 6000	: 2400/ 4200	: 2400/ 4200	: 1680/ 3000	: 1680/ 3000						18180/ 35400
8	: 3780/ 9000	: 3780/ 9000	: 3120/ 6000	: 3120/ 6000	: 2400/ 4200	: 2400/ 4200	: 1680/ 3000	: 1680/ 3000					21960/ 44400
9	: 4440/ 10200	: 3780/ 9000	: 3780/ 9000	: 3120/ 6000	: 3120/ 6000	: 2400/ 4200	: 2400/ 4200	: 1680/ 3000	: 1680/ 3000				26400/ 54600

Cons = Concentrate .

Connection table 5

Group/Sherd	II		III		IV		V		VI		VII		VIII		IX		X		XI		XII		XIII		XIV			
	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass	Conc/Grass		
00	4440/10200	4440/10200	3780/9000	3780/9000	3780/9000	3780/9000	3120/5000	3120/5000	3120/5000	3120/5000	2400/4200	2400/4200	2400/4200	2400/4200	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	
01	4980/10200	4440/10200	3780/9000	3780/9000	3780/9000	3780/9000	3120/5000	3120/5000	3120/5000	3120/5000	2400/4200	2400/4200	2400/4200	2400/4200	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000	1680/3000
02	4980/12000	4980/12000	4440/10200	4440/10200	4440/10200	4440/10200	3780/9000	3780/9000	3780/9000	3780/9000	3120/5000	3120/5000	3120/5000	3120/5000	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200	2400/4200
Total:	40800/358200	358200/305400	26400/26400	26400/26400	21960/21960	21960/21960	18180/18180	18180/18180	14400/14400	14400/14400	11280/11280	11280/11280	11280/11280	11280/11280	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760	5760/5760
	88800	76800	64800	54600	44400	44400	35400	35400	26400	26400	20400	20400	20400	20400	14400	14400	14400	14400	14400	14400	14400	14400	14400	14400	14400	14400	14400	14400

Explanation : Conc = Concentrate.
 Grass = Grass feeding (Elephant Grass)

T a b l e 6

Cost requirement for feeding compound purchase on
Feedlot Fattening Process Freisean Holstein Cow
(X \$ 1,000.00)

Group/ S herd	I		II		III		IV		V		VI		VII		IX		XI		XIII		Juli		
	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	
1	252/ 30																						252/ 30
2	252/ 30	252/ 30																					504/ 60
3	300/ 42	252/ 30	252/ 30																				304/ 102
4	300/ 42	300/ 42	252/ 30	252/ 30																			1104/ 144
5	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30																		1494/ 204
6	390/ 60	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30																	1884/ 264
7	435/ 90	390/ 60	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30																2319/ 354
8	435/ 90	435/ 90	390/ 60	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30															2754/ 444
9	555/ 102	435/ 90	435/ 90	390/ 60	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30														3309/ 546

Connection table 6

Group/ Month No.	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass	Conc/ Grass
10	555/ 102	555/ 102	435/ 90	435/ 90	390/ 60	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30	252/ 30	252/ 30	3864/ 618
11	622,5/ 120	555/ 102	555/ 102	435/ 90	435/ 90	390/ 60	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30	252/ 30	4486,5/ 723
12	622,5/ 120	622,5/ 120	555/ 102	555/ 102	435/ 90	435/ 90	390/ 60	390/ 60	300/ 42	300/ 42	252/ 30	252/ 30	5109/ 838
Total	5109/ 838	4486,5/ 723	3864/ 618	3309/ 546	2754/ 444	2319/ 354	1824/ 264	1424/ 204	1104/ 144	804/ 102	504/ 60	252/ 30	26863,5/ 4452

Explanation : KLF/KDG # Group of Sherd.

Conc = Concentrate.

Grass = Green Feeding (Elephant Grass).

T a b l e 8

RECEIVING MONEY FROM SOLD OF COW THAT BE FATTENED
 WITH THE SOLD PRICE ₱ 2,000.- PER kg LIVE WEIGHT
 PER MONTH FOR EVERY YEAR FOR 20 YEARS FATTENING
 EXERT (X ₱ 1,000,000.00)

=====									
Month	Incow from cow's sold year no .								
No.	1	2	3	4	5	6	7	8 - 19	20
1 :	-	16	16	16	16	16	16	16	16
2 :	-	16	16	16	16	16	16	16	16
3 :	-	16	16	16	16	16	16	16	16
4 :	-	16	16	16	16	16	16	16	16
5 :	-	16	16	16	16	16	16	16	16
6 :	-	16	16	16	16	16	16	16	16
7 :	-	16	16	16	16	16	16	16	16
8 :	-	16	16	16	16	16	16	16	16
9 :	-	16	16	16	16	16	16	16	16
10 :	-	16	16	16	16	16	16	16	16
11 :	-	16	16	16	16	16	16	16	16
12 :	-	16	16	16	16	16	16	16	16

	-	192	192	192	192	192	192	192	192 .

T a b l e 9.

CURRENT OF MONEY BETWEEN THE RESULT OF SOLD OF COW THAT BE FATTENED WITH COST OF FIXED WORKING CAPITAL , THE PURCHASE OF COW THAT BE FATTENED ALSO ITS FEEDING COMPOUND PER MONTH FOR ONE YEAR *)

Month No.	Sold of Cow (Rp)	Fixed working capital (Rp)	Purchasing of cows (Rp).	Compound Feeding Cost (Rp).	Rest (Rp).
1	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
2	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
3	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
4	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
5	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
6	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
7	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
8	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
9	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
10	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
11	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
12	:16.000.000	:3.422.337	: 2.500.000	:5.997.000	:4.080.663
Amount:	192.000.000	:41.068.044	:30.000.000	:71.964.000	:48967956.

T a b l e 10.
 CREDIT TAKING OVER, REPAYMENT INSTALMENT ON LOAN AND BANK INTEREST PURCHASE
 (TO BE CALCULATED AS BANK ACCOUNT INTEREST LEVEL 18 % PER YEAR.

Year No.	Taking over of Credit (A)	Repayment per Year (Rp)	Bank Interest (Rp)	Amount Repayment (Rp)	Amount of Credit.
0	74.355.000,-	-	6.691.950,-	-	81.046.950,-
1	77.065.044,-	-	28.452.616,92	-	105.517.660,92
2	-	14.417.109,63	33.582.390,32	48.000.000,-	172.154.033,-
3	-	17.012.182,41	30.987.510,59	48.000.000,-	155.142.313,90
4	-	20.074.353,50	27.925.616,50	48.000.000,-	135.067.930,40
5	-	23.687.772,53	24.312.227,47	48.000.000,-	111.390.157,90
6	-	27.951.571,56	20.048.428,42	48.000.000,-	63.428.586,40
7	-	32.932.854,45	15.017.145,55	48.000.000,-	50.445.731,95
8	-	38.919.768,25	9.030.231,75	48.000.000,-	11.525.955,70
9	-	11.525.963,70	2.074.673,47	13.600.637,17	N i h i l

Table 11.
AMOUNT OF COST PURCHASE PER YEAR FOR 21 YEARS.

Year No.	Investment (₹)	Fixed-Working Capital (₹)	Variable Working Capital (₹)	Repayment of Bank Loan (₹)	Amount of Cost (₹)
0	74,355,000,-	-	-	6,691,950,-	81,046,950,-
1	-	41,068,044,-	101,964,000,-	28,459,961,92	171,492,006,-
2	-	41,068,044,-	101,964,000,-	48,000,000,-	191,032,044,-
3	-	41,068,044,-	101,964,000,-	48,000,000,-	191,032,044,-
4	-	41,068,044,-	101,964,000,-	48,000,000,-	191,032,044,-
5	-	41,068,044,-	101,964,000,-	48,000,000,-	191,032,044,-
6	-	41,068,044,-	101,964,000,-	48,000,000,-	191,032,044,-
7	-	41,068,044,-	101,964,000,-	48,000,000,-	191,032,044,-
8	-	41,068,044,-	101,964,000,-	48,000,000,-	191,032,044,-
9	-	41,068,044,-	101,964,000,-	13,600,637,-	156,632,681,-
10	-	41,068,044,-	101,964,000,-	-	143,032,044,-
11	-	41,068,044,-	101,964,000,-	-	143,032,044,-
12	-	41,068,044,-	101,964,000,-	-	143,032,044,-
13	-	41,068,044,-	101,964,000,-	-	143,032,044,-
14	-	41,068,044,-	101,964,000,-	-	143,032,044,-
15	-	41,068,044,-	101,964,000,-	-	143,032,044,-
16	-	41,068,044,-	101,964,000,-	-	143,032,044,-
17	-	41,068,044,-	101,964,000,-	-	143,032,044,-

Source: Author's calculations

Connection table II.

Year No.	Investment (Rp)	Fixed Working Capital (Rp)	Variable Working Capital (Rp)	Repayment of Bank Loan (Rp)	Amount of Purchase
18	-	41.068.044,-	101.964.000,-	-	143.032.044,-
19	-	41.068.044,-	101.964.000,-	-	143.032.044,-
20	-	41.068.044,-	101.964.000,-	-	143.032.044,-
	74.355.000,-	821.360.880,-	2.039.230.000,-	384.752.548,92	3.339.748.422,-

- *) If calculated follow Bank Account.

CASH FLOW FROM F.H. COWS CALF FEEDLOT FATTEING
FOR 20 YEARS, COOPERATIVE OWN

	Cash Out Flow* (Rp)	Cash In Flow (Rp)	Net Cash Flow (Rp)	Cumulative Net Cash Flow (Rp)
0	81.046.950,-	-	81.046.950,-	81.046.950,-
1	171.492.006,-	-	171.492.006,-	252.538.956,-
2	191.032.044,-	192.000.000,-	967.956,-	251.571.000,-
3	191.032.044,-	192.000.000,-	967.956,-	250.603.044,-
4	191.032.044,-	192.000.000,-	967.956,-	249.635.088,-
5	191.032.044,-	192.000.000,-	967.956,-	248.667.132,-
6	191.032.044,-	192.000.000,-	967.956,-	247.699.176,-
7	191.032.044,-	192.000.000,-	967.956,-	246.731.220,-
8	191.032.044,-	192.000.000,-	967.956,-	245.763.264,-
9	156.632.681,-	192.000.000,-	35.367.319,-	210.395.945,-
10	143.032.044,-	192.000.000,-	48.967.956,-	161.427.969,-
11	143.032.044,-	192.000.000,-	48.967.956,-	112.460.033,-
12	143.032.044,-	192.000.000,-	48.967.956,-	63.492.077,-
13	143.032.044,-	192.000.000,-	48.967.956,-	14.524.121,-
14	143.032.044,-	192.000.000,-	48.967.956,-	34.443.935,-
15	143.032.044,-	192.000.000,-	48.967.956,-	63.411.791,-
16	143.032.044,-	192.000.000,-	48.967.956,-	132.379.747,-
17	143.032.044,-	192.000.000,-	48.967.956,-	181.347.703,-

Persarban

Connection table 12

	Cash Cut Flow (Rp)	Cash In Flow (Rp)	Net Cash Flow (Rp)	Cumulative Net Cash Flow (Rp)
18	143.032.044,-	192.000.000,-	48.967.956,-	230.325.653,-
19	143.032.044,-	192.000.000,-	48.967.956,-	279.293.609,-
20	143.032.044,-	192.000.000,-	48.967.956,-	328.261.565,-
	5.529.745.429,-	5.648.000.000,-	328.251.571,-	

*)

Table 13

CALCULATION OF INTERNAL RETURN (IRR)

Year no.	Current Payment (Rp)	Current Income (Rp)	Cash Flow (Rp)	D.F 27%	NPV D.F 27%	D.F 25%	NPV D.F 25%
0	74.355.000,-	-	74.355.000,-	1,0000:-	74.355,000:	1,0000:-	74.355.000,-
1	143.032.044,-	-	-143.032.044,-	0.7936:-	-113.510.230:	0.8000:-	-114.425.635,-
2	143.032.044,-	192.000.000	48.967.956:	0.6299:+	30.844.915:	0.6400:+	31.339.492,-
3-20	143.032.044,-	192.000.000	48.967.956:	3.2043:+	156.908.021:	3.3139:+	162.274.909,-
							112.294: :+ 4.834.066,-

1. Full fill change = $\frac{188,780,635}{48,967,956} = 3,855$ to be syplified = 3.9 year.
more save became 4 years.

2. NPV with discount factor 27% is Rp 187,752,963 - Rp 187,865,230 = - Rp 112,294
(not go project).

3. NPV with discount factor 25% is Rp 193,614,701 - Rp 188,780,635 = Rp 4,834,066
(go project)

4. IRR with interpolastment $i' + \frac{NPV'}{NPV' + NPV''}$ (100 - 10)
= 25% + $\frac{Rp 4,834,066.-}{Rp 4,834,066 + Rp 112,294}$ (2 %)
= 25% + $\frac{Rp 4,834,066}{Rp 4,946,360}$ X 2% = 25% + 10.98 X 2%
= 25% + 1.95 % = 26.95%

T a b l e 14
CURRENT CASH FLOW

Year	Payment	Income	Cash Current Netto.	Cummulative Current Netto
0	74.355.000:	-	- 74.355.000,-	- 74.355.000,-
1	143.032.044:	-	-143.032.044,-	-143.355.000,-
2	143.032.044:	192.000.000	+ 48.967.956,-	-168.419.088,-
3	143.032.044:	192.000.000	+ 48.967.956,-	-119.451.132,-
4	143.032.044:	192.000.000	+ 48.967.956,-	- 70.483.176,-
5	143.032.044:	192.000.000	+ 48.967.956,-	- 21.515.220,-
6	143.032.044:	192.000.000	+ 48.967.956,-	+ 27.452.736,-
7	143.032.044:	192.000.000	+ 48.967.956,-	+ 75.420.692,-
8	143.032.044:	192.000.000	+ 48.967.956,-	+125.388.648,-
9	143.032.044:	192.000.000	+ 48.967.956,-	+174.356.604,-
10	143.032.044:	192.000.000	+ 48.967.956,-	+223.324.560,-
11	143.032.044:	192.000.000	+ 48.967.956,-	+272.292.516,-
12	143.032.044:	192.000.000	+ 48.967.956,-	+321.260.472,-
13	143.032.044:	192.000.000	+ 48.967.956,-	+370.228.428,-
14	143.032.044:	192.000.000	+ 48.967.956,-	+419.196.384,-
15	143.032.044:	192.000.000	+ 48.967.956,-	+468.164.340,-
16	143.032.044:	192.000.000	+ 48.967.956,-	+517.132.296,-
17	143.032.044:	192.000.000	+ 48.967.956,-	+566.100.252,-
18	143.032.044:	192.000.000	+ 48.967.956,-	+615.068.208,-
19	143.032.044:	192.000.000	+ 48.967.956,-	+664.036.164,-
20	143.032.044:	192.000.000	+ 48.967.956,-	+713.004.120,-
<hr/>				
2.934.995.880:3.648.000.000:			+713.004.120,-	✓

) Pay back period Based on calculation with Formulars :

$$P = C/E \quad \text{is} = \frac{5 \cdot 217.387.044}{48.967.956} = 4.4394 \text{ to be syplified } 4.5$$

in order to more save beco-
me 5 years .

(2). Rentabilita (Profit level) Based on formulars :

$$\frac{II}{T C} \times 100 \% \text{ is } \frac{Rp 713,004,120.00}{Rp 2,934,995,880} \times 100 \% \\ = \underline{\underline{24.29 \%}}$$

(3). Rate of return (return level)

Based on formulars :

$\frac{II}{II^R} \times 100 \%$ when Rp 713.004,120,00 is the absolute profit .

$$\text{So rate of return is } = \frac{Rp 713,004,120,00}{Rp 3,648,000,000.00} \times 100\% \\ = \underline{\underline{19.55 \%}}$$

5. Absolute profit without percent value is ;

$$\begin{aligned} & \text{Rp } 48,967,956 \times 19 - \text{Rp } 143,032,044,00 \\ & = \text{Rp } 787,359,120,00 \\ & \text{=====} \end{aligned}$$

6. Profit (P I) .

a. With Discount 25 %

$$\text{P.I} = \frac{\text{Rp } 193,164,701.00}{\text{Rp } 74,355,000.00} = \frac{2,604}{\text{=====}}$$

b. With Discount 27 %.

$$\text{P.I} = \frac{\text{Rp } 187,752,935,00}{\text{Rp } 74,355,000.00} = \frac{2,525}{\text{=====}}$$

7. Break Even Point

$$BEP = \frac{FC}{P-V}$$

P = Sales price per head of cow .

V = Price Variable per head .

FC = Fix Cost .

$$P = Rp 2,000.- \times 400 \text{ kg} = Rp 800,000.-$$

BEP/Q = Amount of unit

$$Fc = Rp 41,068,044.-$$

$$Vc/Unit = \frac{\text{Cows purchase} + \text{Working Capital /year} + \text{Feed Cost}}{240 \text{ heads}}$$

$$Vc = \frac{30,000,000.- + 41,068,044.- + 71,964,000.-}{240}$$
$$= Rp 595,966.85 .$$

$$B E Q = \frac{F C}{P - C}$$
$$= \frac{41,068,044}{800,000 - 595,966.85}$$
$$= \frac{41,068,044}{204,033.15}$$
$$= 201.28$$

Q/total cow every year .

$$= 202.28$$

$$\text{BEP} = \frac{F C}{1 - \frac{V C}{S}}$$

Fc = Fixed Cost .

Vc = Variable cost .

S = Volume of selling .

Fc = 41,068,044,-

Vc = 101,964,000,-

S = 192,000,000.-

$$\begin{aligned} \text{BEP} &= \frac{41,068,044}{1 - \frac{101,964,000}{192,000,000}} \\ &= \frac{41,068,044}{1 - 0.531} = \frac{41,068,044}{0.469} \\ &= \underline{87,565,125} . \end{aligned}$$

Price = Rp 87,565,125 for 240 cows .

Price minimum per cow ;

$$= \frac{87,565,125}{240}$$

$$= \underline{364,854.68}$$

Appendix II.

FOURTH DAIRY ANIMAL DEVELOPMENT
THREE MONTHS PERIOD (DEC-1987)

NO	KUD/COOPERATIVE	FARM	TOTAL DEAD	EXISTING COW				Total Cow	LACTATION		DO NOT PREGNANT 2 YEAR	NO LACTATION	CALF		MILK COW		MILK PRODUCT				
				COOP CREDIT	PRE SUP - PORT CREDIT	PUSP CREDIT	LOCUT		PREG-NANT.	NO PREG-NANT.			SEEDS	YOUTH	YOUTH AND CALF	YOUTH		COOPERATIVE LIT/DAY			
1	CENTRAL JAWA																				
1	LICEPOGO	11.639	661	469	-	38	4.0551	4.5621	5101	295	7731	31	-	2.621	170	1721	1.1051	406	7.900		
2	DIAMPEL	1.836	751	403	-	292	2.5441	3.2391	1981	659	2961	3	-	1.9531	40	581	1401	61	8.056		
3	BOYOLALI KOTA	11.781	2371	684	-	-	2.9141	3.5981	2831	535	4131	4	-	1.8531	425	451	2471	23	6.260		
4	USUK	640	781	429	-	47	2.5531	3.0291	7261	140	8301	64	-	9271	170	2721	1.1051	406	8.748		
5	ILO	675	401	430	-	90	3.1251	3.6451	2811	86	1951	36	-	2.7511	49	2141	1.0151	1	3.010		
6	KOTOSONGO	240	631	202	-	-	4661	6681	1271	139	1211	-	-	221	45	191	131	6	2.599		
7	SERAJAN	140	341	109	-	-	2211	3301	221	13	721	-	-	221	5	71	951	-	275		
8	UTARA	40	51	35	-	-	651	1001	91	8	261	2	-	431	2	41	281	-	120		
SUB TOTAL BOYOLALI				5981	2.762	0	467	115.9431	139.171	2.1561	1.875	2.7261	140	-	0.110.671	906	591	3.7521	903	36.968	
SUB TOTAL SEMARANG				1.332	4371	901	0	158	2.4061	3.4651	4181	331	6061	179	33	1.2641	244	3901	4381	-27	5.511
SUB TOTAL KARTASURA				282	801	110	-	7	3531	4701	501	56	871	-	-	1331	50	371	151	-	700
SUB TOTAL KARANG				46	101	42	-	-	801	1221	91	12	431	3	-	271	7	211	121	3	140
SUB TOTAL KARAWA				50	71	44	-	-	281	721	71	9	181	6	-	331	1	11	9	-	75
SUB TOTAL KARANG				52	81	48	-	-	4141	4621	801	149	591	-	-	1931	1	21	501	23	1.630
SUB TOTAL SALATIGA				430	1051	244	0	7	8751	1.1261	1461	306	807	9	0	3731	59	271	861	26	2.545

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
71JAWA	1	3501	491	2701	301	-	6331	9331	1631	1681	1421	201	-	1551	1881	971	771	51	2.675	8,00
81KARANGUNING	1	2101	601	2541	271	-	2931	5741	901	621	301	121	-	2371	351	681	531	-	1.213	7,90
91MANTIS BERGGO	1	2601	821	1791	-	-	1481	3271	391	641	961	-	-	791	291	201	551	-	784	7,60
01KEPALANG	1	2381	421	2181	-	-	2941	5121	581	1091	1251	91	-	1431	371	311	1021	11	1.255	7,51
1SUB TOTAL Klaten	1	1.0581	2331	9211	571	01	1.3681	2.3461	3501	4031	3931	411	01	6541	2891	2161	2871	61	5.927	7,75
1IKOPERASAKA	1	721	651	851	-	-	4901	5751	-	-	-	-	-	-	-	-	-	-	-	-
1SUB TOTAL SURABAYA	1	721	651	851	-	01	4901	5751	01	01	01	01	01	01	01	01	01	01	01	0
21TAWANGANGU	1	301	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56
31TASIK MADU	1	991	231	241	-	31	291	841	101	231	241	-	-	181	51	41	131	11	165	5,00
41KARANGAYAR	1	211	81	501	-	-	601	1101	281	111	191	-	-	391	71	61	81	11	263	6,73
51KARANGANDAN	1	311	171	391	-	-	231	621	141	151	171	-	31	111	11	21	21	11	137	6,50
1SUB TOTAL K. ANYAR	1	1811	531	1131	01	31	1121	2561	521	491	601	01	31	681	131	111	231	31	621	6,30
61KARTOSURO	1	1161	351	691	201	381	1141	2411	231	151	481	81	-	1321	71	81	131	11	331	8,70
71KALINYA BAKTI	1	681	371	671	-	-	261	931	181	121	321	11	-	181	41	81	61	21	228	7,10
81KEMAPAN GREGOL	1	641	111	891	111	-	441	1441	201	371	331	11	-	391	71	71	101	21	370	6,50
1SUB TOTAL SUKOHARJO	1	2481	831	2251	311	381	1841	4781	611	641	1131	101	01	1891	181	231	291	51	929	7,40
91SEDEHAWANA	1	501	51	471	-	-	661	1131	151	141	131	251	-	361	61	41	121	21	195	5,00
01PRASOJO	-	-	131	-	-	-	121	121	-	-	-	-	-	121	-	-	-	-	-	-
11DAYA SINDORO	1	1291	131	1301	-	-	1191	2491	121	101	611	31	-	1171	241	221	741	11	171	7,60
21W I D O D O	1	-	311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31SUMBER HARJO	1	471	111	521	-	-	351	871	81	91	211	31	-	211	121	131	121	11	117	6,88
1SUB TOTAL TEMALANGGUNG	1	2261	731	2291	01	01	2321	4611	351	331	951	311	01	1861	421	391	981	41	483	6,40
41SRI RAHAYU	1	591	471	831	-	-	451	1281	141	101	331	21	-	261	121	311	21	11	190	7,90
1SUB TOTAL PURWOREJO	1	591	471	831	01	01	451	1281	141	101	331	21	01	261	121	311	21	11	190	7,90
51W I R A T A M A	1	781	461	631	-	-	661	1291	71	81	241	21	-	621	71	191	201	11	109	7,50
1SUB TOTAL KAGELANGI	1	781	461	631	01	01	661	1291	71	81	241	21	01	621	71	191	201	11	109	7,50
1TOTAL JAWA TENGAH	1	9.6751	1.7401	5.6251	881	701	21.721128.1351	3.289129791	4.2601	4141	36	113.5041	1.5901	1.5521	4.7351	9761	53.283	1	7.41	

Recomendation .

1. To prepare the loan fund to the farmer in Cooperative for the farmer requirement , once in a month , then to be compensated it purchase on the time of cows - sold .
2. To give away of opportunity to farmer who have a grass area for cow's forrage , so need not buy forrage feeding to Cooperative , so would give the increasing of farm earn .
3. For increasing of the cooperative profit , there fore:
 - basic sold price of cow Rp 2,000.- per head in live weight in Central Java more be increased / make the contract through of meat supply , special for Hotel and restaurant .
 - To increase of its effort unit activity by the way made contract of the compound feeding supply (material for concentrate) alone , need not buy of finishing concentrate because its price is expensive .

CALCULATION OF INCOME FOR FATTENING
FARMER FROM THE CULTIVATION OF MALE
F.H CALF BREEDING IN COOPERATIVE .

I. FERTILIZER .

Fertilizer sales every year maximum 8 tons in wet weight with the 20% of water content = Rp 8.00 to Rp 10, per kg value . So income of farmer from fertilizer - sold Rp 68.00 per head per day . Earning for 4 heads per farmer per day Rp 272.00 .

II. VACCINE .

Vaccine cost during in the fattening (12 months) is Rp 2,000.00 per two months . Vaccine cost per head per day Rp 30.00 .

Vaccine cost for 4 heads per day average Rp 120.00 .

III. COST FOR SHERD EQUIPMENT .

Cost of Sherd equipment consisting of :

--. Floor cleaner	Rp 3,333.34
--. Fork and brush	Rp 6,666.67
--. Water can	Rp 6,666.67

Amount Rp 16,666.68

Equipment cost per day for 4 heads Rp 46.30 .

IV . **SHERD INVESTMENT.**

Sherd investment per head more than Rp 30,000.00
per m² , so cost of sherd for 4 heads =

$$1.5 \times 2 \times 4 \times 30,000.00 =$$

Rp 360,000.00

Average of sherd cost per day Rp 90.00

V. **COST OF COMPOUND FEEDING .**

Cost of Compound Feeding during in the fattening
unit for 12 months , according to concentrate and

grass is Rp 303,615.00 per head . Cost per day

is Rp 843.74 . Cost of Compound feeding for 4 heads

Rp 3,373.50 .

VI. **RESULTING OF SALES AFTER IN THE FATTENING UNIT .**

Resulting sales after in the fattening with the
live weight 400 X Rp 2,000.00 X 4 = Rp 3,200,000.00
per 12 months every farmer .

The result of sales in everyday in the farmer =

Rp 8,888.88 .

VII. **CALF PURCHASE .**

Calf purchase for 4 heads =

$$4 \times \text{Rp } 125,000.00 = \text{Rp } 500,000.00$$

Average purchase per day = 1,388.88 .

VIII . INTEREST OF BANK LOAN .

--. Equipment	= Rp	16,666.68
--. Calf purchase	= Rp	500,000.00
--. Vaccine	= Rp	12,000.00
--. Sherd	= Rp	360,000.00
--. Compound feeding	= Rp	1,214,460.00
		<hr/>
Amount	= Rp	21,103,126.68

Interest of Bank loan per year 18% is
 $18\% \times \text{Rp } 21,103,126.68 = \text{Rp } 378,562.80$

Interest of Bank loan per day = Rp 1,051.56 .

IX . INCOME PER DAY .

$$\begin{aligned} \text{Farmer earn} &= (I + VI) - (II + III + IV + V + VII + \\ &\quad \text{VIII}) \\ &= (272 + 8,888.89) - (120 + 46.30 + \\ &\quad 90 + 3,373.5 + 1,388.88 + 1,051.56) \\ &= 9,160.89 - 6,070.24 \\ &= \text{Rp } 3,090.65 . \\ &\quad \text{=====} \end{aligned}$$

Second ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia

NEW DELHI, BANGKOK, TOKYO, SEOUL

October 26, 1987—May 10, 1988

Project Prepared During Home Country Assignment

Project Title : ESTABLISHING A UNIT OF FEED MILL PLANT.

Country : INDONESIA.

Prepared by : Mr. MAHARSI ADI SUKIPTO.

Funded by the Government of Japan

and

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

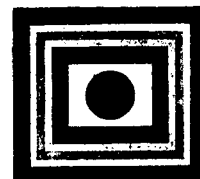
ICA Management Training Project for Agricultural Cooperatives in Asia



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THE DEVELOPMENT OF SETIA KAWAN DAIRY COOPERATIVE
IN NONGKOJAJAR BY
ESTABLISHING A UNIT OF FEED MILL PLANT

BY :

MAHARSI ADI SUCIPTO

P R E F A C E

This project proposal for 'The Development of Setia Kawan Dairy Cooperative in Nongkojajar' is a requirement for the accomplishment of the 'Training Course for Strengthening Management of Agricultural Cooperatives in Asia' sponsored by the International Cooperative Alliance (ICA).

By the writing of this proposal, I would like to express my deep gratitude to:

1. The Board of Dewan Koperasi Indonesia / DEKOPIN (Board of Indonesian Cooperative Council),
2. The Board of Gabungan Koperasi Susu Seluruh Indonesia / GKSI (Indonesian Dairy Cooperative Alliance),
3. Mr. M.V. Madane, the training course coordinator from ICA,
4. Prof.Dr. Oza, an expert from ICA,
5. The Board of Setia Kawan cooperative at Nongkojajar.

With my truly cooperative greeting, I hope this writing will be useful for all of us.

Malang, February 1988

Maharsi Adi Sucipto.

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CHAPTER I
A B S T R A C T

Setia Kawan dairy cooperative is located in Nongkojajar, westward of Mount Tengger, 65 km from Pasuruan. It covers the area of $\pm 94 \text{ km}^2$. It is 400-2000 m above the sea level, under the temperature range of $16^{\circ}\text{C} - 25^{\circ}\text{C}$. Most of the people (95.5%) earn their living by farming/breeding, 2% as civil servants/ABRI (Armed Forces of the Republic of Indonesia), and 2.5% as traders.

In 1986 the members of this cooperative reached the total number of 5042, while the cows reached the number of 12533. Each dairy cow generally needs concentrate and grass 3% and 10% of its weight. The use of concentrate depends upon the farmers' condition. They generally use 1 kg concentrate for calf, 1.5 kg for heifer, 3 kg for lactation, 1 kg for bull, and 1.5 kg for dry lactation. In 1986 the dairy production was 14,721,791 liter, or 42,000 lt/day with the average sales price of Rp. 400 per liter. The sales price depends on the contents of fat and SNF. One gram of fat costs Rp.5 and one gram of SNF costs Rp. 3.04.

The members of the cooperative get the supply, either input or output supply, through the farmer groups. The establishment of this feed mill plant is meant to increase the farmers' income by reducing the production cost, increase the milk production and quality, and increase the productivity of the dairy cows. Concentrate for calves, heifers, lactations, bulls,

and dry lactations is fitted to their need of nutrient.

The total cost of the project is Rp. 1,159,093,000 in which 15.8% of it is obtained from the cooperative itself, and 84.2% from the Credit Bank (cooperative bank). The sales price of concentrate from factory is Rp. 225 / kg, while the average sales price from the cooperative is only Rp. 188 / kg. The net profit before tax sales is 18.17 % and the net profit before tax of capital is 49 %. The break event point of normal capacity reaches 6,481.57 tons. The break event point of each product is as follows:

- concentrate for calves / product A : 1,052 tons , with sales price of Rp. 179 / kg,
- concentrate for heifers / product B : 915,47 tons, with sales price of Rp. 171.5 / kg,
- concentrate for lactations / product C : 2,337.22 tons, with sales price of Rp. 212 / kg,
- concentrate for bulls / product D : 245 tons, with sales price of Rp. 174 / kg,
- concentrate for dry lactations / product E : 2,727 tons, with sales price of Rp. 174.5 / kg.

The rate of return is 18.76 % in five years period of pay back.

CHAPTER II
INTRODUCTION

1. Background

The development of dairy cooperatives in Indonesia started in 1980s with 183 cooperatives. The population of dairy cows now is 197,000, and the population of farmers is 66,000. The total dairy production is 454,000 lt/day. Only 30% of it is consumed as fresh milk. Over 700,000 tons of milk per year is imported from other countries with the total expense of US \$ 75 million. Because of an increase in population and income, the demand for milk also increases. Until this time the ratio of imported milk and self-product (Indonesian product) is 2 : 1.

The purchase price from the cooperative or the farmers themselves depends upon the amount and quality of the milk. One major factor which influences this purchase is the high quality of concentrate. In dairy-cows industry about 70% of the expenses are for the feeding and the rest of the expenses go for the management and breeding.

By pressing the concentrate's price the farmers' income will increase. Other advantages can be mentioned, namely the cows will be healthier, calving interval will be shortened, and there is an increase in the production and quality of milk product. The feeding is sold to the farmers by milk included price. The farmers can take it soon after they send

the milk to the cooperative. Therefore, the feed mill plant is really advantageous to the farmers.

2. Setia Kawan Dairy Cooperative at Nongkojajar

2.1. Area of Project

Nongkojajar is located westward of Mount Tengger, Pasuruan. It is 65 km from Pasuruan, 45 km from Malang, and 85 km from Surabaya. It covers the area of $\pm 94 \text{ km}^2$. The population reaches 39,208 persons, consisting of 19,342 males and 19,884 females, with various educational background. Twenty one (21) of them are scholars, 321 are Senior High School graduates, and 698 are Junior High School graduates.

This area is 400 m above the sea level, 2,000 m above the sea level at the highest. The average temperature is 16°C - 25°C . The land is composed from highly fertile andosol soil with sandy texture. The rainfall is about 3,650 mm per year. Most of the people (95.5 %) are farmers/breeders, 2% are civil servants/ABRI, and 2.5 % are traders. This area produces farm crops such as cabbages, potatoes, onions, apples, coffee, clove, capok, and dairy product. The land slope is about 15%. Therefore, the land needs continuous fertilization.

2.2. The Population Growth of Cows and Farmers

From year to year the population of dairy cows continuously grows. This business is very beneficial for the farmers and it is not seasonable. They can get the money every ten days. This business is an essential source for them to support their family. As a result, the numbers of farmers

increase 11.3 % and the cows increase 5.9 %.

TABLE 1. The Population of Dairy Cows and Members of Cooperative

No	Names of village	1985		1986	
		Cows	Farmers	Cows	Farmers
1.	Wonosari	1,299	499	1,368	557
2.	Gendro	998	378	982	408
3.	Tlogosari	1,352	518	1,477	599
4.	Blarang	1,317	488	1,414	533
5.	Kayu Kebek	988	388	1,090	433
6.	Andonosari	1,596	584	1,602	646
7.	Pungging	838	323	803	339
8.	Tutur	1,618	592	1,738	673
9.	Kalipucang	1,031	401	1,139	468
10.	Sumberpitu	750	303	920	366
T o t a l		11,787	4,474	12,533	5,042

2.3. Dairy Cows Feeding

A calf is killed in the age of 18 months. It's main food is grass and concentrate. Grass is given according to it's weight. Generally 10% of it's weight is given grass while 3% of the ideal weight is provided by concentrate. However, in practice this feeding depends on the farmer's condition. The farmer has to provide at least 1 kg concentrate for each cow per day. Actually, a heifer or a dry lactation is supposed to have 1.5 kg concentrate to make it well prepared for breeding. A lactation needs more feeding and nutrient. If a lactation is given 1 kg

of concentrate it may produce 3 liter milk a day. To have a lactation produce 10 liter milk/day, it should be given 3 kg of concentrate. A bull needs only 1 kg of concentrate a day.

2.4. Dairy Production

From 4,062 dry lactations can be produced 14,721,791 liter milk in a year. In other words, the average production for each is 10 lt/day. This amount, 10 lt/day for each cow, is considered under the optimum production of Fries Holstein dairy cows. This is caused by lack of good management of the farmers, and the difficulties in getting high quality of concentrate and the continuity of giving it to the cows.

TABLE 2. Milk Product and Marketing

No	Explanation	1985	1986
1.	Production	13,749,060 lt	14,721,791 lt
2.	Factory sale	13,843,089 kg	14,808,333 kg
3.	Consumers sale	4,921 lt	4,739 lt
4.	House to house	95,195 lt	31,700 lt
5.	Social	6,446 lt	12,860 lt

2.5. Processing and Marketing

Milk from the farmers is collected in the receiving stations. Before it is accepted by the cooperative, several things such as organoleptics, alcohol test, specific gravity, and fat content should be checked in the laboratory first. If these requirements are fulfilled, then the cooperative will accept it. The cooperative men then take the milk to the

cooler-system center to process it by using plate cooler. The capacity of the plate cooler is 5 tons/hour. The temperature of fresh milk from the farmers is about 27°C. The cooler then freezes it down to 4°C in a very short time. Next, the milk will be taken to the processing plant in Surabaya. The farmer's payment is given every ten days. One gram fat costs Rp. 5 and SNF costs Rp. 3.04.

TABLE 3. Requirements for Pure Milk

No	Elements	Condition
1.	color, flavor, and viscosity	not changing
2.	specific gravity, minimal 27.5°C	1,0280
3.	minimal fat	2.8 %
4.	SNF	8.0 %
5.	acidity	4.5 - 7° SN
6.	alcohol test	negative
7.	minimal catalyst	3 cc
8.	freezing point	-0.520°C - -0.560°C
9.	reductase test	2 - 5 hours
10.	maximal amount of germs / cc	3 millions

The cooperative buys milk from the farmers in the same way. The approach used is the correlation between specific gravity and fat. (Appendix 1).

2.6. Groups of Farmers

In 1986 the cooperative's area covers ten villages, with 5,042 farmers. To make the operational easy, there are groups of farmers who function as the mediators between the farmers and the cooperative. These farmers take care of such things, like giving technology extention, dairy collecting, and distributing the feed mill. There are 100 groups of farmers; each group consists of 30 - 50 farmers.

2.7. Kind of Business Cooperative

The main activity of this kind of cooperative is selling and purchasing milk from the farmers. Because of the increasing demand, there are a unit of input supply, a unit of consumption, and a unit of photocopy.

The assets the cooperative has are as follows:

--. dairy unit	Rp. 4,995,901,531
--. input supply unit	Rp. 182,576,897
--. consumption unit	Rp. 58,036,788
--. photocopy unit	Rp. 6,779,165

2.8. The Infrastructure

The cooperative has dairy implements which are complete enough to support its operational tasks. This can be seen from the following properties it has:

No	Items	Amount	Capacity
1.	Land	1	± 10,000 m ²
2.	Office building	1	1,200 m ²
3.	Plate cooler	1	5 tons / hour

No	Items	Amount	Capacity
4.	Transfer tanks	7	6,000 - 7,000 lt
5.	Trucks	8	Fuso
6.	Motorcycles	12	Honda
7.	Laboratory equipment	1 set	-
8.	Office equipment	1 set	-

2.9. The Organization

The organization of the cooperative includes board of directors and the assistants, board of control, manager, and staff. All of these components are responsible for the continuity of the cooperative.

Both boards of directors and control are chosen by the members in the annual members meeting. The main task of board of directors is making up policies and decisions of the organization. The manager is responsible for the operational tasks under the board's supervision. The board of control is responsible for auditing and controlling the cooperative's activities.

The personnel of the cooperative are as follows:

- Board of directors : 6 persons
- Board of assistant directors : 3 "
- Board of control : 3 "
- Manager : 1 "
- Assistant manager : 1 "
- Staff : 165 "

2.10. The Problems Arised

The main problem faced by the cooperative is its inability to continually provide consenstrate with a standard quality and a relatively low price for the farmers. It is impossible for the farmers to produce feed mill by themselves with a standard quality in order to reduce the cost of the product. Therefore, to tackle this problem, the cooperative has to found a feed-mill plant.

2.11. The Goals

1. To increase the farmers' income by continually providing consenstrate with a relatively low price and a high quality.
2. To increase the cooperative's activities in order to raise the farmers' income.
3. To reduce the farmers' dependence upon consenstrate from the factory.
4. The feed-mill plant functions as a buffer, to keep the consenstrate's price stable.
5. To increase the dairy product and its quality.
6. To raise the farmers' income.
7. To increase service for members of the cooperative.

CHAPTER III
FEED MILL PLANT BUSINESS

1. Purpose of the Project

Setia Kawan dairy cooperative in Nongkojajar, Pasuruan, continuously tries to improve and increase its service, particularly for the sake of the members' prosperity. By establishing a feed-mill plant, the following advantages may be gained, namely:

- increasing the farmers' income by reducing the cost of the feeding,
- increasing the cooperative's activities which are oriented to the raising of the farmers' income,
- increasing production and improving the quality of dairy product,
- saving expenses and maintaining the stability of price.

2. Location of the Project

This project is located in Purwodadi, Pasuruan. It operates in ten villages, namely Wonosari, Gendro, Tlogosari, Blarang, Kayu Kebek, Andonosari, Pungging, Tukur, Kalipucang, and Sumberpitu. It also covers other dairy cooperatives which are located in the neighborhood. This area has 12,533 cows with an intensive breeding system, meaning that the cows are kept in stables and given grass and concentrate.

The rainfall goes on in about 5 - 6 months per year. Dry season lasts in 6 - 7 months. It is difficult to get grass

when the dry season is longer. That is why concentrate is the most valuable feeding.

There is a road connected to the main highway of Surabaya - Malang. The distance between the project's area to the office is 20 km and to Surabaya is 85 km. Therefore, raw materials as well as product can be transported easily.

3. Components of the Project

Based on cattle-population estimation and the success in marketing within 10 years of time (producing and marketing estimation), I suggest that the cooperative operates a feed mill-processing machine with a product capacity of 7 tons/hour or 56 tons/day or 14,784 tons/year. This is to be done to:

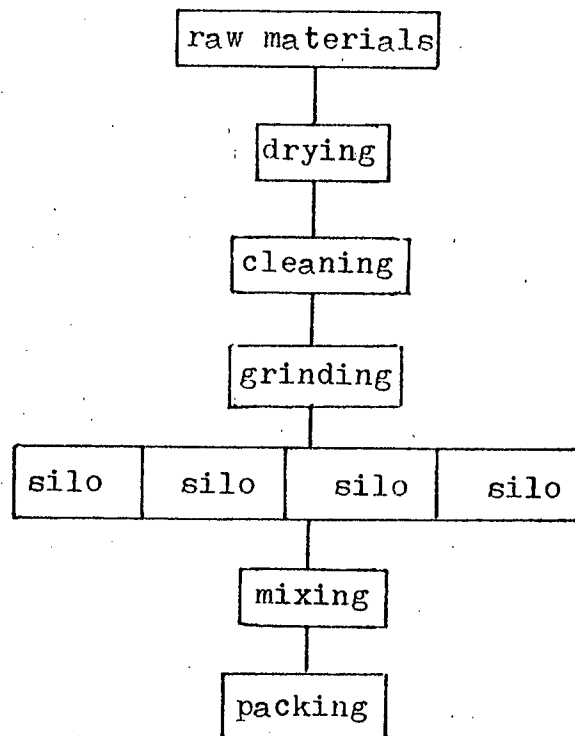
- avoid unemployed capacity,
- specify the machinery existing in the market,
- put overtime work and shifts as a consideration in the effort to cover the loss of product in the previous 6th up to 10th year.

4. Concentrate Processing

The raw materials, either dry matter or fresh, should be dried first. The grinding machine then will process them into powder matter. However, the raw materials should be cleaned first to prevent the rough materials from being ground because this may break the machine. Powdered concentrate is kept in silos. The five kinds of raw materials are put into the mixer. Portions for calves, heifers, lactations, dry lactations, and bulls are based on their needs of nutrient.

Within a certain period of time, if the concentrate has been homogenous, the mixer will stop working. The concentrate is then packed in 50 kg-plastic bags and ready to distribute to the farmers.

Chart of Processing



5. Concentrate Marketing

Concentrate marketing is done by the cooperative by enclosing it in the milk's price (market monopoly). The farmers receive payment from the cooperative every ten days. The milk is purchased at Rp. 400/liter -- deducted by Rp. 63 for the feeding. Therefore, the farmers need not worry about the concentrate because it is always available in the cooperative. The price of concentrate from the factory is Rp. 225/kg, while the cooperative sells it at only Rp. 188/kg.

TABLE 4 : Population Estimation of Dairy Cows of Setia Kawan
Cooperative Nongkojajar.

Year	Kinds of Cows					Total
	Calf	Heifer	Lactation	Bull	Dry Lactation	
1985	3,776	1,760	3,864	211	2,176	11,787
1986	3,984	1,848	4,051	265	2,385	12,533
1987	4,413	2,174	4,062	335	4,237	15,121
1988	4,562	2,341	4,190	394	4,994	16,481
1989	4,831	2,548	4,289	456	6,025	18,149
1990	5,100	2,755	4,388	518	7,056	19,817
1991	5,369	2,962	4,487	580	8,087	21,485
1992	5,638	3,169	4,586	642	9,118	23,198
1993	5,907	3,376	4,685	704	10,149	24,821
1994	6,176	3,583	4,784	766	11,180	26,489
1995	6,445	3,790	4,883	828	12,211	28,157
1996	6,714	3,997	4,982	890	13,242	29,825
1997	6,983	4,204	5,081	952	14,273	31,493

6. Operation Plant

The Operation Days and Plant's Capacity

1. The plant's rate of operation/year = 14,784 tons (technical) or 13,306 tons (practical)
2. Trial production was done in the first year
3. Number of operational work days = 264 days
4. Work hours / shift = 8 hours
5. Working shift per day
 - raw materials = 1 shift
 - production / processing
 - * years I - IV = 1 shift
 - * years VI - X = 1 shift + overtime-work
 - marketing = 1 shift
 - finance = 1 shift

TABLE 5 : Estimation of Concentrate Production and Marketing (tons)

Year	Kinds of Cows					Total
	Calf Product A	Heifer Product B	Lactation Product C	Bull Product D	Dry Lactation Product E	
1	1,664.54	1,297.47	4,588.87	328.13	2,730.05	10,609.10
2	1,739.16	1,375.92	4,632.12	328.32	3,253.50	11,329.02
3	1,836	1,487.70	4,739.04	372.96	3,810.24	12,245.94
4	1,932.84	1,599.48	4,845.96	417.60	4,366.98	13,162.86
5	2,029.68	1,711.26	4,952.88	462.24	4,923.72	14,079.78
6	2,126.52	1,823.04	5,059.80	506.88	5,480.46	14,996.70
7	2,223.36	1,934.82	5,166.72	551.52	6,037.20	16,913.62
8	2,320.20	2,046.60	5,273.64	596.16	6,593.94	17,645.62
9	2,417.04	2,153.38	5,380.56	640.80	7,150.68	17,742.46
10	2,513.88	2,270.16	5,487.48	685.44	7,707.42	18,664.38

Notes :

a. Required concentrate per day :

- Calf : 1 kg.
- Heifer : 1.5 kg.
- Lactation : 3 kg.
- Bull : 2 kg.
- Dry Lact. : 1.5 kg.

b. Estimatic production is based on the market share of the cows available in the area of KUD Setia Kawan.

c. The market is in the form of monopolistic market.

d. First year production (1988) including 200 tons ending inventories.

TABLE 6 : Raw Materials and Subsidiary Materials Consumption.

	Pillar		Capex		Raw Materials		Subsidiary Materials	
	120 -/Kc	Monthly	110 -/Kc	Monthly	75 -/Kc	Monthly	110 -/Kc	Monthly
1st Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
2nd Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
3rd Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
4th Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
5th Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
6th Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
7th Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
8th Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
9th Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
10th Year :	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount

Notes : a. One year = 264 working days

b. One month = 22 working days

c. Fuel Consumption of diesel oil @ 40 lt./days.

d. Unit quantities for raw material used tons.

e. Unit quantities for subsidiary materials used case and liter.

f. Amount in Rp. 000.

TABLE 7. Feed-Mill Production

Year	Working-days	Average machinery operation capacity	Materials (tons)	Concentrate product (tons)
1	264	79 %	10,439	10,609
2	264	85 %	11,457	11,329
3	264	92 %	12,442	12,246
4	264	98 %	13,371	13,163
5	264	105 %	14,240	14,080
6	264	112 %	15,229	14,997
7	264	119 %	16,158	15,914
8	264	126 %	17,059	16,831
9	264	133 %	18,010	17,742
10	264	140 %	18,938	18,664

CHAPTER IV
ORGANIZATION AND MANAGEMENT

1. System of Organization

The project's organization cannot be separated from the cooperative's organization. It is the manager who is able to carry out the activities, assisted by the staff. (Enclosed).

2. Function of Organization

The function of the organization is carrying out the tasks given by the members to advance the cooperative and increase their income. The board of directors are chosen by the members together with the manager to act as the executor of the cooperative's activities.

3. Numbers of Personnel Required

- Manager	=	1
- Assistant manager	=	1
- Staff	=	21
- Clerks/Secretaries	=	4
- Drivers	=	4
- Unskilled workers	=	<u>15+</u>
		46

TABLE 8. The Project System of Organization

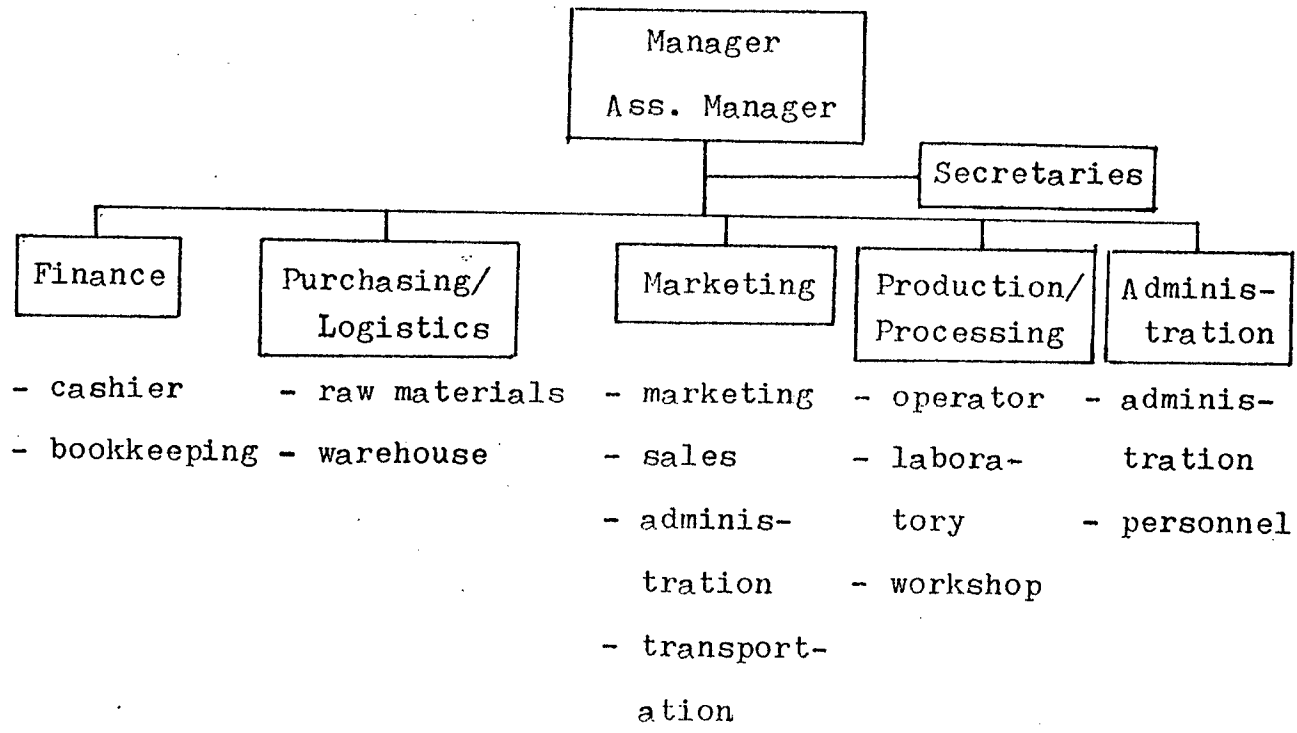


TABLE 9. Workers Wage Expenses

Occupation	Worker	Wage/month/ person	Wage/ month	Wage/year
<u>I. Staff Wage</u>				
1. Manager	1	500,000	500,000	6,000,000
2. Ass. Manager	1	500,000	500,000	6,000,000
3. Financial Supervisor	1	250,000	250,000	3,000,000
4. Purchase/Logis- tics Supervisor	1	250,000	250,000	3,000,000
5. Marketing Supervisor	1	250,000	250,000	3,000,000
6. Production Supervisor	1	250,000	250,000	3,000,000
7. Administration Supervisor	1	250,000	250,000	3,000,000
8. Financial Staff	4	150,000	600,000	7,200,000
9. Marketing Staff	3	150,000	450,000	5,400,000
10. Production Staff	5	150,000	750,000	9,000,000
11. Adm. Staff	4	100,000	400,000	4,800,000
12. Drivers	4	100,000	400,000	4,800,000
13. Bonus (A month wage)				<u>4,850,000</u>
Total	27		4,850,000	63,050,000
14. Other Expenses				<u>6,850,000</u>
				70,000,000
<u>II. Factory-labor Wage</u>				
1. Direct Labors	15	60,000	900,000	10,800,000
2. Work shop/ Operation	4	75,000	300,000	3,600,000
3. Bonus (A month wage)				<u>1,200,000</u>

Occupation	Worker	Wage/month/ person	Wage/ month	Wage/year
	27		4,850,000	
	19		<u>1,200,000</u>	85,600,000
4. Other Expenses				<u>2,500,000</u>
Total Wages	46		6,050,000	88,100,000

TABLE 10. Other Operational Expenses

1. Repairs and Maintenance	7,800,000	2% of equipment-purchasing expenses	
2. Overhead/Commercial Expense (without workers wages + depreciation)	11,500,000	- Electricity	2,500,000
		- Buildings establishment	1,500,000
		- Official Tour	3,000,000
		- Insurance	2,700,000
		- Other Expense	1,500,000
3. Administration Expenses (without workers wages + depreciation)	9,000,000	- Official Equipment	1,500,000
		- Meetings	2,500,000
		- Accounting/Law	5,000,000
4. Marketing Expenses (without workers wages)	23,000,000	- Raw materials	10,000,000
		- Expenses for driver's journey	2,000,000
		- Vehicles repairs	500,000
		- Spare parts	4,000,000
		- Vehicles Insurance	2,500,000
		- Others	3,000,000
Total Expenses		Rp. 52,300,000	

CHAPTER V
CAPITAL REQUIRED

1. Capital Required

1.1 Project Cost

Project cost is estimated under the following conditions:

- a. the rate of exchange is set on January 1988 basis,
that is US \$1 = Rp. 1,600
- b. prices are estimated on the basis of the prices in
January 1988
- c. period of construction (in year-0) is :
 - buildings construction + land reform = 5 months
 - machinery + installation + experiments = 3 "
 - preparation of production, etc. = 4 "

1.2 Estimation of Project Cost / Investment Cost

- | | |
|-------------------------------|-------------------|
| 1. Land | : Rp. 108,500,000 |
| 2. Buildings | : Rp. 475,500,000 |
| 3. Machinery and Installation | : Rp. 390,000,000 |
| 4. Vehicles | : Rp. 60,000,000 |
| 5. Office Equipment | : Rp. 15,000,000 |
| 6. Other Expenses | |

Part of the training fee for two staff of processing and operation is paid by the machinery equipment manufacturer, and the rest of it is paid by the cooperative. The cost is Rp. 1,500,000/person/two months. So the total cost is Rp. 3,000,000.

1.3 Working Capital

The estimation of the working capital required is based on:

- a. stock of raw materials : 5 days
- b. stock of finished product : 2 days
- c. personnel + direct labor cost : 1 month
- d. general and administration cost : 1 month
- e. claims collection period : 10 days
- f. product processing : 1 day

a. Raw Materials

- Polland 18 x 120 x 5.37 tons = Rp. 11,599,000
- Capok seed 18 x 110 x 7.18 tons = Rp. 14,216,400
- Bran 18 x 75 x 25.41 tons = Rp. 34,303,500
- Molasses 18 x 110 x 2.21 tons = Rp. 4,375,800
- Mineral 18 x 2,000 x 0.44 tons = Rp. 15,840,000

b. Personnel Cost

- A month Rp. 6,050,000
- Production/month = 22 x 40 = 880 tons
- Cost/year = $\frac{6,050,000}{880}$ = Rp. 6,875
- Cost/day = 40 tons x 6,875 = Rp. 275,000
- Personnel cost at rotating period =
 $18 \times 275,000$ = Rp. 4,950,000

c. Administration/General Cost

- A month = Rp. 20,500,000
- Production/month = 22 x 40 = 880 tons
- Cost/year = $\frac{20,500,000}{880}$ = Rp. 23,295
- Cost/day = 40 tons x 23,295 = Rp. 931,600
- Administration/general cost at
 rotating period = 18 x 931,600 = Rp. 16,768,800

d. Indirect material Cost

- Plastic bags/day = 40 tons : 50 kg = 800 bags

Cost/day = 800 x Rp. 340 = Rp. 272,000

Total cost at rotating period =

18 x 272,000 = Rp. 4,896,000

- Diesel oil = 40 lt/day

Cost/day = 40 lt x 200 = 8,000

Total cost at rotating period =

18 x 8,000 = Rp. 144,000

The total required working capital

Rp. 91,235,700 + Rp. 15,840,000 = Rp. 107,093,000

2. Total Project Cost Required

I t e m	T o t a l	B r e a k D o w n	
		Owner Portion	Credit Portion
1. Machinery + Installation	390,000	-	390,000
- Training Fee	3,000	3,000	-
2. Building Con- struction+land			
- Land	108,500	41,000	67,500
- Buildings	475,500	125,000	350,500
3. Vehicles	60,000	-	60,000
4. Office Equipment	15,000	15,000	-
5. Initial Working Capital	107,093	-	107,093
Total Investment- Cost Required	1,159,093	184,000	975,093

CHAPTER VI
FINANCIAL ANALYSIS

1. Internal Rate of Return (IRR)

IRR is computed on the basis of the project period, namely within 10 years.

$$\begin{aligned}\text{Internal Rate of Return} &= P_1 - C_1 \left(\frac{P_2 - P_1}{C_2 - C_1} \right) \\ &= 18\% - 39,191 \left(\frac{19 - 18}{-12,012 - 39,191} \right) \\ &= 18\% + \frac{39,191}{51,203} \\ &= 18\% + 0.76 = 18.76 \%\end{aligned}$$

P_1 = rate of interest I = 18 %

P_2 = rate of interest II = 19 %

C_1 = Net Present Value (NPV) I = + 39,191

C_2 = Net Present Value (NPV) II = - 12,012

The estimation of Internal Rate of Return is enclosed (Appendix 6).

2. Depreciation

Depreciation method applied is the Straight Lines method with salvage value = 0

I t e m	Purchasing price/ Tool's age (000)	Depreciation/ Year (000)
- Machinery + Installation	310,000/20 years	19,500
- Buildings	475,500/20 years	23,775
- Vehicles	60,000/ 5 years	12,000
- Office Equipment	15,000/ 5 years	<u>3,000</u>
- Depreciation Exp. / year		Rp.58,275

3. Loan

a. Long-term Loan

- Loan period = 10 years
- Grace period = 1 year
- Interest/year = 12 %
- Interest expense
(In the first year of operation) = Rp. 104,160,000

b. Short-term Loan

- Loan period = 1 year
- Interest = 16 %
- Interest expense
(In the first year of operation) = Rp. 17,134,880

4. Corporate / Income Taxes

The rate of income taxes is based on the Taxation Act of the Republic of Indonesia, namely :

- 0 - 10 millions = 15 %
- 10 millions - 50 millions = 25 %
- Over 50 millions = 35 %

5. Production Expenses

Defining the average sale price:

- Formula = full cost + % expected profit
- Assumption : * the percentage of expected profit is at least above deposit interest,
* full cost is defined at normal rate of capacity, considering the sale trend within the project period.

- Calculation :

$$\text{Normal capacity} = \frac{\text{sale trend in 10 years}}{\text{project age}} = \frac{147,389.48}{10} \text{ tons}$$

$$= \underline{14,738.948} \text{ tons}$$

The production calculation in the sixth year

is more or less = 14,997.7 tons

a. Raw materials purchasing

- Pollard = Rp. 226,292
- Capok = Rp. 277,201
- Bran = Rp. 730,740
- Molesses = Rp. 93,087
- Mineral = Rp. 468,380

Rp. 1,795,700

b. Direct labor

" 10,800

c. Factory overhead

- Minimum depreciation = Rp. 19,500
- Indirect labor = Rp. 3,600
- Bonus + other expenses = Rp. 3,700
- Repairs + maintenance = Rp. 7,800
- Indirect materials = Rp. 104,089

	Rp. 138,689	
- Electricity	= Rp. 48,000	
- Staff/worker wage	= <u>Rp. 12,000</u>	Rp. 198,689
Total production expenses		<u>Rp. 2,005,189</u>
d. Administration/general	= Rp. 20,500	
- Workers wage	= Rp. 58,000	
- Depreciation Exp.	= <u>Rp. 38,775</u>	Rp. 117,275
e. Sales Expenses		Rp. 23,000
f. Interest and Installment		
- Long-term loan installment	= Rp. 96,444,000	
- 12 % of interest	= <u>Rp. 57,866,000</u>	Rp. 154,330
		<u>Rp. 2,299,794</u>

Full Costing = Rp. 2,299,794

Total Production = 14,996.7 tons

Cost of good sold / kg (average) = Rp. 154 / kg

\bar{x} Sale price = cost of good sold + (22.5 % x cost of good sold)

= Rp. 154 + Rp. 34

= Rp. 188 / kg

6. Interest and Installment Expenses /

a. Long-term Loan

- Loan period = 10 years

- Grace period = 1 year

- Interest/year = 12 %

- Repayment method: - interest is paid during the grace period,
- the capital loan is paid by installments in the same amount during the loan period.
- Loan expenses = Rp. 868,000,000
- Interest payment during grace period
= Rp. 104,160,000 (12 % x 868,000,000)
- Loan repayment + interest =

Year-end	Loan balance	Installment	Interest (12%)
1.	868,000,000	-	104,160,000
2.	868,000,000	96,444,000	104,160,000
3.	771,556,000	96,444,000	92,586,720
4.	675,112,000	96,444,000	81,013,440
5.	578,668,000	96,444,000	69,440,160
6.	482,224,000	96,444,000	57,866,880
7.	385,780,000	96,444,000	46,293,600
8.	289,336,000	96,444,000	34,720,320
9.	192,892,000	96,444,000	23,147,040
10.	96,448,000	96,444,000	11,573,760

b. Short-term Loan

- Loan period : 1 year
- Interest expense : 16 %
- Repayment method : paid every three months in the same amount of payment
- Interest : Rp. 107,093,000

- Interest expense in the first year (Year I)

$$= 16 \% \times \text{Rp. } 107,093,000 = \text{Rp. } 17,134,880$$

Year-end	Loan	Interest	Installment
1.	107,093,000	1,427,907	-
2.	107,093,000	1,427,907	-
3.	107,093,000	1,427,907	26,773,250
4.	80,319,750	1,070,930	-
5.	80,319,750	1,070,930	-
6.	80,319,750	1,070,930	26,773,250
7.	53,546,500	713,953	-
8.	53,546,500	713,953	-
9.	53,546,500	713,953	26,773,250
10.	26,773,250	356,976	-
11.	26,773,250	356,976	-
12.	26,773,250	356,976	26,773,250

7. Capital Required

The whole project investment cost is covered by the long-term loan, short-term loan, and the cooperative's own capital.

a. Long-term Loan

The long-term loan is spent for machinery and its installation, buildings, and vehicles. The investment cost, Rp. 868,000,000, will be paid by the long-term loan, within 10 years, and with 12 % rate of interest and 1 year of grace period. The capital loan is paid by installments in the same amount, starting from the first year.

b. Short-term Loan

The short-term loan, Rp. 107,093,000 , is spent to fulfill the working-capital requirement in the first year. It will be paid by the loan from the Government Bank with 16 % rate of interest.

c. Cooperative's Own Capital

Sixteen percent (16 %) of investment cost, namely Rp. 184,000,000 , is paid by the cooperative itself to cover the expenses for land, office equipment, warehouse, etc.

8. Net Profit Before Taxes (in normal capacity)

Sales Revenue :

- Product A	2,126.52 x 179	= Rp.	380,647
- Product B	1,823.04 x 171.5	= Rp.	312,652
- Product C	5,059.8 x 212	= Rp.	1,072,678
- Product D	506,88 x 174	= Rp.	88,197
- Product E	5,480,46 x 174.5	= Rp.	956,340
			<u> +</u>

Rp. 2,810,514

Total Cost

Rp. 2,299,794

Rp. 510,720

Net profit before taxes of sales = 510,720 / 2,810,514
= 18.17 %

Net profit before taxes of capital = 510,720 / 1,159,093
= 44 %

9. Pay-back Period

Year	Cash Flow	Covered Investment	Pay-back years
1.	138,197	138,197	1 year
2.	192,339	192,339	1 year
3.	234,526	234,526	1 year
4.	277,209	277,209	1 year
5.	324,487	<u>326,938</u>	0,97 year
		1,159,093	

Pay-back period = 4,97 years = 5 years

10. Break Event Point

In normal capacity of sales volume (Rp. 000)

$$= \frac{\text{Fixed Cost}}{1 - \text{VC/Sales revenue}}$$

$$= \frac{402,117}{1 - \frac{1,897,677}{2,810,514}} = \frac{402,117}{1 - 0.67} = \frac{402,117}{0.33}$$

$$= \text{Rp. } 1,218,536$$

$$= 6,481,57 \text{ tons (43 \%)}$$

Break Event Point of Each Product

- Product A :

$$= \frac{56,293}{1 - \frac{253,474}{380,647}} = \frac{56,293}{0,54}$$

$$= \text{Rp. } 165,568$$

$$= 925 \text{ tons (43 \%)}.$$

- Product B :

$$= \frac{48,200}{1 - \frac{205,938}{312,652}} = \frac{48,200}{0,34}$$

$$= \text{Rp. } 141,765$$

$$= 826.61 \text{ tons (45 \%)}.$$

- Product C :

$$= \frac{136,712}{1 - \frac{738,555}{1,072,678}} = \frac{136,712}{0,31}$$

$$= \text{Rp. } 441,006$$

$$= 2,080.22 \text{ tons (41 \%)}.$$

- Product D :

$$= \frac{11,702}{1 - \frac{60,448}{88,197}} = \frac{11,702}{0,31}$$

$$= \text{Rp. } 37,748$$

$$= 217 \text{ tons (43 \%)}.$$

- Product E :

$$= \frac{141,728}{1 - \frac{639,065}{956,340}} = \frac{141,728}{0,33}$$

$$= 2,461.20 \text{ tons (45 \%)}.$$

$$= \text{Rp. } 429,479$$

11. Internal Rate of Return

The calculation of IRR is enclosed (Appendix 6).

CHAPTER VII

CONCLUSION AND RECOMMENDATION

1. From the previous calculation, it can be seen that the average sale price of concentrate from the cooperative is Rp.188/kg, compared to Rp.225/kg, the factory sale price. Consequently, the expenses for concentrate can be reduced by Rp. 37/kg or 16.4 %.
2. The financial analysis reveals that the total investment cost is Rp. 1,159,093,000; the profitability is 44 % with an internal rate of return of 18.76 % and a pay-back period of 4.97 years (5 years).
3. In fact, a project may last in 10 - 20 years. Although this project obtains its normal capacity in the sixth year, it is surely that the profitability will increase in the next periods. The internal rate of return of 18.76 % is higher than the bank interest; and the pay-back period of 4.97 years is shorter than the analyzed project period of 10 years. Therefore, it is reasonable that this project should be carried out.

APPENDIX I. MILK PURCHASE FROM THE MEMBERS
SEPTIA KAWAN COOP.

No.	GRAVITY ON 27, 5°C.										
	F. A. T.	1.0290	1.0280	1.0270	1.0260	1.0250	1.0240	1.0230	1.0220	1.0210	1.0200
3,7		319,52	314,12	308,72	303,32	297,92	292,52	287,12	281,72	276,32	270,92
3,6		316,08	310,68	305,28	299,88	294,48	289,08	283,68	278,28	272,88	267,48
3,5		312,64	307,24	301,84	296,44	291,04	285,64	280,24	274,84	269,44	264,04
3,4		309,20	303,80	298,40	293	287,60	282,20	276,80	271,40	266	260,60
3,3		305,76	300,36	294,96	289,56	284,16	278,76	273,36	267,96	262,56	257,16
3,2		302,32	296,92	291,52	286,12	280,72	275,32	269,92	264,52	259,12	253,72
3,1		298,88	293,44	288,08	282,68	277,28	271,88	266,48	261,08	255,68	250,28
3,0		295,44	290,04	284,64	279,24	273,84	268,44	263,04	257,64	252,24	246,84
2,9		292,-	286,60	281,20	275,80	270,40	265,-	259,60	254,20	248,80	243,40
2,8		288,56	283,16	277,76	272,36	266,96	261,56	256,16	250,76	245,36	239,96
2,7		285,12	279,72	274,32	268,92	263,52	258,12	252,72	247,32	241,92	236,52
2,6		281,68	276,28	270,88	265,48	260,08	254,68	249,28	243,88	238,48	233,08

APPENDIX 2 : Estimation of Required Raw Materials.

Kind of Product	Production Quantity (ton).	Kinds of Raw Materials									
		Follard (ton)		Canok (ton)		Bran (ton)		Moleses (ton)		Mineral (ton)	
		SUR/ton		SUR/ton		SUR/ton		SUR/ton		SUR/kg	
1st Year.											
- Product A	1,664.54	0.219	364.54	0.293	487.71	0.449	747.38	0.039	64.92	0.008	13.14
- Product B	1,297.47	0.052	67.47	0.07	90.82	0.807	1,047.05	0.07	90.82	0.012	15.17
- Product C	4,588.87	0.157	720.45	0.583	959.07	0.583	2,675.31	0.051	234.03	0.024	108.60
- Product D	328.13	0.031	10.17	0.042	45.70	0.853	279.90	0.074	24.28	0.016	4.53
- Product E	2,730.05	0.094	256.62	0.126	343.99	0.718	1,960.17	0.062	169.26	0.012	32.36
			1,419.24		1,895.37		6,709.81		583.31		173.80
2nd Year.											
- Product A	1,739.16		380.88		509.57		780.88		67.83		13.91
- Product B	1,375.92		71.55		96.31		1,110.36		96.31		16.51
- Product C	4,632.12		727.24		968.11		2,700.52		236.24		111.17
- Product D	328.32		10.18		13.79		280.05		24.29		5.25
- Product E	3,253.50		305.83		409.94		2,336.01		201.72		39.04
			1,495.68		1,997.72		7,207.82		626.39		185.88
3rd Year.											
- Product A	1,836		402.08		537.95		824.36		71.60		14.69
- Product B	1,487.70		77.36		104.14		1,200.57		104.14		17.85
- Product C	4,739.04		744.03		990.46		2,762.86		241.69		113.74
- Product D	372.96		11.56		15.66		318.13		27.60		5.97
- Product E	3,810.24		358.16		480.09		2,735.75		236.23		45.72
			1,593.19		2,120.30		7,841.67		681.26		197.97
4th Year.											
- Product A	1,932.84		423.29		566.32		867.84		75.38		15.46
- Product B	1,599.48		83.17		111.96		1,290.78		111.96		19.19
- Product C	4,845.96		760.81		1,012.80		2,825.19		247.14		116.30
- Product D	417.60		12.94		17.54		356.21		30.90		6.68
- Product E	4,366.98		410.50		550.24		3,135.49		270.75		52.40
			1,690.71		2,250.87		8,475.51		736.14		210.03
5th Year.											
- Product A	2,029.68		444.50		594.70		911.32		79.16		16.24
- Product B	1,711.26		88.98		119.79		1,380.98		119.79		20.53
- Product C	4,952.88		777.60		1,035.15		2,887.53		252.60		118.87
- Product D	462.24		14.33		19.41		394.29		34.20		7.39
- Product E	4,923.72		403.61		620.39		3,535.23		305.27		59.08
			1,729.02		2,384.43		9,109.35		791.01		222.11

Kind of Product	Production Quantity (ton)	Kinds of Raw Materials									
		Follard (ton)		Capok (ton)		Bran (ton)		Molasses (ton)		Mineral (ton)	
		SUR/ton		SUR/ton		SUR/ton		SUR/ton		SUR/kg	
6th Year.											
- Product A	2,126.52	0.219	465.71	0.293	623.07	0.449	954.81	0.038	82.93	0.008	17.012
- Product B	1,823.04	0.052	127.61	0.07	127.61	0.807	1,471.19	0.07	127.61	0.012	21.876
- Product C	5,059.80	0.157	794.39	0.209	1,057.50	0.583	2,949.86	0.051	258.05	0.024	121.436
- Product D	506.88	0.031	15.71	0.042	21.29	0.853	432.37	0.074	37.51	0.016	8.11
- Product E	5,480.46	0.094	515.16	0.126	690.54	0.718	3,934.97	0.062	339.79	0.012	65.76
			1,885.77		2,820.01		9,734.20		845.89		234.19
7th Year.											
- Product A	2,223.36		486.91		651.44		998.29		86.71		17.79
- Product B	1,934.82		100.61		135.44		1,561.40		135.44		23.22
- Product C	5,166.72		811.17		1,079.84		3,012.19		263.50		124
- Product D	551.52		17.10		23.16		470.45		40.81		8.92
- Product E	6,037.20		567.50		760.69		4,334.71		374.30		72.45
			1,983.29		2,650.57		10,377.57		900.76		246.38
8th Year.											
- Product A	2,320.20		508.12		679.82		1,041.77		90.49		18.56
- Product B	2,046.60		106.42		143.26		1,651.60		143.26		24.56
- Product C	5,273.64		827.96		1,102.19		3,074.53		268.95		126.57
- Product D	596.16		18.48		25.04		508.52		44.11		9.54
- Product E	6,593.94		619.83		830.84		4,734.44		408.82		79.13
			2,080.81		2,754.15		11,010.86		955.64		258.36
9th Year.											
- Product A	2,417.04		529.33		708.19		1,085.25		94.26		19.34
- Product B	2,153.38		111.97		150.73		1,737.78		150.73		25.84
- Product C	5,380.56		844.75		1,124.54		3,136.87		274.41		129.13
- Product D	640.44		19.86		25.91		546.60		47.42		10.25
- Product E	7,150.68		672.16		900.98		5,134.18		443.34		85.81
			2,178.07		2,911.35		1,640.68		1,010.34		270.37
10th Year.											
- Product A	2,513.88		550.54		736.57		1,128.73		98.04		20.11
- Product B	2,270.16		118.05		158.91		1,832.01		158.91		27.24
- Product C	5,487.48		861.53		1,146.88		3,199.20		279.86		131.70
- Product D	685.44		21.25		28.79		584.68		50.72		10.97
- Product E	7,707.42		724.50		971.13		5,533.93		477.86		92.49
			2,275.87		3,039.28		2,278.55		1,062.39		282.51

APPENDIX 3 : Estimation of Concentrate Price for Each Product. (Rp. 000).

Kinds of Expenses	Product A	Product B	Product C	Product D	Product E
1. Raw Materials Used :					
- Pollard	55,885	11,376	95,329	1,805	61,819
- Capok	68,357	14,037	116,325	2,342	75,959
- Bran	71,610	110,339	221,329	32,428	295,123
- Molasses	91,221	14,037	28,385	4,126	37,377
- Mineral	<u>34,040</u>	<u>43,752</u>	<u>242,870</u>	<u>16,220</u>	<u>131,520</u>
	239,014	193,541	704,148	57,001	601,798
2. Direct Labor	1,512	1,296	3,672	324	3,996
3. Factory Overhead :					
- Dep. Expense (machinery)	2,730	2,340	6,630	585	7,215
- Indirect Labor	504	432	1,224	108	1,332
- Bonus & Other exp.	518	444	1,258	111	1,369
- Repairs & Maintenance	1,092	936	2,652	234	2,886
- Subsidiary Materials :					
- Elastic bag.	14,460	11,347	34,407	3,447	37,267
- Diesel oil	296	253	718	63	781
- Electricity	6,720	5,760	16,320	1,440	17,760
- Production staff salaries	<u>1,680</u>	<u>1,440</u>	<u>4,080</u>	<u>360</u>	<u>4,480</u>
	28,000	23,952	67,289	6,348	73,090
Total Production Cost	268,526	218,789	775,109	63,673	678,884
4. General & Adm. Expenses	2,870	2,460	6,970	615	5,535
- Staff Salaries	8,120	6,960	19,720	1,740	21,460
- Depreciation Exp.	<u>5,428</u>	<u>4,653</u>	<u>13,183</u>	<u>1,163</u>	<u>14,346</u>
	16,418	14,073	39,873	3,518	41,341
5. Sales Expenses	3,220	2,760	7,820	690	8,510
6. Cost of Capital :					
- Installment	13,502	11,573	32,791	2,893	35,648
- Interest Expense	<u>8,101</u>	<u>6,943</u>	<u>19,674</u>	<u>1,736</u>	<u>21,410</u>
	21,603	18,516	52,465	4,629	52,058
Total Expense/Cost	<u>309,767</u>	<u>254,139</u>	<u>875,267</u>	<u>72,150</u>	<u>780,793</u>
Total Production	2,126.52 tons	1,823.04 tons	5,059.8 tons	506.88 tons	5,480.46 tons
Cost of production per kg	146,-	140,-	173,-	142,-	142,50
Cost of sales/sales price per kg	179,-	171,50	212,-	174,-	174,50

Notes :

- Fixed Cost applied proportional with total production for each product.

- Product A : $(2,126.52/14,996.7) \times 100 \% = 14 \%$

Product B : $(1,823.04/14,996.7) \times 100 \% = 12 \%$

Product C : $(5,059.80/14,996.7) \times 100 \% = 34 \%$

Product D : $(506.88/14,996.7) \times 100 \% = 3 \%$

Product E : $(5,480.46/14,996.7) \times 100 \% = 37 \%$

APPENDIX 4 : Profit/Loss and Cash Flow Projection (Rp. 000).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1. Long term loan																					
Short term loan																					
Cooperative Owner Cap.																					
Sales :																					
- Product A	-	293,975	311,310	328,644	345,978	363,313	380,647	397,981	415,316	432,650	449,984	467,318	484,652	501,986	519,320	536,654	553,988	571,322	588,656	605,990	623,324
- Product B	-	216,800	235,970	255,140	274,311	293,481	312,652	331,822	350,992	369,305	389,332	409,359	429,386	449,413	469,440	489,467	509,494	529,521	549,548	569,575	589,602
- Product C	-	952,342	982,009	1,004,676	1,027,343	1,050,010	1,072,677	1,095,344	1,118,011	1,140,678	1,163,345	1,186,012	1,208,679	1,231,346	1,254,013	1,276,680	1,299,347	1,322,014	1,344,681	1,367,348	1,390,015
- Product D	-	49,760	57,128	64,895	72,662	80,430	88,197	97,008	105,732	114,456	119,286	128,010	136,734	145,458	154,182	162,906	171,630	180,354	189,078	197,802	206,526
- Product E	-	470,585	567,736	564,887	752,038	559,189	956,340	1,053,491	1,150,642	1,247,794	1,344,945	1,442,096	1,539,247	1,636,398	1,733,549	1,830,700	1,927,851	2,025,002	2,122,153	2,219,304	2,316,455
Cash in Flow																					
2. Project Cost :																					
- Land	108,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Buildings	475,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Machinery & Installation	390,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Vehicles	60,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Office Equipment	15,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Training Fee	3,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Cash Operating Expenses :																					
- Raw Materials	-	1,270,333	1,380,472	1,484,296	1,588,059	1,692,151	1,795,700	1,899,560	2,000,307	2,107,605	2,210,200	2,318,479	2,422,804	2,527,129	2,631,454	2,735,779	2,840,104	2,944,429	3,048,754	3,153,079	3,257,404
- Direct Labor	-	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800
- Factory Overhead	-	158,954	173,049	179,984	186,219	192,455	198,689	211,724	216,702	217,361	223,630	229,900	236,170	242,440	248,710	254,980	261,250	267,520	273,790	280,060	286,330
- General & Adm. Expenses	-	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275	117,275
- Sales Expenses	-	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000
Total Cash Operating Exp.																					
1. Interest Expenses :																					
- Long term loan	-	104,160	104,160	32,587	91,013	59,440	57,865	45,294	34,720	23,147	11,574	-	-	-	-	-	-	-	-	-	-
- Short term loan	-	7,135	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Interest Expenses																					
5. 3890 Out Flow																					
Profit Before Taxes																					
3. Corp. Tax Estimation																					
Profit After Taxes																					
3. Depreciation																					
10. Repayment :																					
- Long term loan	-	-	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)	(96,444)
- Short term loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Cooperative Owner Cap.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11. Cumulative Profit																					
12. Net Cash Flow																					

APPENDIX 5 : Monthly Cash Budget for the First Year. (Rp. 000)

Particulars	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1. Cash Receipt from Credit Sales :												
- Product A	16,551	24,497	24,497	24,497	24,497	24,497	24,497	24,497	24,497	24,497	24,497	24,497
- Product B	12,044	18,066	18,066	18,066	18,066	18,066	18,066	18,066	18,066	18,066	18,066	18,066
- Product C	53,297	79,945	79,945	79,945	79,945	79,945	79,945	79,945	79,945	79,945	79,945	79,945
- Product D	2,742	4,113	4,113	4,113	4,113	4,113	4,113	4,113	4,113	4,113	4,113	4,113
- Product E	26,143	39,215	39,125	39,215	39,215	39,215	39,215	39,215	39,215	39,215	39,215	39,215
Total Cash Receipt	110,557	165,836	165,836	165,836	165,836	165,836	165,836	165,836	165,836	165,836	165,836	165,836
2. Cash Disbursements :												
a. Purchase of Raw Materials	82,147	105,791	105,791	105,791	105,791	105,791	105,791	105,791	105,791	105,791	105,791	105,791
b. Direct Labor	900	900	900	900	900	900	900	900	900	900	900	1,800
c. Factory Overhead	12,346	12,346	12,346	12,346	12,346	12,346	12,346	12,346	12,346	12,346	12,346	13,646
d. General & Adm. Expenses	2,600	2,600	2,600	2,600	2,600	2,600	2,500	2,600	2,600	2,600	2,600	6,450
e. Sales Expenses	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916
f. Interest Expenses	10,108	10,108	36,811	10,108	10,108	36,881	10,108	10,108	36,381	10,108	10,108	36,881
Total Cash Disbursements	110,017	133,661	160,434	133,661	133,661	160,434	133,661	133,661	160,434	133,661	133,661	166,484
3. Deficit or Surplus	540	32,175	5,402	32,175	32,175	5,402	32,175	32,175	5,402	32,175	32,175	- 648
4. Cumulative Deficit or Surplus	540	32,715	38,117	70,292	102,467	107,869	140,044	172,219	177,621	209,796	241,971	241,323

Notes :

- First years production = 10,609.1 = ± 40 tons per days.
- production quantities per month is

APPENDIX 6 : Calculation of Internal Rate of Return (IRR).

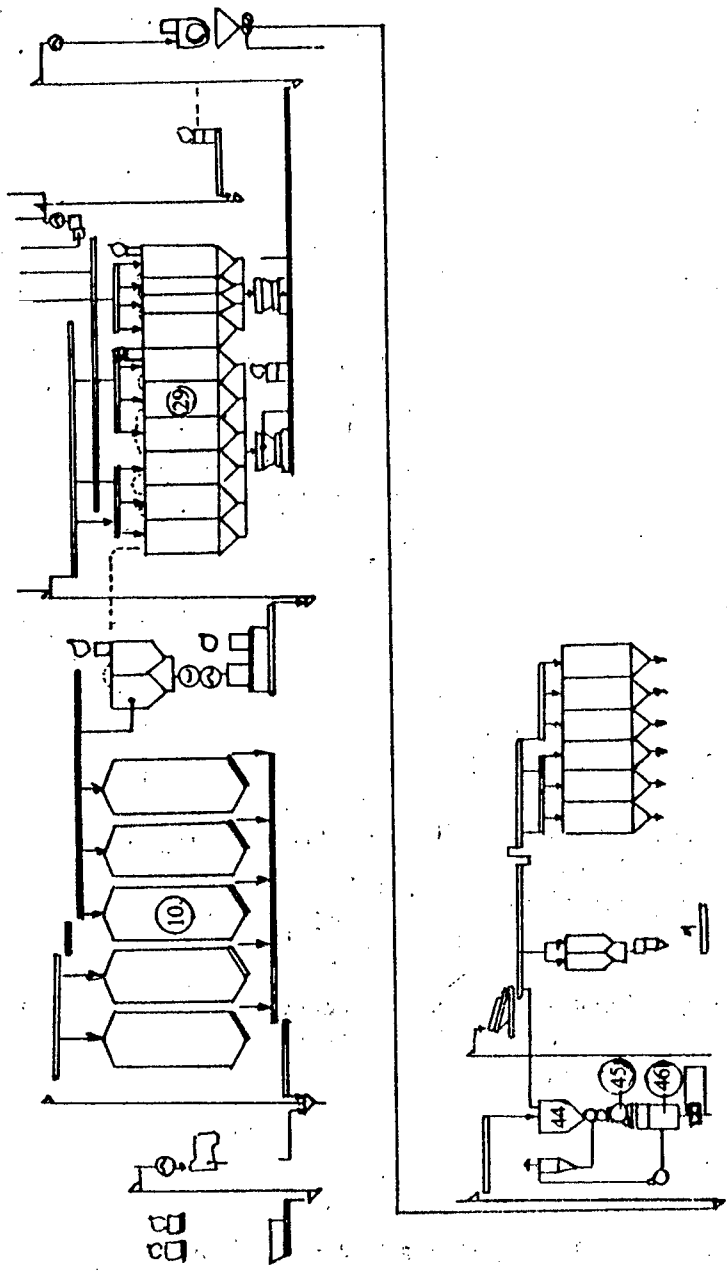
(Rp. 000)

Years	Investment Cost	Benefit	Cost	Earning Before taxes	Earning After taxes	Depreciation	Installments/Repayment	Cash Flow	Discount Factor 18 %	Present Value	Discount Factor 19 %	Present Value
0	- 1,159,093	-	-	-	-	-	-	-	1.0000	- 1,159,093	1.0000	- 1,159,093
1	-	1,190,062	1,711,577	278,485	187,015	58,275	107,093	138,197	0.8475	117,122	0.8403	116,127
2	-	2,154,153	1,808,756	345,397	230,508	58,275	96,444	192,339	0.7182	138,139	0.7062	135,830
3	-	2,518,242	1,907,942	410,300	272,695	58,275	96,444	234,526	0.6086	142,732	0.5934	139,168
4	-	2,482,332	2,006,366	476,966	315,378	58,275	96,444	277,209	0.5158	142,984	0.4987	138,244
5	-	2,546,423	2,097,721	548,702	362,656	58,275	96,444	324,487	0.4371	141,833	0.4190	135,960
6	- 75,000	2,310,514	2,278,330	532,184	351,920	58,275	96,444	313,751	0.3704	116,213	0.3521	110,471
7	-	2,975,647	2,308,773	666,874	439,468	58,275	280,444	217,299	0.3139	68,210	0.2959	64,298
8	-	3,138,694	2,402,904	755,890	484,329	58,275	96,444	446,160	0.2660	118,676	0.2487	110,957
9	-	3,301,927	2,499,188	802,739	527,780	58,275	96,444	489,611	0.2255	110,407	0.2090	102,328
10	-	3,466,373	2,596,479	870,394	571,756	58,275	96,444	533,587	0.1911	101,968	0.1756	93,598

PV = + 1,198,284 PV = + 1,147,081

IC = - 1,159,093 IC = - 1,159,093

NPV = + 39,191 NPV = - 12,012



GAMBAR 7. Diagram Arus dari Proses Pembuatan Ransum dengan kapasitas 10 ton per jam
(Feltwell & Fox, 1978)

Promill

N° BP. 109

28104 DREUX - CEDEX

F R A N C E