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5. Raising Dairy Cows for Small Holders Project
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8. Rubber Seedling Project
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9. Rice Mill Processing Project
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10. Poultry Project
by Mr Riaz Akhtar, Pakistan
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12. Wasteland Development Project
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by Ms Chandrika Samanthi Ramanayake, Sri Lanka
14. High Yield Seeds for Paddy Project
by Ms Sunee Karndee, Thailand
15. Jute Production Project
by Mr Pham Minh Duc, Vietnam.

REVISED

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : GARPARA CO-OPERATIVE FISH CULTURE PROJECT

Country : BANGLADESH

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CHAPTER-I Executive Summary

1. Name of the Project : Garpara Co-operative Fish Culture Project.
 2. Project area : Garpara Union.
 3. Total Project cost : Tk.70.00Lacs(10 lac is equalto 1 million)
 4. Source of fund : (a) Share capital Tk.20.00 lacs.
(b) Long term loan Tk.50.00 lacs.
- Share Capital : Long Term loan**
2 : 5 Or 28.57% : 71.43%
5. Debt Equity Ratio : 2 : 5 Or 28.57% : 71.43%
 6. Installed capacity : (a) Ruhi fish(Major carp) 23250 kg.
(b) Catla fish(Major carp) 11625 kg.
(c) Silver carp(exotic carp)37200 kg.
Yearly Total : 72075 kg.
 7. Expected capacity utilization : Ist year 85%, 2nd year 100% & onward.
 8. Product : Fish (3 varities).
 9. Implementation period : 6 (six) months.
 10. Organisational Management : 12 Members Board of Directors.
 11. Operational Management : 12 staff headed by Manager + casual labour.
 12. Project life(assumed) : 10 years.
 13. Target Group : Farmers of Garpara Union.
 14. Rate of interest : 15%
 15. Instalement of Loan : 11.50 Lacs.
 16. Financial Analysis Result :
 - (a) pay back period : 3.32 years.
 - (b) NPV : 5441
 - (c) BCR : 1.78
 - (d) IRR : 30.68%
- (e) **Sensitivity :**
- (i) At 10% lower price of commodity : Pay back period = 3.90 years
: NPV =3562
: BCR = 1.51
: IRR = 25.25%
 - (ii) At 50% higher cost of raw materials : Pay back period = 3.70 years.
: NPV =4348
: BCR =1.62
: IRR =26.90%

CHAPTER-2

2.0 Background :

Bangladesh is an agriculture based developing country. Its area is 143999 Sq.k.m. The major portion of the land consists of low, flat and fertile. A net work of rivers is important and their tributaries numboering 230 with a total length of about 24140 k.m. covering the country flow down to the Bay of Bengal. Bangladesh enjoys generally a sub-tropical monsoon climate. Total population of the country asper general censuss of 1991 is about 111.4 million having growth rate of 2.17%. The density of population per Sq.k.m. is 755 which has been indentified as No.1 problem of this country.

Agriculture is the main occupation of the people employing 66% of the labour force. This sector directly contributes around 35% to the gross domestic product. The rural poor having no education had to depend on agriculture and allied activites for income generation. In the event of crop failure they had no other alternative but to strive. With such events they had to borrow, but having no normal source of borrowing they borrowed from the local private money lenders at a very uncomfortable terms which led to loss of their land and other properties. The money lenders used to accept land and other properties as securities or hypothecation of future crop. But due to high rate of interest the farmers were never able to repay the loan infull and the compounding rate of interest made the loan amount manifold. So, it has been said that the farmers were born in debt, lived in debt and died indebt transferring the burden of debt on to the children. To face such situation and save the farmers from landlessness it is required to implement various types of agricultural projects which may create employment opportunities as well as value addition to their produces giving re-munerative prices.

Fisheries, one of the major sub-sectors of agriculture, plays a vital and dominant role in nutrition, employment generation, foreign exchange earning and other areas of economy. This sub-sector contributes about 80% of

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the nation's annual protein in-take, nearly 3.5% of the gross Domestic product and more than 12% as the export earnings of the country. So fish culture plays a very vital role in the economic growth of this country meeting demand of animal protein and in generating employment.

As per the perspective plan for Bangladesh the population of the country in 2000 is expected to be 131.00 million which will require daily in take of 24.55 grams of fish protein per head which is resulting annual demand of 0.96 million M.T of Fish. At present available rate of fish protein in-take is only 21.00 grams per head per day.

Inland fisheries resources are generated mainly from three sources-impound waters, inundated crop-fields and open water. Impounded water bodies in the form of ponds, dighis and tanks are scattered all over the country. There are 12,90,316 number of ponds in the country of which 48.35% are being used in fish culture. The remaining ponds are not being used for the purpose. About 30% of them are culturable and 21.65% are derelict. Total area of cultured, culturable and derelict ponds in Bangladesh is 205047, 100570 & 57560 acres respectively. If the culturable and derelict ponds can be brought under fish culture project, The country will be able to reach the terget of meeting animal protein needs and will help to improve the socio-economic condition of fishermen and others engaged in fisheries and create additional employment opportunities for poverty alleviation. Keeping the above view in mind I have identified the fish culture project to be implemented by the farmers on co-operative basis.

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2.1 Overall situation of the project area:

- The over all situation of the Project area is mentioned below :-

-	Area of Garpara Union	:	6.24 Sq.miles.
-	Population	:	20393
	(a) Male	:	10071
	(b) Female	:	10322
-	Number of villages	:	36
-	Farmer House-hold	:	3202
-	Actual cultivable land	:	3039 acres
	(a) One crop	:	365 acres
	(b) Two crop	:	912 acres
	(c) Three crop	:	1762 acres
-	Area of ponds	:	58 acres
	(a) Cultured	:	52 acres
	(b) Culturable	:	6 acres.

2.2 Details of agricultural production (1993-94):

Sl. No.	Name of crop	Cultivated land (in acre)	Production per acre (in k.g.)	Total Production in acre(in k.g.)
1.	Paddy(Hyv)	62	1163	72106
2.	Paddy(pazam)	34	935	31790
3.	Paddy(local)	78	600	46800
4.	Paddy(Aus)	9	952	8568
5.	Jute(Tosa)	5	209	1045
6.	Jute(local)	260	650	169000
7.	Wheat	90	700	63000
8.	Pulse(Mash)	15	300	4500
9.	Pulse(Masur)	12	300	3600
10.	Oil seed(Masur)	260	350	91000
11.	Tobacco	15	300	4500
12.	Spices	10	600	6000
13.	Vegetable	120	1500	180000
14.	Fish	10	900	9000

2.3 Existing co-operatives:

The Proposed Project will be situated in Garpara Union of Manikgonj Thana. At present there are 21 Agricultural Co-operative Societies, 12 Fishermen Co-operative societies and 69 others Co-operative societies in Manikgonj Sadar Thana. The amount of shares and deposit held by these societies are Tk.0.4 & Tk.0.6 million respectively. The agricultural Co-operative Societies in the Project Area are all most defunct due to lack of financial support. There are two agricultural co-operative societies, 1 weaver's co-operative society and 2 Milk producers' co-operative societies in the Project area.

2.4 Area of Project :

The Project will cover the whole area of Garpara Union. Membership will be open to all farmer house hold. A well organised co-operative society will be formed to ensure reasonable price for the produces of the members. The farm labourers will also be subsequently included in the co-operative so that they can be provided with employment opportunities for their livelihood.

2.5 Problems faced by the farmers:

In over all situation of this project area it has already been mentioned that in proposed project area there are 58 acres of ponds of which 52 acres of ponds are cultured. The rest of the ponds remain uncultured due to lack of proper knowledge and capital. The ponds which are already in culture does not give remunerative production as the system of culture is unscientific. The main factors are two :- (i) Lack of adequate knowledge about modern fish culture technique and (ii) Non-availability of credit at easy term. There is no farmers organization to provide credit, supply of input and marketing of fishes.

2.6 Need and justification of the project :

Fish production has failed to keep pace with its ever increasing demand due to increase of population although there is tremendous opportunity for development. As a result per capita availability of fish has declined over the years causing nutritional and others problems. Price of fish increasing day by day. Inadequate knowledge and information on fish culture, lack of proper management policy and modern fishing know-how, use of inefficient fishing equipments, in adequacy of processing, marketing and other facilities as well as credit are some of the major constraints for development of fish culture in Bangladesh. These problems can be over come only through a well organised co-operative society. Modern scientific fish culture techniques may be adopted through trained employees.

The members of the proposed project will get remunerative return as well as other additinal benefit out of the project through its implementation. Besides, the members will enjoy the ownership of this project. On the other hand it will be supportive to the nation in respect of food production. It will also develop co-operative sense in the people and thereby promote co-operative leadership. The project will encourage this people to come under the fold of co-operative to increase their income.

CHAPTER-3 **Project**

3.1 Objectives :

The main objectives of the Project is to increase the income of the members by providing remunerative price of the produces. The other objectives of project are mentioned below :-

- (i) Promote the continued growth of fish culture through co-operatives.
- (ii) Remove the impact of unemployment.
- (iii) Increase the availability of fish for domestic consumption.
- (iv) Make optimum use of the members' land/culturable ponds.
- (v) Stimulate systematic co-operative activities.
- (vi) Strengthen the co-operative movement.

3.2 Implementation period :

The implementation period of the project is 6(six) months.

3.3 Justification of the location :

The location of the proposed project area is well communicated to the capital city and rest of the country. The soil of the locality has good water containing capacity. The ponds in the area remains suitable for fish culture even in dry season. Fish fry can easily be procured from nearby Manikgonj, Bhat Baor and Krishnapur. Produced fish can easily be marketed to Dhaka and other parts of the country by road. The area selected for the project is not usually flood affected and as such there is no risk for undertaking fish culture there. The location of the project is shown in Annexure-1.

3.4 Project components :

There is only one product of this project. But the activities of the project may be divided into three stages such as (i) Raw material procurement(ii) Plant operation(fish culture) (iii) Marketing.

3.5 Procurement activities :

Fry of three species of Fish-Ruhi, Catla and Silver Carp, Chemical Fertilizer - Urea, T.S.P and Patash, Supplimentary food such as cow dung, husk/bran of pulse and paddy, medicine and lime are the main raw materials of the project. Fish fry can easily be procured from nearby hatchery of Manikgong, Bhat Baor and Krishnapur. Some hatcheries of these places are managed by the Department of fisheries of the Ministry of Fisheries and livestock of Bangladesh. Other hatcharies are managed by private ownership. Chemical fertilizer may be procured from the authorised dealer of Agricultural Development corporation managed by the Ministry of Agriculture. Supplimentary food like cow-dung, husk/bran of pulse and paddy will be procured from the members of the society as the member house holds are engaged mainly in Agriculture. Medicine like diptrex and patassium permanganate may be procured from the authorised dealer with the help of fisheries Department. Diptrex are used against fish louse like argulas, laranaya and irgasilas. These kinds of louse are the main cause of deadly epidemic of fishes. Another kind of fish disease is called gill putrefaction. Lime and patassium per manganate work against this type of disease. Lime can easily be procured from nearby market.

3.6 Culture operation :

Fish culture operation will include the following activities :-

- Food supply
- Checking
- Medicine
- Catching

3.7 Marketing :

It has been mentioned above that produced fish can easily be supplied to capital city Dhaka and other places of the country by road. Fish of

the project will be marketed to the following nearby sales centres. The mini truck of the project will be used for this purpose.

Market Segment	Distance from the project
Manikgonj	8 k.m.
Savar	45 k.m.
Dhaka City	70 k.m.

The sales supervisors will ensure timely sale of the product. It is expected that maximum fishes will be sold on the spot.

3.8 Integration :

- (a) The Farmers will form a primary co-operative society.
- Common objective.
 - Work together for common goal.

(b) **Horizontal integration :**

Primary Co-operative Society to Central Co-operative bank and Central Co-operative Bank to Bangladesh Samabaya Bank Ltd.

(c) **Vertical Integration :**

- (i) **Backward linkage :** Members to supply supplementary. Food & get employment on preferential basis.
- (ii) **Forward linkage :** Members to buy fish on preferential basis-health improvement through nutritional food to increase in come - better standard of living-boost fish culture - economic development of the country.

Products are to be marketed in urban centres which will fetch better price for the product.

Part of the profit of the society will be used to create educational facilities, health care centres etc. for the benefit of the members and the Village community.

CHAPTER-4
DETAILS OF OPERATION

4.1 Species:

According to the sample pond study conducted by the Directorate of fisheries of Bangladesh, it is observed that out of total cultured fishes share of three species named Ruhi(Major Carp), Catla(Major Carp) and silver Carp (Exotic) are high in the country. percentage of weight in culture of these species is 62%. So these species are popular in Bangladesh. The project will select only these species in culture.

4.2 Capacity utilization :

The utilization of the available capacity has been assumed as follows :-

year	% of utilization
1	85%
2 & on ward	100%

Net annual productivity at 100% efficiency will be as follows :-

Sl.No.	Species	production in kg.
1.	Ruhi (Major Carp)	23250
2.	Catla (Major Carp)	11625
3.	Silver Carp	37200
Total :		72075

4.3 Raw materials Requirement :

The main raw materials of the fish culture project are fry and food :-

(i) **Fry** : Fish fry will be purchased from nearby hatcheries which are running under both private and public ownership. Annual requirement of fries at 100% capacity is 1,40,000

(ii) **Food** :

(a) **Chemical Fertilizer Urea** : Annual requirement of urea per acre will be 600 kg. so total requirement of urea will be 20 acres x 600 =12000kg. The present rate of urea is Tk.6/- per kg.Total price of urea in a year is 12000 x 6 =Tk.72,000/-

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(b) T.S.P : Annual requirement of T.S.P per acre will be 600 kg. So, total requirement of T.S.P. will be 20 acres x 600 = 12000 kg. The present rate of T.S.P. is Tk. 9/- per kg. Total price of TSP in a year is 12000 x 9 = Tk. 1,08,000.

(c) Patash : " Annual requirement of patash per acre will be 300 kg. Total requirement of patash will be 20 acres x 300 = 6000 k.g. The present rate of patash is Tk 9/- per kg. So, total price of patash will be 6000 x 9 = Tk.54,000.

(d) Supplementary Food : For supplementary food such as cow-dung, husk/bran of pulse and paddy will be procured from the members of the society. Annual cost for these supplementary food is assumed to be Tk.72,000

4.4 Details of Culture :

Fish Fry :

Fish fry to be required at the beginning of the operation year is mentioned below :-

Sl.No.	Species	(Required) composition	for one acre	Total required fry
1.	Ruhi(Major carp)	40%	2000	20 acres x 2000=40000
2.	Catla(Major carp)	20%	1000	20 acres x 1000=20000
3.	Silver carp (Exotic Carp)	40%	2000	20 acres x 2000=40000
Total :		100%	5000	20 acres x 5000=100000

Pilferage and Mortality Rate :

Sl. No.	Species	Total fry	Pilferage 5%	Mortality(20%) at earlier stage	Catchable quantity
1.	Ruhi	40,000	2,000	8,000	30,000
2.	Catla	20,000	1,000	4,000	15,000
3.	Silver carp	40,000	2,000	8,000	30,000
Total :		1,00,000	5,000	20,000	75,000

There will be separate ponds for different types of fishes and their age groups.

It is assumed that from 1,00,000 fries, 75%, i.e 75,000 fishes will be caught from the ponds. After 6(six) months of the first year, the average weight(minimum) of each silver carp will be of 600 grams. As in the first half

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of the year pilferage rate will be 2.5%. So. it is expected that Silver carp will be caught for marketing after six months. It is expected that minimum price will be Tk.60.00. So total sales after 6(six) months of the first year will be 31000 x 600 = 18600 k.g. As such 18600 x 60 = Tk. 11,16000. After catching of 31,000 number fishes again 40,000 fries of Silver carp will be cultured in the ponds. So, at the end of the first year total number of fishes will be

Ruhi	=	30,000
Catla	=	15,000
<u>Silver carp</u>	=	<u>31,000</u>
Total=		76,000

It is assumed that at the end of the year, 100% of the Silver carp and 75% of the Ruhi and Catla will be caught from the ponds. so, total No. of catchable fishes at the end of the year will be :-

Ruhi	75%	=	22,500
Catla	75%	=	11,250
<u>Silver carp</u>	<u>100%</u>	=	<u>31,000</u>
Total=			64,750

At the end of the year average weight of each Ruhi and Catla will be 700 grams and Silver carp will 600 grams. So in the second half of the year total production will be as under :-

Ruhi	= 22500 x 700 grams =	15,750 k.g
Catla	= 11250 x 700 grams =	7,875 k.g
<u>Silver carp</u>	<u>= 31,000 x 600 grams =</u>	<u>18,600 k.g</u>
Total=		42,225 k.g.

The average price will be Tk. 60.00 per kg. So. total sales in 2nd half of the year will be Tk. 42,225 x 60.00 = Tk.25,33,500. Thus in the first year total Production will be 18,600 kg. + 42,225 kg. = 60,825 kg. x 60 = Tk.36,49,500.

Second year :

Ist half of the year Silver carp	=	31,000
<u>2nd half of the year Silver carp</u>	=	<u>31,000</u>
Total=		62,000

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Average weight = 600 grams
Total weight = 62,000 x 600 grams = 37200 kg.

25% of Ruhi of previous year	=	7500
<u>25% of Catla</u>	=	<u>3500</u>
Total	=	11250

Average weight of Ruhi and Catla will be 1(one) kg. So, total weight will be =11,250 kg.

75% of Ruhi of 2nd year.	=	22500
<u>75% of Catla of 2nd year.</u>	=	<u>11250</u>
Total =		33750

Average weight of each Ruhi and Catla will be 700 grams. So, total weight of Ruhi & Catla will be 33750 x 700 grams = 23625 k.g. Total production will be 37,200 kg. + 11,250kg. + 23,625 kg. = 72,075 kg. Minimum price per kg. will be Tk.60/-. So total sales in 2nd year will be 72075 x 60.00 = Tk.43,24,500. At 3% inflation in 2nd year, total sales will be 72075 x 61.8Tk.= 44,54,235.

4.5 Labour :

Salaries and wages may be increased @ 5% from year to year. In addition to that (Salaries) fringe benefit equivalent to 35% would also have to be provided.

CHAPTER-5
ORGANIZATION AND MANAGEMENT

5.1 Organizational structure :

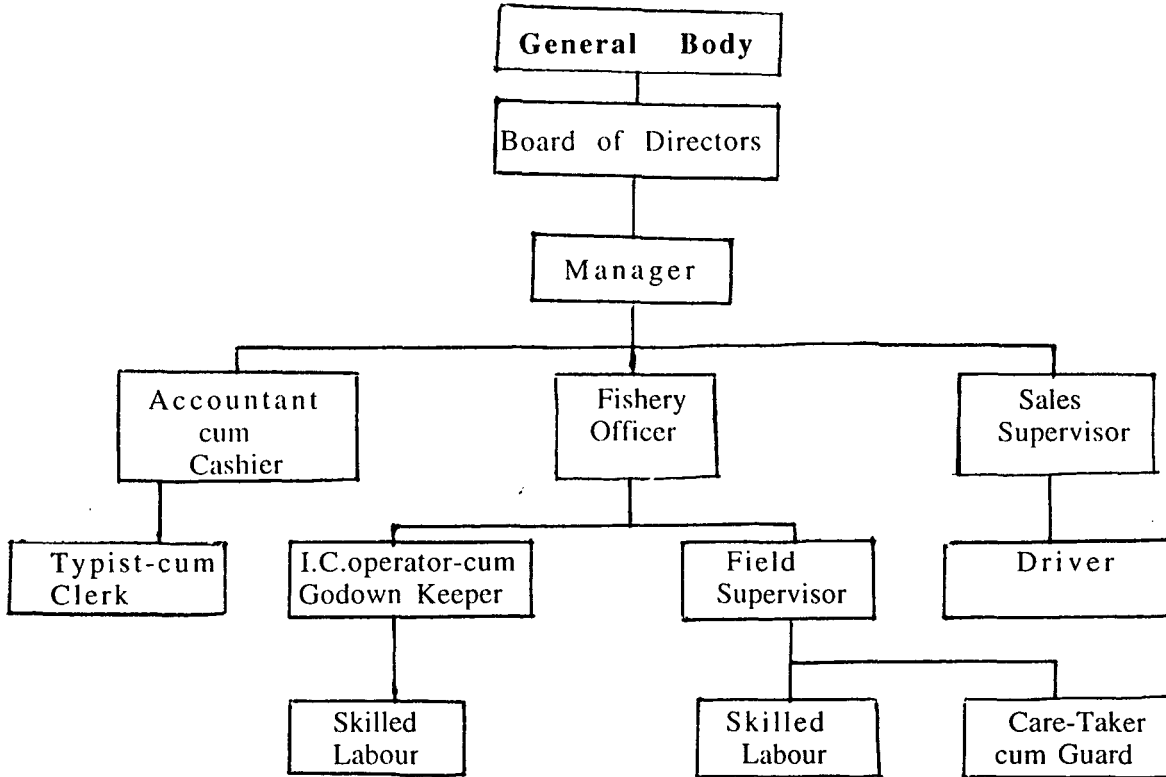
The project will be implemented by Garpara Union fish culture co-operative society Ltd. The final authority of the society shall vest in the general body of members in General Meeting. The management of the society shall vest in a Board of Directors consisting of 12 members. The one third of the Board of Directors will be nominated by the Government and the rest of the Directors including the Chairman and the Vice-Chairman will be elected from amongst the members by way of direct voting. The terms of Board of Directors will be of three years. The Power duties and functions of the Board of Directors will be as follows :-

- To admit members
- To raise funds, to invest funds
- To appoint salaried employees
- To prepare annual report and statement of accounts
- To convene annual general meeting

The Board of Directors will hold meeting at least once in every two months. They will be entitled to sitting fee and daily allowance as per provision of the co-operative societies Act and by laws of the society. the Board of Directors will formulate policies and provide guidelines for its business operation. The over all management of the project will be vested on the manager. The manager will be the chief executive who will manage the day to

day operation of the project. He will be assisted by the staff.

The Organizational Structure of the Society will be as under :-



Sl.No	Designation	No. of Posts.
1.	Manager	1
2.	Accountant-cum-Cashier	1
3.	Fishery Officer	1
4.	Sales supervisor	1
5.	Typist-cum-Clerk	1
6.	Field Supervisor	2
7.	Driver	1
8.	Ice Compressor Operator cum-Godown Keeper.	1
9.	Skilled Labour	2
10.	Care taker-cum-Guard	2
Total :		13

5.2 Details of Operational Management :

Sl. Mo.	Description	Qualification	Monthly Salary	Required Number
1.	Manager	Masters degree in Fishery (Experience 5 years)	7000	1
2.	Accountant cum-Chashier	Bachelor degree in Commerce. (Experience 5 years)	4000	1
3.	Fishery Officer	Bachelor degree in Fishery (Experience 5 years)	4000	1
4.	Sales Supervisor	Bachelor degree in Commerce. (Experience 5 years)	4000	1
5.	Typist-cum-Clerk	H. S.C. with typing (Experience 5 years)	3000	1
6.	Field Supervisor	H. S.C (Experience 5 years)	3000	2
7.	Driver	Class-VIII (Experience 5 years)	3000	1
8.	Ice Compressor Operator-cum-Godown Keeper.	Class-VIII (Experience 3 years)	3000	1
9.	Skilled Labour	-	2500	2
10.	Care taker-cum-Guard.	-	2000	2
Tota; :				13

The whole operation of the project will be managed by the employee under the guidance of the Board of Directors. Their duties and fundtions will be as under :-

Manager :

The society will recruit an effecient and qualified officer to act as manager of the project. During the implementation period of the project this

officer will get proper guidance from a consultant to be appointed by the society. The powers and functions of the manager will be as under :-

- Have control over the staff.
- Receive all money on behalf of the society.
- Pay all cost of management.
- Maintain proper and accurate accounts.
- Call meetings of the Board of Directors.
- Call Annual General Meeting.
- Implement the decision of the Board of Directors.

Accountant-cum-Cashier :

The accountant-cum-Cashier will receive and pay all cash on all transactions and maintain all books of accounts and records.

Fishery Officer :

The post of fishery officer is very important in the project as he will look after day today operation of fish culture. He is fully responsible to find out all problems in operation and solve them. He will procure fish fry, fish meal, fertilizer etc.

Sales Supervisor :

The sales supervisor will look after on market of fishes. He will contact the persons who are engaged in purchasing fishes on whole sale basis. He will furnish all the sale contact in whole sale market on behalf of the society.

Field Supervisor :

He will supervise the work of Guards and maintenance of ponds. He is responsible to supply fish meal, chemical fertilizer, medicine in the ponds under the instruction and guidance of fishery officer.

Ice compressor operator-cum-godownkeeper :

The Ice compressor operator-cum-goodown keeper will maintain Ice compressor machine. He will also maintain the stock of fish meal, fertilizer and surplus marketable fish in godown. He is also responsible to operate power pump machine during watering of ponds.

CHAPTER-6
FINANCIAL ANALYSIS

6.1 Details of project components :

Tk.70.00 Lac is the total cost capital of project. The details of which is shown in Annexure-2.

6.2 Land :

(a) Land for office building :

The cost of land for office building measuring 1125 sft. will be of the cost of Tk.5,200/- including stamp duty and registration fee.

(b) Land for godown & Ice Factory :

The cost of land for godown and Ice Factory measuring 1250 sft. will be of the cost of Tk.5,800.00 including stamp duty and registration fee.

(c) Land for ponds :

The cost of land for ponds measuring 10 acres will be of the value of Tk. 20,00,000.00 including stamp duty and registration fee.

6.3 Excavation of ponds :

The excavation of ponds of 10(Ten) acres at the rate of Tk.1,00,000.00 per acre will be a total of Tk.10,00,000.00.

6.4 Re-excavation of ponds :

Ten acres of leased ponds will be re-excavated. Re-excavation cost of one acre will be Tk.40,000.00. Total cost for re-excavation will of Tk. 4,00,000.00

6.5 Watering and preparation of ponds :

Watering and preparation cost will be Tk.5,500.00. per acre. Total cost for this purpose will be Tk.1,10,000.00. Details of cost for land and land development with specification has been shown in Annexure-3.

6.6 Office Building, Guard-Shed, Go-down-Cum-Ice Factory:

Office building, Guard shed, Godown-cum-Ice factory will be constructed covering side of the plot. It will be Semi-pucca Tin shed building consisting of different sections for accommodation of office, godown and Ice factory. 5(five) guard sheds will be constructed on suitable place. The cost of construction is estimated at Tk.10,29,000.00. Details of construction with specification has been shown in Annexure-4.

6.7 Machinery and Equipment :

One Ice compressor machine having a capacity of 5 MT per day will be procured from local market. Weighing scale handling equipments, water testing kit, fishing nets, fry carrying vessels, power pump machine, tubes for tube-well and other equipments will have to be purchased from the local market. It is estimated that the machineries and equipment will cost Tk.10,57,000.00 including installation. Details of machinery and equipments have been shown in Annexure-5.

6.8 Vehicles :

One mini truck, one motor cycle and 4(four) by cycles will be procured from local market. It is estimated that the vehicles will cost Tk.3,69,000.00.

6.9 Miscellaneous fixed assets :

The cost of office furniture, fixture and equipments have been estimated at Tk. 1,67,000.00. The details of vehicles, furniture, fixture and equipments have been shown Annexure-6.

6.10 Pre-operative expenses :

Pre-operative and other expenses during construction period have been estimated at Tk. 5,61,000.00 which is shown in Annexure-7.

6.11 Working capital :

Working capital has been calculated as per requirement. Margin money of the working capital will be 10%. working capital loan will be renewed every year. Details of working capital requirement is shown in Annexure-8.

6.12 Debt-Equity ratio :

The co-operative society will raise share capital to the tune of Tk.20,00,000.00 to support 28.57% equity money to the project. As per financial plan Tk. 50,00,000.00 will be arranged as long-term loan.

6.13 Production or catching of fish :

The details position of production or catching of fish is shown in Annexure-9.

6.14 Sales revenue :

The details of sales revenue is shown in Annexure-10.

6.15 Variable cost :

The variable cost for 10 years is shown in Annexure-11.

6.16 Fixed cost :

The fixed cost for 10 years is shown in Annexure-12.

6.17 Income :

The statement of income including contribution and net profit is shown in annexure-13

6.18 Net cash inflow :

The statement of net cash inflow is shown in Annexure-14

6.19 Pay back period :

Pay back period of the project is 3.32 years. Details is shown in Annexure-15.

6.20 Net present value :

Net present value of the project has been calculated at 15% discount factor for 10 years for Tk. 54,41,000.00. Details of calculation is shown in Annexure-16.

(21)

6.21 Benefit cost ratio :

At 15% interest or discount rate benefit cost ratio is 1.78. Details of calculation is shown in Annexure-16

6.22 Internal rate of return (IRR):

The internal rate of return of the project is 30.68%. Detail of calculation is shown in Annexure-17.

6.23 Sensitivity Analysis:

(a) At 50% higher cost of raw materials net cash inflow is shown in Annexure-18

Pay back period = 3.70 years Annexure-19

Net present value = 4348 thousands. Annexure-20

Benefit cost ratio = 1.62 Annexure-20

Internal rate of return = 26.90% Annexure-21

(b) At 10% lower price of commodity net cash inflow is shown in Annexure-22.

Pay back period =3.90 years. Annexure-23

Net present value = 3562 thousand. Annexure-24

Benefit cost ratio = 1.51 Annexure-24

Internal rate of return = 25.25% Annexure-25

(c) Summary of sensitivity analysis is shown in Annexue-26.

6.24 Debt service coverage ratio :

Calculation of debt service coverage ratio is shown in Annexure-27

6.25 Depreciation :

Depreciation has been computed on assets in the following rates :-

(a) Building : 5%

(b) Plant and equipments : 10%

(c) Vehicles : 15%

(d) Other fixed assets : 15%

Calculation is shown in Annexure -28.

6.26 Salvage value :

The salvage value is Tk. 4717 thousands. Details of salvage value is shown in Annexure-29.

6.27 Break even point :

The project will break even from the first year of its running. Break even point of the project come to 51.99% capacity utilization. Break even quantity comes at 3747 kg.(2nd year). Margin of safty is 34605 kg. Margin of sately is 48.01%. Detailed calculation is shown in Annexure-30.

6.28 Term loan repayment schedule :

The loan is proposed to be repaid in 8 annual statements starting from the 1st year of operation. The instalment will be Tk. 11.50 lacs including interest. This instalment will be equal upto seventh year. A schedule showing repayment of loan and payment of interest is shown in Annexure-31

6.29 Profit distribution :

As per provision of the co-opearative societies Act and Rules the profit will be distributed as under :-

- (i) Reserve fund 15% 28.75%
- (ii) Dividend(Maximum) 50%
- (iii) Contribution to co-operative Development fund 5%
- (iv) Contribution charitable purpose 10%
- (v) Bonus 6.25%

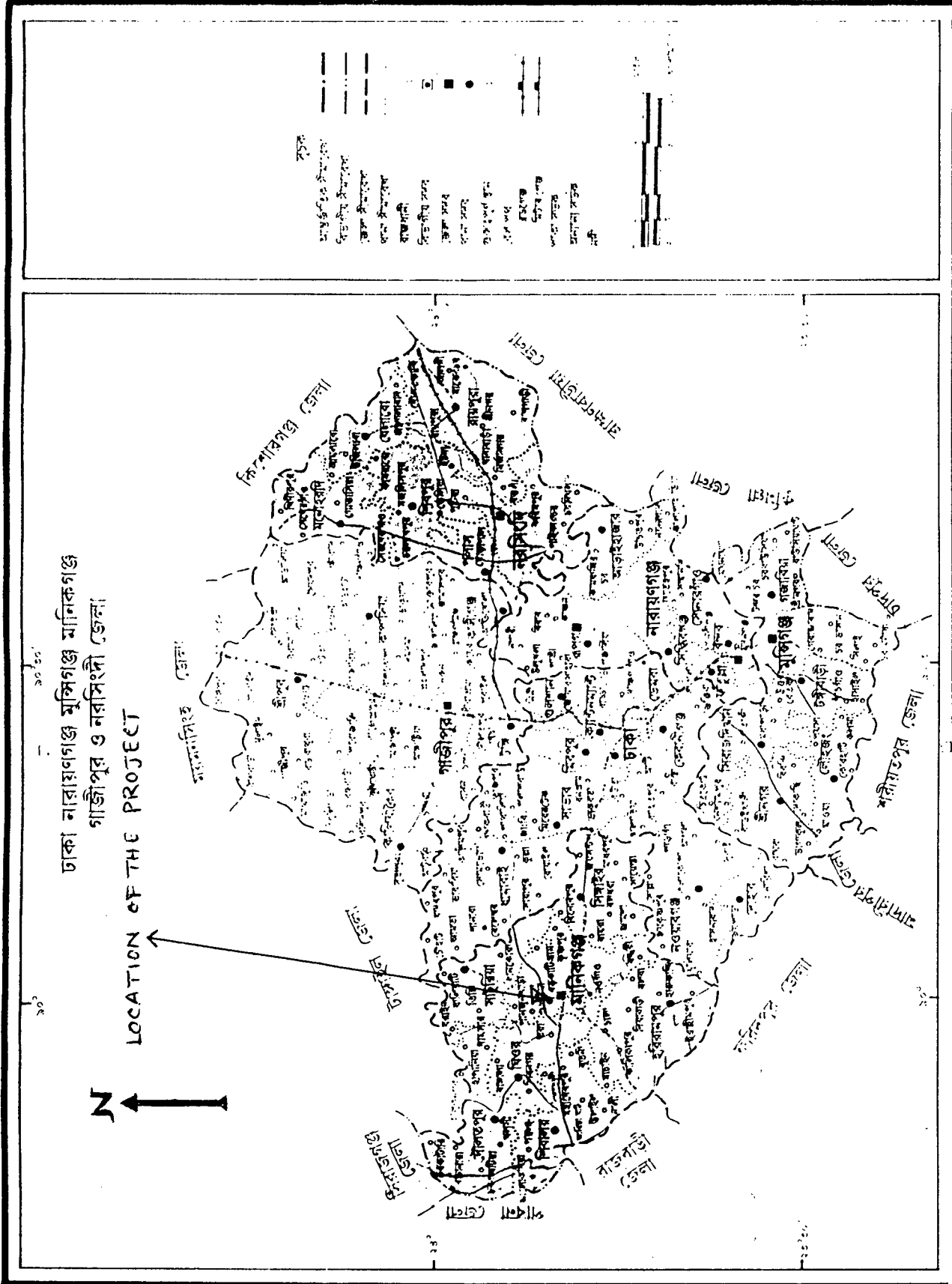
CHAPTER-7
RECOMMENDATION

Fisheries contributes about 80% of the nation's animal Protein in-take. so Fish culture plays a very vital role in the economic growth of the country meeting demand of animal protein and in generating employment.

The main objectives of the Project is to increase the income of the members by providing remunerative price of the produces and to promote the continued growth of fish culture through co-operatives. The proposed project is found financially rewarding economically viable and in terms of its objectives it has immense socio-economic impacts.

The members of the society will be able to buy fish and get employment on preferential basis. Income of the member will be increased and their better standard of living will be assured. Boosting of fish culture will develop the economic growth of the country. There is a provision in profit distribution that 10% of profit will be distributed for charitable purposes. Through this provision, creation of educational facilities, health care centre etc. will be possible for the benefit of the members and the village community. Besides, the society will be able to create further income generating activities and more people will get membership of the society. The project will use the culturable ponds of the project area. So, optimum use of the culturable ponds will be assured. Moreover, backward, forward and horizontal linkages will be established towards development strategy.

Therefore, the Project may be implemented.



CAPITAL COST OF THE PROJECT

(Figure in '000 Tk)		
Sl.No.	Particulars	Cost
1.	Land and pond development.(Annexure-3)	3521
2.	Office building, Ice Factory & Godown. (Annexure-4)	1029
3.	Machinery and equipments.(Annexure-5.)	1057
4.	Miscellaneous fixed assets.Annexure-6.	536
5.	Pre-operative expenses.(Annexure-7.)	561
6.	Margin money for working capital.(Annexure-8)	88
7.	Contingency (Technical know how & consumables)	208
Total :		7000

LAND FOR OFFICE BUILDING, PONDS, GODOWN-CUM-ICE FACTORY AND POWER DEVELOPMENT COST.

(Figure in'000 Tk)			
Sl. No.	Item	Area in acre	Estimated Cost
1.	Land for office building	45' x 25'=1125 sft=.025	5' 2
2.	Land for godown	40' x 20'=800 sft= .02	3' 7.
3.	Land for Ice factory	30' x 15'=450 sft= .01	2.1
4.	Land for Ponds	10 acres	2000
5.	Excavation of ponds (per acre 1,00,000/-)	10 acres	1000
6.	Watering of ponds	10 acres	40.
7.	Re-excavation of ponds (leased ponds)	20 acres	40 0
8.	Pond preparation	20 acres	70
Total :			3521

1 acre = 43560 sft.
Land price Tk. 2.00 lac per acre.

(26)

**DETAILS OF OFFICE BUILDING, GUARD SHED,
GODOWN-CUM-ICE FACTORY**

Annexure-4					
SL. No.	Item	Specification	Site & Area	Rate Tk/Stt	Estimated Cost in '000Tk.
1.	Office Building	5" brick wall, brick pillar, Rcc column, c.l. sheet roof over wooden truss, brick soiling floor 10'high.	1000 sft.	400	400
2.	Boundary fencing	Wooden pillar with gap of 8' & barbed wire 10' height.	300'	70	21
3.	Godown-cum Ice factory.	5" brick wall, 10" x 10" brick pillar, Ice factory=25'x15' godown= 30' x 15' C.I. sheet roof over wooden truss,brick soiling floor,ceiling height = 14'.	900 sft	400	360
(24)					
4.	Guard shed (Five)	Earthen floor,C.I. sheet fench, C.I. sheet roof over wooden truss.	12' x10'= 120' x 5'= 600 sft.	120 sft	20
5.	Toilet(Eight).	-	-	Tk.5500 per toilet.	44
6.	Electrification. & Sanitation.	-	-	-	70
7.	Other works.	-	-	-	20
8.	contingency.(10%).	-	-	-	94
Total :					1029

MACHINERY AND EQUIPMENT
WITH COST OF INSTALLATION

Sl. No.	Particulars of Machineries & Equipment	Number/Set	Value in '000 Tk.
1.	Ice compressor(capacity 5MT per day) company name - Bilzer, Italy.	1	120
2.	Weighing scale and handling equipment	1	12
3.	Water Testing kit	-	50
4.	Fishing Nets.	6	300
5.	Fry carrying vessels.	30	15
6.	Power pump(Main pump machine).	2	60
7.	Tube well.	20	200
8.	Ice can(for carring fish into market & preservation in godown with Ice) capacity 10 kg. per can.	150	300
Total :			1057

DETAILS OF OTHER FIXED CAPITAL REQUIREMENT

SL. No.	Particulars	Number	Estimated Value in '000 Tk.
1.	Mini Truck (Motor lorry) (Reconditioned)	1	275
2.	Full Secretariate Table	3	15
3.	Half Secretariate Table	3	9
4.	Cushion Chair	2	8
5.	Armed Chair	16	10
6.	Iron Safe	1	10
7.	Steel Almirah	5	25
8.	Rack	6	3
9.	Small Table	4	2
10.	Electric Fan	6	12
11.	Type Writer	1	20
12.	Calculator	4	4
13.	Motor cycle	2	86
14.	By-cycle	4	8
15.	Sign board	1	2
16.	Light fittings	-	5
17.	Telephone	1	20
18.	Torch	10	2
19.	Haricane	20	2
20.	Khat	4	8
21.	Miscellaneous	-	10
Total :			536

**PRE-OPERATIVE AND OTHER EXPENSES DURING CONSTRUCTION
PERIOD (TO BE CAPITALISED)**

		(Figure in Tk)
Sl.	Item	Estimated Cost.
1.	Establishment expenses(Salaries)	
	(a) Salary for Manager	42000
	(b) Salary for Accountant-cum-Cashier.	16000
	(c) Fishery Officer.	16000
	(d) Typist-cum-Clerk	12000
2.	Rent for ponds(lease cost)	50000
3.	Travelling expenses.	5000
4.	Interest on term loan.	375000
5.	Stationery.	5000
6.	Brokerage.	40000
Total :		5,61,000

WORKING CAPITAL REQUIREMENT

SL.No.	Item	Inflation rate	No.of months	Year											
				01	02	03	04	05	06	07	08	09	10		
1	Fish fry	3%	6	160	165	170	175	180	185	191	197	203	208		
2.	Chemical fertilizer.	3%	6	117	121	125	129	133	137	141	145	149	153		
3.	Supplement food.	3%	6	35	36	37	38	39	40	41	42	43	44		
4.	other con-sumables	3%	6	143	147	151	156	161	166	171	176	181	186		
5.	Cash require-ment for salary.	5%	6	375	394	414	435	457	480	504	529	555	583		
6.	Other Mise Exp.	3%	6	50	52	54	56	58	60	62	64	66	68		
Total :				880	915	951	989	1028	1068	1110	1153	1197	1242		
Margin money(10%)				88.0	91.5	95.1	98.9	102.8	106.8	111.0	115.3	119.7	124.2		
working Capital Loan.				7.92	823.5	855.9	890.1	925.2	961.2	999.0	1037.7	1077.3	1117.8		
Total :				880	915	951	989	1028	1068	1110	1153	1197	1242		
Interest on working capital @ 15%				118.8	123.5	128.4	133.5	138.8	144.2	149.9	155.7	161.6	167.7		

(31)

PRODUCTION OF FISH

Annexure-9

Sl. No.	Species	Ist yr 85%	2ndyr 100%	3rd yr 100%	4th yr 100%	5th yr 100%	6th yr 100%	7th yr 100%	8th yr 100%	9th yr 100%	10th yr 100%
1.	Silver Carp	37200	37200	37200	37200	37200	37200	37200	37200	37200	37200
2.	Ruhi	15750	23250	23250	23250	23250	23250	23250	23250	23250	23250
3.	Catla	7875	11625	11625	11625	11625	11625	11625	11625	11625	11625
Total :		60825	72075	72075	72075	72075	72075	72075	72075	72075	72075

SALES REVENUEAnnexure-10
(Figure in '000 Tk.)

Sl.No	Species	Sales					Revenue				
		Ist yr	2ndyr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
1.	Silver Carp	2232	2299	2368	2439	2512	2587	2565	2745	2827	2912
2.	Ruhi	945	1437	1480	1524	1570	1617	1666	1716	1767	1820
3.	Catla	472	718	740	762	785	809	833	858	884	911
Total :		3649	4454	4588	4725	4867	5013	5164	5319	5478	5643
Price per kg. (in Tk)		60.00	61.80	63.654	65.563	67.529	69.554	71.640	73.789	76.002	78.282

(33)

(Figure in `000 Tk)

Sl. No	Item	Year											
		1st	2th	3rd	4th	5th	6th	7th	8th	9th	10th		
4.	Fuel for vehicles and power pump.per month 700 litre 1-lit=Tk.14/-	118	118	118	118	118	118	118	118	118	118	118	118
5.	Kerosine for Haricane.	6	6	6	6	6	6	6	6	6	6	6	6
6.	Dry cell for torch.	3	3	3	3	3	3	3	3	3	3	3	3
7.	Bamboo.	10	10	10	10	10	10	10	10	10	10	10	10
8.	Repairs & Maintenance.	50	50	50	50	50	50	50	50	50	50	50	50
9.	Temporary labour.	30	30	30	30	30	30	30	30	30	30	30	30
10.	Electricity.	30	30	30	30	30	30	30	30	30	30	30	30
11.	Medicine & lime	15	15	15	15	15	15	15	15	15	15	15	15
12.	Misecllancous.	25	25	25	25	25	25	25	25	25	25	25	25
	Total :	753	753	753	753	753	753	753	753	753	753	753	753
	At inflation rate 3% from 2nd year.	753	776	799	823	848	873	899	926	954	983		
13.	Interest on working capital.	118.8	123.5	128.4	133.5	138.8	144.2	149.9	155.7	161.6	167.7		
	Grand Total :	871.8	899.5	927.4	956.5	986.8	1017.2	1048.9	1081.7	1115.6	1150.7		

(34)

(Annexure-12)
(₹. in '000 TK)**FIXED COST**

Sl.No	Item	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	6th yr.	7th yr.	8th yr.	9th yr.	10th yr.
* * 1.	Salaries Annual increment 5% from 2nd year (Annexure-32)	749.00	786.45	825.77	867.06	910.41	955.93	1003.73	1053.92	1106.62	1161.95
* 2.	Postage, Telegram & Telephone.	4.00	4.12	4.24	4.37	4.50	4.64	4.78	4.92	5.07	5.22
* 3.	Printing & Stationary.	12.00	12.36	12.73	13.11	13.50	13.90	14.32	14.75	15.19	15.65
* 4.	Travelling & conveyance.	25.00	25.75	25.52	27.32	28.14	28.98	29.85	30.74	31.66	32.61
5.	D.A & sitting fee of Directors.	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
6.	Honorarium of Chairman.	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
7.	Depreciation (Annexure-28).	237.55	212.35	190.14	170.54	153.23	137.90	124.32	112.26	101.54	92.00
* 8.	Rent for leased ponds.	50.00	51.50	53.05	54.64	56.28	57.97	59.71	61.50	63.35	65.25
* 9.	Advertising cost	10.00	10.30	10.61	10.93	11.26	11.60	12.18	12.55	12.92	13.31
* 10.	Miscellaneous.	15.00	15.45	15.91	16.38	16.87	17.38	17.90	18.44	18.99	19.56
Total :		1142.55	1158.28	1178.97	1204.35	1236.19	1268.30	1306.79	1349.08	1395.34	1445.55
11.	Less : Depreciation.	237.55	212.35	190.14	170.54	153.23	137.90	124.32	112.26	101.54	92.00
12.	Fixed cost without depreciation & interest on long term loan	905.00	945.93	988.83	1033.81	1080.96	1130.40	1182.47	1236.82	1293.80	1353.55

* provision of 3% inflation rate.

* * Provision of 5% increase on Salaries.

(35)

ANNEXURE-13

INCOME STATEMENT

(Fig. in 000TK)

Sl.No.	Particulars	Ist yr.	2nd yr.	3rd yr	4th yr	5th yr.	6th yr.	7th yr.	8th yr.	9th yr.	10th yr.
1.	Sales revenue	3649	4454	4588	4725	4867	5013	5164	5319	5478	5643
	Less : Variable cost (Annexure-11)	872	900	927	957	987	1017	1045	1082	1116	1151
2.	Contribution	2777	3554	3661	3768	3880	3996	4119	4237	4362	4492
	Less : Total fixed cost. (Annexure-14)	1893	1848	1820	1813	1694	1625	1544	1450	1396	1446
3.	Profit before Tax	884	1706	1841	1955	2186	2371	2575	2787	2966	3046
	Less : Tax(20%).	177	341	368	391	437	474	515	557	593	609
4.	Net profit.	707	1365	1473	1564	1749	1897	2060	2230	2373	2437
(1)	Contribution to Sales %	76.10	79.79	79.79	79.75	79.72	79.71	79.76	79.66	79.63	79.60
(2)	Net profit to Sales %	19.37	30.65	32.11	33.10	35.94	37.84	39.89	41.93	43.32	43.19

(36)

ANNEXURE-14

NET CASH INFLOW

(Fig. in 000 Tk.)

Sl.No.	Particulars	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	6th yr.	7th yr.	8th yr.	9th yr.	10th yr.
1.	Capacity utilization	85%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2.	Net sales.	3649	4454	4588	4725	4867	5013	5164	5319	5478	5643
3.	Total variable cost.	872	900	927	957	987	1017	1049	1082	1116	1151
4.	Interest on term loan.	750	690	621	608	460	357	238	101	-	-
5.	Depreciation(Annex-28).	238	212	190	171	153	138	124	112	102	92
6.	Other fixed cost(Annex-12).	905	946	989	1034	1081	1130	1182	1237	1294	1354
7.	Total fixed cost(4+5+6)	1893	1848	1820	1813	1694	1625	1544	1450	1396	1446
8.	Profit before Tax(2-3-7)	884	1706	1841	1955	2186	2371	2571	2787.	2966	3046
9.	Tax 20%	177	341	368	391	437	474	514	557	593	609
10.	Profit after Tax(8-9)	707	1365	1473	1564	1749	1897	2057	2230	2373	2473
11.	Salvage value.	-	-	-	-	-	-	-	-	-	4717
12.	Internally generated fund (5+10+11)	945	1577	1663	1735	1902	2035	2181	2342	2475	<u>7282</u>
13.	Net cash inflow(4+12)	1695	2267	2284	2343	2362	2392	2419	2443	2475	<u>7282</u>

CALCULATION OF PAY BACK PERIOD
(Normal)

(Figure in `000 Tk.)

Sl. No.	Particulars	Year 0	1st yr.	2nd yr.	3rd yr	4th yr	5th yr
1.	Capital cost.	7000					
2.	Net cash inflow.		1695	2267	2284	2343	2362
3.	Cumulative cash inflow.		1695	3962	6246	8589	10951
4.	Unrecovered Capital Investment.		-5305	-3038	-754	+1589	+3951

$$\text{Pay back period} = 3 + \frac{754}{2343} = 3 + .32 = 3.32 \text{ years.}$$

NPV AND BENEFIT COST RATIO

(Figures in `000Tk.)

Year	Investment cost	Net cash inflow	Discount factor at 15%	Present value cash inflow(Benefit)
0	7000			
1		1695	0.8696	1474
2		2267	0.7561	1714
3		2284	0.6575	1502
4		2343	0.5718	1340
5		2362	0.4972	1174
6		2392	0.4323	1034
7		2419	0.3759	909
8		2443	0.3269	799
9		2475	0.2843	704
10		7282	0.2472	1800
Total :				12450

$$\text{NPV} = 12450 - 7000 = 5450$$

$$\text{Benefit cost Ratio(BCR)} = \frac{\text{Present value}}{\text{Capital cost.}} = \frac{12450}{7000} = 1.78$$

INTERNAL RATE OF RETURN
(Normal)

(Figur 000 Tk)

Year	Net cash inflow	Discount factor at 30%	PV at 30%	Discount factor at 31%	PV at 31%
1	1695	.7692	1304	.7633	1294
2	2267	.5917	1341	.5827	1321
3	2284	.4552	1040	.4448	1016
4	2343	.3501	820	.3395	795
5	2362	.2693	636	.2592	612
6	2392	.2072	495	.1978	473
7	2419	.1594	386	.1510	365
8	2443	.1226	300	.1153	282
9	2475	.0943	233	.0880	218
10	7282	.0725	525	.0671	486
Total present value :			7080		6962

NPV at 31% = 6962 - 7000 = - 38(Negative)

NPV at 30% = 7080 - 7000 = 80(Positive).

$$\begin{aligned}
 \text{IRR} &= \text{LRD} + \frac{\text{NPV}_{\text{LRD}} - \text{NPV}_{\text{HRD}}}{\text{NPV}_{\text{LRD}} - \text{NPV}_{\text{HRD}}} \times (\text{HRD} - \text{LRD}) \\
 &= 30 + \frac{80 - (-38)}{80 - (-38)} \times (31 - 30) \\
 &= 30 + \frac{80}{80 + 38} \times 1 \\
 &= 30 + \frac{80}{118} \times 1 \\
 &= 30 + .68 \times 1 \\
 &= 30.68\%
 \end{aligned}$$

(39)

Annexure-18

SENSITIVITY ANALYSIS
NET CASH INFLOW AT 50% HIGHER COST OF RAW MATERIAL. (Fig. in crores)

Sl.No	Particulars	1st yr	2ndyr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
1.	Raw material cost.	466	466	466	466	466	466	466	466	466	466
2.	Raw material cost at 3% inflation from 2nd yr.	466	480	494	609	524	540	556	573	590	608
3.	50% higher price in each year.	699	720	741	764	786	810	834	860	885	912
4.	Other variable cost.	287	287	287	287	287	287	287	287	287	287
5.	3% inflation from 2nd year on other variable cost.	287	296	302	311	320	330	340	350	361	372
6.	Variable cost excluding interest on working capital (3 +5).	986	1016	1043	1075	1106	1140	1174	140	1247	1284
7.	Interest on working capital.	119	124	128	134	139	144	150	156	162	168
8.	Total variable cost(6 + 7).	1105	1140	1171	1209	1245	1284	1324	1366	1406	1452
9.	Earlier variable cost.	872	900	927	957	987	1017	1049	1082	1116	1151
10.	Excess cost at 50% higher price.	233	240	244	252	258	267	275	284	290	301
11.	Earlier net cash inflow.	1695	2267	2284	2343	2362	2392	2419	2443	2475	7246
12.	Net cash inflow(11 - 10).	1462	2027	2040	2091	2104	2125	2144	2159	2185	6945

SENSITIVITY ANALYSIS
CALCULATION OF PAY BACK PERIOD AT 50% HIGHER COST
OF RAW MATERIALS.

(Figure in `000 Tk)

Particulars	0 yr.	1st.yr.	2nd yr.	3rd.yr.	4th.yr.	5th.yr.
Capital cost	7000					
Net cash inflow		1462	2027	2040	2091	2104
unrecovered capital investment.		- 5538	- 3511	-1471	+ 620	+ 2724

$$\text{Pay back period} = 3 + \frac{1471}{2091} = 3 + .70 = 3.70 \text{ years.}$$

SENSITIVITY ANALYSIS
NPV AND BCR CALCULATION AT 50% HIGHER PRICE OF
RAW MATERIALS.

(Figure in 000TK)

Year	Net cash inflow	Discount factor at 15%	Present value
1	1462	.8696	1271
2	2027	.7561	1533
3	2040	.6575	1341
4	2091	.5718	1196
5	2104	.4972	1046
6	2125	.4323	919
7	2144	.3759	806
8	2159	.3269	706
9	2185	.2843	621
10	6945	.2472	1717
Total :			11156

$$\text{BCR} = \frac{\text{PV}}{\text{Capital Cost}} = \frac{11156}{7000} = 1.59$$

$$\text{NPV} = 11156 - 7000 = 4156$$

SENSITIVITY ANALYSIS
CALCULATION OF IRR AT 50% HIGHER PRICE OF RAW MATERIALS

(Figure in '000 Tk)

Year	Net cash inflow	Discount factor at 28%	Present value at 28%	Discount factor at 25%	Present value at 25%
1	1462	0.7812	1142	.8000	1170
2	2027	0.6103	1237	.6400	1297
3	2040	0.4768	973	.5120	1044
4	2091	0.3725	779	.4096	856
5	2104	0.2910	612	.3277	689
6	2125	0.2273	483	.2621	557
7	2144	0.1776	381	0.2097	450
8	2159	0.1387	299	0.1678	362
9	2185	0.1084	237	0.1342	293
10	6945	0.0847	588	0.1074	746
Total :			6731		7464

Capital Cost = 7000

NPV at 28% = 6731 - 7000 = - 269 (Neg)

NPV at 25% = 7464 - 7000 = 464 (Positive)

$$\begin{aligned}
 & \text{IRR} = \text{LRD} + \frac{\text{NPV}_{\text{hrd}} - \text{NPV}_{\text{lrd}}}{\text{NPV}_{\text{lrd}}} \times (\text{HRD} - \text{LRD}) \\
 & = 25 + \frac{464}{464 - (-269)} \times (28 - 25) \\
 & = 25 + \frac{464}{733} \times 3 \\
 & = 25 + 1.90 \\
 & = \text{IRR} = 26.90\%
 \end{aligned}$$

**SENSITIVITY ANALYSIS
NET CASH INFLOW AT 10% LOWER PRICE OF COMMODITY**

(Fig in 000 Ru)

SL.	Particulars	1st.yr.	2nd.yr.	3rd.yr.	4th.yr.	5th.yr.	6th.yr.	7th.yr.	8th.yr.	9th.yr.	10th.yr.
1.	Net sales. (at 10% lower price)	3284	4009	4129	4252	4380	4512	4648	4787	4930	5079
2.	Total variable cost.	872	900	927	957	987	1017	1049	1082	1116	1151
3.	Interest Invest on term loan.	750	690	621	608	460	357	238	101	-	-
4.	Depreciation.	238	212	190	171	153	138	124	112	102	92
5.	Other fixed cost.	905	946	989	1034	1081	1130	1182	1237	1294	1354
6.	Total fixed cost(3+4+5).	1893	1848	1820	1813	1694	1625	1544	1450	1396	1446
7.	Profit before tax(1-2-6).	519	1261	1382	1482	1699	1870	2055	2255	2418	2482
8.	Tax (20%).	104	252	276	296	340	374	411	451	484	496
9.	Profit after tax(7-8).	415	1009	1106	1186	1359	1496	1644	1804	1934	1986
10.	Salvage value.	-	-	-	-	-	-	-	-	-	4717
11.	Internally generated fund (4+9+10)	653	1221	1296	1357	1512	1634	1768	1916	2036	6795
12.	Net cash inflow(3 + 11).	1403	1911	1917	1965	1972	1991	2006	2017	2036	6795

SENSITIVITY ANALYSIS
CALCULATION OF PAY BACK PERIOD AT 10% LOWER PRICE OF
COMMODITY

Particulars	Figure in '000 TK.					
	O yr.	Ist.yr.	2nd yr.	3rd.yr.	4th.yr.	5th.yr.
Capital cost	7000					
Net cash inflow		1403	1911	1917	1965	1972
Unrecovered capital investment.		-5597	-3686	-1769	+196	+2168

$$\text{Pay back period} = 3 + \frac{1769}{1965} = 3.90 \text{ Years.}$$

SENSITIVITY ANALYSIS
BCR AND NPV CALCULATION AT 10% LOWER PRICE OF COMMODITY

year	Net Cash Inflow	Discount factor at 15%	Figure in '000 Tk.
			Present Value
1	1403	0.8696	1220
2	1911	0.7561	1445
3	1917	0.6575	1260
4	1965	0.5718	1124
5	1972	0.4972	980
6	1991	0.4323	861
7	2006	0.3759	754
8	2017	0.3269	659
9	2036	0.2843	579
10	6795	0.2472	1680
Total :			10562

$$\text{NPV} = 10562 - 7000 = 3562$$

$$\text{BCR} = \frac{\text{NPV} + C}{C} = \frac{3562 + 7000}{7000} = 1.51$$

SENSITIVITY ANALYSIS
IRR CALCULATION AT 10% LOWER PRICE OF COMMODITY

(Figure in '000 Tk.)

Year	Net cash inflow	Discount factor at 25%	Present Value at 25%	Discount factor at 26%	Present Value at 26%
1	1403	.8000	1122	.7937	1114
2	1911	.6400	1223	.6289	1202
3	1917	.5120	982	.5000	959
4	1965	.4096	805	.3968	780
5	1972	.3277	646	.3145	620
6	1991	.2621	522	.2500	498
7	2006	.2097	421	.1984	398
8	2017	.1678	338	.1575	318
9	2036	.1342	273	.1250	255
10	6795	.1074	730	.0992	674
Total :			7062		6818

$$\text{NPV at 25\%} = 7062 - 7000 = 62$$

$$\text{NPV at 26\%} = 6818 - 7000 = -182$$

$$\begin{aligned} \text{IRR} &= \text{LRD} + \frac{\text{NPV}_{\text{lrd}}}{\text{NPV}_{\text{lrd}} - \text{NPV}_{\text{hrd}}} \times (\text{HRD} - \text{LRD}) \\ &= 25 + \frac{62}{62 - (-182)} \times (26 - 25) \\ &= 25 + \frac{62}{62 + 182} \times 1 \\ &= 25 + \frac{62}{244} \times 1 \\ &= 25 + .25 \times 1 \\ &= 25.25 \times 1 \\ &= 25.25\% \end{aligned}$$

SAMMARY OF SENSITIVITY ANALYSIS

SL. No.	Critical Assumption	Pay back period (years)	NPV @ 15% (Tk.'000)	BCR @ 15% (Ratio)	IRR %
1.	Normal (Main results)	3.32	5441	1.78	30.68
2.	Product price Lower by 10%	3.90	3562	1.51	25.25
3.	Raw materials cost high by 50%	3.70	4156	1.59	26.90

DEBT SERVICE COVERAGE RATIO

Particulars	Figure in '000 TK.				
	Ist.yr.	2nd yr.	3rd.yr.	4th.yr.	5th.yr.
Net Profit	707	1365	1473	1564	1949
Add.Depreciation.	238	212	190	171	153
Add.Interest on term loan.	750	690	621	608	460
Total :	1695	2267	2284	2343	2362
Term loan <i>Instt.</i>	400	460	529	542	690
Interest on term loan(add)	750	690	621	608	460
Total :	1150	1150	1150	1150	1150
Debt service coverage ratio.	1.47	1.97	1.99	2.04	2.05

(46)

Annexure-28

COMPUTATION OF DEPRECIATION

(Fig. in 000 Rs)

Year	Building(5%)		Plant and equipment(10%)		Vehicles(15%)		Other fixed Assets(15%)		Total Annual Depreciation
	Value (end of period)	Depreciation	Value (end of period)	Depreciation	Value (end of period)	Depreciation	Value (end of period)	Depreciation	
0	1029.00	-	1057.00	-	369.00	-	167.00	-	-
1	977.55	51.45	951.30	105.70	313.65	55.35	141.95	25.05	237.55
2	928.67	48.88	856.17	95.13	266.60	47.05	120.66	21.29	212.35
3.	882.24	46.43	770.55	85.62	226.61	39.99	102.56	18.10	190.14
4.	838.13	44.11	693.49	77.06	192.62	33.99	87.18	15.38	170.54
5.	796.22	41.91	624.14	69.35	163.73	28.89	74.10	13.08	153.23
6.	756.41	39.81	561.73	62.41	139.17	24.56	62.98	11.12	137.90
7.	718.59	37.82	505.56	56.17	118.29	20.88	53.53	9.45	124.32
8.	682.66	35.93	455.00	50.56	100.55	17.74	45.50	8.03	112.26
9.	648.53	34.13	409.50	45.50	85.47	15.08	38.67	6.83	101.54
10.	616.10	32.43	368.55	40.95	72.65	12.82	32.87	5.80	92.00
Written down value	616.10		368.55		72.65		32.87		
Total Depreciation		412.90		688.45		296.35		134.13	1531.83

(47)

Annexure-29.

SALVAGE VALUE

(figure in '000Tk)

SL.No	Item	Writtens sdown value	
1.	Building	616.10	
2.	Plant & equipements	386.55	
3.	Vehicles.	72.65	
4.	Other fixed assets.	32.87	
Total :		1108.17	

Total written down value = 1108.17

Add. undepreciated capital(Land) = 3521.00

Add. Margin money 88.00

Total Salvage Value : 4717.17

BREAK EVEN QUANTITY AND MARGIN OF SAFETY

SL.	Particulars	1st.yr.	2nd.yr.	3rd.yr.	4th.yr.	5th.yr.	6th.yr.	7th.yr.	8th.yr.	9th.yr.	10th.yr.
1.	Production in kg.	60825	72075	72075	72075	72075	72075	72075	72075	72075	72075
2.	Total variable cost(in Tk.)	871800	899500	927400	956500	986800	1017200	1048900	1081700	1115600	1150700
3.	Average variable cost (in Tk.) 2 ÷ 1	14.33	12.48	12.87	13.27	13.69	14.11	14.55	15.01	15.47	15.97
4.	Price per kg. (in Tk.)	60.00	61.80	63.654	65.563	67.529	69.554	71.640	73.789	76.002	78.282
5.	Total fixed cost (in Tk.)	1893000	1848000	1820000	1813000	1694000	1625000	1544000	1450000	1396000	1446000
6.	Price - AVC (in Tk.) 4-3.	45.67	49.32	50.78	52.29	53.84	55.44	57.09	58.78	60.53	62.31
7.	Break even quantity in kg. (5+6).	41450	37470	35841	34672	31464	29311	27045	24668	23063	23207
8.	Margin of safety in kg. (1 - 7)	19375	34605	36234	37403	40611	42764	45030	47407	49012	48868
9.	Break even % (<u>Break even quantity x 100</u>) Total quantity. <u>7 x 100</u>	68.15	51.99	49.73	48.11	43.65	40.67	37.52	34.23	32.00	32.20
10.	Margin of safety in % <u>8 x 100</u> 1	31.85	48.01	50.27	51.89	56.35	59.33	62.48	65.77	68.00	67.80

Annexure-31

LOAN REPAYMENT SCHEDULE

(Figure in'000 Tk.)

Year.	Instalment	Interest	Total repayment	Closing Balance
0.	-	-	-	50,00,000.
	4,00,000	7,50,000	11,50,000	46,00,000
2	4,60,000	6,90,000	11,50,000	41,40,000
3	5,29,000	6,21,000	11,50,000	36,11,000
4	5,41,650	6,08,350	11,50,000	30,69,350
5	6,89,598	4,60,402	11,50,000	23,79,752
6	7,53,037	3,56,963	11,50,000	15,86,715
7	9,11,993	2,38,007	11,50,000	6,74,722
8	6,74,722	1,01,208	7,75,930	
Total	50,00,000	38,25,930	88,25,930	-

Annexure-32

CALCULATION OF WAGES & SALARIES(Figure in ~~000~~ Tk)

SL. Mo.	Designation	Number	Monthly Salary.	Annual Salary.
1.	Manager.	1	7000	84000
2.	Account ^{ant} and cum-Cashier	1	4000	48000
3.	Fishery Officer.	1	4000	48000
4.	Sales Supervisor	1	4000	48000
5.	Typist-cum-Clerk	1	3000	36000
6.	Field Supervisor.	2	6000	72000
7.	Driver.	1	3000	36000
8.	I.C. Operator-cum-godown keeper.	1	3000	36000
9.	Skilled Labour.	2	5000	60000
10.	Caretaker-cum-Guard.	2	4000	48000
Total :		13	43000	5,16,000

Total Annual Salary = 5.16 lacs.

Add. Fringe benefit @ 35% = 1.81 lacs.

Add. P.F. contribution @ 10% = 0.52 lacs

Grand Total = 7.49 lacs.

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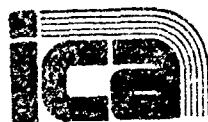
**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : CATTLE BREEDING, FATTENING AND SLAUGHTERING

Country : CHINA

Project Prepared by : Liu Hui

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February, 1996

Liu Hui

ACFSMC

Beijing, CHINA

Chapter 1 Summary

1.1 The project is cattle breeding, fattening, slaughtering and processing, which is a corporated programme between Beefalo Company of U.S.A and Zhongjia Business and Trade Company, an affiliated company of ACFSMC. The project will be implemented and run by a joint venture which will be formed and registered by above two companies.

1.2 The project is located in Fenglin and Dachang counties of Hebei province which are very near to Beijing and Tianjin, two biggest cities in north China.

1.3 The objects of this project are to meet an increasing demand in market, introduce improved breed and advanced management skills and techniques from abroad, increase the income of farmer members and cooperatives.

1.4 Total investment of the project is 31.98 million yuan (about 3.85 million U.S. dollars).

1.5 The sources of fund are from Beefalo Company (14.38 million yuan, 45% of total investment) and Zhongjia Company (17.6 million yuan, 55% of total investment). The investment of Zhongjia Company will be financed by ACFSMC investment fund (10 million yuan) and bank loan (7.6 million yuan).

1.6 The major components of the project are as follows:

Breeding farm

Fattening farm

Slaughtering and processing factory (including a cold storage house)

1.7 The capacities of this project are to breed 300 heads of calves, fatten 8,000 heads of beefs, and slaughter 25,000 heads annually. The capacity of cold storage is 500 tons.

1.8 The project will procure other cattle required for fattening and slaughtering from local farmer members. The main machinery and equipment of the slaughtering and processing factory will be introduced from Holland, other supplementary equipment and instrument will be purchased in domestic market.

1.9 All the beef products will be sold in Beijing and Tianjin markets.

1.10 The results of financial analysis of the project are as follows:

Payback periods:	3 years
NPV (10%):	53.17 million yuan
IRR:	37.5%

1.11 There will be 23 staff, 77 technicians and 110 workers employed in the project. Four experts from abroad will come to China to help the implementation of the project.

1.12 The farmers will get benefits from the project with 707.86 million yuan income increased. Moreover, the project will provide 210 employment opportunities to farmers, which means another income channel for the farmers.

1.13 The construction period of the project will be about 1 year.

Chapter 2 Background

2.1 Overall situation

2.1.1 After the economic reform started in 1978, the people's income has increased rapidly and their living standard has been improved. This transformation has brought a change in households' consumption structure on food which are shown on the following table.

Household food expenditure structure (%)

	Rural Area		Urban Area	
	1978	1994	1978	1994
Grain	65.3	41.7	22.85	14.20
Non-Staple Food	31.4	44.2	54.20	61.00
Other	3.3	14.7	22.95	24.80
Total	100.0	100.0	100.00	100.0

2.1.2 Especially, in recent years, there is an increasing demand for beef products along with the improvement of peoples' living standard. In Beijing market, the average consumption of beefs were 49.7 tons per day in 1990, but in 1994 it increased to 80 tons. In 1994, 60% consumption of beefs were supplied by local producers, 40% were purchased

from other places. Besides, many hotels and foreign embassies imported a lot of beefs from abroad to meet their special needs.

2.1.3 So it is high time for the supply and marketing cooperative, the farmers' organization, to positively participate in this field. As the apex organization, All China Federation of Supply and Marketing Cooperatives (ACFSMC) has made its decision to chose Zhongjia Company to undertake this task by taking advantages of the cooperatives' large marketing networks and facilities across the country.

2.1.4 For this reason, on Dec. 1995, the Zhongjia Company invited Beefalo Company which was interested in cooperating and investing in China, to visit some areas in north China. Two companies investigated the beef market and the conditions of cattle breeding in north China. They discussed and decided to cooperate in a project of cattle breeding, fattening, slaughtering and processing.

2.2 Project area

2.2.1 The project area, Fenglin and Dachang are two counties of Hebei province, which are very near to Beijing and Tianjin, two biggest cities in north China.

2.2.2 Fenglin county is located on the contiguous area of inner Mongolia Highland and North China Plain, 270 km north to Beijing. There is abundant water and grass resources with

491,000 hectares grassland and 32,400 hectares artificial grassland. One of the main crops is maize which provides enough supply for fine fodder for beefs production.

There has been a long history of cattle breeding in this county, and the local government thinks highly of it with credit and technical helps. Fenglin is the biggest county on cattle breeding in Hebei province with average cattle bred 1.5 heads per household. In 1994, 180,000 heads of cattle were produced and in 1995 it's estimated to be 210,000 heads. The half of total agricultural gross output value in the county is animal husbandry in which 60% is cattle breeding.

The county has began to improve the cattle breeds from 1970s. Now the percentage of improvement has reached 80%. There are 59,000 heads of improved female parent cattle. The livestock department of government has built a three-tier service system to provide technical guidance, epidemic prevention from village, township to county level.

2.2.3 Dachang county is located 90 km east to Beijing and 180 km north to Tianjin, so it is very near to harbour and airport with transport facilities, this great geographical advantage makes it convenient to market fresh beefs. Another advantage is that Dachang is a Muslim county, it has a long history on beef slaughtering and processing, and is famous for its high quality of beefs.

2.3 Though there are above advantages, the farmers are still faced some problems. First, farmers have no channel to

market their beefs, they are usually exploited by the middlemen and private traders. Secondly, there is no modern slaughtering and processing factory, so there is no benefits from beef processing as value addition. Thirdly, the farmers themselves can not yet afford all of the cattle which they want to breed, the local banks are also short of money to finance farmers' breeding. On the other hand, the local cooperatives' strengths are very poor, they are still struggling for their surviving. So this project is expected to solve above problems and benefit farmers and local cooperatives.

Chapter 3 Project

3.1 Project Description

This project is designed on the basis of discussion between Beefalo Company of U.S.A and Zhongjia Company of ACFSMC. The joint venture formed by two companies will introduce Beefalo parent cattle to crossbreed with the local female parent cattle so as to improve the breed of local cattle. The Beefalo cattle is a new breed which has been successfully bred in recent 20 years in America, it is highly appreciated by consumers for its high quality beefs with low content of cholesterol and by producers for its fast fattening with low cost. The breeding farm of the project will be the breeding centre and technical service centre to demonstrate and help farmers to breed the improved beef cattle. The fattening farm of the project will purchase the improved cattle bred by farmers, and the slaughtering and processing factory will process and market the beef products.

3.2 Detailed features

3.2.1 The project includes three parts: breeding farm, fattening farm, slaughtering and processing factory (including a cold storage house).

3.2.2 The Beefalo cattle breeding farm is located in Fenglin county, Hebei province, the area of farm is 1,000 hectares. The farm will import 4 heads of Beefalo cattle from U.S.A for breeding. At the first year, there will be 200 heads of female cattle on farm, the calves bred annually will be 114 heads. In the normal years, there will be 500 heads of female cattle on the farm, 300 heads of calves will be bred annually. Besides breeding, the farm will also serve farmers to mate Beefalo cattle with their female parent cattle.

3.2.3 The fattening farm is located in the Dachang county, the area of farm is 8.7 hectares. Normally, there will be 2,000 heads on farm, and annually 8,000 heads of beef cattle will be fattened and sold.

3.2.4 The slaughtering and processing factory, including a cold storage house, will be located in Dachang county near to the fattening farm. The area of the factory will be 1.3 hectares. The designed capacity is 39,000 heads of fattened cattle slaughtered annually. The normal capacity is 25,000 heads slaughtered and processed annually. The capacity of the cold storage is 500 tons.

3.3 Inputs

3.3.1 The project will introduce 4 heads of Beefalo parent cattle from America (2 male and 2 female, 84,000 yuan or 10,000 U.S. dollars per head) and purchase 500 heads of local parent cattle for improvement of breed in breeding farm. The project will also procure 8,000 feeder beef cattle and

25,000 heads of cattle from local farmers for fattening and slaughtering.

3.3.2 The manpower required by the project are from local farmers. The detailed distribution of the employees is shown on the table as follows. And there are four foreign experts coming to work for the project, 1 from Beefalo Company to impart the breeding technical skills, 3 from a Holland company to guide the installation of machinery in slaughtering and processing factory.

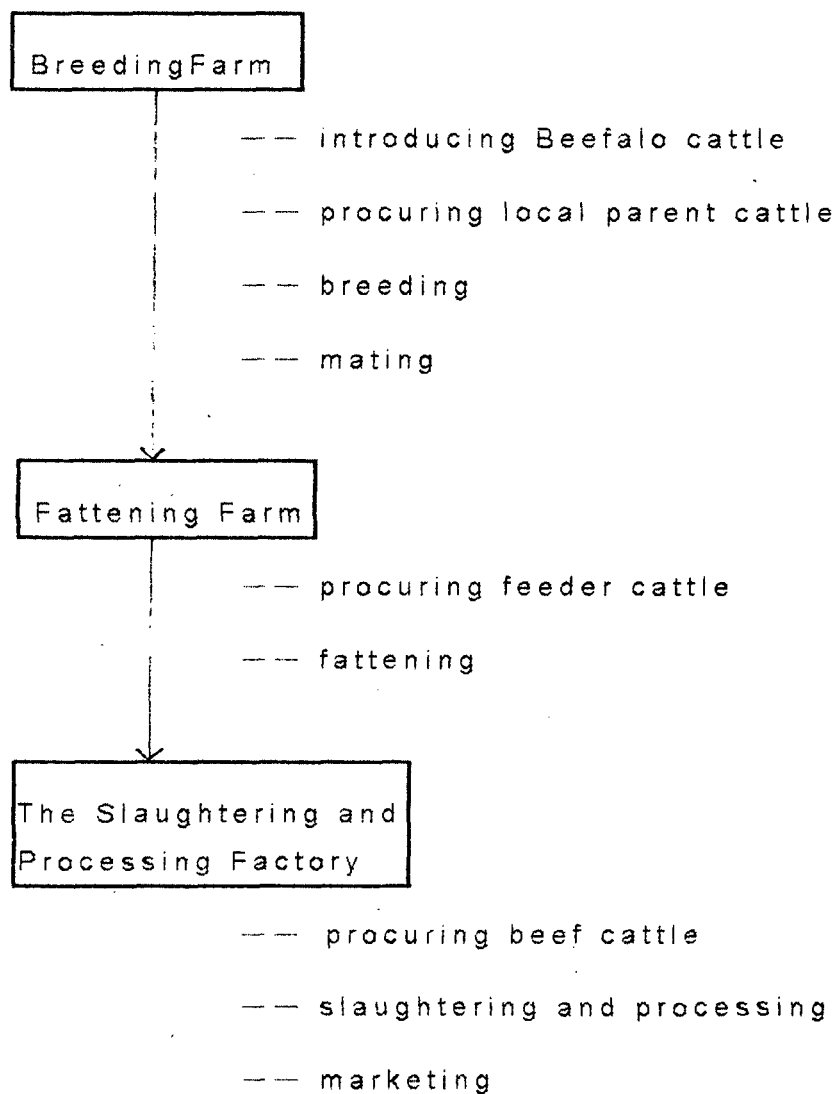
(in persons)

	Total	Administrative staff	Technicians	Workers
Breeding farm	15	3	4	8
Fattening farm	75	5	3	67
Slaughtering and processing factory	120	15	70	35
Total	210	23	77	110

3.3.3 The investment of the project will be 31.98 million yuan. The sources of the investment are 45% from Beefalo Company (about 14.38 million yuan or 1.73 million U.S. dollars) and 55% from Zhongjia Company (17.6 million yuan or 2.12 million U.S. dollars). The investment of Zhongjia Company will be financed by ACFSMC investment fund (10 million yuan) and bank loan (7.6 million yuan). Besides, additional investment of the project will be financed by the local bank as working capital loan.

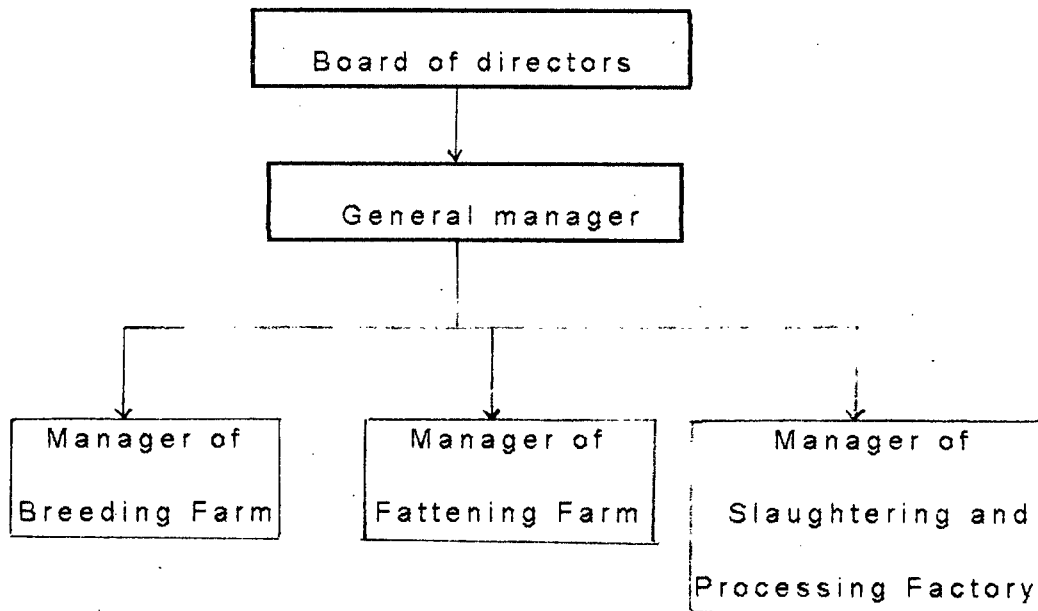
3.4 The beef products of the project will be sold on Beijing and Tianjin markets. As there is an increasing demand of beefs in market and good transport facilities of the project, there is no problem in marketing.

3.5 The integrated activities of the project are shown on the following chart:



3.6 Organization and management

3.6.1 There is a joint venture formed by Beefalo Company and Zhongjia Company to undertake this project. In the joint venture, there will be a board of directors which appoints a general manager to carry out the management policies and be responsible for the performance of the project. The organization of the project is shown on the chart as follows:



3.6.2 As shown on the above chart, the management of the project is under the leadership of the general manager and board of directors. The management policies of the project are:

— to ensure the effective marketing of beef products with good prices,

— to procure high quality beef cattle from local farmers for fattening and slaughtering,

— to attract and encourage farmers to raise new breed cattle with good services and good prices for their selling,

— to control and manage the process of production to improve the efficiency.

3.7 The implementation plan

3.7.1 The construction of the project will need 1 year, including the construction of farms and factory, the installation of machinery and equipment, the professional training of employees. This plan is shown on appendix 3.

3.7.2 After the construction of the project, the production will begin and gradually reach their normal capacities at the third year. This process is shown on the table as follows:

(in heads)

Year	1	2	3
Breeding Farm			
Breeding	114	200	300
Mating	46,000	60,000	100,000
Fattening Farm	8,000	8,000	8,000
Factory	15,000	20,000	25,000

Chapter 4 Financial Analysis

4.1 Basic Assumptions

The financial analysis of the project will be done according to the assumptions as follows:

1. The construction period will last for one year. The project period will be ten years.

2. The investment fund from Beefalo Company is share capital, the investment from Zhongjia Company will be financed by ACFSMC investment fund at interest rate of 3% and bank loan at the rate of 13.5%. The ACFSMC investment fund will be repaid in 4 years and the bank loan in 3 years, the detailed repayment schedule is arranged on the basis of discussion with creditors (appendix 4 for more details).

3. The project will be ensured by the local bank to provide working capital loan as required at the interest rate of 14.47%.

4. Breeding farm will be import 4 heads of Beefalo parent cattle with 84,000 yuan (10,000 U.S. dollars) per head, the breeding time will be 6 years. Besides, the farm will procure

female parent cattle from local farmers with 3,000 yuan per head, the breeding time of these cattle will be expected to be 10 years. These expenditure as additional investment will be financed by local bank as working capital loan and repaid at same year.

5. The cattle required for fattening and slaughtering will be procured from local farmers. The local cooperatives will be the agent to procure these cattle with a commission of 10 yuan per head.

6. The rents of grassland and land are 150,000 and 50,000 yuan yearly.

7. The depreciation rates of building and other fixed assets are 10% calculated by the straight method with 5% of salvage value. The repairs and maintenance are 50% of depreciation.

8. The salaries will be increased by 10 per cent every two years according to the labor contracts.

9. The breeding farm will sell calves with 1,600 yuan per head, and help local farmers to mate their female parent cattle with Beefalo cattle with a service charge of 30 yuan per head.

10. The fattening farm will sell the fattened beef cattle to the slaughtering factory of the project in market price of 4,250 yuan per head.

11. The average income from slaughtering and processing is 5,436 yuan per head.

12. The project will get a favored tax policy. According to the central government policies, the project will be exempted from income tax totally in first 2 years and 50% in the following 3 years. The local government will exempt the joint venture 12.5% from incremental tax, besides it will pay back 50% income tax of the joint venture from the 3rd to 5th years and total income tax at 6th and 7th years. The detailed tax calculation of the project is shown on appendix 10.

13. The net profit will be shared by two investors according to their proportion of the investment.

4.2 Investment of Project

4.2.1 The total cost of the project is estimated at 31.98 million yuan as follows:

(See appendix 5 for more details.)

(in million yuan)

Land	1.00
Building	12.16
Machinery	13.22
Miscellaneous Fixed Assets	3.27
Pre-operative Expenses	0.80
Contingency	1.53
Total	31.98

4.2.2 The fund of the project costs will be financed by the following sources. The weighted average cost of capital is 4.15%.

in million yuan		
Sources	Amount	Int.rate
1. Foreign Investment	14.38	—
2. ACFSMC investment fund	10.0	3%
3. Bank Loan	7.6	13.5%
Total	31.98	

The weighted average cost of capital:

$$14.38/31.98*0\%+10.0/31.98*3\%+7.6/31.98*13.5\%=4.15\%$$

4.2.3 As shown on the implementation plan and mentioned on the basic assumptions, there will be additional investment after construction on the breeding farm as follows:

Item	YR1	YR2	YR3
Import Beefalo Cattle	0.336		
Procurement of Local Parent Cattle	0.600	0.45	0.45
Total	0.936	0.45	0.45

This additional investment will be financed by the working capital of the joint venture and repaid at the same year.

4.3 Cost Analysis

The costs of the project are shown on table of the following page. The depreciation and interests are not included. The detailed features of the costs are on the appendix 6.

4.4 Working Capital

The total working capital required includes the additional investment at 1st and 2nd year. The working capital required will be financed by local bank at the interest rate of 14.47%. The calculation of working capital is shown on appendix 7.

Cost of the Project (in million yuan)

Year	1	2	3	4	5	6	7	8	9	10
Breeding Farm	1.06	1.19	1.47	1.47	1.48	1.48	1.49	1.49	1.50	1.50
Fattening Farm	33.42	33.42	33.47	33.47	33.53	33.53	33.60	33.60	33.67	33.67
Slaughtering Factory	69.92	90.98	112.40	112.40	112.53	112.53	112.67	112.67	112.83	112.83
Total Cost	104.40	125.59	147.34	147.34	147.54	147.54	147.76	147.76	148.00	148.00

Working Capital (in million yuan)

Year	1	2	3	4	5	6	7	8	9	10
Breeding Farm	2.00	1.64	1.92	1.47	1.48	1.48	1.49	1.49	1.50	1.50
Fattening Farm	4.72	4.72	4.77	4.77	4.83	4.83	4.90	4.90	4.97	4.97
Slaughtering Factory	11.07	14.60	18.16	18.16	18.17	18.17	18.18	18.18	18.19	18.19
Total WC	17.79	20.96	24.85	24.40	24.48	24.48	24.57	24.57	24.66	24.66
Int. of WC	2.57	3.03	3.60	3.53	3.54	3.54	3.56	3.56	3.57	3.57

4.5 Cashflow of the Project

(in million yuan)

Year	Inflow		Outflow		Net cashflow
	Revenue	Salvage Value	Investment	Cost	
0			31.98		-31.98
1	116.93		0.94	106.97	9.02
2	144.70		0.45	128.62	15.63
3	173.22		0.45	150.94	21.83
4	173.38			150.87	22.51
5	173.38			151.08	22.30
6	173.38			151.08	22.30
7	173.38			151.32	22.06
8	173.38			151.32	22.06
9	173.38			151.57	21.81
10	173.38	1.43		151.57	23.24
Total	1648.51	1.43	33.82	1445.34	170.78

Note: 1) The calculation of revenue is shown on the appendix 8.

2) Total cost excludes depreciation and interest on term loan but includes interests of working capital.

3) Salvage value is calculated in terms of building and other fixed assets (excluding parent cattle).

4.6 Profitability Analysis

4.6.1 The profit of the project is calculated on table 1 at the following page (See appendix 9 for more details).

4.6.2 The Beefalo Company and Zhongjia Company will share the total profit according to their proportion of investment as mentioned on basic assumptions. Of course, the depreciation will also be shared by two investors. The distribution of benefits that two investors can get from the project is shown on the table 2 at the following page.

But Zhongjia Company must repay the term loan and pay its interests, so the real profit/loss that Zhongjia Company will get is calculated at the table 3 of the following page.

Depreciation and salvage value	3.31	3.35	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.34	3.34	3.34	4.77	35.05
Interest on TL	1.99	0.81	0.15											2.95
Total net cashflow	6.00	11.60	16.79	17.47	17.26	17.26	17.26	17.02	12.51	12.34	13.77	142.02		
Beefalo Company(45%)	2.70	5.22	7.56	7.86	7.77	7.77	7.66	5.63	5.55	6.20	63.92			
Zhongjia Company(55%)	3.30	6.38	9.23	9.61	9.49	9.49	9.49	9.36	6.88	6.79	7.57	78.10		

Table 3 (in million yuan)

Year	1	2	3	4	5	6	7	8	9	10	Total
Share of profit	3.30	6.38	9.23	9.61	9.49	9.49	9.36	6.88	6.79	7.57	78.10
(-)Payment of int.	1.99	0.81	0.15								2.95
(-)Repayment of term loan	3.80	8.80	5.00								17.60
Total profit/loss	-2.49	-3.23	4.08	9.61	9.49	9.49	9.36	6.88	6.79	7.57	57.55

Table 1 (in million yuan)

Year	1	2	3	4	5	6	7	8	9	10
1. Revenue	116.93	144.7	173.22	173.38	173.38	173.38	173.38	173.38	173.38	173.38
2. Operation cost	106.97	128.62	150.94	150.87	151.08	151.08	151.32	151.32	151.57	151.57
Repayment of WC	0.94	0.45	0.45							
Depreciation	3.31	3.35	3.40	3.40	3.40	3.40	3.34	3.34	3.34	3.34
Interest on TL	1.99	0.81	0.15							
3. Profit before tax	3.72	11.47	18.28	19.11	18.90	18.90	18.72	18.72	18.47	18.47
4. Tax (production)	3.02	4.03	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04
Income tax(33%)										
5. Profit after tax	0.70	7.44	13.24	14.07	13.86	13.86	13.68	9.17	9.00	9.00

Table 2 (in million yuan)

Year	1	2	3	4	5	6	7	8	9	10	Total

4.7 Selected Financial Data

The detailed financial calculation is given on appendix 9, the main financial data is shown as follows:

Payback period (years)	3
NPV (million yuan)	31.26 53.17
IRR (%)	37.5

4.8 Sensitivity Analysis

Assumption	Payback period (years)	NPV (million)	IRR (%)
Original	3	53.17	37.5
Inflation of cost 5% increase	5	13.41	18.2
Change of tax policy	4	34.04	27.8

Notes: 1) The cost excludes depreciation and maintenance, salaries, interests.

2) The change of tax policy means no exemption from any tax.

Chapter 5 Benefits and Justification

5.1 Farmers' Benefits

5.1.1 As above chapters mentioned, the project will procure cattle for breeding, fattening and slaughtering, the farmers will get a lot of money for selling cattle. The farmers' benefits from the project directly is shown as follows:

(in million yuan)

Item	Amount	Remarks
Revenue (total)	884.25	Sale of cattle
from: Breeding farm	1.50	500*3000yuan/head
Fattening farm	224.00	8000*2800*10yrs
Slaughtering and processing factory	658.75	(15000+20000+25000*8-8000*10)*4.250
Cost (total)	176.39	Fodder & calves purchase, mating
on: Breeding farm	11.39	(114+200+300*8)*1600+235000*30
Fattening farm	72.00	8000*10*180*5
Slaughtering factory	93.00	(235000-80000)*120*5
Total net income	707.86	

Besides the direct income from the project, the local farmers will also get benefits from the project indirectly. First, the project will protect farmers from the exploitation of private traders who usually purchase farmers' cattle with price lower than in market. Secondly, the project will provide farmers new breed of cattle whose feeding duration is at least 20 days shorter than the cattle's which farmers are breeding now, this will save farmers' money about 90.6 million yuan. Thirdly, the project will provide local farmers more than 200 long-term employment opportunities.

5.2 Cooperatives' Benefits

The local cooperatives will help the joint venture to procure cattle required by the project as the agent, the commission is 10 yuan per head. Total commission the local cooperatives will get from the project is 2.355 million yuan.

(in million yuan)

Item	Commission Amount	Remarks
Procurement of		
parent cattle	0.005	500heads*10yuan
feeder cattle	0.800	8000*10*10yrs
fattened cattle	1.550	(235000-80000)*10
Total	2.355	

5.3 Justification

From above calculation and analysis, we get conclusions as follows:

1. The farmers will get 707.86 million yuan net income from the project and save their cattle breeding and feeding expenses about 90.6 million yuan. And farmers will get other benefits from the project such as employment, improvement of market circumstances.

2. The local cooperatives will get 2.355 million yuan commission from the project. And they will get benefits from the increase of supply and marketing of commodities which is brought about by the above increase of farmers' income.

3. The investors will be satisfied by the project with as high as 37.5% return rate. The Beefalo Company will get its investment back with 3 years pay-back period, and total 63.92 million yuan (about 7.61 million U.S. dollars) profit. The Zhongjia Company will get 57.55 profit at last.

Chapter 6 Recommendations

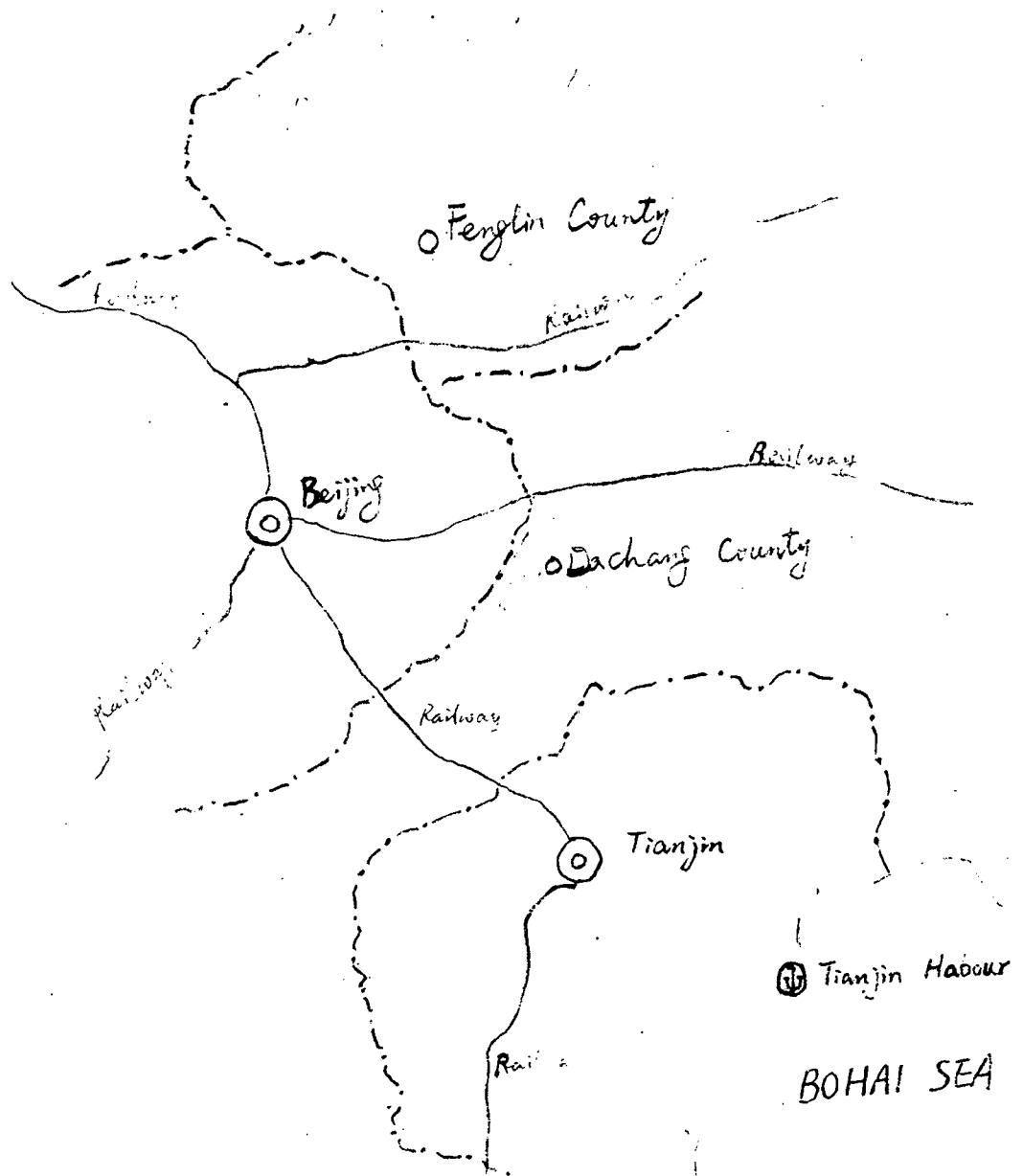
6.1 As farmers in the project area are suffering from the fluctuation of the market and exploitation of private traders, the local cooperatives in the project area are still struggling for surviving in the market with a poor strength, it is natural and inevitable duty for ACFSMC to help the farmers and cooperatives with implementation of the project.

6.2 With the development of the market economy, the competition in market becomes more and more fiercely. The beef cattle breeding, slaughtering and processing is a high profitable business, and more and more business companies are participating in this field, so the project mentioned and analysed above should be implemented as soon as possible.

6.3 One problem that the project will be possibly faced is the quarantine of the imported Beefalo parent cattle, because the government controls the import of animal strictly in case some animal infectious diseases come into China. The joint venture of the project should present the application of import of foreign cattle in advance.

Appendix 1

The Map of the Project Area



Appendix 2

The General Information of the Project Area

Item	Fenglin	Dachang	Total
Population (1000 persons)	362	106	468
Rural population (1000 persons)	331	92	423
Area (km)	8765	176	8941
Grassland (1000 hectares)	523.4	10.5	533.9
GNP (million yuan)	460	360	820
Gross output value of agriculture (million yuan)	303.5	132.3	435.8
Animal husbandry (million yuan)	93.38	44.3	137.68
Cattle on hand at end of year (1000 heads)	156	23	179
Net income per capita of farmers (yuan)	500	1350	685

Appendix 3

The Proposed Implementation Plan of the Project

Activities	Month	1996		1997		1997		1997		1997		1997		1997	
		Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May		
Construction of slaughtering and processing factory		Foundation			Structure		Fences & other								
Installation of machinery & equipment of the factory															
Training of staff members															
Training of technicians & workers															
Construction of fattening farm															
Construction of breeding farm															

Procurement of parent cattle

Appendix 4

The Repayment Schedule of Term Loan

(in million yuan)

Year	YR0(yr)	YR1	YR2	YR3
ACFSMC Investment Fund				
Repayment(10.0)	—	—	5.0	5.0
Interest (3%)	(0.15)	0.45(0.15+0.3)	0.3	0.15
Bank Loan				
Repayment(7.6)	—	3.8	3.8	—
Interest (13.5%)	(0.51)	1.54(0.51+1.03)	0.51	—
Total: Repayment	—	3.8	8.8	5.0
Interest	—	1.99	0.81	0.15

(3) Machinery	(0.37)		(0.45)	(12.4)	13.22
Machine and Installation	0.1		0.2	10.6	
Equipment	0.07				
Transportation	0.2		0.25	1.8	
(4) Miscellaneous Fixed Assets	(0.24)		(0.40)	(2.63)	3.27
Office Facilities	0.1		0.1	0.2	
Power Supply	0.1		0.1	1.3	
Water supply & drainage	0.04		0.15	0.3	
Sewage treatment				0.3	
Others			0.05	0.53	
(5) Pre-operative expenses				0.8	0.8
(6) Contingency	0.07		0.18	1.28	1.53
Total	1.33		3.74	26.91	31.98

Appendix 5

The Investment of the Project

(in million yuan)

Classification	Breeding Farm		Fattening Farm		Slaughtering & Processing Factory		Total	
	Quan.	Amount	Quan.	Amount	Quan.	Amount	Quan.	Amount
(1) Land	1000ha	0.15	8.7ha	0.05	1.3ha	0.8	1010ha	1.00
(2) Building	1350m	(0.50)	8850m	(2.66)	6000m	(9.00)	16200m	12.16
Cattleshed	800m	0.24	8000m	2.00				
Storage House	200m	0.06(fodder)	500m	0.2	800m	0.4(stock)		
Office & dorm	300m	0.12	350m	0.14	1500m	1.2		
Workshop					2000m	2.0		

Appendix 6

The Cost of the Project

Breeding Farm

(in million yuan)

Item	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
Fodder	0.3	0.53	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Salaries	0.21	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.15
Power	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Rent	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Maintenance	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Administration & overheads	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Depreciation	0.25	0.29	0.34	0.34	0.34	0.34	0.28	0.28	0.28	0.28
Total	1.31	1.48	1.81	1.81	1.82	1.82	1.77	1.77	1.78	1.78

Notes: 1 The 1st year salaries include a foreign expert's salary

2 In depreciation, 0.13 from building and other fixed assets and write-off, others are from parent cattle.

Fattening Farm (in million yuan)

Item	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
Procurement of cattle	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40
Fodder	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60
Salaries	0.54	0.54	0.59	0.59	0.65	0.65	0.72	0.72	0.79	0.79
Power	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Maintenance	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Commission	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Rent	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Administration and overheads	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Depreciation	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Total	33.79	33.79	33.84	33.84	33.9	33.9	33.97	33.97	34.04	34.04

Slaughtering and Processing Factory (in million yuan)

Item	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
Procurement of cattle	63.75	85.00	106.25	106.25	106.25	106.25	106.25	106.25	106.25	106.25
Salaries	1.42	1.18	1.3	1.3	1.43	1.43	1.57	1.57	1.73	1.73
Power	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Maintenance	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Commission	0.07	0.12	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Selling expenses	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Administration and overheads	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Depreciation	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
Total	72.61	93.67	115.09	115.09	115.22	115.22	115.36	115.36	115.52	115.52

Notes: 1. The procurement of cattle is 4,250 yuan per head in average. 8,000 heads of cattle are from fattening farm without commission.

2. The salary at the first year includes 3 foreign experts' salaries.

Appendix 7

Calculation of Working Capital (1st year)

Breeding Farm (in million yuan)

Item	Amount	Norms of months
Fodder	0.30	12
Salaries	0.21	12
Power supply	0.18	12
Rent of grassland	0.15	12
Maintenance	0.07	12
Administration and overheads	0.15	12
Required working capital	1.06	12
Investment financed by working capital	0.94	12
Total required WC	2.00	
Int. of WC (14.47%)	0.29	

Fattening Farm in million yuan

Item	Amount	Norms of months
Salaries	0.54	12
Maintenance	0.19	12
Rent of land	0.05	12
Fodder	3.20	4
Procurement of feeder cattle	0.56	3
Commission	0.02	3
Power	0.06	4
Administration & overheads	0.10	4
Working capital required	4.72	
Interest of WC (14.47%)	0.68	

Slaughtering and Processing Factory (in million yuan)

Item	Amount	Norms of months
Procurement of cattle	10.63	2
Commission	0.01	2
Salaries	0.12	1
Power	0.06	1
Maintenance	0.11	1
Administration and overheads	0.01	1
Selling expenses	0.13	1
Working capital required	11.07	
Interest of WC (14.47%)	1.60	

Appendix 8

The Revenue of the project

(in million yúan)

Year	YR1	YR2	YR3	YR4-10
Breeding farm				
Sales	0.00	0.18	0.32	0.48
Mating	1.38	1.80	3.00	3.00
Fattening farm	34.00	34.00	34.00	34.00
Slaughtering factory	81.55	108.72	135.90	135.90
Total	116.93	144.70	173.22	173.38

D	P.B.I.D.T	9.96	16.08	22.28	22.51	22.30	22.06	22.06	22.06	21.81	21.81
E	Repayment of WC	0.94	0.45	0.45							
F	Depreciation	3.31	3.35	3.40	3.40	3.40	3.34	3.34	3.34	3.34	3.34
G	Interest on TL	1.99	0.81	0.15							
H	Profit before tax (PBT)	3.72	11.47	18.28	19.11	18.90	18.72	18.72	18.72	18.47	18.47
I	Tax of production	3.02	4.03	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04
	Income tax (33%)							4.51	4.43	4.43	4.43
J	Profit after tax	0.70	7.44	13.24	14.07	13.86	13.68	13.68	9.17	9.00	9.00
K	PAT+Dep.+Int. of TL	6.00	11.60	16.79	17.47	17.26	17.02	17.02	12.51	12.34	12.34
L	Net salvage value									1.43	
M	Net Cashflow	-31.98	6.00	11.60	16.79	17.26	17.02	17.02	12.51	12.34	13.77
N	Payback period (3 years)	-31.98	-25.98	-14.38	2.41						
O	NPV (10%)										
P	IRR (%)										

Appendix 10

The calculation of Taxation

(in million yuan)

Item	YR 1	YR 2	YR 3
Incremental tax	2.63	3.51	4.39
Slaughtering tax	0.09	0.12	0.15
Education addition & Urban development tax	0.30	0.40	0.50
Total tax payment	3.02	4.03	5.04

Notes: 1) The incremental tax is calculated according to the formula:

$\text{Revenue} / 1.13 * 13\% - \text{Cost of procurement of cattle} * 10\%$

As there is a 12.5% exemption from the tax, the real incremental tax is the formula above timed by 87.5%. Only factory must pay this tax.

2) The slaughtering tax is 6 yuan per head of cattle which is slaughtered.

3) Education addition and urban development tax is 10% of the incremental tax which should be paid.

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

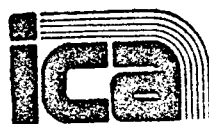
Title of Project : **DESICCATED COCONUT**

Country : **I N D I A**

Project Prepared by : **GEORGE KURIAKOSE**

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Trivandrum
February 1996

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CHAPTER - I

SUMMARY

1. This proposal envisages the possibility of establishing an integrated farming system for the beneficiaries of the Agricultural and Rural Development Bank, Kerala by linking credit with processing and marketing.
- 1.2 At present the Bank is engaged only in providing investment credit to the farmers of the State to meet their long term Agricultural Credit needs and no support is given for marketing or processing of their agricultural proceeds and they are left at the mercy of other co-operative organisations engaged in the field or to the middlemen.
- 1.3 The objective of this project is to increase the income of member farmers through value addition to the agricultural produce, at least in respect of certain cash crops, which are raised with the loan from the Bank.
- 1.4 It is imperative from the point of view of the institution that diversification of its activities is required as there is a saturation in regard to their traditional business.

- 1.5 The co-operative organisations which are already in the field of marketing and processing such as Marketing Federation, KERAFED etc have touched only a fringe of the problem and still there is wide scope for organising some such processing and marketing co-operatives under the auspices of Agricultural and Rural Development Bank which has a wide net work of Branches all over the State right from the village level to the State level.
- 1.6 The due date for the repayment of loan and payment of interest is linked with the harvesting of various agricultural produce. But it is a common phenomenon that the prices of agricultural produces will be the lowest during the harvesting season. In order to save the farmers from this difficult situation forward linkage is considered as the best remedy.
- 1.7 An agro-processing activity using the main agricultural produce of each (District) may be arranged with the financial and supervisory control of the Kerala State Co-operative ARD Bank as a part of its responsibility to guarantee a better price for the products.

- 1.8 The project proposed is for the setting up of a coconut based industry in Trichur District for the production of "Dehydrated coconut meat" which has a wide national and international market.
- 1.9 The product can be marketed through the supermarkets of State Consumer Federation inside the State and for export and upcountry sales, the assistance of Asian and Pacific Coconut community or NAFED etc may be availed. The important market places in the country are Bangalore, Madras, Bombay, Delhi and Calcutta.
- 1.10 The results of financial analysis of the project are as follows. Pay back period is 3 years, IRR is 35% NPV is 23.88.
- 1.11 The initial project cost is estimated at Rs.2.55 million which will be sourced out from member co-operatives by way of share capital, from member Banks, share capital contribution from Govt. and from the Kerala State ARD Bank.
- 1.12 Based on the computed data the project is financially viable and technically feasible.

CHAPTER - II

BACK GROUND

2.1 ROLE OF COCONUTS IN KERALA:

The significance of coconuts in Kerala and different coconut products are dealt with in this chapter.

The main agricultural crops of Kerala and the share in India's production during the year 1992-93 are as follows.

Product	Area (ha)	Production (tonnes)	Yield (Kg/ha)	Share in India's Production
a. Coconut	860500	4931000 (mln. nuts)	5730 (nuts/ha)	48%
b. Pepper	170670	48860	286	98%
c. Tea	34622	56250	1625	8%
d. Coffee	74794	25000	334	15.48%
e. Cardamom	39930	2424	61	80.80%
f. Natural Rubber	428864	368648	1164	93.69%
g. Arecanut	62333	59666	957	24.62%

In terms of our exports and foreign exchange, while pepper, cardamom, tea, coffee etc occupies a prime position, hardly there is any export of coconut products.

The coconut palm thrives well under an evenly distributed annual rainfall ranging from 1000 mm to 300 mm. The distribution of rainfall, drainage status and moisture holding capacity of the soil are more important. The palm requires a climate neither hot nor very cold. The coconut palm can tolerate a wide range of soil conditions. The major soil types that support coconut cultivation in India are laterite, alluvial, red sandy loam, coastal sandy and reclaimed soil with a pH ranging from 5.2 to 8.0.

The soil types occupying a major portion of the area of the state are suitable for coconut cultivation. The District wise production of coconut in the state for the year 1992-93 is given below.

<u>State</u> <u>Dist</u>	<u>Share in State</u> <u>Production (%)</u>
1. Kozhikode	15.22
2. Trissur	10.99
3. Malappuram	10.78
4. Trivandrum	10.70
5. Kannur	10.30
6. Ernakulam	8.18
7. Kollam	8.60
8. Alappuzha	6.97
9. Kasargod	5.52
10. Kottayam	4.61
11. Pathanamthitta	4.61
12. Palakkad	3.07
13. Idukki	1.49
14. Wynad	0.14

	100%
	=====

The National Bank for Agriculture and Rural Development Bank (NABARD) is an institution accredited with all matters relating to credit for Agriculture. With the refinance facility available from NABARD, the State Agriculture and Rural Development Bank, the State Co-operative Bank, the Scheduled Banks and Regional Rural Banks are providing both long term and short term loans to the farmers.

Life span of a coconut palm is around 50-60 years. A coconut palm could take 5-7 years to bear fruits. Once in every two months a crop can be harvested and there will be six crops in a year. The average monthly yield of coconut in Kerala is given below.

Annual yield of Coconut in Kerala

January	6.4%	August	7.7%
February	7.7%	September	6.5%
March	9.8%	October	5.6%
April	14.1%	November	6.5%
May	11.7%	December	6.0%
June	9.8%	Total	----- 100 % =====
July	8.2%		

From the above table it can be seen that the coconut production is comparatively low during the period from October to January. But during the heavy season, the farmers find it difficult to sell their products at a remunerative price, due to lack of holding power on farmers, which at times are just around 60-70% of the regular price. In order to manage their coconut cultivation profitably, the coconut growers are required to get a good farm-gate price.

Coconut is not a highly perishable fruit. The coconut can be kept for 3 months without processing after picking, and hence there is a chance for someone could speculate the market before selling which is highly risky.

2.2 COCONUT PRODUCTS:

Coconut has a variety of uses. It is estimated that about 50% of the coconut produced in the State is used for household consumption leaving the rest for being processed as copra. About half of the per capita vegetable fat available in the state is accounted for by coconut oil. The coconut husk available in the state supports the coir industry, which provides employment for about 3.5 lakh workers. The value added in the coir sector is about Rs.50 crores annually.

Thus every part of the palm is useful to mankind in one way or the other. It supports food, drink, fuel, shelter and also raw material for a number of industries.

The tender nuts are valued both for the sweet water which is rich in pottassium, glucose and other minerals and the gelatinous kernel which is a delicious food. The matured coconuts are used for copra making, for the manufacture of desiccated coconut and coconut cream, for edible purposes as fresh kernal, for religious offerings and for raising seedlings.

2.3 ADMINISTRATION AND MONITORING OF COCONUT PRODUCTION AND INDUSTRY:

Coconut is the most important plantation crop grown in Kerala. It is the second most important crop in terms of cultivated area in the state, the first being paddy. Out of the total cropped area of about 3 million hectares in 1992-93 in Kerala about 30% was under paddy and 28% was under coconut. About a third of the value of agricultural output is from coconut.

Kerala is the prime producer of coconut in India, accounting for about 60% of the area under the crop in India. However, the relative position of Kerala with

regard to its contribution to total production of coconut in India has changed over the years from 70% in 1964-70 to 48% in 1992-93. This decline was mainly on account of the decline in productivity due to the incidence of root wilt disease and inadequate use of inputs. Various surveys conducted in this regard revealed that the incidence of disease was around 15% for the state as a whole in early seventies has been increased to 25% in early eighties. The present strategy is to increase the production of coconut in the state by increasing the area under cultivation and to increase the productivity of existing gardens through intensive cultivation practices like irrigation, manuring etc.

The Govt. of India has established a Coconut Development Board on 12th January 1987 under the administrative control of the Ministry of Agriculture, Government of India, with its head quarters at Kochi, in Kerala. The Coconut Development Board undertakes various projects/schemes in the field of production and distribution of planting materials, expansion of area under coconut etc.

2.4 PROBLEMS FACED BY FARMERS:

Though coconut palm supplies raw materials for a number of industries such as Copra making, oil extraction, desiccated coconut, coconut cream, coconut water, coconut toddy, coir products, coconut shell based products, coconut leaves and coconut wood, but none of the above industries except copra making, oil extraction, coir products and coconut leaves have been developed. As a result the price of the coconut is purely dependent on the ups and downs of the prices of copra and oil in which the farmers have no control. Thus in most occasions the farmers are being exploited by the organised copra dealers and oil mill owners. Hence for the farmers to get a remunerative price, some more industries based on coconut will have to be developed, especially as the coconut cultivation becomes non-remunerative along with the sharp decline in the prices of coconut.

The Government have declared coconut as an oil seed and a floor price for copra have also been fixed to help the farmers.

2.5 NEED AND JUSTIFICATION FOR THE PROJECT:

In view of the multi faceted problems faced by our coconut growers and the urgent need to improve their income from agricultural activities, the establishment of a coconut based industry is proposed.

The Govt. of Kerala is providing all assistance for increasing the cultivation and production of coconuts. The Govt. is also declaring awards for the best coconut cultivator viz. "Kerakesari" on an yearly basis which includes cash award and citation. In spite of all these, the arrangement for the processing and marketing of coconut products is seen inadequate and hence the promotion of one co-operative society for the processing of coconut under the auspices of Kerala State Co-operative Agricultural and Rural Development Bank is recommended.

The cocout processing society is proposed to be started at Trichur District, one of the major coconut producing centre of the State, which is about 85 Kms away from Kochi, the port city of Kerala. The share of coconut production of Trichur District in the total production of the State during 1992-93 was about 11%.

CHAPTER - III

THE PROJECT

3.1 OBJECTIVES:

1. The main objective of this projet is to enhance the income of the coconut growers by processing their coconut and producing desiccated coconut which can be marketed within the country or can be exported to any part of the world.
2. To assure a remunerative price to the farmer's produce by protecting them from middlemen's price manipulations.
3. To provide farmers with extension service to increase productivity.
4. To establish a Co-operative Processing Society to provide forward integration.

3.2 LOCATION:

The proposed co-operative society can be started at Trichur District, which is well connected by rails and roads with other parts of the state. The proposed site is only about 85 Kms. away from the Kochi Port, the export zone of the State.

3.3 AREA OF OPERATION:

The area of operation of the society may be limited to Trichur District. At present two Primary Agricultural and Rural Development Banks are functioning in the District and they meet the credit requirement of the farmers. Within the area of operation of the Society there are no factories for the production of disiccated coconut.

The Society will be supervised and financed by the Kerala State Co-operative Agricultural and Rural Development Bank.

3.4 MEMBERSHIP:

The membership of the proposed Society may be issued to the Primary Agricultural and Rural Development Banks functioning in the Distirct. All coconut cultivators in the District who own at least half an acre of coconut garden can become the members of the proposed society.

3.5 FUNCTIONS OF THE SOCIETY:

The main function of the Society is to purchase the coconuts produced by its members and to give them a remunerative price by processing.

The Society will mainly concentrate on the production of desiccated coconut. At present, the coconut produced by the farmers, irrespective of its quality, are taken for copra processing. Hence the farmers who produce good quality nuts are not getting a remunerative price. In desiccated coconut processing good quality nuts are required and thereby an attractive price can be given to such farmers.

At present the price of nuts are purely dependent on the price of copra as there is no alternative for fixing the price. With the introduction of desiccated coconut processing, a competitive price can be emerged. Since the Society's motive is not profit maximisation, but to give the best possible price to the members, the Society can play a vital role in the price fixing policy.

Unlike any other crop, coconut cultivation is a very long term investment which takes 6-7 years to yield. Hence by the time when the yielding begins and if the price goes down, the farmers are not in a position to change the crop of the land easily. So the Co-operative Bank which finances the cultivators has a responsibility to guarantee future market for coconuts, at least to minimize the risk of the farmers regarding future demand for coconuts. The society can

ensure the future market for coconuts by maintaining international quality standards of desiccated coconuts produced and thereby to fetch a higher price for its produce.

3.6 COMPONENTS OF THE PROJECT:

1) FORMATION:

a) The Society will be located in the sub-urban area of Trichur Municipality which is about 85 Km away from Kochi, the port city of Kerala. The ideal location of the society makes it easy to collect and transport raw materials and finished goods.

b) The area of the Society's premises will be 50 cents of land and 4000 m² building.

c) The major parts of construction of the Society building are as follows:

- building construction for collecting, de-husking, hatcheting, paring, washing, dry section and attached facilities such as office, store room etc.

- set up machinery for disintegration, drying, packing etc.

(See Appendix - 2 for more details of the factory facilities)

2. PROCUREMENT OF RAW MATERIALS AND MARKETING:
- a) Shares of the Society may be allocated according to the acreage of the farmers. Supply of nuts may be linked to the shares held separately for heavy season and lean season.
 - b) Coconut will be purchased from the members. Price will be determined by the weight of the kernel. Good quality nuts would fetch a better price than the low quality nuts.
 - c) As soon as the coconuts have been picked by the farmers it has to be registered with the Society. According to the chronological order of the registration, coconut will be transported to the Society free of charge by its own vehicle. The coconut will be ready for processing after 30 days of picking.
 - d) Coconuts will have to be husked by the huskers of the Society and graded in the Society as No. I and No. II and No. 3 coconuts.
 - e) A random sample of 100 nuts will be drawn separately from each heap and process upto kernal weight.

- f) Daily production of desiccated coconut will be apportioned according to the Kernel weight and calculate the price per 1000 nuts for each member.
- g) Full payment will be made after 30 days, after processing. At the time of procurement about 75% of the value of the registered nuts based on market price will be paid.
- h) The Board of Directors may determine the purchase price of coconuts depending upon the forward sales.

3. PROCESSING:

The processing of desiccated coconut is comparatively simple. The final yield of desiccated coconut will depend on the maturity and the weight of fully matured husked nuts. The colour, taste, and smell are the main factors to be protected while processing. The product should also be free from foreign materials. Production process must be carried out as hygienically as possible. Since the product is directly used for human consumption without further processing, great care must be taken to ensure that there is no bacterial contamination while processing. Coconut kernal is highly perishable and it has to be processed within 2 hours after removing the shell.

Moisture content of the Kernel is 55%. This has to be reduced to 3% by ovening at a temperature of 95°C. The desiccated coconut packed in bags could be kept for 6 months.

4. QUALITY CONTROL:

In order to maintain high quality standards it is very important to have a laboratory within the factory premises. Each and every stage of production should be checked with laboratory tests to ensure that salmonella or any other type of a germ has not entered into the product.

5. BASIC CHARACTERISTICS OF THE PRODUCT:

The approximate composition of the product is given below.

<u>Component</u>	<u>Approximate %</u>
Moisture	3%
Fat (66-70%)	67.5%
Carbohydrate	5.9%
Protien	9.3%
Ash (minerals)	2.4%
Fibre	3.9%
Pentosan	3.9%

- a) The taste and smell of desiccated coconut should be sweet and pleasant.
- b) It should be free from all undesirable flavours such as Cheesy, Smoky, Soapy, Sour etc.
- c) Bactrial count should be less than 5000 per one gram of desiccated coconut.
- d) Entrobacterial count should be less than 100 per gram of desiccated coconut.
- e) It should be free from salmonella and other contaminations.
- f) Fine grade of D.C can contain only 20% medium grade and the medium grade can contain only 20% fine grade.
- g) According to the tintometer test colour should be as follows:
 - 1) Red - less than 0.2
 - 2) Yellow - less than 0.7
 - 3) Blue - less than 0.1

C. MARKETING:

A study conducted by the Coconut Development Board has revealed that a growing consumer demand for

desiccated coconut could be developed in the country by resorting to organised market promotion activities for the popularisation of the product in consumer packs for household uses. The survey has also shown that desiccated coconut in consumer pack is acceptable not only in non-coconut producing states but also in Kerala. From the survey it was revealed that sizeable section of the middle class and upper class families residing in cities and towns in Kerala would prefer desiccated cocout, if readily available, to raw nuts.

In India the production of desiccated coconut industry is still in its infancy though there is an increasing demand for the product in the food industry. It is a very important commercial product having demand all over the world in the confectionery and other food indstries. The present demand for desiccated coconut all over the world is met by Sri Lanka and Philippines on an equal basis. The major consumer of the product are the U.S.A., West Germany, Australia, Canada, the Netherlands, Denmark, South Africa, Sweden, Belgium and New Zeland.

For marketing the product aborad and upcountry the assistance of Coconut Development Board, NAFED and Asian Pacific Coconut Community and Co-operative Consumer Federation of the State may be used

after obtaining necessary licence from the Govt. At present it is decided to market only within the country.

7. BY PRODUCTS:

Parings is a by product of dessiccated coconut which has a marketable value. The parings which amount to 12 to 15% of the Kernal are usually sundried/ovendried and pressed for oil, known as paring oil and the yield being 60 to 62%. The oil is of inferior quality and finds use in Soap manufacture. 40 Kgs of parings would be obtained for one m.tonne of desiccated coconut. When processing the parings the output will be as follows:

Oil	-	61%
Poonac	-	35%
Normal Loss	-	0.4%

		100%
		=====

Parings poonac also have a local market. The society will sell out the dried parings to the local oil extraction units.

The other by-products are as follows.

1. Husk - Rs.250 per 1000 husks
2. Broken Shells - Rs.150 per 1000 shells
3. Coconut Water - not taken into account

The coconut shell can be sold out. Industrial oil could be extracted out of coconut water; 3.5 Kg of majan oil could be obtained out of coconut water in 1000 nuts. For the time being the society is not processing it, as there is no facility for processing locally.

CHAPTER - IV
DETAILS OF OPERATION

4.1 TRANSPORTING OF COCONUT:

Nuts will be transported to the Society by tractors/lorries owned by the Society. Nuts will be counted in the presence of the owner and a receipt will be issued before moving the nuts from the gardens.

4.2 HUSKING OF COCONUTS:

Fully matured nuts which have been kept for one month will be used for desiccated coconut. Husking of coconuts may be done by the Society. Husking is done manually and the huskers will be paid on piece-rate basis. A skilled husker will husk about 1500 to 2000 nuts per day.

4.3 SORTING OF NUTS:

This is a highly skilled job. All the nuts will be sorted by a special gang who will be paid on daily pay basis.

4.4 HATCHETING:

The dehusked nuts are carefully chipped by a special type of small axe and the shells removed.

This is a highly skilled job and a skilled hatcheter can remove the shells of about 1500 to 2000 nuts in an eight hour working day. The payment is made on a piece-rate basis.

4.5 SHAVING:

The whole kernal when removed from the shell will be covered with a surface layer of brown testa which has to be removed. This has to be done very carefully manually and payment is made on a piece rate basis. This is a section where a lot of supervision is needed. If shaving is not done properly it will affect the quality of the product and if shaving is done more vigorously, out-turn will be low and the income will also be reduced. A female labourer can complete the paring of about 1000 nuts in one day.

4.6 WASHING:

The pared kernels will be collected in steel tanks for washing. Washing will be done in two stages and wages paid on piece rate basis. The pared kernels will be sliced into two to release the coconut water. The coconut water is led into the settling tanks and the surface scum when formed are removed and boiled to get majan oil and

the resulting press cake has a high fertilizer value. The oil is not derived from the coconut water but it is from the pored surface of the kernel.

4.7 **STERILIZATION:**

The kernel pieces after thorough washing are sterilized by passing through large tanks containing boiling water for a period of 90 seconds with the help of screw conveyors. This would enable to kill the germs if any in the coconut kernel.

4.8 **DISINTEGRATOR:**

Sterilized coconut kernel will be sent through a conveyor into the disintegrator. Here the kernel is disintegrated into small particles or according to the market requirements.

4.9 **DRYING:**

This is the most crucial part of the process. Disintegrated wet coconut will be fed into the dryer through a conveyor. In this process 55% moisture content in raw coconut kernel will be reduced up to 2 to 3 percent. Drying temperature is 100 C. Drying capacity is around 150 Kg. per hour. Drying time is about 7 hours per day.

4.10 SIFTING AND PACKING:

Dried desiccated coconuts are graded as fine, medium and coarse depending on the size of particles. Desiccated coconut is fed into the sifter through a conveyor/feeder. Graded desiccated coconut is packed into bags according to the buyers requirements.

4.11 SEALING AND STITCHING:

Desiccated coconut is packed in thick polythene bags which will be sealed by a polythene sealer and the outer craft paper bags will be stitched properly by a stitching machine.

4.12 LABELLING AND MARKETING:

All the desiccated coconut bags produced is labelled containing serial numbers, so as to identify each bag for quality checks. The date of production, the grade, weight etc. will be clearly marked on the bags.

Good desiccated coconut will be crisp, snow white in colour with a sweet, pleasant and fresh taste of the nuts.

CHAPTER - V
ORGANISATION AND MANAGEMENT

5.1 MANAGEMENT POLICY:

The Management of the Society will be vested with a Board of Directors consisting of representatives of farmers, primary co-operative banks and State Agricultural and Rural Development Bank.

Every decision concerning the operation of the society will be taken according to the bye-laws and Kerala State Co-operative Agricultural Rural Development Banks Act and Rules, keeping in view the interest of the farmers.

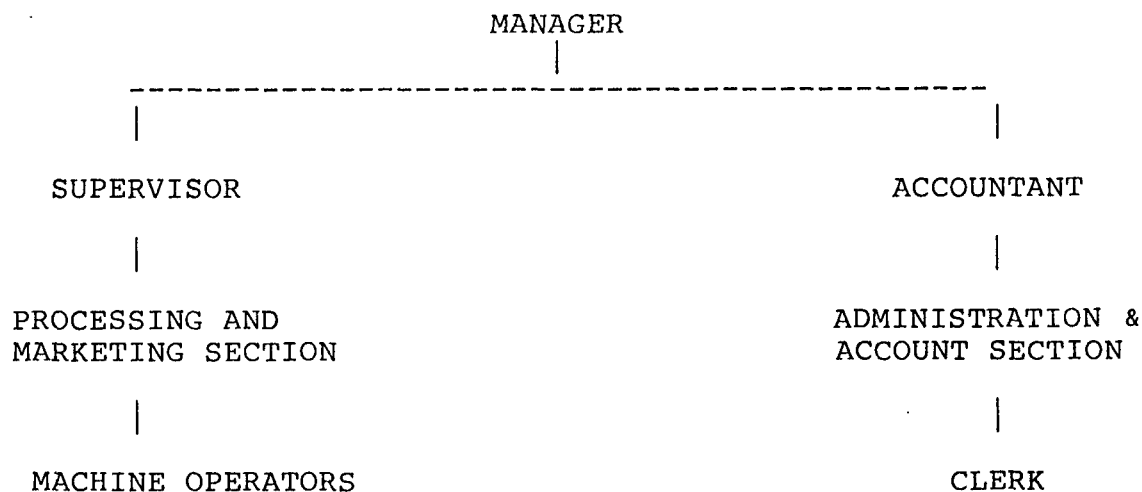
FUNCTIONS

5.2 ~~CLASSIFICATION~~ OF MANAGEMENT:

The functions of the management will be classified as follows:

- 1) Administration and general affairs
- 2) Accounting and Financing
- 3) Procurement
- 4) Price information and advertisement
(Sales Promotion)
- 5) Maintenance of Machinery.

5.3 ORGANISATIONAL CHART:



5.4 TASK OF THE SECTION:

There will be one manager with technical background to control the overall operation of the Society and to make important decisions in consultation with Board, as per rules.

In the absence of Manager, the Supervisor will perform duties for him in the factory and the Accountant will control the office. The supervisor will look after all works relating to procurement, processing and marketing of the product. The Accountant will maintain the books of accounts of the Society and will also manage the general administration of the Society subject to the control of the manager. They will be

vested with necessary power to control all the activities related to their own section.

1. Procurement, Processing and Marketing Section:
 - a) Plan of Operation
 - b) Procurement of raw materials and inventory control.
 - c) Market and Price survey
 - d) Management of processing activities
 - e) Marketing of produce.
 - f) Sales Promotion
 - g) Transportation.

2. Administration and Accounts Section:
 - a) General Administration and Personnel matters.
 - b) Settlement of accounts/managing of receivables.
 - c) Preparation of Income and Expenditure Statements.

5.5 EMPLOYMENT OF MANPOWER:

1. Regular Employees:

Regular employees will be the Manager, Supervisor, Accountant, Machine Operators and Driver.

2. Temporary Employees;

The temporary employees, unskilled persons, will be recruited in the project depending on necessity.

CHAPTER - VI
FINANCIAL ANALYSIS

6.1 BASIC ASSUMPTIONS:

The financial analysis of the project will be done under the following assumptions.

1. Project Period is 11 years including the construction period.
2. Depreciation is calculated by the straight line method.
3. The unit is expected to work for 300 days on a single shift basis.
4. The unit is expected to achieve a capacity utilisation of 60% in the first year, 70% in the second year and 80% in the third year.
5. Raw Material - The cost of raw materials will be Rs.3.75/nut.
6. The selling price is assumed at Rs. 38/Kg of D.C
The selling price of bye-product are assumed as follows:

Husk	-	Rs.250/1000 Nos.
Shell	-	Rs.150/1000 Nos.
Parings	-	Rs.20/Kg.

7. Sales promotion expenses is expected @ 2% of Sales revenue.
8. It is assumed that any increase in the cost of raw material, consumables etc will be offset by a corresponding increase in the selling price.

6.2 INVESTMENT OF THE PROJECT:

The total project costs are estimated at Rs.25.50 lakhs.

(Rs. lakhs)			
Classification	Size and Quantity	Amount	Ramarks
1. Land	2000 m ²	3.75	No Tax
2. Building	400 m ²	10.00	See Appendix-2
3. Machinery	-	8.00	See Appendix-3
4. Vehicle	-	3.25	
5 Pre-operational Expenses	-	0.50	
TOTAL		25.50	

The funds for the project will be raised by issuing shares.

(Rs. lakhs)			
	Amount	Rate	Remarks
1. Share Capital - Members	<u>15.00</u>	12%	Share Value Rs.100/-
2. Share Capital - PADBS	3.00	"	
3. Share Capital - Kerala State CARDB	5.00	"	
4. Share Capital Participation by Government.	2.50	Interest free	
25.50			

In the initial years dividend @ 12% is expected on shares and subsequently it will be increased to 15%.

6.3 WORKING CAPITAL REQUIREMENT:

The working capital requirement during the first 3 years are estimated as follows. The entire working capital will be financed by Kerala State Co-operative Agricultural and Rural Development Bank as loan at an interest rate of 16.5% per annum.

Quantity	Yr. I	Yr. II	Yr. III
1. Raw material one month	5.78	6.74	7.70
2. Work-in-progress 0.03 month	0.20	0.23	0.26
3. Finished goods 0.25 month	1.70	1.95	2.21
4. Book debts 1 month	6.94	7.97	9.03
	14.62	16.89	19.20
5. Less Trade Creditors 25%	1.41	1.64	1.88
Working Capital requirement	13.21	15.25	17.32
Interest on working capital @ 16.5%	2.18	2.52	2.86

6.4 SELECTED FINANCIAL DATA:

Particulars	Yr. I
1. Pay back period (Years)	3 Yrs.
2. NPV (Rs. lakhs) \sqrt{S}	23.88
3. IRR (%)	35
4. PV Ratio	15.81%
5. B.E.Sales	33.41

6.5 SENSITIVITY ANALYSIS:

Assumption	Pay back Period	NPV (Rs. lakhs)	IRR %	B.E Sales of 3rd Yr.
1. Original estimates	3 Yrs.	23.88	35	33.41
2. Selling price decreased by 5%	5 Yrs.	3.96	18.63	44.48
3. 5% increase in Raw material cost	5 Yrs.	3.50	18.25	47.74

According to the above analysis raw material cost is more sensitive to the project than the reduction in selling price.

CHAPTER - VII
RECOMMENDATIONS

8.1 NECESSITY OF THE PROJECT:

The coconut producers in the project area are suffering from the fall or fluctuations in the price of coconuts because of deficient processing activities.

The Primary Agricultural Development Bank which provides credit for Agricultural activities does not provide any facility for value addition to such agricultural produce of the farmers. Therefore it is the duty of the KSCARD Bank to implement a project based on the major agricultural produce of that district/Area, as a preliminary step to provide forward linkage.

2. SALES PROMOTION:

In order to increase the consumption of desiccated coconut among the middle and upper class people both inside and outside State, 2% of the sales revenue is provided. The promotion activities would be easier to perform in co-operation with National Consumer Federation by advertising through T.V, Radio and News Paper.

8.2 RECOMMENDATIONS:

1. Governemnt support is the most crucial point for the successful implementationof the project. Such as release of share captial contribution, Registration of the society etc.
2. It is also necessary that the Kerala State ARD Bank has to collaborate closely with the other co-operatives such as Consumer Federation, NAFED etc.
3. The project is expected to be started functioning on 1st September 1997, since the activities for the implementation of the Project is scheduled to be commenced on 1st July 1996.
4. The project is sensitive to the price flectuations. Hence the pricing policy of the Govt. is vital factor to the viability of the project. The Govt. have already declared floor price to the produce.
5. The project in the initial years envisages the production and marketing of D.C only. As the business stabilises and the society procures sufficient surpluses the society can diversify its production activities utilising various bye-products.

APPENDIX - 2

LIST OF BUILDING CONSTRUCTION

			(Rs. lakhs)
Item	Size		
			Amount
- Office	50m ²		
- Store	100m ²		
- Factory	250m ²		8.00
- Roofed yard for storage of raw materials	500m ²		1.00
- Attached facilities	-		1.00
			----- 10.00

APPENDIX - 3

DETAILS OF MACHINERY

		(Rs. lakhs)
Item		
		Amount
1. Disintegrator		0.75
2. Drier		3.25
3. Sifter		0.30
4. Conveyor, Hand tools, - Bag stitching machine - Polythene Bag sealer - Common balance, Lab Equipment, Pumpsets 2HP, Furnitures.		2.70
5. Steel tanks 3 Nos.		1.00
		----- 8.00

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DAUSA (RAJASTHAN).

Country : INDIA

Project Prepared by : S. G. PARASHAR
Director
National Cooperative Union of India
New Delhi

Funded by the Government of Japan
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and

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India, Malaysia and Japan**



ICA Management Training Project for Agricultural Cooperatives in Asia
INTERNATIONAL COOPERATIVE ALLIANCE

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her

S.G. PARASHAR
DIRECTOR
NATIONAL COOP. UNION OF INDIA
NEW DELHI (INDIA)

A B B R E V I A T I O N S

NCUI	: National Cooperative Union of India
PACS	: Primary Agricultural Credit Cooperative Societies
IDA	: International Development Association
CIDA	: Canadian International Development Agency
SIDA	: Swedish International Development Authority
USAID	: United States Agency for International Development
ODA	: United Kingdom overseas Development Administration
IBRD	: International Bank for Reconstruction and Development (The World Bank)
G.W.	: Ground Water
EPS	: Electric Pump System
DPS	: Diesel Pump System
Ha.	: Hectare
DCS	: District Credit Scheme
IRDP	: Integrated Rural Development Programme
PLDB	: Primary Land Development Bank
U.P.	: Uttar Pradesh
SWDF	: Sadguru Water and Development Foundation
AI	: Artificial Insemination
DRDA	: District Rural Development Agency
OPP	: Oil Production Programme
NPDP	: National Pulses Development Programme
SSI	: Small Scale Industries
ITI	: Indian Technical Institute
TRYSEM	: Training of Rural Youth Self Employment
BHC	: Benzen Hexachloride
IRMA	: Institute of Rural Management, Pune
VAMNICOM	: Vaikunth Mehta National Institute of Cooperative Management
GOVT.	: Government
Deptt.	: Department
IFFDC	: Indian Farm Forestry Development Cooperative Limited

Chapter I

SUMMARY

1. The project is titled as "FARM FORESTRY DEVELOPMENT FOR FARMER MEMBERS OF PRIMARY AGRICULTURAL COOPERATIVE SOCIETIES THROUGH NCUI COOPERATIVE EDUCATION FIELD PROJECT, DAUSA (RAJASTHAN) ."
2. The main objective of the Farm Forestry Development Project is to promote, develop, educate, assist and motivate farmer members to grow tree crops on bounds of their own fertile lands/degraded lands to meet the requirements of local fuel wood, fodder, small timber and Ber(Fruit), with the objective to improve the economic and socio-economic conditions of farmer members and maintain the ecological and environmental balance.
3. The area of operation of the project is the area of NCUI Cooperative Education field project, Dausa(Rajasthan). The project is having 130 PACS but to begin with 30 PACS have been adopted in which the project activities will be carried out.
4. The target group of this project is farmer members in the adopted PACS who are economically, socially and educationally weak. They will be motivated to grow tree crops with the main objective of the project.
5. The PACS/farmer members will be guided in Developing nurseries of seedlings for sale on regular basis and also planting these seedlings in their fields/farms to generate extra income. This will lead to full working hours employment for all members of farmer family.
6. The project duration is 1.7.1996 to 30.6.2011.
7. The NCUI has been operating 22 Cooperative Education Field Projects located in 12 states of the country with the 100% financial assistance from the Ministry of Agriculture, Govt. of India. Each project consists of six personnels. For initiating and implementing this Project one of the NCUI Cooperative Education Projects located at Dausa Distrit of Rajasthan State has been selected. The project staff working in the Project will educate, guide, assist and motivate the farmer members of PACS to grow tree crops on the available lands. The NCUI will publish the required guidelines, leaflets, pamphlets to popularise the farm forestry development programme. Hence there will not be any additional financial burden on the part of PACS or its farmer members. However, the farmer members/PACS will invest for arranging seedlings, fertilizers etc.
8. After the completion of the project, the tree crop will improve the viability of PACS and its members.
9. The NCUI project will keep on extending the support in providing guidance in the activities of farmer members and PACS to make them self-reliant .
10. With the implementation of the project, the income of farmer members will be increased atleast by Rs. 5,997.26 per annum on an average.

11. The major components of the project are Cooperative Education and Training material e.g. leaflets, pamphlets, documentary films on successful farm forestry development activities, seedlings, fertilizer, finance and market intelligence etc.

12. The project will provide market intelligence and marketing services to farmer members of PACS. Other relevant information as contained in guidelines for tree plantations will also be provided by the Project Personnel of NCUI Cooperative Education Field Project, Dausa (Rajasthan) as and when necessary.

Chapter II

INTRODUCTION

Farm forestry is the term usually applied to programmes which aim to encourage commercial tree growing by individual farmers on their own private land. In these programmes, trees are regarded as a cash crop, and farmers are provided with assistance in growing them. This may include technical help, free or subsidised seedlings, loans and various market support measures.

In the last few decades, farm forestry has emerged as one of the principal responses to the problems caused by the widespread loss of trees and forest cover in India. Its aim is to help people to solve their own wood supply problems, meet their own needs and preserve the environment in which they live by planting trees on their farms and around their villages. Programmes to promote tree growing in rural areas have been launched all over the country with the help of Central/ State Govts. Cooperative Organisations and International donor agencies like IDA, IRDB, ODA, CIDA, SIDA and USAID.

Farm Forestry can be termed broadly as a sustainable tree crop management system to maximise the economic return from the disposal of tree crop based on direct or derived products for a given agro-climatic conditions without adversely affecting the fertility of the land. Therefore, a successful farm forestry programme would take into account the inter linkages and the role played by the various inputs of farm forestry system viz, seedlings, water, animals, fertiliser, people, agro-climatic conditions and the produce disposal infrastructure. The farm forestry programme promote commercial tree growing by farmers on their own land.

The Govt. of India in the erstwhile Ministry of Food and Agriculture enunciated a forest policy to be followed by the Management of State forests in the country. However, over the years, forests in the country have suffered serious depletion. This is attributable to relentless pressures arising from ever increasing demand for fuel wood, fodder and timber, inadequacy of protection measures, diversion of forest lands to non forest uses without ensuring compensatory afforestation and essential environmental safeguards and the tendency to look upon forests as revenue earning resource. The need to review the situation and to evolve, for the future, a new strategy of forest conservation has become imperative. Conservation includes preservation, maintenance, sustainable utilisation, restoration and enhancement of the natural environment. It has thus become necessary to review and revise the National Forest Policy.

Basic Objectives of National Forest Policy

- i) Maintenance of environmental stability through preservation and where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country.
- ii) Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.

- iii) Checking soil erosion and denudation in the catchment areas of rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for the retardation or siltation of reservoirs.
- iv) Checking the extension of sand dunes in the desert areas of Rajasthan and along the coastal tracts.
- v) Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands. vi) Meeting the requirements of fuelwood, fodder, minor forest produce and small timber of the rural and tribal populations.
- vii) Increasing the productivity of forests to meet essential national needs.
- viii) Encouraging efficient utilisation of forest produce and maximising substitution of wood.
- ix) Creating a massive peoples' movement with the involvement of women for achieving these objectives and to minimise pressure on existing forests.

The Principal aim of forest policy was to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms, human, animal and plant. The derivation of direct economic benefit must be subordinated to this principal aim.

The National goal is to have a one third of the total land area of the country under forest or tree cover. In the hills and in mountainous regions, the aim is to maintain two thirds of the area under such cover in order to prevent erosion and land degradation and to ensure the stability of ecological system.

Need of Farm Forestry in India

A massive need based and time bound programme of afforestation and tree planting with particular emphasis on fuel wood and fodder development on all degraded and denuded lands in the country, whether forest or non-forest land, is a national imperative.

Agricultural/degraded lands, should be taken up for the development of tree crops and fodder resources. Though, several schemes of Central/State Govts. are in operation to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium but still, a lot of scope is there to do in this field. One of the activities of Farm Forestry may contribute to check ecological balance as well as to strengthen the financial position of Farmers. There is no doubt that under the appropriate conditions, where there is a strong market demand for wood, tree growing can be a profitable activity. This has already been demonstrated by the successful programmes carried out in the Philippines and India, and promising initial results obtained in Haiti.

The achievements in India have been particularly impressive. In a number of States, demand for seedlings has expanded rapidly as a result of the high rates of return that can be obtained from commercial tree growing. In Gujarat, alone, nearly 200 million seedlings were distributed during the 1983 planting season.

The advantages of farm forestry are considerable. Programmes tend to be simpler to design and run than community based schemes, so costs are usually lower. At the same time, visible returns, measured by the number of trees planted, are often greater. When a programme is successful, it can also become self-supporting, so that the need for subsidies and other support measures diminishes as the financial attractions of tree growing become more obvious to local farmers.

Farm Forestry Programme for PACS

The farm forestry programme for Farmer members of Primary Agricultural Cooperative Societies, will meet the requirements of fuel wood, fodder, small timber, other vegetation etc. of rural people. This programme in long run will also improve the productivity of degraded lands and maintain Ecological Equilibrium. Besides these, this will help to generate the employment opportunities to the farmers community and thus strengthen the financial position of farmers as well as P.A.C.S.

Chapter III

BACK GROUND

Farmers use their land basically for crop production and would, therefore, plant only a few trees in home lands or on farm boundaries. The tree-planting programme in India, called farm forestry, was launched in the late 1970s. Farm forestry targets were kept modest and attention was focused more on planting by the government on village lands. However, the results were totally unanticipated and tree cultivation by private households in some states surpassed all calculations. In U.P., during 1979-84, the target for farm forestry was overachieved by 300 per cent, whereas all over components like block plantation on community lands failed to meet the targets (Centre for Science and Environment [CSE] 1985; World Bank 1989). As against the then existing 49 million full grown trees in Gujarat, farmers planted 195 million trees in 1983-84 in that state (Government of Gujarat [GOG] 1986). That is, in one year alone farmers in Gujarat planted as many as four times the number of the total existing tree. Indeed, in Gujarat, Punjab, Haryana, western Uttar Pradesh and some districts of Karnataka, the farmers' enthusiasm for raising trees on crop lands, even on irrigated lands, during the period 1980-85 took everyone, the donor agencies and state governments, by surprise.

Progress of Forestry Programme:

Reforestation programmes are not unique to India. Many developing countries are facing chronic shortages of fuelwood, industrial timber and other wood products for domestic use. South Asia is one region where forests are deteriorating fast. Table provides the state of forest resources in major South Asian countries and the rate of deforestation and reforestation. It can be seen from the table, given below, that rate of deforestation is higher than that of reforestation (columns 4 and 6) in almost all countries of South Asia. It has been estimated that out of 359 million hectares of productive dry land, 70 per cent has already been desertified. In India over 27 per cent geographical area, and in Nepal the entire country, is affected by soil erosion due to loss of forest cover.

TABLE
State of Forest Resources in South Asia

Country	Percentage of forest land to geographical area	Per capita forest land (ha)	Annual deforestation ('000 ha)	Percent per year deforestation	Annual reforestation ('000 ha)
1	2	3	4	5	6
India	23	0.10	147✓	0.2	120✓
Bangladesh	17	0.02	8	0.4	9
Pakistan	4	0.04	7	0.2	7
Sri Lanka	37	0.16	58	2.1	10
Nepal	33	0.12	84	3.9	2

In response to these problems, the South Asian countries have increased their investment to varying degrees in forestry development. In some of these countries, particularly in India, the farm forestry programme had an important component on farm lands. The programme, however, achieved spectacular success only in regions characterised by commercial and monetised agriculture. The picture was somewhat different in subsistence-oriented eastern states like Orissa, Bihar, eastern U.P. and Madhya Pradesh, where farmers remained comparatively indifferent to the government's call, or the momentum remained slow, despite the fact that rainfall and soil conditions are more favorable to trees in the east than in the low rainfall region of west and north India. Similarly, in the semi-arid millet-growing regions of Maharashtra, Andhra Pradesh, Tamil Nadu and Karnataka (Except in the commercialised area and the districts of Kolar, Bangalore and parts of Tumkur) farm forestry did not take off or remained at a low level, although the ecological benefits from tree growing would have been perhaps maximum in this semi-arid, undulating and ground water-deficit region. From the experience of the Sadguru Water and Development Foundation (SWDF), a voluntary organisation in Panchmahals district in Gujarat and the Forest department in West Bengal it appears that a good deal of extension is required before farmers take to tree planting in areas of low productivity. What is more disconcerting is the fact that the farmers' enthusiasm to plant eucalyptus (which was the main farm forestry species) even in the 'green revolution' states declined after 1986, as the tree failed to generate the kind of returns the farmers were expecting. Two features of the farm forestry programme which help us in understanding the reasons for its failure need to be mentioned at this stage. One, farming systems and production objectives vary from region to region, but forest officials being generally ignorant of such differences tried to promote a uniform strategy, particularly in India, based on short-rotation species with which they were familiar due to their experience of working in forest areas. Two, the farm forestry programme was not directly targeted at strengthening the traditional agro-forestry practices.

In India, wherever farm forestry has been successful in the past, there is a guilt of eucalyptus wood, and farmers do not seem to be keen to continue planting eucalyptus now. Although improving marketability of trees and removing market constraints could help, yet over-supply of one particular type of wood could lead to a situation, where it may not have adequate demand at a price which is considered remunerative by the farmers. Hence, it is better to take a long-term view and plan for a shift to such trees as can enhance both farmers' consumption and income in a short time, or which are complementary to crop production by providing nutrients and inputs like mulch and fodder. This would require a thorough understanding of the role of trees in traditional farming systems and re-orienting research towards indigenous species. Thus the objective should change from 'how can farmers be persuaded to change their land use in favour of trees?' to 'in what manner can technology help increasing overall biomass production from private land by meeting farmers' priorities?'

Role of National Cooperative Union of India

To meet the above objective, farmers should be persuaded by imparting education and training to grow trees on bounds of their fields through Dausa project in the cooperatively under developed state of Rajasthan, being run by the National Cooperative Union of India which is the apex body of Indian Cooperative Movement. The objects of NCUI are to

promote and Develop Cooperative Movement in India, to educate, guide and assist the people in their efforts to build up and expand the Cooperative sector and to serve as an exponent of Cooperative opinion in accordance with Cooperative Principles. In furtherance of these objects, the Union may either by itself or in collaboration with other Cooperative Institutions.

- i) Organise Coop. Education and training programmes,
- ii) Develop inter-coop. relations and help the coordinated functioning of the Cooperative Movement in various sectors.
- iii) Formulate Cooperative Development Projects.

In order to achieve the above objectives, the National Cooperative Union of India with the 100% grants-in-aid from the Ministry of Agriculture, Govt. of India is implementing a scheme of Intensification of Cooperative Education Programme in under-developed states/ under developed areas of Developed States since 1976-77 to reduce regional imbalances in the level of Cooperative Development in India. In pursuance of this, special attention was given to cooperatively under developed and less developed states to accelerate the pace of development. One of the reasons responsible for the uneven development/growth of cooperatives was indifferent attitude of the members towards cooperatives and their management as well as services and facilities extended by them. Therefore, it was felt to intensify efforts to motivate them for participating actively and efficiently in the Management, business and services of the society. This scheme was formulated with specific techniques in management, training and farm technical guidance for the growth and development of Primary Agricultural Cooperative Societies. Further, it was aimed to assist the decision makers in the society to monitor the performance of the activities and evaluate its development periodically to help the policy makers and planner at higher level.

NCUI Cooperative Education Field Projects Objectives:

The broad objective of the scheme is to Develop Cooperative Societies in Project areas and through them to increase the productivity of the farmer members, and thus, improve their socio-economic conditions. The aim of the above scheme are:-

- i) To increase in the membership of local Coop.Society.
- ii) To convene meeting of Managing Committees and General Body regularly, increasing attention at these meetings and securing active participation of members.
- iii) To assist in the assessment of credit and other inputs required on the basis of real planning of crops and preparing the societies to provide the members need.
- iv) To assist in timely repayment of loans and marketing of sale proceeds through cooperatives/cooperative efforts.
- v) To prepare the societies towards self-reliance,assist them in preparing long term development plans for mobilising deposits.
- vi) To motivate societies to develop farm guidance services on their own in due course.

- vii) To utilise services of secretary/manager and Managing Committee members for local education work.
- viii) To undertaken family welfare education activities.

The main objective of the scheme of intensification of Cooperative Education in under developed states/under developed areas of developed states is to develop and promote cooperative societies in project areas and through them to increase the productivity of members and potential members and thus improve their socio-economic conditions.

Approach:

The team work and intensified efforts of Cooperative Development through Cooperative Education combined with farm/technical guidance are the main ingredients of the approach of the project. The Office-bearers and members are motivated educated for their active participation at the level of planning of business activities, their operations, management and evaluation of results. The members participation in planning implementation, monitoring and evaluation of business activities, planned by the Cooperatives for a year or long term in project areas is the crux of the approach under which main emphasis has been on business development planning of PACS. All educational/farm guidance and developmental activities are linked with business development plans of PACS adopted by the projects for their overall development.

Progress

Cooperative Development Activities:

During the year 1994-95, the projects conducted 2758 events of educational activities in which 44,669 farmers were benefited.

Besides the above, 819 farm guidance activities on Crop.Development, Dairy Development, Horticulture, Plant Protection, Vegetable Development, Marketing/Grading Crops, use of Fertilizers, Poultry Development , Fodder Development Oil and Pulses Development Environment Protection and Farmers Meetings were conducted in which 14,462 farmers were benefited.

Farm/Technical Guidance Activities:

The main thrust of technological improvement/development in project areas was on provision of Farm/Technical Guidance to the members, so that they could raise the farm production by adopting improved farm technology keeping in view the goal the projects conducted soil testing activities, arranged demonstration plots for educating farmers about the selection and use of improved variety of seeds, seed treatment use of fertilisers, grading of agricultural produce etc.

A large number of Primary Agricultural Cooperative Societies are non viable and not functioning efficiently due to lack of awareness, lack of business skills, low business turnover, poor share capital, inadequate members participation in societies activities, lack of professionalism etc.etc.

In order to make the PACS viable in all respect, and eliminating the problems, the NCUI through its NCUI Cooperative Education Field Project, Dausa (Rajasthan) will assist, guide and motivate the Primary Agricultural Cooperative Societies to start farm forestry development programme by growing trees crops in their farm fields which in turn will meet their requirement of fuel wood, fodder, timber Ber(Fruit) other vegetation etc. and will also maintain ecological equilibrium.

RELEVANCE OF EDUCATION AND TRAINING

Education and Training for farm forestry should be appropriate with regard to both existing conditions and future requirements. Its objective is to develop human resources to correspond to the requirements of the farm forestry.

The Govt. of India and State Govts. are making their efforts to achieve goals and maintain environmental stability. Other Cooperative Organisations like National Tree Growers' Cooperative Federation and Indian Farm Forestry Development Cooperative Ltd. are also contributing a lot to the restoration and protection of ecological security. In this direction, National Cooperative Union of India through its Cooperative Education and Training Programme proposed to ensure, to assist, to guide, to motivate the Primary Agricultural Cooperative Societies to start the development of Farm Forestry.

The 22 NCUI Cooperative Education Field Projects which work as a laboratories for the PACS in assisting and guiding in plan formulation, development and implementation of various plan activities through its intensive Cooperative Education methodology and increasing the productivity of farmer members through farm/technical guidance for attaining the economic viability/prosperity and social states of members in the adopted PACS. The targeted groups for forestry Programmes are the farmer members.

Chapter IV

THE PROJECT AREA

AREA OF OPERATION

The Project will be implemented through NCUI Cooperative Education Field Project located at Dausa (Rajasthan) being the cooperatively less developed area of Rajasthan state. The Dausa Distt. area of NCUI Cooperative Education Field Project is having at least 130 Primary Agricultural Cooperative Societies. To begin with, the NCUI has adopted 30 PACS in which the project will be carried out.

Institutional Attachment/Location

The NCUI Cooperative Education Field Project, Dausa is attached with Rajasthan State Cooperative Union, Jaipur where as project is located in the premises of the Kraya Vikray Sahakari Samiti Ltd., Dausa (Rajasthan).

PHYSICAL FEATURES

Geographical Location

The distt. Dausa was formed on 10th April, 1991 by covering 4 blocks i.e. Bandikui, Dausa, Lalsot and Sikrai of jaipur district Later by the State Govt. notification dated 15th August, 1991 the Mahuwa block was segregated from the Sawai Madhopur distt. and made a part of this new distt. The Dausa distt is situated between 26.3 degree and 27.11 degree latitude and 76.50 degree and 76.90 degree longitude. It is bounded on the North by Alwar Distt. on the South by Sawai Madhopur distt. on the East of Bharatpur distt and on the West by the Jaipur distt. The total geographical area of the distt is 340478 hectares which forms 0.99% of the total area of the state. The rural and urban area from 98.37% and 1.63% respectively.

1. Administrative set-up

Administratively the distt is divided in 5 Tehsils and 5 Blocks as given below:-

	Tehsil	Block
1.	Baswa	Bandikui
2.	Dausa	Dausa
3.	Lalsot	Lalsot
4.	Mahuwa	Mahuwa
5.	Sikarai	Sikarai

As per the census 1991 the distt is having total 1052 villages of which 43 villages are not inhabited. The present number of Gram Panchayets at 196 will increase to 225 after redemarcation of the boundaries of Panchayets.

2. Climate

The average rainfall of the distt is 549.9 mm. The distt had a good rainfall in past 2 years as given below :-

Year	Rainfall	Normal Rainfall (Annually)
1992	803.5 mm	549.9 mm
1993	712.2 mm	549.9 mm

On an average there were 31 rainy days during the year 1991 and 50 rainy days in 1992. In 1994, the distt had a rainfall above average and till the end of August, 1994 the distt had 858 mm rain fall. This increased the potential for increasing area under irrigation and cultivation.

Temperature:	Maximum	44°C
	Minimum	3.33°C

IRRIGATION/WATER RESOURCES

As per the revenue records out of the gross sown area of the distt of 306254 hectares during the year 1993-94 the area under irrigation of 135030 hectares which works out to 44.09% indicating the potential for increasing the irrigation facilities to a great extent. Of the total gross area net irrigated area is 128169 hectares while 6861 hectares are under double irrigation use. The details of sources for irrigation & area irrigated by them are as under:-

(Area in hectares)

Sr. No.	Sources	Water Resource	Area irrigated
1.	Wells	Underground Water Resource	108623
2.	Tube wells		23632
3.	Canal	Surface (Water Resource)	2723
4.	Tank		52
Total			135030

As will be observed from the above table that the wells and tube-wells are the major sources of irrigation which irrigated the 80.44% and 17.50% respectively of the total irrigated area. While 97.94% area is irrigated by the wells and tube wells the area irrigated by canals and tanks is negligible however, attempts are being made to increase the area of irrigation by these sources through Govt. budgetary allocations. There are 4 medium irrigational projects with the total irrigation capacity of 18336 hectares and 21 small irrigation projects with irrigation capacity of 4087 hectares. With a view to increase irrigational facilities 2 irrigation projects in the distt. have already been completed viz. Chandrana and Rahuwas dams with the estimated expenditure of Rs. 106.18 lakhs and Rs. 122.65 lakhs respectively. By these dams

254 hectares and 596 hectares are being irrigated and during the year 1993-94 additional work was undertaken to increase the irrigation facilities for additional 26 hectares and 50 hectares by Chandrana and Rahuwas dams respectively.

Taking into account the needs of expansion of irrigation facilities the exploitable ground water potential in Dausa distt is not sufficient. The status of ground water available(as per the latest ground water survey) for further exploitation for construction of irrigation structures is given below:

Block	Utilisable recharge (Ham)	Net yearly draft (Ham.)	Ground water balance (Ham.)	Stage of G.W.		Category	Ultimate No.of dug wells with pump Sets
				As on date	At 5 year		
1	2	3	4	5	6	7	8
Bandikui	4282	5404	(-)1122	126	128	Dark	-
Dausa	1486	4276	(-)2790	288	290	.	-
Lalsot	5672	6499	(-) 827	115	117	.	-
Mahuwa	1451	4770	(-)3319	329	331	.	-
Sikarai	2607	875	1732	34	36	White	1170

It will be observed from above that out of the 5 blocks in the distt 4 have been categorized 'Dark' and only Sikarai block remains in 'White' category. This limits the further scope of construction of minor irrigation structures in the distt. Keeping in view the need of construction of additional minor irrigation structures and above average rainfall during preceding two years i.e. 1992 and 1993 and current year also there is an urgent need of fresh survey by the State Ground Water Deptt. to assess the present stage of ground water potential in the distt.

As per the revenue records, during the year 1993-94, out of total 3291 tube wells while 367 are operated by electric engines 2954 tubewells are fitted with diesel pumpsets. Similarly, out of total 41724 wells(including 481 govt. wells) the number of wells operated by electric pump sets, diesel pump sets and other means like 'Rahat' etc. is 9462 wells, 22333 wells and 9929 wells respectively. Though there is a big demand for electric connections for wells, having in view the number of electric connections being provided every year, it will take a long time to bring to pendency to zero level. Presently a scheme sanctioned by NABARD for replacement of EPS/DPS is Mahuwa block involving bank loan of Rs. 10,384 lakhs is under implementation by PLDB Hindaun.

ECONOMIC BASE

A. *Livestock Resources*

Animal husbandry is the main allied activity to agriculture supplementing the farm income in those distt where due to the limited potential of irrigation facilities the major crops grown in the area are mainly dependent on rains. The majority of small/marginal farmers and landless labourers earn their livelihood through animal husbandry activities.

The distt. has 7.42 lakhs animal population as per the census 1992. Of this, there are 2.66 lakhs buffalo species, 1.65 lakhs cow species, 2.13 lakhs goats and 0.47 lakh sheep constituting 35.8%, 22.5%, 28.5% and 6.28% respectively of total animal population. Comparatively cow species in Lalsot block, buffalo species in Dausa block and Goat & sheep in Bandikui block are larger in number. The blockwise details of the animal population are as under :-

Animal	Bandikui	Dausa	Lalsot	Sikarai	Mahuwa	Total
1. Cow/Bullock	53076	25012	57539	19794	9617	165038
2. Buffaloes	55741	63754	45390	50247	50485	265617
3. Sheep	19641	7324	5480	7692	6504	46641
4. Goat	57305	50719	54232	32891	17870	213017
5. Horse	186	79	146	62	42	518
6. Donkey	228	332	317	181	374	1432
7. Camel	1737	2846	2959	2544	2192	12278
8. Pig	2692	1687	2340	1178	2297	10194

Most of the farmers in the distt are having agriculture land and pasture land is also available. As such, no problem is faced in meeting the feed requirements. The blockwise details of the pasture land are as under :-

S. No. Block	Pasture land(Ha)
1. Dausa	9040
2. Bandikui	6757
3. Lalsot	6121
4. Sikarai	3494
5. Mahuwa	1589
Total	27001

During the year 1993-94, 1,15,750 animals were given treatment and medicines were provided for 54418 animals. Against the targets of 15000 castration and 16,500 insemination the achievements were at 17979 and 17525 respectively.

The distt has a very good potential for dairy development. Buffaloes and cross-bred cows are reared together for milk production. The distt is well covered by the 76 Dairy Cooperative Societies of the 'Jaipur Zeela Dugdh Utpadak Sangh'. here are 5 milk routes in operation in the distt and 1 more milk route is proposed to be started during the year 1994-95 which will cover the villages from Gudha Katla to Dausa.

As per the census report there are 1052 villages in the distt out of which 225 are covered under the above project. The project was initiated in year 1975 by organising 12 DCS on Dausa Lalsot route. Looking to the distances and to maintain the good quality of milk a 20 thousand litre capacity chilling plant was established at Dausa in the year 1981.

Besides a remunerative price paid to the milk producers for the milk sale the Dairy Cooperatives also provide the input facilities like A.1 balanced cattle feed, improved variety of fodder seed, animal treatment, immunisation & family welfare activities to the farmers at their door steps.

Out of 4.5 thousand families covered under the project, 50% are IRDP beneficiaries. The Dugdh Utpadak Sangh has also established cluster A.I. centres which provide the A.I. services within 8 kms' radius. Presently two such cluster centres are functioning at Didwana and Panchodi and 3 more such centres are proposed to be established during the year 1994-95 at Kot, Khairwal and Garh-Himmat Singh.

The average dairy milk collection has improved considerably in the distt. The peak average dairy collection which was 11824 litres during December,1993 is targeted to be improved to 13930 litres during December,1994. Thus the dairy activity is showing a good impact on the economy of the distt and this has good potential in the area for expansion. As per the animal census 1992 the number of cows/ buffaloes in milk and dry was as under in the distt.

			(No. in thousand)
1.	Local cows	In milk	31.17
		Dry	27.97
2.	Cross Bred Cows	In milk	0.18
		Dry	0.09
3.	Buffalo	In milk	89.67
		Dry	47.64

The distt being very near to the State capital, gives it added advantage for procuring animal feed and other extension services. Any surplus left out of the animal husbandry produces can easily be marketed at Jaipur.

Availability of good quality milk animals is the other critical factor for the success of the animal husbandry programme. In this connection the DRDA is doing a commendable job by arranging good quality graded murrh buffaloes for the beneficiaries under IRDP from the cattle fairs held outside the distt. i.e. Goverdhan cattle fair, weekly cattle fair at Jaipur, etc. Sometimes purchases are also arranged from Haryana. However, in order to make the distt. self-sufficient to meet the every increasing demand for good quality animals, efforts should be made to improve, strengthen and motivate extension services of the Animal Husbandry Deptt. for ensuring that the A.i facilities are made available at the door steps of the dairy farmers and effective follow-up action is taken to sustain the programme. increase in number of BAIF centres in the distt will also help in this regard.

The allocations for various animal husbandry activities in ACPS 1993-94 and 1994-95 are given below:-

(Rs. in Lakhs)

Activity	ACP 1993-94		ACP 1994-95	
	PU	BL	PU	BL
1. Cross bred cows	136	15.47	62	5.26
2. Buffaloes	2964	152.59	3704	233.39
3. Sheep rearing	4154	13.07	3627	12.81
4. Goat rearing	2499	11.70	2563	11.80
5. Pig rearing	115	1.13	149	1.54
		193.96		264.80

Thus, the distt has good potential & infrastructure for dairy development but this potential can only be exploited speedily if the distt. Animal Husbandry Deptt is able to motivate its various units to undertake extension work in addition to their present duties so that more and more area based schemes involving bank credit can be prepared for development of animal husbandry particularly dairy. The cooperation of the extension services available with the Jaipur Jeela Dugdh Utpadak Sangh through Dairy Cooperative Societies may also be helpful for this purpose.

The mixed bred flocks of sheep and goats are commonly reared alongwith other large animals by the majority of small and marginal farmers and landless labourers . As per Animal Census 1992 there were 46641 sheep and 213017 goats in Dausa distt. The present status of these activities indicates further scope and potential for future development through bank finance. For development of sheep rearing one Sheep and Wool Extension unit is also functioning in the distt but its main activities are presently confined to dispensing and spraying of medicines, castration and vaccination etc. If the unit also concentrate on extension work this activity has a scope for expansion in the distt.

As the above activities are mainly being undertaken by small and marginal farmers and agricultural labourers the most of the beneficiaries are availing finance under the Govt. subsidised schemes through DRDA and the SC Development Corporation.

The pig rearing is not a popular activity in the distt and only a few units have been financed under Govt. subsidised schemes.

(II) Poultry

So far no attempt has been made to develop this activity in an organised way in the distt. upto the year 1992-93 a poultry extension unit of the State Govt. was functioning at Dausa which was subsequently shifted to some other distt. The unit till its existence provided training to some individuals in batches. However, after imparting the training no attempt was made for motivating them to set-up poultry farms with the help of bank finance. Due to the non-performance of some officials the distt. has to suffer and whatever hope was there for developing this activity in the distt has since been lost with the shifting of this unit to some other distt.

The poultry is essentially a demand based activity. Dausa distt. is well connected by rail/road with the capital of the State as well as the big cities like Delhi & Agra as such demand is not a constraint for development of this activity. The climate of the distt is also suitable for this activity. There are certain other locational advantages for this activity in Dausa distt. There is a poultry estate in Jaipur distt on the Jaipur-Dausa road hardly 40 kms away from Dausa. The successful poultry units running there can also be utilised as a catalyst for motivating potential individuals who may take-up this activity.

AGRICULTURAL CROPS

As per census 1991 about 790.51% of the total work force in the distt is engaged in agricultural operations and mainly depends on this activity for their livelihood.

The total geographical area of the distt is 340478 hectares. As per the revenue records, of the total area mentioned above the net sown area during the year 1993-94 was 2189804 hectares constituting 64.29% of the total geographical area. The gross sown area was 306254 hectares as 87350 hectares were the double cropped area. Thus, the crop intensity of the distt works out to 139.90% indicating that the major area of the distt under cultivation is of monocrop. Of the total gross cropped area 135-3- hectares are irrigated while 17/224 hectares are unirrigated.

The main crops sown in the distt in the Kharif area Bazara, Jawar, Maize, Pulses, Groundnuts, Till, etc. while Wheat, Barley, Gram, Mustard and Taramira are the major Rabi crops. In some areas cash crops like Chilly, Onion, Sugar Cane etc. are also grown but they are not of much significance.

As per the revenue records of the distt the details of the area covered under different crops during the years 1992-93 and 1993-94 are as under :-

S. No.	Name of the Crop	(Area in hectares)	
		Area sown during	
		1992-93	1993-94
A.	Kharif		
1.	Bazara	86300	77842
2.	Ground nuts	17860	20630
3.	Jawar	5130	4906
4.	Maize	3682	3332
5.	Pulses	3729	2648
6.	Guwar	7370	77737
7.	Till	2960	2459
8.	Others	13318	6722
	Total	140349	126312
B.	Rabi		
1.	Wheat	71577	70655
2.	Barley	7093	6087
3.	Gram	21296	16381
4.	Mustard	63859	3432
5.	Taramira	4651	2801
6.	Others	4477	2801
	Total	172953	178836
	G. Total	313302	305148

In addition to above certain 'Jayad' crops are also grown in the area however, the area covered under these crops is negligible at 925 hectares and 1106 hectares during the years 1992-93 and 1993-94 respectively.

It will be observed from above that the total cropped area in the Kharif 1993-94 has declined in comparison to the previous year while the cropped area of the Rabi crops has increased during the year 1993-94 over the year 1992-93. It will also be observed that while the cropped area of almost all other crops have declined during the year 1993-94 in comparison to the year 1992-93, the cropped area of cash crops viz Groundnut and Mustardseeds have increased. This trend indicates that farmers are opting for these oil seed crops to fetch good returns and there is shift in favour of these crops.

The Blockwise area covered under the different crops during 1993-94 is given below :-

(Area in hectares)

Name of the crop	B l o c k s					
	Dausa	Lalsot	Bandikui	Sikarai	Mahuwa	Total
A. Kharif						
1. Bazara	17765	9799	19047	19579	11652	77842
2. Ground nut	4250	12812	954	2515	99	20630
3. Jawar	079	102	965	1291	631	4906
4. Maize	892	1590	680	146	24	3332
5. Pulses	890	506	893	331	28	2648
6. Guwar	1556	3787	1405	886	139	7773
7. Til	685	191	693	629	261	2459
8. Others	2339	969	782	767	1865	6722
Total	30456	29756	25419	24982	15699	126312
B. Rabi						
1. Wheat	13579	19389	13778	14362	9547	70655
2. Barley	2284	1602	975	829	397	6087
3. Gram	3668	2100	4869	1315	4429	16381
4. Mustard	18999	21322	11629	7675	19855	79480
5. Taramira	1453	596	726	222	435	3432
6. Others	1131	1001	364	203	102	2801
Total	41114	46010	32341	24606	34765	178836
G.Total	71570	75766	57760	49588	540464	305148

It will be seen from above table that during Kharif the major crops i.e. Bazara and Groundnut covered 61.6% and 16.3% respectively of the total cropped area in this season. in Rabi season Mustard and Wheat covered 44.4% and 39.5% respectively of the total area sown.

The gross cropped area (including the 'Jayad' crops) at 314227 hectares during the year 1992-93 slightly declined to 306254 hectares, This was mainly due to decline in the total cropped area in Kharif 1993-94 at 126312 hectares from 140349 hectares during 1992-94. The reasons for this decline may be attributed to the late commencement of rains during the year 1993-94. Due to this, some farmers preferred to keep their fields uncultivated so that this land may be available in time for sowing mustard. This also resulted in increased cropped area in Rabi season. This is not a normal phenomenon and as learnt from the Distt. Agriculture Deptt, there are not much abnormal fluctuations in the total sown area in the distt.

The distt. is covered under the OPP and NPDP for increasing production of oil seeds and pulses respectively. The three blocks of the distt. vis. Dausa, Bandikui and Lalsot are covered under the intensive Cereal Development Programme for Bazara. The distt is also covered under the Central Sector Scheme for Jawar and maize. Under the above programmes apart from arranging demonstrations, distributing minikits, providing training etc. subsidy is also given to the farmers for undertaking certain activities.

The District Agriculture Deptt. is having a good net work in the distt. for arranging necessary inputs such as HYV seeds, fertilizers and pesticide. The use of these inputs is gradually increasing in the distt which may be seeds from the following table.

(In Metric Tons)

Year	Distribution of fertilizers				Distribution of HYV seeds
	Nitrozen (N)	Phosphate (P)	Potash (K)	Total	
1991-92	4555.00	2150.00	100.00	6805.00	3795.00
1992-93	6971.00	1926.00	86.00	8983.00	5081.00
1993-94	11990.00	5040.00	21.00	17051.00	9739.00

The area under irrigation is only 135030 hectares out of the total gross sown area of 306254 hectares constituting 44.09% only. Of the five blocks of the distt 4 blocks have been declared as 'Dark'. This limits the further scope for increasing the irrigated area in the distt by having additional minor irrigation structures. Due to lesser availability of water farmers tend to grow such crops which need lesser moisture/ irrigation Consequently, there has been marked shift over the years in the distt in favour of oil seed crops as Groundnut and mustard.

OTHER ECONOMIC ACTIVITIES

Unemployment is the major problem of rural economy in India. While the availability of agricultural land is not much flexible the increasing population is creating pressure on agriculture resulting in unemployment or disguise unemployment in the rural areas. In view of the declining scope for employment in the agriculture sector non-farm activities constitute the most important economic proposition for the rural masses.

The area of the distt is rich in mineral resources. The major minerals found in the distt are silica sand, quartz, soap stone and china clay. Iron ore deposits of about 30 lakh tons have

been located at Deego 12 kms away from Lalsot. Total no. of mining leases are 54 in the distt of which 20 are for major minerals and 34 for minor minerals. Availability of these minerals provide good potential for SSI units for exploitation of these resources.

With a view to promote industrial units in the distt. in addition to the two developed industrial areas at Dausa and Deedwana(Lalsot-block), the industrial areas at Jeerota, Bapi and Mitrapura in Dausa block, Kolana in Bandikui block and Samleti and Mandawar in Mahuwa block have been developed/under process of development.

About 60.2% of operation land holdings (below 2 hectares) in Dausa distt. fall in the category of small and marginal farmers who, by and large need supplementary avenues of employment to raise their income level above the poverty line. As per census 1991 there are 21034 agricultural labourers in the distt. These labourers are also finding employment on land for lesser number of days resulting in their migration from rural to urban area in search of employment. As per the census 19912 out of total work force of the distt at 3.05 lakhs the number of workers engaged in industries and service, repairing and other workers stood at 221'16 and 9056 persons respectively. Thus, availability of labour force for extension of rural and cottage industries, small scale industries, rural art and crafts and other industrial units is not a constraint rather expansion of these industries and crafts can provide gainful jobs to the persons over crowding the agriculture sector.

Thus, the main strength of the distt are availability of land in Industrial areas at a cheaper rate, approximity to capital city, Jaipur, abundance of mineral deposits, good agriculture production and good transport facilities. For dausa distt inadequate availaibility of power and water has been the main constraints in industrial development. The efforts are on to remove these constraints by augmenting water supply schemes and by commissioning grid sub-stations. Efforts are also being made to provide separate electric feeders to the industrial areas. However, urgent steps are required by the concerned authorities in this regard so that industrial potential of the area may be exploited at the earliest.

There is only one ITI for providing the training to the prospective enterpreneurs in the distt. For the persons identified under TRYSEM, the DRDA is also arranging training programmes for various activities through ITI, Dausa and other training institutes/agencies at Jaipur.

Industrially, the Dausa distt. must be considered backward distt. This is mainly due to the fact that earlier it was a part of Jaipur distt. and could not get due attention despite the industrial potentiality of the area.

The lower level of literacy at 36.86% and higher percentage of SC/ST about 50% of the total population indicate towards lack of entrepreneurship resulting in industrial backwardness of the area. As no voluntary agency is operating in the area this is also proving a constraint in motivating prospective enterpreneurs for setting up small industrial units in the area.

Presently, there is no large and medium scale industry in Dausa distt.

The distt has potential for development of demand based, resource based had foot-loose industries. The distt. has good industrial opportunities for agro-based, livestock based, mineral based, demand based industries as well as engineering industries besides, the diversified rural and cottage industries. The details of the potential identified for different type of industries in the survey are given below :-

A. POTENTIAL OF SMALL SCALE AND TINY INDUSTRIES

Name of Industry	Potential Block
1. FOOD PROCESSING & AGRO BASED INDUSTRIES	
i) Thin walled stainless tubes, Dall mill Confectionery Oil Mill, Bread unit, Biscuit unit	Dausa
ii) Pickles, Jam etc.	Dausa/Bandikui
2. RESOURCE BASED	
i) Mosaic, Cement tiles, stone crusher	Dausa
ii) Lime Kiln	All Blocks
3. FOREST BASED	
i) Wood seasoning & Panel Doors	Dausa
ii) Wood based furniture manufacturing	Dausa, Lalsot, Sikarai
4. TEXTILE - BASED	
i) Sanitary napkins	Dausa
5. ENGINEERING BASED	
i) Steel furniture & allied, Rolling shutters	Dausa
ii) Agricultural implement & appliances	Lalsot, Sikarai, Dausa Bandikui
iii) Automobile repair shops	All Blocks
6. DEMAND BASED INDUSTRIES	
i) Black phenyle	Dausa
ii) Detergent powder	Dausa

B. FOOT LOOSE INDUSTRIES

Besides above, there is a good scope of foot loose industries in the distt which are market oriented and do not generally depend upon the resources available in the surrounding near by area. The setting up of such industries mainly depends upon the individual's choice

and convenience. Dausa distt being well connected with roads railway routes can be a good location for establishing many of these industries in township, semi/ urban and rural areas. The RAJCON in its survey report has identified 64 such industries in the industrial potential of the distt.

The District Industries Centre, Dausa taking into account the industrial potential of the distt. has projected for establishment of about 54 SSI units in the different industrial areas of the distt during 1994-95. These units relate to the manufacturing of various items such as marble & dolomite chips, granite tiles, quartz grinding, C.P.W. P.V.C.pipes, polythene bags, edible oil, refined lubricant oil, stone greeet, cement pipes, steel furniture, washing shop, agriculture implements. L.P.G. cylinder, stone cutting & polishing, garments etc. The DIC has also identified about 41 items for which foot-loose industries can be set up in the distt.

The cottage industries of the distt include marble statue making, stone cutting & carving, cotton & woolen carpet weaving, leather tanning, shoe making, pottery, carpentry, blacksmithy, goldsmithy, spinning & weaving on hand-looms, cotton Durray weaving, stone jally making, rope making and brass utensil making etc. The Khadi and Village Industries Board is also providing the financial assistance for the development of cottage & village industries in the distt. In some of these activities the artisans are engaged in clusters which provide good potential to upgrade/ expand these activities by arranging necessary infrastructure by the concerned agencies/ authorities.

1. FARM MECHANISATION

The potential area for farm mechanisation is in the medium and big holdings and farmers from these categories have adopted mechanised methods of agriculture over the traditional methods. As such for arriving at the approximate potential of tractors in the distt. the land holding pattern can be a guiding factor. Dausa distt is having 101758 agriculture land holdings and the total operated area of 245842.60 hectares as per the details mentioned below:-

Sr.No.	Area of holdings	No. of holdings	Operated area (hectares)
1.	0 to less than 1 (Marginal)	35311	17705.00
2.	1 to less than 2 (Small)	25989	37353.29
3.	2 to less than 4 (Semi-medium)	23168	65294.22
4.	4 to less than 10 (Medium)	14732	87414.32
5.	10 and above (Big)	2558	38075.77

The limited availability of drought power and its maintenance cost and cost of farm labour are also important factors having bearing on mechanisation for farmers with small holdings. Increasingly recurring maintenance cost of bullocks/ camels also compel them for hiring of tractors and threshers. The aspiration of social status also promotes the thinking of owning tractors. The necessity of completing the agricultural operations in time compels farmers to opt for mechnisation.

The mechanisation of farming operations is spring gradually, the traditional methods have not lost their importance, Particularly, the small and marginal farmers are fully dependent on traditional methods as neither they have large cultivable lands for use of mechanised methods in agricultural operations nor they have means for acquiring the same. The camels and bullocks in undertaking various farming operations and camel/ bullock-carts for transporting agricultural inputs and produce are still having utility and popularity in the area of the distt.

The land holding pattern indicates that the total marginal and small holdings at 61300 constitutes 60.2% of the total land holdings in the distt. The marginal and small farmers mainly depend on the traditional means of cultivation and trasportation of the agriculture inputs and produce. The majority of agricultural labourers also depend on the animal driven carts to supplement their income. The number of agricultural labourers as per census 1991 is 21034 constituting 2.12% of the total population of the distt. Thus, there is a good potential for drought animals and carts in the distt.

3. Population

As per the census 1991 the population of the distt was 9.94 lakhs which formed 2.26% of the population of the State. The density of the population at 293 persons per square km. is much higher than the density of the State at 129 persons per sq. km. Of the total population, there are 5.28 lakhs males and 4.66 lakhs are females. Areawise, while 89.42% persons live in the rural areas, the remaining 10.58% persons live in the urban area.

The percentage of male literacy in the distt at 56.26 is slightly higher than the literacy percentage of state at 54.99. However, the female literacy percentage at 14.15 is very much lower than the state percentage at 20.44. The percentage of the total literacy at 36.86 is also lower than the State percentage at 38.55.

4. Infrastructure

i) Rail & Road linkages

The headquarters of the distt i.e. Dausa is situated at Jaipur- Delhi and Jaipur-Agra rail lines and Bikaner-Agra Highway No.11. The distt is having total 86 kms rail lines and 772 kms (1992) mortar roads. The total rail lines which were earlier of meter gauge have now been converted into broad gauge which may give a boost to the economic development of the distt in the coming years.

ii) Electricity & Water supply

The distt is having 20 electric sub-stations at 16 places spread over in all blocks of the distt. However, the present electric supply is not adequate to meet the present as well as future electric needs of agriculture & industrial sectors.

There is shortage of water supply in the Dausa block which is affecting the industrial development of the area.

iii) *Post & telecom network*

Apart from the chief post office at the distt headquarters, there are 23 departmental post offices and 171 additional departmental and branch post offices in Dausa distt. The important centres of the distt are also well connected with the telecom facilities.

iv) *At present there are 65 branches of banks in the distt of which there are 41 branches of the commercial banks, 15 branches of regional rural banks.*

District profile : At a Glance
(31st March, 1994)

Name of the district : Dausa

Status of District : Other

1. Geographical Area

a. Number of block/talukas 5

b. Number of villages 1052

2. Rainfall(mm) 1992 1993

a. Normal rainfall(Annual) 549.9 549.9

b. Actual average rainfall 803.5 712.2

3. Agriculture (Ha)

a. Geographical area 340478 340478

b. Net area sown 219575 218904

c. Fallow land 23170 24533

d. Land not available for cultivation 97733 97041

4. Irrigation(Ha)

Net irrigated area 129383 128169

By canals 4314 2666

By tanks 243 52

By wells 124545 125451

By other sources 281 -

5.	Size of holdings		
	a.	Less than one ha.	35311
	b.	Between 1 and 2 ha.	25989
	c.	Above 2 ha.	40458
6.	Animal Husbandry (1992)		
	a.	Plough animals	n.a.
	b.	Dairy animals -Cattle	165038
		Buffaloes	265617
	c.	Sheep,goat and pigs	269852
	d.	Poultry	14792
7.	Population(in '000)	Urban	Rural
	a.	Male	56
			472
	b.	Female	49
			417
8.	Classification of workers		
	a.	Cultivators	215257
		of which small/marginal	N.A.
	b.	Agricultural labourers	21034
	c.	Artisans	N.A.
	d.	Household/cottage industries	7310
	e.	Allied agro-activities	3064
	f.	Other workers	58637

Chapter V

THE PROJECT

PROJECT ON "FARM FORESTRY DEVELOPMENT FOR FARMER MEMBERS OF COOPERATIVE SOCIETIES THROUGH NCUI COOPERATIVE EDUCATION FIELD PROJECT, DAUSA (RAJASTHAN)".

Objectives

The objective of the Farm Forestry Development Project for farmer members of Primary Agricultural Coop. Societies shall be to promote, develop, educate, assist and motivate farmer members to grow tree crops, on bounds of their own fertile lands, degraded lands to meet the requirements of local fuelwood, fodder, small timber and Ber(fruit) with the objective to improve the economic and socio-economic condition of farmer members and maintain the ecological and environmental balance.

In furtherance of these objectives, the NCUI Cooperative Education field Project, Dausa (Rajasthan) may with itself or in collaboration with National Tree Growers Cooperative federation Ltd., Indian Farm Forestry Development Cooperative Ltd., or other International/organisational e.g. CIDA, IDA, IBRD, SIDA and USAID:-

- i) Organise Cooperative Education and training programmes for farmer members of Primary Agricultural Cooperative Societies(PACS) to promote and develop farm forestry on large scale on their fertile/waste land.
- ii) To assist and guide farmer members of PACS to raise nurseries and supply plants and other assistance including inputs to other members of PACS and non members .
- iii) To assist and guide in collaborating the PACS with National or International agencies for development of farm forestry.
- iv) To assist the PACS in getting agricultural implements and plant protection equipment to its members.
- v) To give publicity and popularise the Farm forestry development programme through 'THE COOPERATOR' , T.V. & Radio.
- vi) To guide and assist in all such other activities which are identical or ancillary or conducive to the attainment of all over any of the above objective.

Duration

The duration of the Project will start as on 1.7.1996 and will expire on 30.6.2011. After this period of 15 years, evaluation of the programme will be done.

Project Components :-

I. *Cooperative Education & Training*

To attain the objectives of the proposed project, farmer members of PACS will be motivated and educated by a team of project personnel consisting of one Project Officer, One Farm Guidance Instructor, three Cooperative Education Instructors and one Lady Mobiliser, to grow tea crops of various spices on bounds to improve their economic condition. In this regard, detailed guidelines for project personnel of NCUI Cooperative Education Field Project, Dausa(Rajasthan) are given at annexure.

II. <i>Farm Inputs</i>	Source
i) Credit	PAC/Distt. Coop. Bank, Dausa (Rajasthan)
ii) Seedlings	Forest Deptt. & others
iii) Fertilizers] PACS
iv) Pesticides	
v) Agricultural implements	

III *The Manpower Resource*

The services of family members will be fully utilised.

IV *Marketing :*

The PACS will arrange to provide maximum price of the tree crops/Ber (Fruit) by collecting and Marketing of the produce of farmer members.

Project risk

Planting trees for the first time entails a lot of risk for the farmer. Seedlings may not be available in good time from the forest department. Second, there is a technical risk that the seedlings may not be healthy enough to grow into robust trees. Finally, trees grown as a cash crop needs to be marketed, and hence the farmer has to locate the market, gain access to it, and obtain permits from forest and other Govt. Deptts. to transport and sell his trees. Alternatively, he must sell his standing crop to a contractor. These problems are likely to be more serious in the initial years of a tree planting programme being introduced in a area where such a tradition does not exist.

Chapter-VI

ORGANISATION AND MANAGEMENT

Management Pattern

NATIONAL LEVEL

The Project will be controlled and supervised at the Head Quarter by the Director (Education Projects) of National Cooperative Union of India.

STATE LEVEL

Project implementation requires necessary coordination among various agencies at various levels to ensure regular flow of guidance, technical know-how or any other support required time to time. To this effect Project Coordination Committee, Dause project will provide timely guidance to the project, review the performance and suggest measures for improvement.

DISTRICT LEVEL

The project Head Quarter is attached to Sale & Purchase Marketing Cooperative Society. This society will provided guidance to the project team and provide post education follow up support and other needed assistance to this project.

PROJECT LEVEL

NCUI Project will implement this project with the help of project team consisting of six personnel i.e. Project Officer (one), Cooperative Education Instructors (three), Farm Guidance Instructor (one) and Lady Mobiliser (one). The team will implement the project under the overall guidance of the project officer.

- Cooperative Education Instructor is key functionaries in conducting educational programmes for the members/office bearers of PACS. He will act as Motivator, Educator and guide for the farmer members at the PACS level. He will associate closely with the farmer members in the planning and implementation of educational programmes for the farmer members and to follow the guidelines for the development of farm forestry.
- Each Cooperative Education Instructor is responsible for overall development of PACS (10) and through them to improve economic conditions of farmer members.
- On the basis of data/information collected by CEI, he will assist PACS in formulating Forest Tree Development Plan for the farmer members who are willing to grow the Tree Crops in their fields.
- He will assist the PACS in procurement of various inputs like credit, seedlings, fertilisers, pesticides, for supply to farmer members. He will also collect market information and assist PACS in Marketing of Forest Produce of farmers members on reasonable prices.

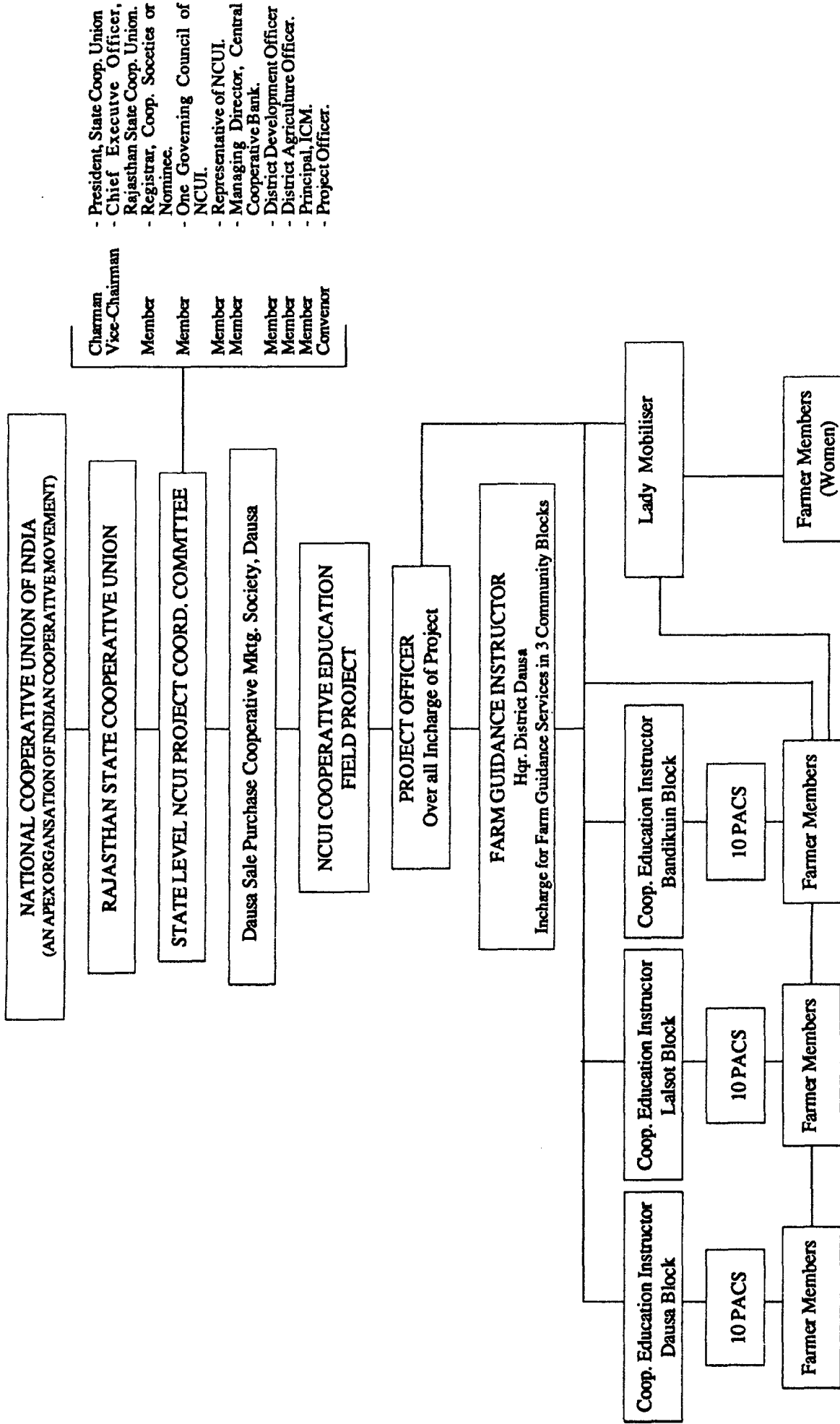
- Farm Guidance Instructor will collect data/information of land, main crops, marketing facilities at district level.
- Motivate and assist PACS in formulating, Forest Tree Development Plan for farmer member in consultation with CEIs. He will educate, motivate and guide farmer members, in implementing their plan and also provide all Farm Technical Guidance to the members.
- He will develop market information system in societies for the benefit of members and assist them in marketing of farmers' tree produce.
- Lady Mobiliser will motivate guide, educate and assist the women in project areas for growing trees.

PACS LEVEL

Primary Agricultural Cooperative Societies in Project areas will arrange supply of credit, other input like seedlings, fertiliser, pesticides, agricultural implements as per need of farmer members.

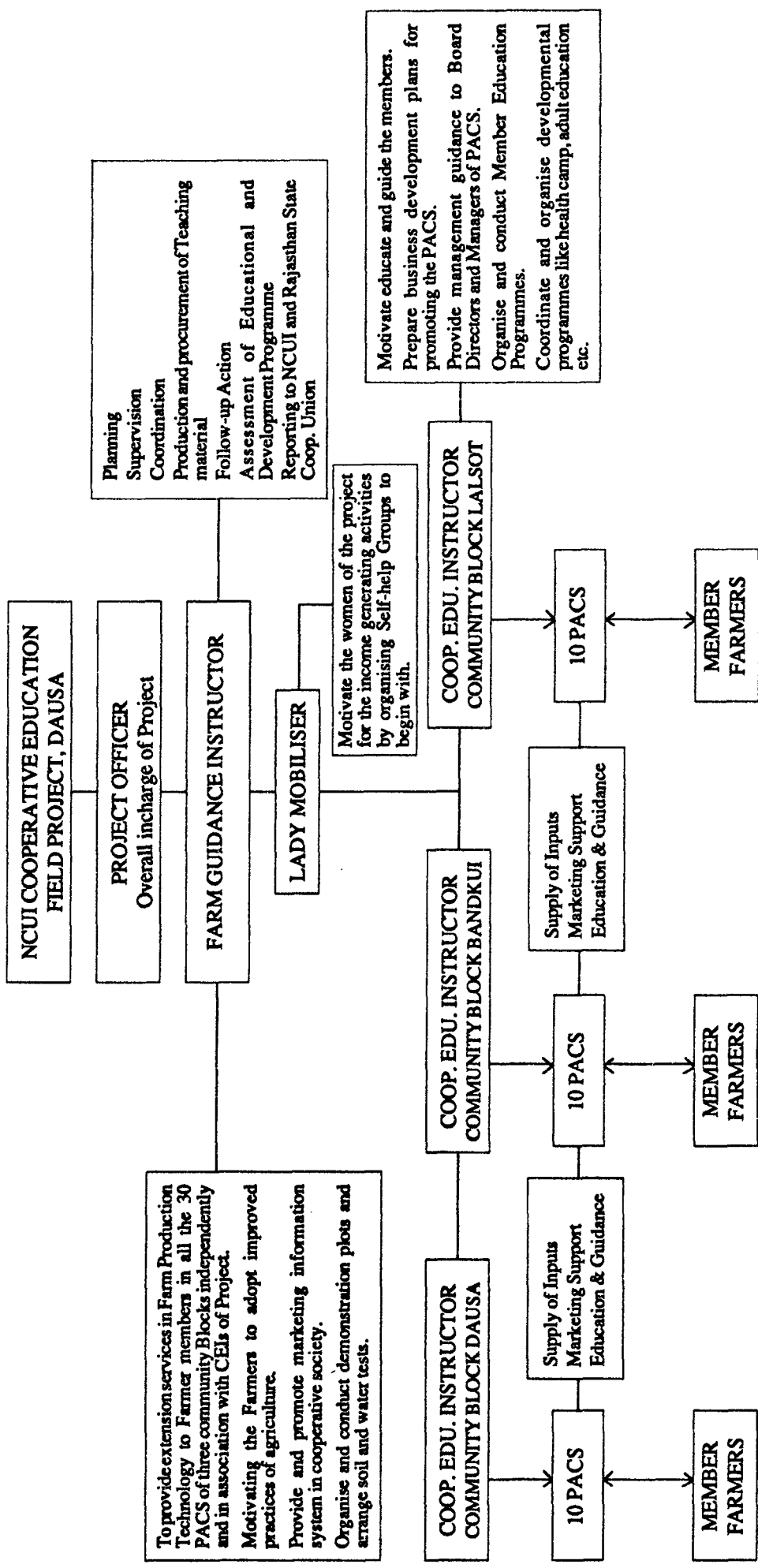
- It will also arrange marketing of tree crops of members through cooperative efforts.
- It will establish close linkages with forest Department and other concerned agencies.

ORGANISATIONAL STRUCTURE OF PROJECT



- | | |
|---------------|---|
| Chairman | - President, State Coop. Union |
| Vice-Chairman | - Chief Executive Officer, Rajasthan State Coop. Union. |
| Member | - Registrar, Coop. Societies or Nominee. |
| Member | - One Governing Council of NCUI. |
| Member | - Representative of NCUI. |
| Member | - Managing Director, Central Cooperative Bank. |
| Member | - District Development Officer |
| Member | - District Agriculture Officer. |
| Member | - Principal, ICM. |
| Convener | - Project Officer. |

Chapter VII FUNCTIONAL INTEGRATION OF PROJECT ACTIVITIES



Chapter VIII

FINANCIAL ANALYSIS

In this part the benefits accruing to farmers has been analysed on successful implementation of the project. The Financial analysis has been done on a hypothetical land holding of one hectare (100 m x 100 m). The analysis has been worked out on the basis of following assumptions :

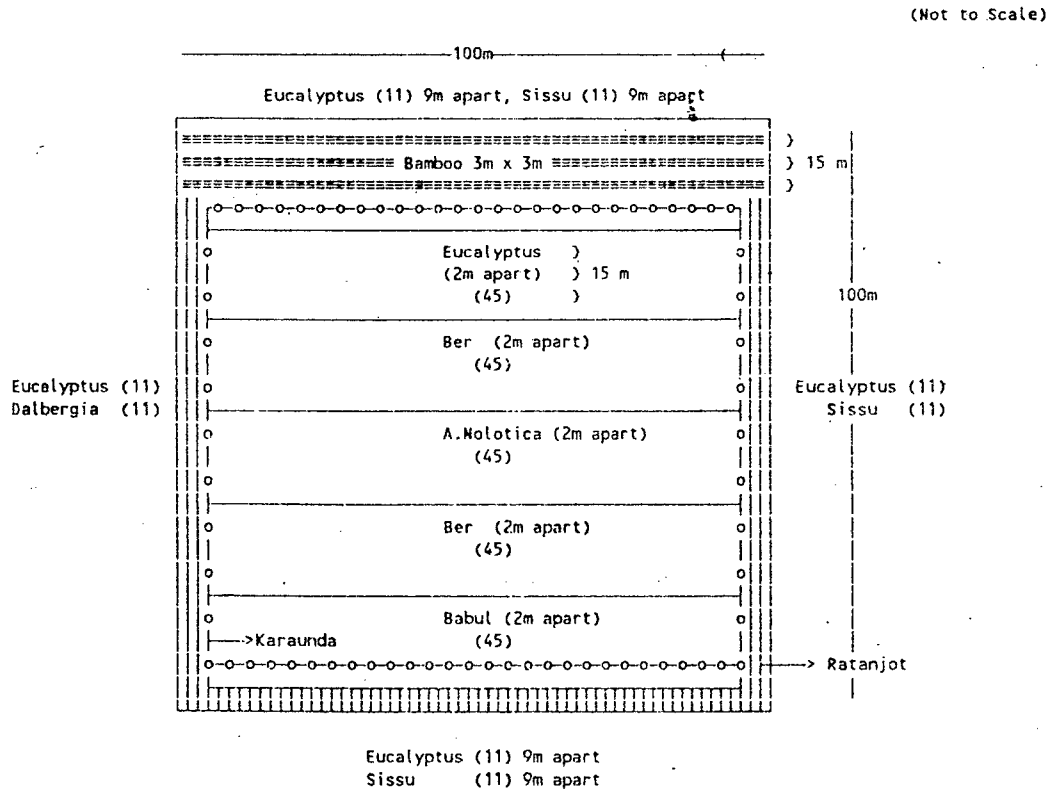
Assumptions

1. Project Period : 15 years
2. One row of trees will affect an area of 5 m wide land.
3. Eucalyptus will be planted on all four sides, 9 m apart. It will be harvested in the 7th year and the first coppice crop will be harvested in the 15th year.
4. Sissu will be harvested in the 15th year.
5. Ber will start yielding in the 7th year.
6. Bamboo will be planted in a pure patch of 0.15 ha. at a spacing of 3 m x 3 m. Bamboo will start yielding from the 5th year.
7. Ratanjot will be planted in a 5 m wide strip on 3 sides (750 no.) at a spacing of 2m x 1m. It will start yielding from the 5th year. Planting will be supplemented by sowing also.
8. On the inner side of the boundary karaunda will be planted 3 m apart and will act as hedge and also give fruits.
9. Income and expenditure for a year accrue at the end of that year.
10. An adhoc amount for labour for harvesting has been assumed which will be contributed by the farmers.
11. Cost of plants including transport is Rs. 4/plant.
12. Cost of Ratanjot & Karaunda is Rs. 1/plant.
13. Cost of cultivation of Jowar and Barley is from average figures of U.P.
14. Cost of fertiliser, pesticides, initial irrigation etc. is Rs. 3/plant.
15. Ber will start yielding from the 7th year. Yield will be 15 kg/tree which will yield Rs. 2/kg.
16. Bamboo will yield after 4 years. The return will be Rs. 10/dump/year.
17. Sissu will be sold in the 15th year, @ Rs. 400/tree.
18. Ratanjot will yield about Rs. 3/plant/year from the 5th year onwards.
19. Discount Rate = 15%.

Tree plantation

Tree would be planted on the bounds of the field. Trees would also be planted in internal rows of large fields such that existing Rabi & Kharif crops are not disturbed. Thus plantation of trees will only bring additional revenues to the farmers. The manner in which trees may be planted on square field an hectare is given as follows :

Farm Forestry Development Model for Farmer members of Primary Agriculture Coop. Societies, Dausa (Rajasthan)



Eucalyptus	:	Boundary (44), Single row (45)
Bamboo	:	15 m wide strip on one side (165)
Sissu	:	Boundary (44)
Babul	:	2 alternate rows (90) (Ramkanti variety)
Ratanjot	:	5 m strip on 3 sides (750)
Karaunda	:	Inner edge of Ratanjot strip, 3 m apart (150)
Ber	:	2 alternate rows (90)
		Total No. of Trees : 478

Inter cropping : Jowar (Kharif) followed by Barley (Rabi)

Species mix	Spacing	Number	Replacement	Area
1. Eucalyptus	9 m apart	44	8	Boundary
2. Sissu	9 m apart	44	9	Boundary
3. Babul	2 m apart	90	18	Two alternate rows, 450 m ²
4. Ber	2 m apart	90	18	Two alternate rows, 450 m ²
5. Bamboo	3 m x 30 m	165	33	Pure patch of 1500 m ²
6. Eucalyptus	2 m apart	45	8	Single row 225 m ²
7. Ratanjot	2 m x 1 m	750	150	Strip of 5 m ² on three sides, 1500 m ²
8. Karaunda	3 m apart	150	30	Inner side of boundary 5875 m ²
9. Agri. : Jowar (Kharif followed by Barley (Rabi				
Total :		900	180	10000 m²

COST—INPUT STATEMENT

(Rs./hectare)

Particulars	YEAR			
	1-3	4-6	7-15	Total
1. Cost of planting including seedling, transportation, fertiliser, manure, soil working etc.	3776	-	-	3776
2. Cost of Ratanjot & Karaunda	12800	-	-	12800
3. Initial watering and maintenance	2410	-	-	2410
4. Harvesting	-	3465	11700	15165
5. Cost of cultivation of Jowar	1800	1800	5400	9000
6. Cost of cultivation of Barley	3000	3000	9000	15000
7. Contingencies	1500	1500	4500	7500
Total :	25286	9765	30600	65651

RETURNS—OUTPUT STATEMENT

(Rs./hectare)

Particulars	Year				Total
	1-4	5-7	8-14	15	
1. Return from Eucalyptus	-	8000	-	8000	16000
2. Return from Ber	-	2700	18900	2700	24300
3. Return from Bamboo	-	4950	11550	1650	18150
4. Return from Nilotica	-	-	-	18000	18000
5. Return from Dalbergia	-	-	-	27000	27000
6. Return from Ratanjot	-	7680	17920	2560	28160
7. Return from Jowar	4800	3600	8400	1200	18000
8. Return from Barley	6800	5100	11900	1700	25500
Total :	11600	32030	68670	62810	175110

Statement Showing Benefits Accruing to Farmers Members on Yearly Basis

Particulars	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Cost																
1. Cost of planting including seedling, transportation, Fertiliser, manure, soil working etc.	3776	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3776
2. Cost of Ratanjot & Karaunda	12800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12800
3. Initial watering and maintenance	2410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2410
4. Harvesting	-	-	-	1155	1155	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	15165
5. Cost of cultivation of Jowar	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	9000
6. Cost of cultivation of Barley	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	15000
7. Contingencies	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	7500
Total Cost A :	21086	2100	2100	3255	3255	3255	3400	3400	3400	3400	3400	3400	3400	3400	3400	65651
Returns																
1. Return from Eucalyptus	-	-	-	-	-	-	8000	-	-	-	-	-	-	-	8,000	16000
2. Return from Ber	-	-	-	-	-	-	2700	2700	2700	2700	2700	2700	2700	2700	2700	24300
3. Return from Bamboo	-	-	-	-	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	18150
4. Return from Nilotica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18000	18000
5. Return from Dalbergia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27000	27000
6. Return from Ratanjot	-	-	-	-	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	28160
7. Return from Jowar	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	18000
8. Return from Barley	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	25500
Total Returns :	2900	2900	2900	2900	7110	7110	17810	9810	9810	9810	9810	9810	9810	9810	62810	175110
Net Benefit (B — A) :	-18,186	800	800	-355	3855	3855	14410	6410	6410	6410	6410	6410	6410	6410	59410	109459

Calculation of Net Present Value

Year	Benefits	Discounting factor	Present value
1	-18186	0.8696	-15813.91
2	800	0.7561	604.91
3	800	0.6575	526.01
4	-355	0.5718	-202.97
5	3855	0.4972	1916.62
6	3855	0.4323	1666.62
7	14410	0.3759	5417.25
8	6410	0.3269	2095.44
9	6410	0.2843	1822.12
10	6410	0.2472	1584.45
11	6410	0.2149	1377.79
12	6410	0.1869	1198.07
13	6410	0.1625	1041.80
14	6410	0.1413	905.92
15	59410	0.1229	7301.16
Net present value/Total			11441.29

We find that net present value of the benefit which will be accruing to farmer members will be Rs. 11,441.29 per hectare.

IRR=22.53%

It is also found that internal rate of return which farmers will be able to achieve through this project is 22.53% which is higher than discounting rate of 15%.

Chart showing the additional income from farm forestry project within a period of Fifteen Years

(Yield one ha.)

Sl. No.	Crops Inputs	Without Project			With Project		
		Output in Rs. hect.	Income in Rs. hect.	Input in Rs. hect.	Input in Rs. hect.	Output in Rs. hect.	Income in Rs. hect.
1.	Farm Forestry Crops						
	Plantation of Eucalyptus, Ber, Bamboo, Nilotica, Dalbergia & Ratanjot	-	-	-	41,651	1,31,610	89,959
2.	Agricultural Crops						
	Cultivation of Jowar	9000	18000	9000	9000	18000	9000
	Cultivation of Barley	15000	25500	10500	15000	25500	10500
	Total	24000	43500	19500	65651	175110	109459

-	Total Income from Farm Forestry Project	109459
-	Total income from without Project	(-) 19500
-	Additional income	<u>89959</u>

Average additional Annual income Rs. 5,997.26 hence the project is very good for the farmer members. Thus, the project is recommended for implementation.

Chapter IX

RECOMMENDATIONS

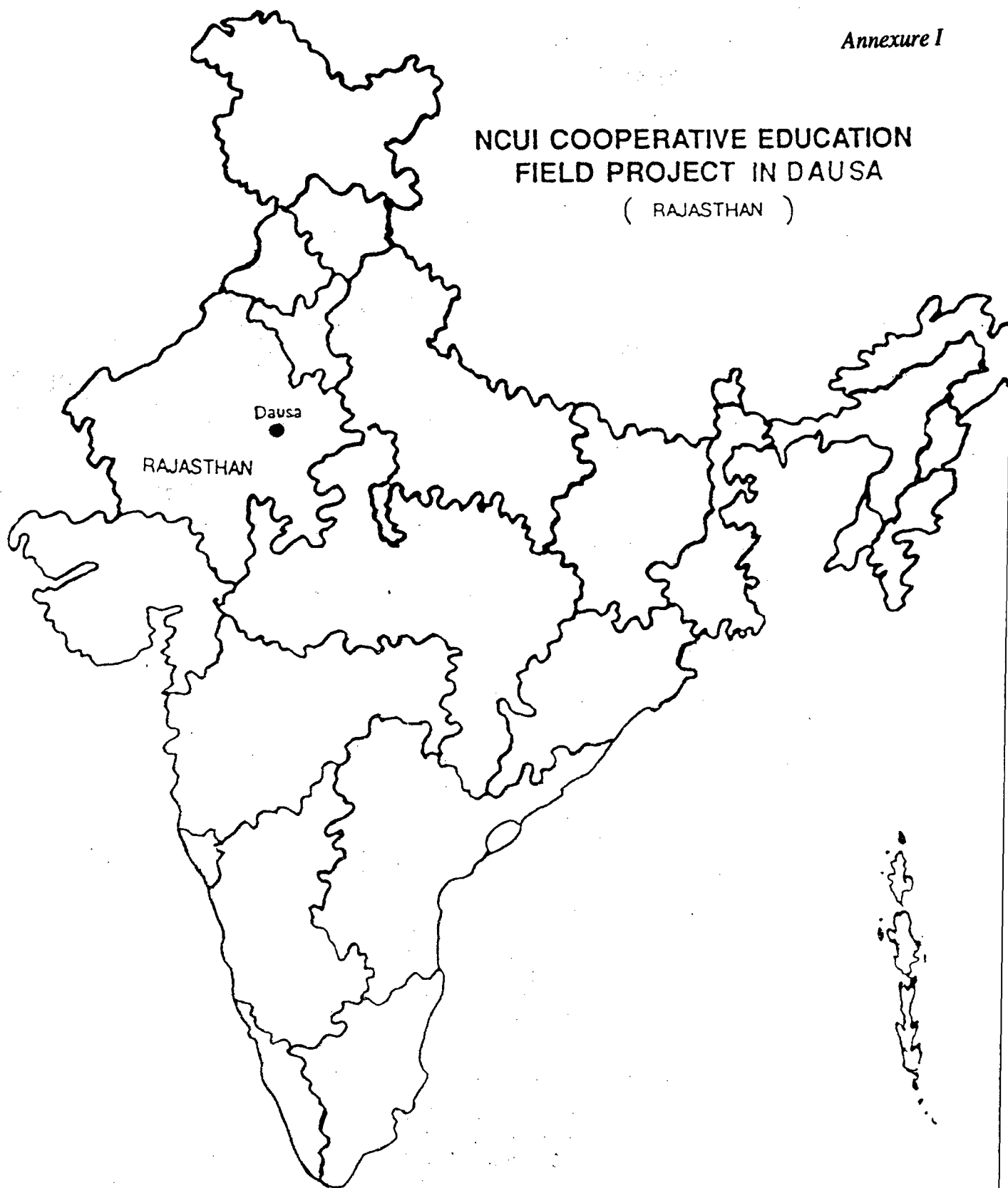
NECESSITY OF PROJECT

Over the years, forest in the country have suffered serious depletion. This is attributable to relentless pressures arising from even increasing demand of fuelwood, fodder and timber, inadequacy of protection measures, diversion of forest lands of non forest uses with out ensuring compensatory afforestation and essential environmental safe guards and tendency to look upon forests as revenue earning resource. The need to evolve a new strategy of forest conservation has become imperative. the Govt. of India and State Govts. are making their efforts to maintain environmental stability. In this direction, NCUI through its NCUI Cooperative Education Field Project, Dausa (Rajasthan) should conduct Cooperative Education and Training Programmes in the PACS to assist, guide, motivate the farmer members to grow tree crops to protect the environment as well as to provide the economic benefits.

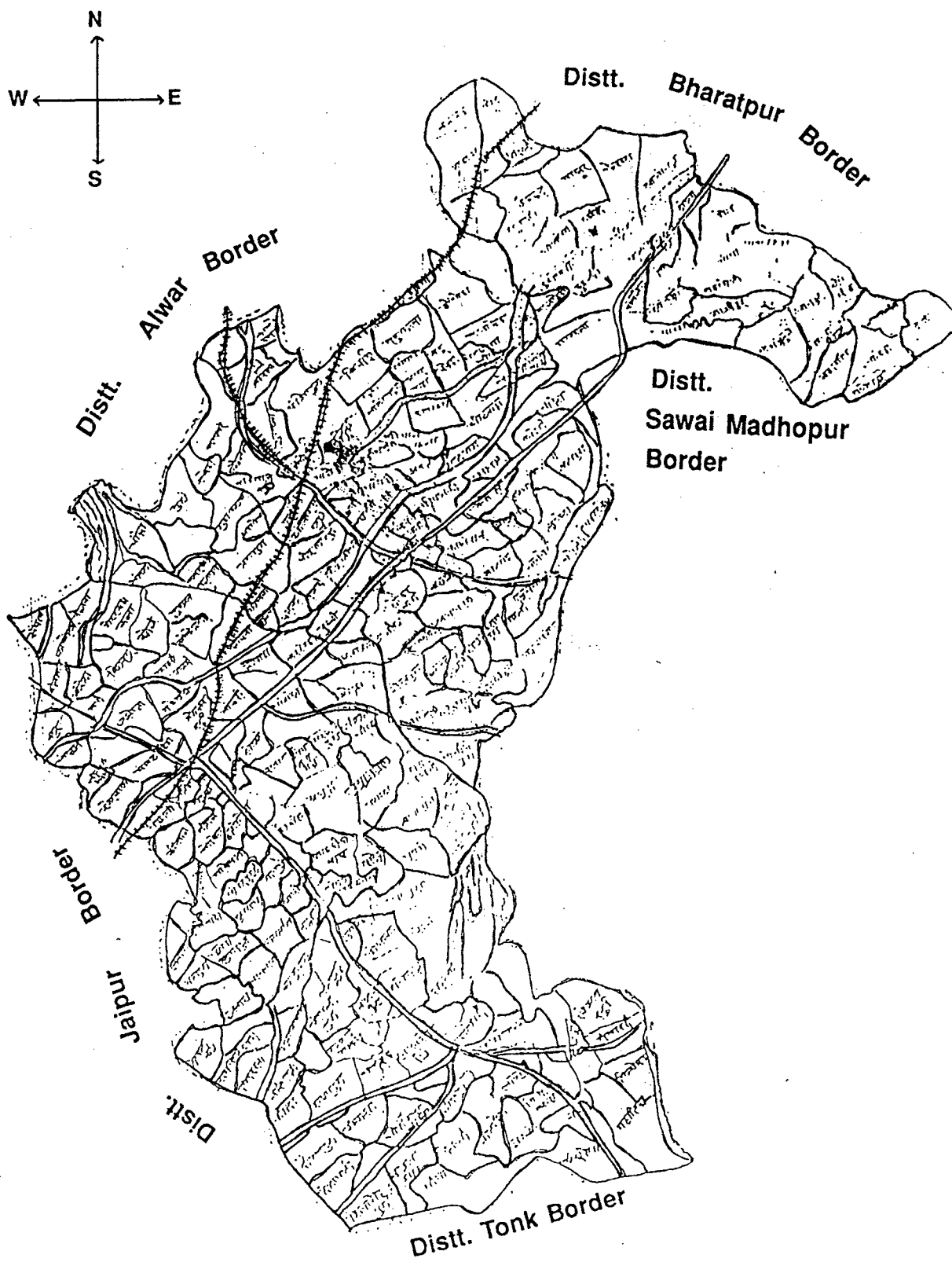
RECOMMENDATIONS

1. The Govt. should arrange the distribution of high yield varieties and disease - resistant seedlings free of cost from forest department to all the farmer members of PACS and other farmers so that the tree- plantation may be started in a big way. This will induce farmers to actively take interest in farm forestry thus accomplishing Govt.'s objective of enhancing socio-economic condition of the farmers and protecting the environment.
2. To increase the interest of farmers, the Govt. can bring competitive schemes of distributing prizes on the basis of number of trees grown and their survival for a stipulated (7-15 years) period of time.
3. The Govt. should provide market intelligence services to the farmers regarding different type of tree-crops.
4. The Govt. should arrange to provide concessional rate of interest to the farmers engaged in tree-cultivation.
5. Legislative restrictions which currently require permits for cutting most species, discourage farmers from growing more species. This restriction is hard particularly on the small farmer who has less access to the bureaucracy to obtain permits and is more doubtful of his rights. Similarly, the legal requirements for obtaining permits to transport trees to market, discourage planting, encourage reliance on middleman and encourage corruption. Hence, the Govt. should amend the laws in favour of the farmers so that the farmers may grow tree-crops with out any hinderence.
6. Research and Development efforts should be taken on raising nurseries, plantations, marketing techniques etc.
7. To popularise the Farm Forestry Programme, film on successful stories of farm forestry be shown on T.V.
8. In order to cater to the needs of Industry and market and rehabilitate degraded lands, Farm Forestry Programmes may be launched in all the present 22 NCUI Cooperative education Field Projects.

**NCUI COOPERATIVE EDUCATION
FIELD PROJECT IN DAUSA**
(RAJASTHAN)



MAP OF DISTRICT DAUSA



**GUIDELINES FOR PROJECT PERSONNEL OF NCUI COOPERATIVE
EDUCATION FIELD PROJECT, DAUSA (RAJASTHAN) FOR TREE PLANTING**

In carrying out plantation work on fairly large scale and specially in afforestation of difficult sites, there are many situations when the field worker has to face some problems or to take decisions. Important considerations are :-

1. Selection of Planting Area

While a large area of various types of land such as wasteland, road-side and railway strips, canal banks, building compounds and even parts of agricultural land are available or offered for plantation, it should always be borne in mind that all lands are not suitable for raising all tree species or even for growing trees at all. Generally, the areas which have been under tree crops in the past or are under good agriculture are eminently suited for raising tree plantations. But the areas where trees have always or long been absent should be carefully studied to determine their suitability for raising trees, and if so, which trees. Often there are strong reasons behind such absence of tree and over such areas tree planting work will not give favourable results. If at all, very specific trees only can be raised on such areas. If some environmental factor is unfavourable, it must first be improved before taking any plantation work.

In a long-term project, the easiest areas should always be tackled first. Initial success in one or two areas boosts confidence of workers and also gives an indication of future pattern of work and problems to be faced. Plantation work should be carried out only when one is sure of success. Experimentation should be left to the research people, who are specially meant for it. Initial failure makes people lose confidence in you.

Particularly bad soils for tree growth are as follows :-

- a) **Soils with excessive moisture:** These soils suffer from bad aeration and will support only certain tree species. These can be improved by suitable drainage of water. Marginal areas may be reclaimed by planting on mounds and ridges.
- b) **Excessively dry areas :** Only drought tolerant species can be used here. Moisture conservation measures and irrigation can help.
- c) **Impervious pan :** Only shallow rooted species can be raised, with irrigation during drought period; or the pan should be broken to permit deep rooted species to penetrate to moisture in lower soil layers.
- d) **Saline and alkaline soils:** Tolerant species can be raised in the area to a limited extent. Such soils can be reclaimed by leaching and addition of Gypsum and Pyrites.
- e) **Grassy 'banjar' lands :** In such land soil gets compacted due to exposure, heavy grazing and compaction by hooves of cattle, dense mat of grass roots and fire. In such areas intensive soil working and removal of grass is needed which adds to the effort and cost of plantations.

2. What to Plant

In deciding on what to plant one should keep in sight both what can grow best at the site and what is desired to be grown there by the local interests such as wishes of local populace and the planned and use of the produce. Often these objects do not match and the tree planter has to take a decisions in the matter. The best indicators of what can best grow at the site are the species which are already growing there and on similar sites near by. In the absence of trees even the shrubs, herbs and grasses indicate the quality of the locality. Suitable tree species can then be chosen and safely planted. If the area is suitable for raising several species, only those should be chosen which meet the object of plantation best i.e. fuel, poles, timber or protection of site. Sometimes, in social forestry areas, local villagers press for planting of certain species which are doing well elsewhere and are economically more attractive to them. If those species are not suited to the site, the people should be very politely persuaded to abandon their demand. If still they persist, rather than to antagonise, them, the desired species may be introduced in minimum acceptable numbers in mixture with the more suitable species. Time in due course will show the people that they are wrong but the plantation will not be a failure.

Use of little known species in planting is to be eschewed unless supported by detailed research.

3. Mixture in plantation

The above point brings us to the subject of mixtures in plantation. Nature almost always maintains a mixture of species in fores. From the ecological point of view it is best to follow nature. Mixed crops cover soil better. Also greater advantage can be taken of the soil variations within the planting areas. Mixed Plantations are less susceptible to damage and produce more and variety of produce. However, if only a single type of produce is aimed at, pure plantations are more economical and easier to manage.

Mixtures can be intimate (by single trees) or by lines or groups. If all species raised suit the site the best policy is to have either mixture in groups (small lots) or with scattered light demanding species as quick growing standards over a full crop in second story of a slower growing shade bearer.

4. Spacing

Spacing of plants is governed by two factors :-

- i) Silvicultural requirement of the species to produce the required size for end use and
- ii) Cost of formation. More the plants, higher the cost of formation of plantation. Both these factors must be assessed before deciding on spacing. Wider spacing is cheap but cannot be taken beyond a limit. In farm forestry it is often desirable as agricultural crops can be taken between the tree lines for several years.

5. Sowing v/s Planting

In recent years planting of nursery raised seedlings in the form of bagged plants has

become a very common practice. It gives the plants great initial advantage of early grow in more or less protected nurseries and planting out with least disturbance to its roots system. However, there are many species which can be grown equally easily with a little protection and care by directly sowing the seed at site.

Direct sowing is much cheaper than planting and less labour intensive. But it is suitable for only the more moist areas where the young seedling is not faced by extreme conditions very early in life. In semi-arid and arid areas planting is the only way to success. Species like ACACIA NILOTICA, A.CATECHU and PROSPIS CHILENSIS are best raised by sowing due to their hardiness and extremely fast rate of growth of taproot. In plants raised in polythene bags the root growth is interfered with, which results in check of growth or even death of the plant at a later stage. Where one of the above species is proposed to be raised in polythene bags such bags will have to be planted out when still quite small.

In short, sowings may be adopted where past results assure of its success. In case of difficult sites and sensitive or problematic species, planting of seedlings is a safer method. Stumps (root-shoot) planting combines certain advantages of both the methods and may be adopted for suitable species such as teak, sissou, etc. where high density of stocking and rapid development of plant in this method, combined with cheapness give it an advantage. Naked rooted plants can be used in case of bamboos and winter planting of deciduous species, through in their case too the planting of contained raised plant is now more in vogue. In case of planting of seedlings or stumps, the stock has to be raised in the nursery for a period of time extending from a few months to a year or more. It means that nurseries have to be planned and raised 1 to 2 years in advance of planting. The transport costs of plants from nursery to planting site are often heavy and to reduce this nursery should be raised as near to the planting site as possible.

6. Container and plant size

The size of container used (mostly perforated polythene bags now a days) depends on the size and age of the seedling to be used in planting. In areas with tall grasses and shrubs, usually large sized bags of 22.5 x 15 cms flat size are used in which plants of 1 meters or more in height can be raised in about one year. For areas with short grasses or barren waste lands or agricultural fields smaller bags of 15 x 10 cms are universally used in which plants of 30 to 45 cms height can be grown easily for planting out.

As a rule smaller the plant, less it suffers from the shock of removal, but larger plants are better able to succeed on poor sites or where heavy grass is present. Very small plants are difficult to handle and more liable to fatal damage due to various adverse factors as well as competition with weeds.

7. Planting time

Planting of trees is a time bound programme and for each region a time table for work should be drawn and strictly adhered to. Preparation of site, collection of seed, sowing, planting, tending, etc. can brook no delay and any neglect of this can only end in disaster. It also means that planning must start 2 to 3 years before actual planting. It must be borne in mind that late start of any operation may end in serious consequences. After planting out, the

seedlings should have enough time to send roots down to deeper soil layers which will not dry-up in the subsequent long drought period till the next rainy season. Hence earlier planting should be aimed at after onset of monsoons. In Gujarat, particularly in the western part in Saurashtra and Kutch, monsoon is very erratic and the other seasons are generally not found suitable for planting.

Where sowing are proposed the need should be sown 10 to 15 days before expected start of rains. Planting should be started immediately after first monsoon showers, preferably on rainy or cloudy days. Watering may have to be resorted to, if there is a break in the rains for any length of time.

8. Preparation of planting stock

When plants are removed from nursery beds it is advisable to cut down initial transpiration by stripping a part of the leaves, some times most of them. Some branches can also be removed. These operation must be carried out a few days before plants are dug out. Usually deciduous plants can be wholly stripped while in case of evergreen plants the crown is reduced by 1/3 to 2 about 15 days before removal. After digging out, the plants with earth ball should be kept in the nursery itself in a shaded place and kept well watered for about 15 days to tide over the uprooting shock. Only the plants which are healthy and vigorous are then taken away for planting to the field. Naked rooted plants and roof shoot cuttings are removed for planting without delay but should be soaked in water for 24 hours or longer before being actually planted to compensate for desiccation during transport. Container plants need no preparation except reduction of crown and a thorough soaking with water before planting out.

9. Transport of Planting stock

The main problem regarding transport are to deliver earth ball or container, plants at site in time and to save naked rooted plants and stumps from desiccation while in transit. The tree planting season coincides with the agricultural season and in case manual transport of contained or earth balled plants is also involved the labour is difficult to come by at the right time. This often delays the planting with adverse effect on success. Therefore, in such areas a safer course would be to transport such plants to the plantation site well ahead of planting time and keeping there after making arrangement for regular watering.

To save the naked rooted plants from desiccation these would never be exposed to wind and roots in particular must be saved from sunlight. To cut the moisture loss from the plants these should be quickly dumped in a pit with puddled soil and cow-dung so that their roots are covered well with the mud. These should be transported as such after covering them well with wet grass or gunny bags which are constantly sprinkled with water. If possible these should be transported at night and planted the very next day, but if need to be kept for some time should again be kept with root dipped in puddled soil, so that roots are never exposed to light or wind. Such plants should be thoroughly soaked in water for 24 hours before planting.

Stumps can also be stored for relatively long period if stored in moist sand and covered with at least 20 cms thick layer of sand at the top.

10. Pit size

Generally 30 x 30 x 30 cms size pits are good enough in ordinary soil and favourable climatic conditions for polythene bag raised plants and root shoot cuttings. On poor soils, hills and adverse climatic conditions as also for larger plants bigger pits of 45 x 45 x 45 cms or more are recommended.

11. Planting

A major problem in case of plants raised in polythene bags is the fact that often the labourers do not cut and remove the container. This prevents the plant root from coming in contact with ground soil quickly and transfer of moisture to the bagged soil from the ground is also not possible. With depletion of moisture inside the bag the plant dies as soon as the rains stop. This mistake should be specially guarded against and to ensure proper planting each torn bag should be insisted to be left at the pit site, where it can be easily checked by the supervisor. This will ensure better compliance of orders.

Another problem with polythene bag raised plants is the curling of roots inside the bag. It results in reduced rate of growth of the plant and sometimes the tap-root is strangulated resulting in death of the plant. This can be controlled by cutting the bottom one centimeter of the bag by a sharp knife and also giving two vertical cuts about 2 cm deep on two sides of the bag. It helps in removal of the bag and also takes care of curved root in the bottom as well as sides.

In planting of naked rooted plants it must be seen carefully that the tap-root does not get bent and curved but remains straight. The planting pit should be fully as deep as the roots are long. The plant is held in the centre of the pit and the soil filled in small stages and compacted till the pit is filled. The side roots as far as possible, should remain the original position in soil.

The plants should normally be planted with the collar at the ground level and the level of filled soil not below the original level, rather a little raised above the ground level. Later the soil sinks and will attain the ground level. The filled soil should slope plant outwards, though, a 'thaonla' may be made around the plant at some distance to hold irrigation and rain water.

Planting of seedlings is carried out after monsoons are well set and the soil has been well watered. But it should not be delayed too long, as new roots thrown by the plants must have sufficient time before the next long drought to penetrate to the deeper layers of soil which retain moisture all the year round.

In case of root-shoot cuttings the pre-monsoon planting has become the standard practice at many places so that the stumps have time to get over transplanting and pruning trauma and start the process of healing before sprouting with the on-set monsoons.

12. Use of fertilizers

Except for planting on agricultural land and some round and canal strips, the land available for planting are generally poor in nutritional quality. Addition of fertilisers generally

gives a favourable response. Correct application of fertilizers the soil of the planting area should be got tested and suitable mix of fertilisers may be added to soil while planting the trees. The response to fertiliser lasts only in juvenile phase. It has no marked effect in adult phase of growth.

13. Protection

Fencing of young plantations against damage by cattle browsing is essential. Even with hardy species much as teak, thorny species like babul and unpalatable species like *Anacardium occidentale* (Kaju) damage will be done by trampling of not by browsing. Social fencing may be practiced where feasible. Otherwise barbed wire, stonewall, trench or hedge fence should be erected around the plantation. Stone wall 1 to 1.2 meters high forms the most effective fence followed by barbed wire and trench fences. But all types of fence need regular checking and repairs to be useful.

5-10 gms of 5 % BHC or Aldrex powder is sprinkled in the pits before filling the soil as a precaution against termites and other insects. In case of more serious danger it may be mixed with the soil also. Naked rooted plants and root shoot cutting are dipped in 0.5 % solution of Diethane-M45 or brassicol before planting to guard against pathogenic root fungi.

Healthy and quality seed and disease free seedlings are necessary for raising healthy and vigorous stands of any forest tree species. Tree seed and nursery seedlings may suffer damage due to pathogenic organisms (fungi, bacteria, viruses, mycoplasma like bodies etc.), insect pests, abiotic agencies (low and high temperatures, low and high soil moisture, air pollution) and deficiency of micro or macro-nutrients. Damage due to fungi exceeds the damage caused by all other agencies put together.

Seedlings in nurseries are more prone to attack by pathogenic organisms than those growing under natural conditions as nursery grown seedlings have more tender tissues, grow in artificial ecosystems are are concentrated in a limited space. Nurseries thus present an ideal situation for epidemic spread of diseases which may sometimes destroy the entire seedling stock grown during a season. Protection of nursery plants from the attack of pathogenic organisms should therefore, form an integral part of any nursery, management programme.

Trees grow very differently than agriculture crops. The trees have very long life span and the peculiarity of tree growth is the non-distinction between capital and interest. The increment of each year is added on to the existing wood. The rates of growth change from year to year. The growth rates are controlled by large number of factors such as genetics of the tree, the site quality, the climatic changes, the cultural practices, presence and crowding of neighbours etc.

DETILS OF NURSERIES IN DAUSA FOR SEEDLINGS DISTRIBUTION

(In lakhs)

Panchyat Samiti	Name of Range	Name of Nuesery	Name of seedlings		Total
			For dist- ribution	For Depart- mental tree plantation	
1	2	3	4	5	6
Bandikui	Bandikui	1. Bandikui	0.31	-	0.31
		2. Pichupada	0.44	0.08	0.52
		3. Dhigaria Bhim x	0.20	-	0.20
		4. Dhigaria Bhim	-	0.38	0.38
		5. Nandera I x	0.20	0.19	0.39
		6. Nandera II x	0.20	-	0.20
		7. Pratap pura xxx	0.25	-	0.25
		8. Kolana xxx	0.25	0.16	0.41
		9. Amaneri x	0.25	-	0.25
		10. Guda Katala x	0.20	0.40	0.60
Sikarai	Bandikui	11. Balaji Mod	0.50	0.20	0.70
		12. Lanka x	0.20	-	0.20
		13. Ghighan x	0.15	-	0.15
		14. Ghijagad x	0.15	-	0.15
		15. Ambadi x	0.20	-	0.20
		16. Sawas x	0.20	0.03	0.23
		17. Padali x	0.21	-	0.21
		18. Faraspura	-	0.52	0.52
Dausa	Dausa	19. Dausa	0.44	-	0.44
		20. Pyarivas	0.80	0.19	0.99
		21. Boroda	0.50	0.32	0.82
		22. Khedli	-	0.32	0.32
		23. Butoli	-	0.32	0.32
		24. Pilava	-	0.44	0.44
		25. Thumdi	-	0.33	0.33
Lalsot	Lalsot	26. Didwana	1.12	0.45	1.57
		27. Rahuwas	0.56	0.15	0.71
		28. Nirjhrana	-	0.32	0.32
		29. Ghata	-	0.45	0.45
		30. Ghonpada	-	0.12	0.12
Total :			7.33	5.40	12.73

**FINANCIAL RESOURCES FOR FARM FORESTRY PROJECT
IN DAUSA (RAJASTHAN)**

The Cooperative Banking structure in Rajasthan is federal in character. At the base i.e. at the village level, there is primary credit society upon which whole edifice of cooperative credit is based. These societies are federated at district level into a central society called Central Cooperative banks. At the state level, the district banks are federated into an apex bank. The apex bank or State Cooperative Bank in turn closely linked with NABARD which provide considerable financial assistance to cooperative credit structure. This is the set up in regard to short term and medium term finance. Dausa is a new city and earlier it was a part of Jaipur District hence at present Jaipur Central Cooperative Bank is taking care of its short term, mid-term requirements. The long term credit is available through Rajasthan State Land Development Bank.

Interest rate of Dausa Central Cooperative Bank for Crop Loan :

- A. Interest rate from Dausa Central Cooperative Bank to PACS 10% Annual
- B. From Primary Agriculture Coop. Societies to farmer members.
- (i) Upto Rs. 25,000 - 14% Annual
- (ii) Above Rs. 25,000 - 15% Annual

Financial Scale for Short-Term Credit or Crop Loan :

1. Component A : Cash Loan direct to farmers
- (a) For Kharif Crop - Rs. 5,400/- per acre
- (b) For Rabi Crop - Rs. 3,600/- per acre
- Rs. 9,000/-
2. Component B - in kinds i.e. inputs of crop like seed, fertiliser etc.
- (a) For both Kharif and Rabi crop - Rs. 1,100/- per acre
- Total maximum credit limit is Rs. 20,000/-

Interest rate of Rajasthan State Land Development bank

S. No.	Volume of Credit	Rate of interest
1.	Upto Rs. 25,000/-	14.00%
2.	More than Rs. 25,000 upto Rs. 2 lakh	15.00%
3.	More than Rs. 2 lakh	
	(a) Agriculture Loan	
	(i) Small irrigation purpose	15.00%
	(ii) Other than small irrigation purpose	16.00%
	(b) Non-agricultural loans	
	(i) More than Rs. 2 lakh	16.00%

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**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : Village Breeding
Dairy Cow for Small Holder's
K.U.D "SETIA KAWAN" NONGKOJAJAR

Country : INDONESIA

Project Prepared by : ANDY SATYANA

**Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and
Executed by the ICA in collaboration with its Member Organisations
in India, Malaysia and Japan**



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- V. Organization and Management
- VI. Financial Analysis
- VII. Budget
- VIII. Recommendation

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Acknowledgement

I would like to express my gratitude to ICA-ROAP and Japanese Government which provide me this good chance to learn on Management Agricultural Cooperative in Asia region.

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Through the Training Programme, I would gain lots of knowledge and supportant concepts to improve management of agricultural cooperative.

I am also grateful to the DEKOPIN, including staffs and to Mr.H.NURWYNDHO, SE for giving me good opportunity and supporting very much in preparing this project.

FEBRUARY , 1996
ANDY SATYANA
NONGKOJAJAR,
PASURUAN
INDONESIA

Chapter I Summary

1.1. Project

The name of the project : Village Breeding for Small Holder in Village Unit Cooperative (K.U.D.) “Setia Kawan” Nongkojajar. The project is a small part of dairy cow aspect, but has basic system for dairy farming.

1.2. Objectivities :

- a) increasing farmers income
- b) replacement dairy stock
- c) reducing dependent imported heifers

1.3. Benefit to the members :

- a) give potent genetic material of cows for dairy farming to produce much more milk
- b) encouraging to the farmer to produce elite calves
- c) reducing fund from imported heifers
- d) efficiency

1.4. Benefit to the cooperative :

- a) increasing activity on all of unit management and department
- b) increase milk production

1.5. Investment and The Source of Fund

The total investment needed Rp. 22.037.000 which is proposed to be financed from commercial bank with interest 19 %.

1.6. Resulted of Finance Analysis

Pay Back Period = 1 year

Break Event Sales = Rp. 11.823.000

IRR = 210.24 %

Chapter II Background

2.1 Overall Situations

Village Unit Cooperative (KUD) "Setia Kawan" was established on December 31, 1977 as the result of amalgamation of 8 primary coop in village. Status as primary coop was given on August 2, 1978 and was changed to KUD since February 21, 1990, at the moment has about 7500 members.

The working territorial covers the area of district Tukur, while its office in Wonosari. District Tukur - Nongkojajar is under the Regency of Pasuruan. Located at western slope of Mount Tengger at the height of 400 - 2000 m. above se level.

The average of rainfall 3650 mm. per annual, the lowest temperature 16 centigrade, the highest 25 centigrade. District of Tukur covers an area of 94 km² consist of 12 villages.

Its location is 85 km. far from Surabaya, 45 km. from Malang and 65 km. from Pasuruan. Animal husbandry has known especially Dairy Cow often introduced by The Dutch in 1911. At that time Dairying was provided fresh milk to European who lived in Nongkojajar.

Main activity of Milk Production (general)

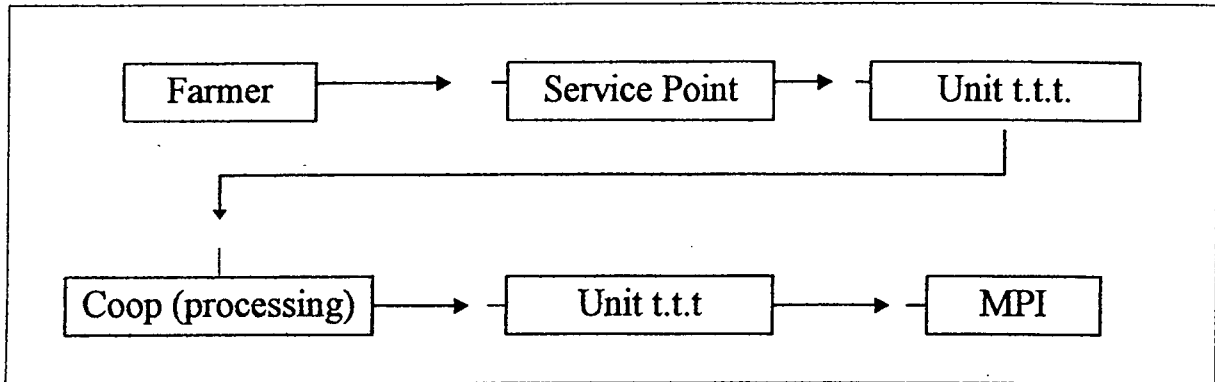


Table 1 Dairy Cow small holder condition

Item	at present
<p>1. Farming</p> <ul style="list-style-type: none"> - scale of business - productivity - breeding 	<p>ownership 3-4 head / household</p> <p>average 10 kg / head / day</p> <p>not yet both Union of Indonesian Dairy / Private Company</p>
<p>2. Processing / Marketing</p> <ul style="list-style-type: none"> - Milk Coop Scale - Milk Product 	<p>60 % production scale of KUD less than B.E.P. i.e. < 5000 Liter/day</p> <p>Milk Powder, Sweetened Milk, Liquid Milk (UHT/ Sterilized, Pasteurized)</p>

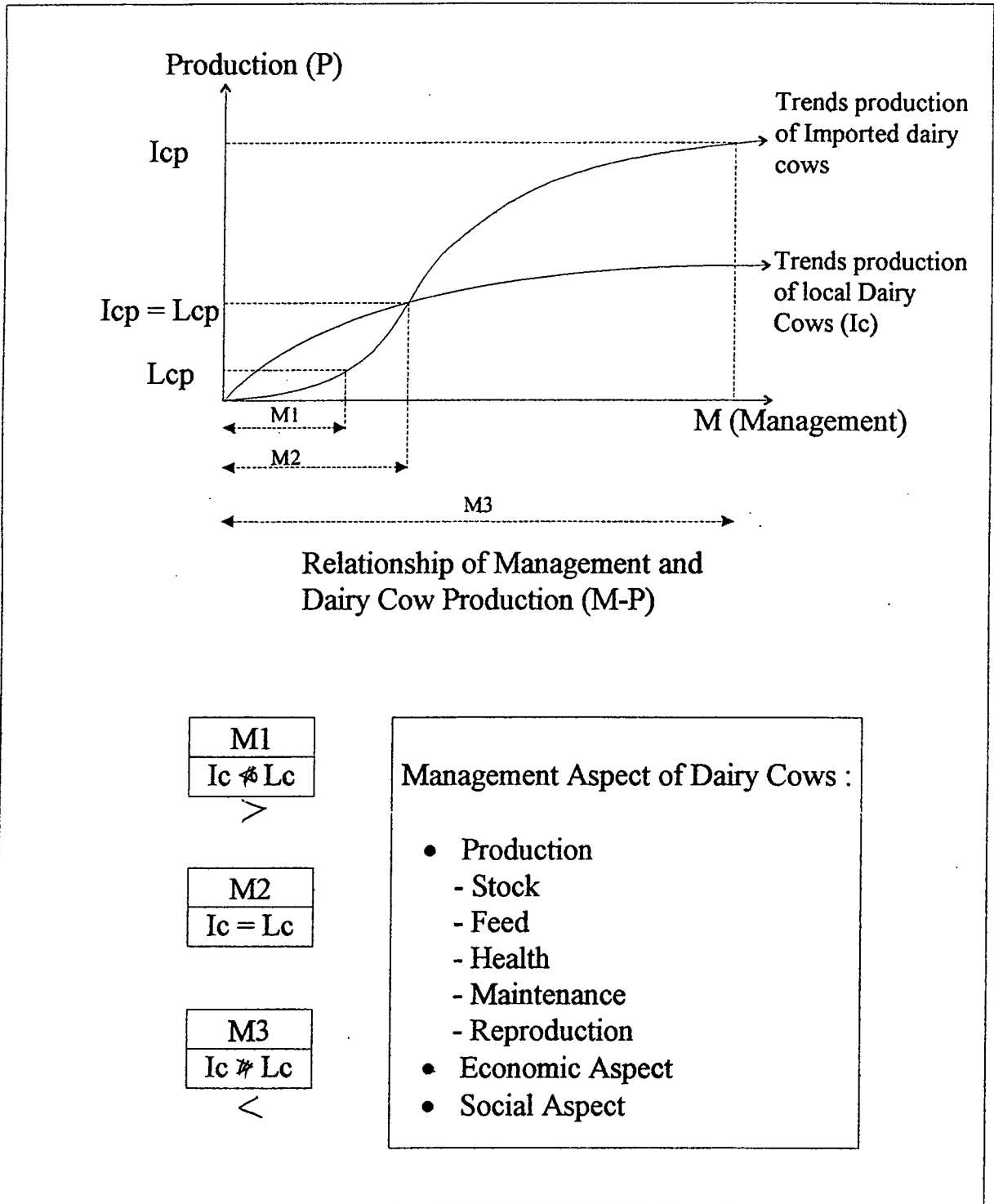
Union of Indonesian Dairy Cooperatives (GKSI)

Table 2 Dairy Development 1979 - 1994

Item	1979	1994
1. Dairy Population	94.000 head	338.000 head
2. Milk Production Ratio Domestic : Import	1 : 20	1 : 2
3. Number of Cooperatives	11	207
4. Milk Processing Industry (MPI)	Repacking	Finished Product

Union of Indonesian Dairy Cooperatives (GKSI)

Table 3 PROBLEM



Source : Directorate General of Animal Husbandry

Table 4 Production Cyclic Through Milk Agrobusiness Approach

COOPERATION	AGRIBUSINESS APPROACH			
	PRODUCT SUPPORT	CULTURE	PROCESSING	MARKETING
<p>MPI</p> <p>SECONDARY COOP (GKSI)</p> <p>PRIMARY COOP (KUD)</p>	<p>STOCK</p> <p>FEED</p> <p>HEALTH</p>	<p>A</p> <p>B</p>		<p>D</p> <p>A</p>
CONSOLIDATION STEP	<p>STOCK :</p> <ul style="list-style-type: none"> -CERTIFICATE -AHL -E.T. <p>FEED :</p> <ul style="list-style-type: none"> -MINI Feed Mill -NES - FEED <p>HEALTH :</p> <ul style="list-style-type: none"> -MASTITIS -HEALTH-SERVICES 	<p>A. COW REPLACEMENT</p> <p>B. K U D PRODUCTI-ON</p>	<p>1. SIMPLE MILK PROCESSING</p> <p>2. HOME INDUSTRY PROCESSING (AGROINDUS-TRY)</p>	<p>TO SHORTEN :</p> <ul style="list-style-type: none"> 1. MARKETING 2. BANKING SERVICE

Source : Directorate General of Animal Husbandry

Table 5 Strategic Approach (Special)

Development of New Center Village Breeding

Principle	Analysis	Policy																
<ul style="list-style-type: none"> • Continous Resources Principle 	<table border="1"> <thead> <tr> <th colspan="2">Calculation</th> </tr> <tr> <th>item</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>Birth Rate</td> <td>36.5</td> </tr> <tr> <td>Death rate</td> <td>5</td> </tr> <tr> <td>Natural Increase</td> <td>31.5</td> </tr> <tr> <td>Slaughter rate</td> <td>11.7</td> </tr> <tr> <td>Foundation stock</td> <td>0.0</td> </tr> <tr> <td>Net increase</td> <td>19.8</td> </tr> </tbody> </table> <p>Directorate General of Animal Husbandry of Indonesia, 1993</p>	Calculation		item	%	Birth Rate	36.5	Death rate	5	Natural Increase	31.5	Slaughter rate	11.7	Foundation stock	0.0	Net increase	19.8	<ul style="list-style-type: none"> • Improving Dairy Cow Birth Rate : - AI, ET, FEED, Health, Sterility Control • Selection Programme Dairy Stock • Improving Management Small Holder and Dairy Coop • Productivity Target : 10 kg / head / day → 15 kg / head / day
Calculation																		
item	%																	
Birth Rate	36.5																	
Death rate	5																	
Natural Increase	31.5																	
Slaughter rate	11.7																	
Foundation stock	0.0																	
Net increase	19.8																	
<ul style="list-style-type: none"> • Supply - Demand balance principle 	<table border="1"> <thead> <tr> <th>Supply - Demand</th> <th>000 ton</th> </tr> </thead> <tbody> <tr> <td>Milk Demand(1994)</td> <td>865.0</td> </tr> <tr> <td>Supply (1994)</td> <td>307.0</td> </tr> <tr> <td>Imported Milk</td> <td>558.0</td> </tr> <tr> <td>Total Milk Ratio</td> <td>1 : 2.3</td> </tr> <tr> <td>Milk Ratio (MPI)</td> <td>1 : 2.9</td> </tr> </tbody> </table>	Supply - Demand	000 ton	Milk Demand(1994)	865.0	Supply (1994)	307.0	Imported Milk	558.0	Total Milk Ratio	1 : 2.3	Milk Ratio (MPI)	1 : 2.9	<ul style="list-style-type: none"> • Controlled Mixing ratio mechanism until 2005 				
Supply - Demand	000 ton																	
Milk Demand(1994)	865.0																	
Supply (1994)	307.0																	
Imported Milk	558.0																	
Total Milk Ratio	1 : 2.3																	
Milk Ratio (MPI)	1 : 2.9																	
<ul style="list-style-type: none"> • Reducing dependence of Imported dairy cows principle 	<ul style="list-style-type: none"> • Replacement demand 5000 - 10,000 head / year • Replacement 1987 - 1994 full filled from imported 	<ul style="list-style-type: none"> • Development of New Center Breeding Village through Elite stock (5%) - Foundation stock 0.5 % - Breeding stock 1.5 % - Commercial stock 3 % 																

Source : Directorate General of Animal Husbandry of Indonesia, 1995

2.2 Area of the project

The working area of K.U.D. "SETIA KAWAN" covers 11 villages and the district of Tukur population more than 42,000 people. on Wednesday, May 16, 1979. The co-op created collaboration with Nestle in Waru, Sidoarjo. The first delivery was 349 kg of fresh milk and now production has reached 64000 L/Day.

The co-op business units which are: milk, credit saving, shop, feed mill, horticultural, rearing and electricity : pattern I

2.3. Problem faced by farmers

The main problem are technical and management aspects, so difficult to improving productivity on average herd. The problems are follows :

1. Non comparing overhead cost between low and medium productivity cows (less than average herd production)
2. Limited area for Pasturage to produce input supply for Dairying.
3. There are no method to reach peak production.
4. Difficult to be guidance.
5. The price of input supply more than of output.

2.4. Need and justification of the project

Dairy farming - village breeding by small holders gave income every 10 days comparing than other agricultural product. Supplying the working area and thousands of worker with different education and discipline are needed and equal developments their results. Although co-operations founded as the place for economic struggle to increasing the members income, but the advantage for community neighbor is very big.

Chapter III Project

3.1 Objectives

The main objectives of the project are to developing breeding village for small holder through :

1. To developing flock - dairy herd population as foundation, breeding and commercial stock of Dairy Cows which has high viability in certain area
2. Producing Dairy Cows as replacement stock to reducing dependent from imported
3. Improving average Daily Herd population in K.U.D. "SETIA KAWAN" Nongkojajar.

3.2 Area of operation

The area of the project are 10 villages i.e. : Wonosari, Gendro, Tlogosari, Blarang, Kayukebek, Andonosari, Pungging, Kalipucang and Sumberpitu.

a. Procurement

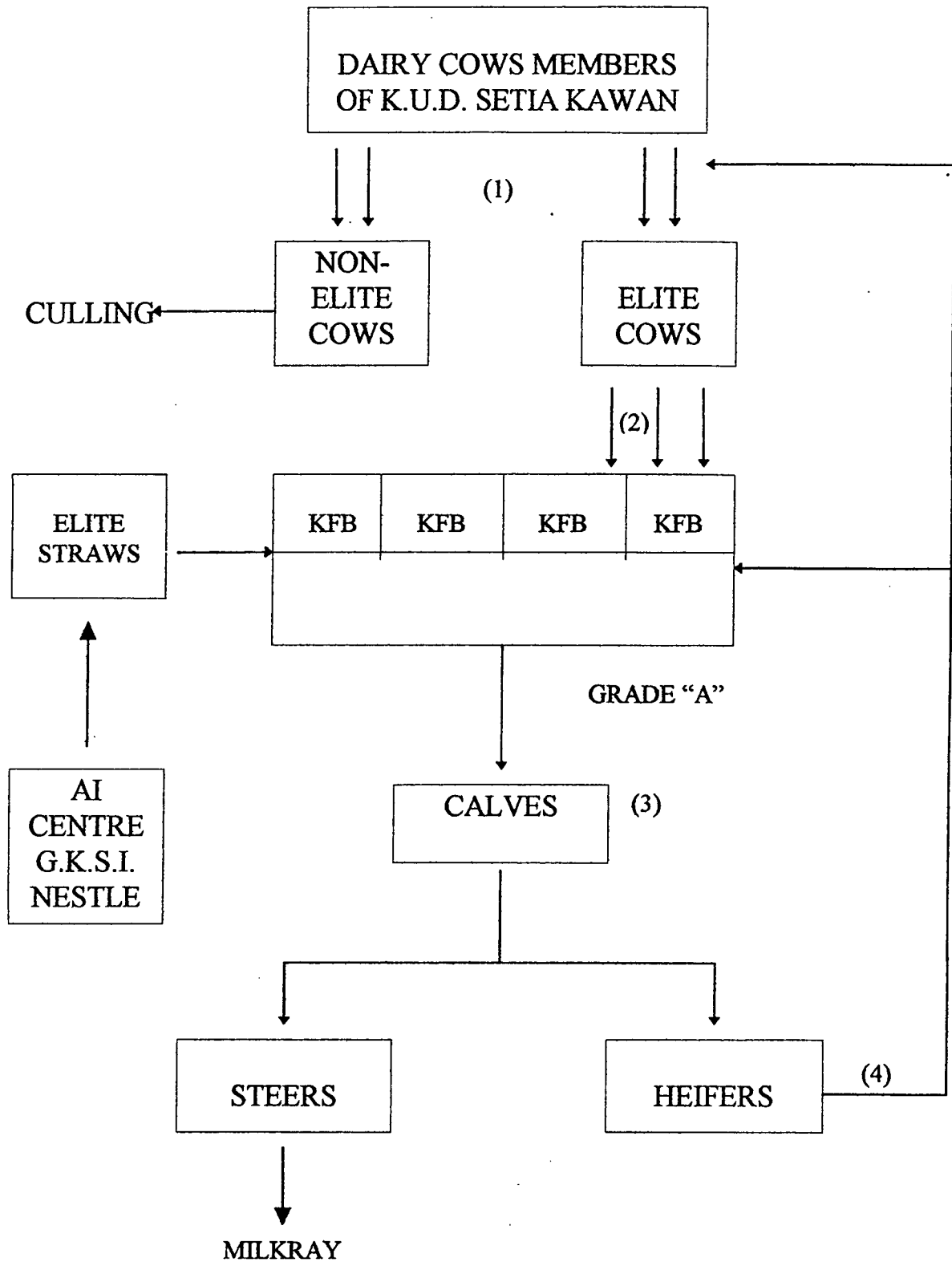
1. Heifers-cows provided by farmers
2. Services :
 - Artificial Insemination : Elite straws frozen semen
 - Animal Health : Reproduction and Sterility Control

– Technical assistance and guidance support by K.U.D.

b. Operational Activities

1. Shaping - Forming Herd Elite Cows depends daily production (H.E.C.)
2. Grading - Rank performance.
3. Determinant population of Herd Elite Cows (H.E.C.), (Lactating and dry period)
4. Selected H.E.C. (3) including area Key Farmer Breeders (K.F.B.)
5. Recording and Monitoring calves from H.E.C.
6. Adjusting and Monitoring calves distribution (5)

SYNOPTIC NETWORKING
 VILLAGE BREEDING
 K.U.D. "SETIA KAWAN" NONGKOJAJAR



Chapter IV Details of Operation

4.1. Capacity

Determinating number of herd elite cows can be done after total member of dairy cows has been count both lactating and dry cows. The number of both has been limited at end of 1995 condition i.e. : 8000 head, its to mantain balance of lactating and dry cows (88% : 12%)

Assumption Annual number of dairy stock for Replacement

item		number (head)
a	number of dairy cows	8000
b	replacement stock demand a year (20% x 8000)	1600
c	number of elite cows (30% x 1600)	<u>480</u>
d	number of calves (female) 50%	480
e	number of calves (male) 50%	480
f	death rate 3% (0.03 x 480 x 2)	30
g	birth rate of elite cows (d + e + f)	990
h	number of elite cows provide (calving rate 70 %) $\frac{100}{70} \times 990$	1400

The above schedule present number based on volume of production and sales projected will follows :

- 1) year 1 = 840 head (60 %)
- 2) year 2 = 980 head (70 %)
- 3) year 3 = 1190 head (85 %)
- 4) year 4 = 1400 head (100 %)

4.2. Implementation

Activities		Time required (days)	Immediate predecessor
a	internal decision making	30	
b	monitoring, evaluating, recording and processing data	90	a
c	draft design organization and management	60	b
d	recruting employees and educating	30	c
e	procure equipment	30	c

4.3 Procurement stock and equipment

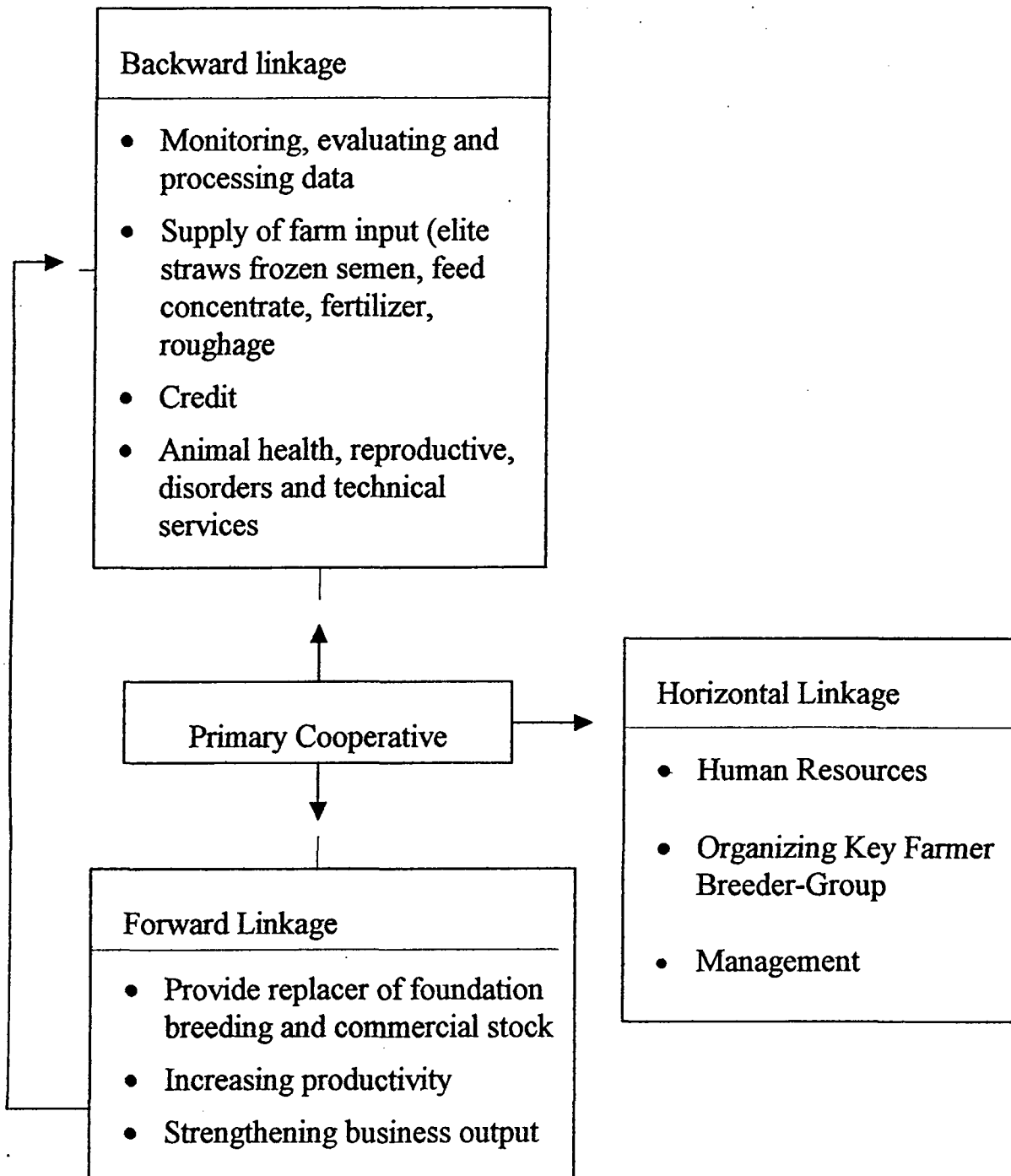
Dairy cows has need for replacer stock 1400 head a year. Mother cow (8000 head) obtained from farmer - breeder.

Year	→	1	2	3	4	5
1	Dairy cattle provide as mother cows - selected (head)	886	1035	1256	1477	1477
2	Artificial Insemination 2 x (service per conception 2 - straw dosage)	1772	2070	2512	2954	2954
3	Liquid Nitrogen per year (Liter)	450	528	635	747	747

Resulted of the village breeding project as elite calves will be rearing heifers by farmer-breeder as replacer stock (candidate of mother cows) and male calves will be rearing outside of area as milk ray

4.4. Integration of activities

Developing village breeding for stock replacement to increasing productivity of cattle and income farmer-members, the integration activities of the project will be implemented as follows.



4.5. Operation

4.5.1. Location

Location of the village breeding are spread in 11 villages formed as Key Farmer Breeder area. The topographical location is :

- 1) Height 400 - 2000 meter above sea level with temperature 16 °C - 25 °C
- 2) The water supply (installation boring land - water resources)
- 3) The distance 1 km. - 9 km. from headquarter K.U.D.

4.5.2. Basic measurements of village breeding - cows project

- 1) Land for green grass - roughage own by members ; regional state own enterprises (running continuous - intensive)
- 2) Stable
- 3) Heifer - cows
- 4) Water Supply
- 5) Yield Production - milk only record
- 6) Breeding - outcrossing
- 7) Body Condition Scoring
- 8) Normal sex - behavior
- 9) Other facilities as input supply by cooperative :
 - a) Chilling Unit
 - b) Quality Control
 - c) Trucks transfer tank
 - d) Feed concentrate

- e) Elite straw frozen semen
- f) Storage container (Liquid N₂)
- g) Operational container - small
- h) Technical services

4.5.3. Technical parameter of the Breeding Village

Dairy cows

- 1) Imported FH as mother cows
- 2) Non reproductive disorders
- 3) Average herd production = 6100 L/year
- 4) Calving interval = 14 months
- 5) Lactation period = 305 days
- 6) Non return rate $\geq 70\%$
- 7) Service per conception ≤ 2
- 8) Productive lives cows until sixth lactation, will run goes down (useful lives)

4.5.4. Loan

The expenses on Village Breeding need loan for working capital.

The credit are coordinated by K.U.D. with the provision

- a) Type of credit : commercial credit (19 %)
- b) Time period : 2.6 years
- c) Capital expenditure : Rp. 24.250.000
- d) Grace period : 1 year

4.6. Input Supply Cost and Depreciatuion

a) Storage container	2 x 8.000.000	(12.5 %)
b) Operation container	10 x 200.000	(20 %)
c) AI - gun	10 x 70.000	(20 %)

16
2
200000
200000
18

4.7. Marketing

Selling prices of calves (2 months) assumpt will increase average 5 % considered market value Rp. 290.000 (female), Rp. 360.000 (male).

Chapter V Organization and Management

5.1. Management Policy

- Project activity will add work activity without change organization structure
- Project activity will increase capacity of each unit, department and agent individu match with coordination line instruction
- Each unit and department conduct activities autonomly on condition that match with their authority

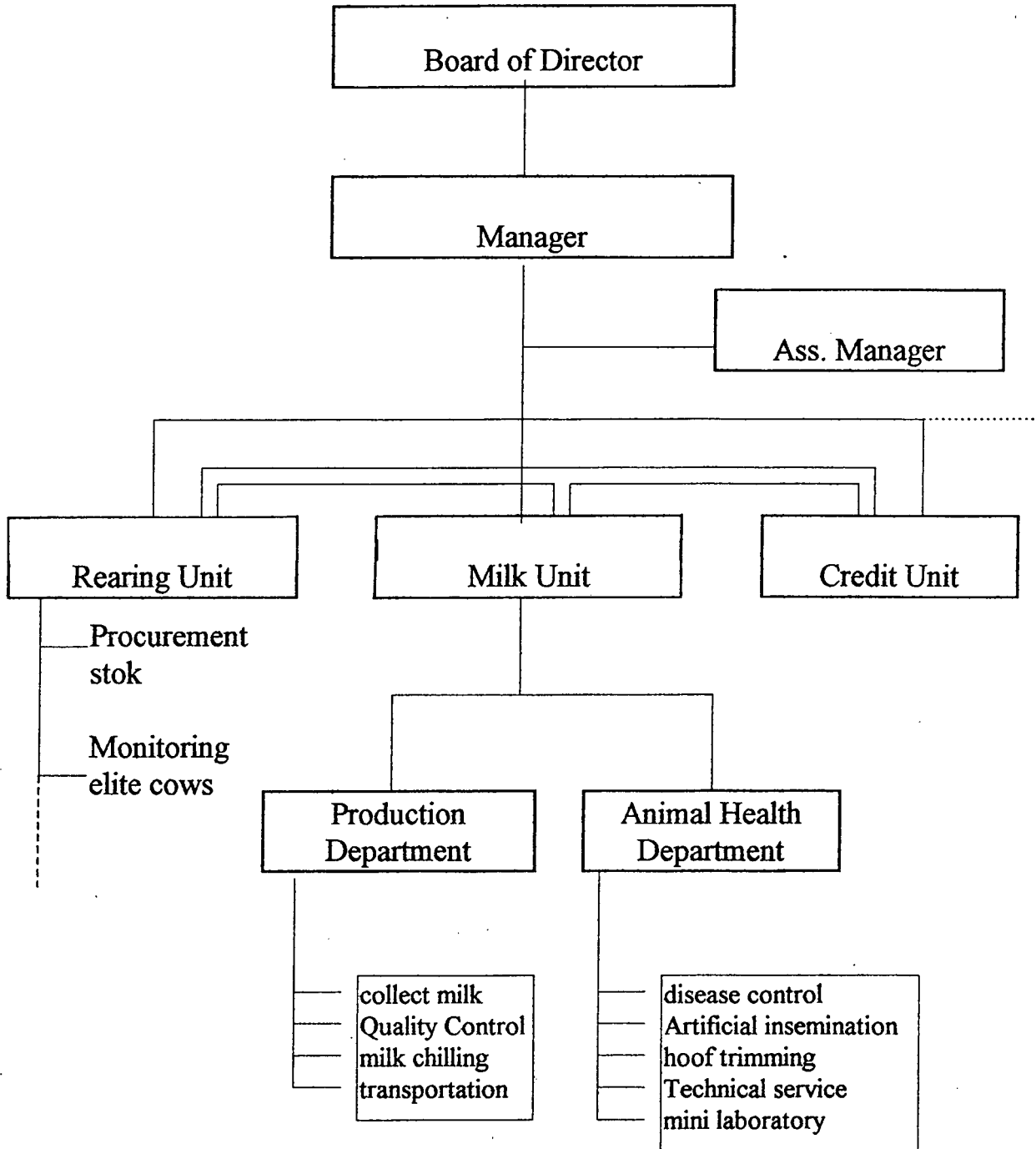
5.2. Classification of Management

The function of management will be classified as follows

1. Administration
2. Accounting and finance
3. Procurement of stock
4. Quality Control and Technical Services

5.3. Organization Chart

The project will add work activity for the operation of village breeding, the chart will be as follows :

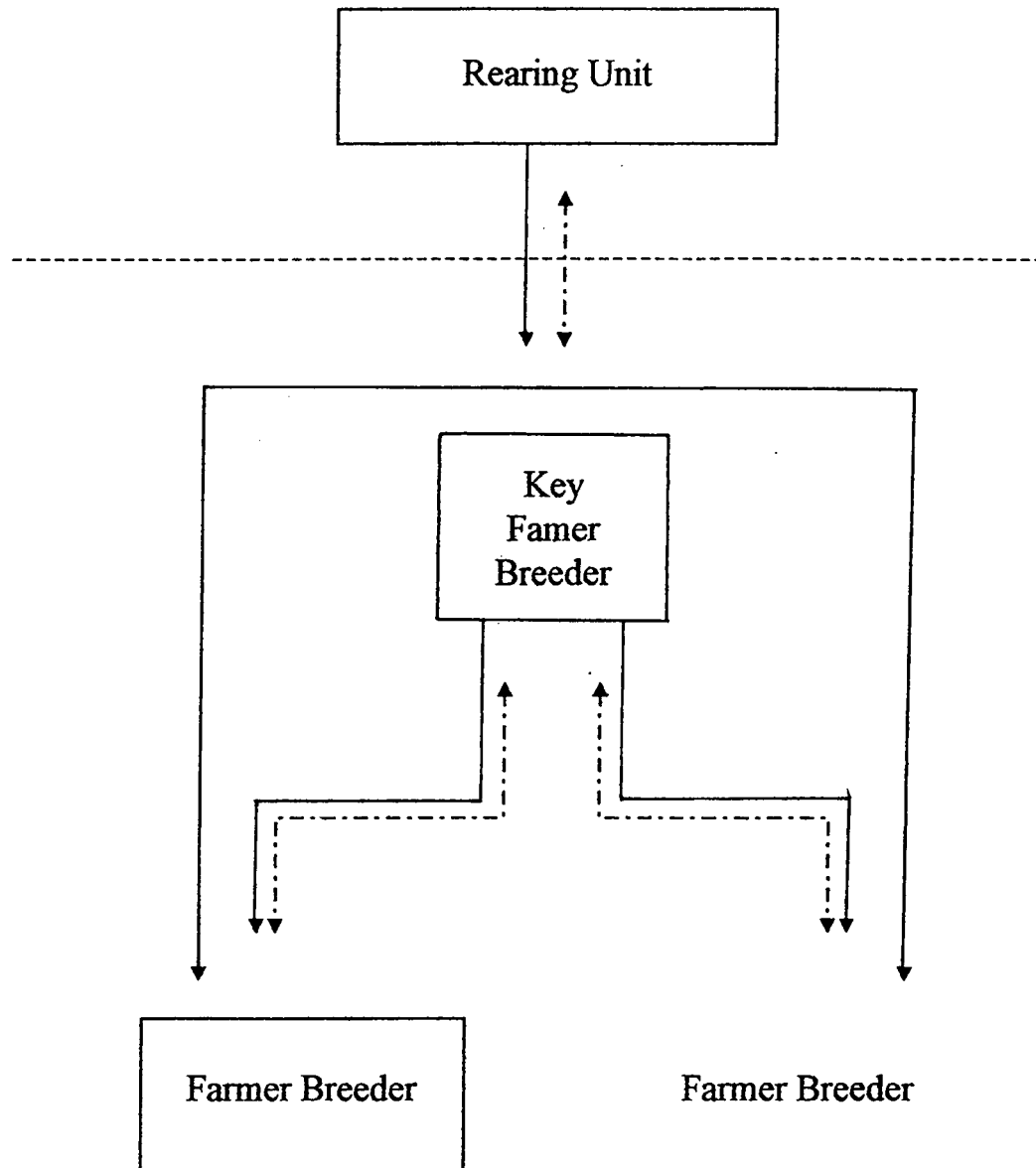


————— : instruction line

————— : coordination information line

5.4. The structural operation

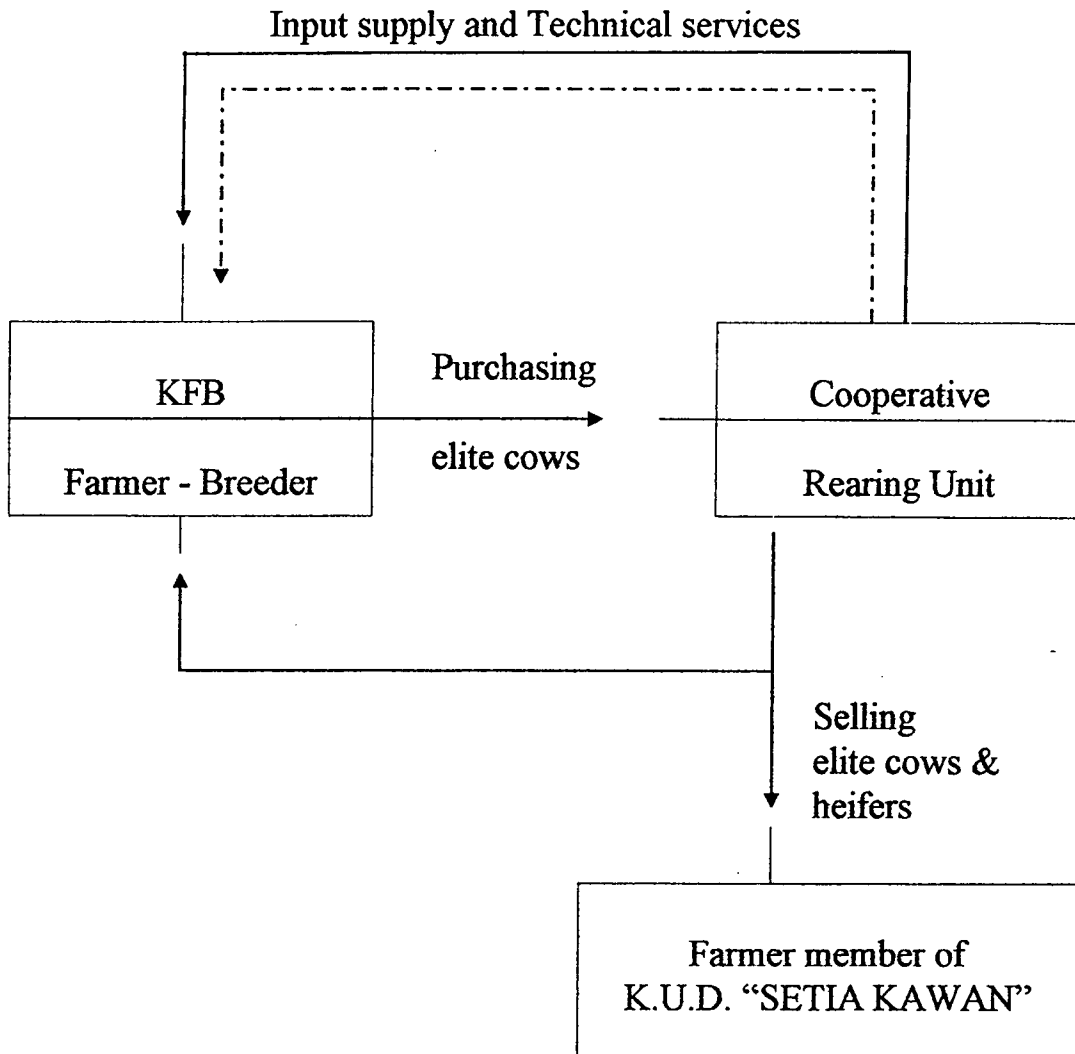
Village breeding project on Key Farmer Breeder Area



————— : guidance

- - - - - : information

5.5. Economic aspect as income of cooperative on Village Breeding Project



Chapter VI Financial Analysis

6.1. Selected Financial data

Years \longrightarrow	1	2	3	4	5
• Pay back period	1				
• NPV (Rp. 000)	1577.1				
• I.R.R	210.24				
• Sales (Rp. 000)	11.823	13.973	13.907	13.272	13.237

6.2. Cost Analysis

The annual expenses will be classified into Variable Cost and Fix Cost

Year	Variable Cost	Fixed Cost	Total
1	26.643	10.699	37.312
2	36.172	12.462	48.634
3	47.973	12.342	60.315
4	61.920	12.241	74.161
5	68.552	11.596	80.148
6	75.185	10.903	86.088
7	82.466	10.316	92.782
8	90.465	10.705	101.170
9	99.255	11.117	110.372
10	106.135	11.633	117.768

6.3. Cash Flow of The Project

Year	In Flow		Out Flow		Net Cash Flow
	Sales Revenue	Salvage Value	Capital Expenditure	Total Cost	
1	245.700	-	51.127	104.336	141.364
2	326.282	-	60.736	130.599	197.683
3	417.199	-	73.024	168.302	248.897
4	516.695	-	91.393	210.295	306.400
5	550.436	-	99.156	225.534	324.902
6	577.961	-	107.628	240.123	337.838
7	606.860	-	116.878	255.373	351.487
8	627.199	-	124.974	271.612	365.587
9	669.058	-	138.016	288.960	380.096
10	687.952	-	145.950	302.679	385.273
Total					

Chapter VII Budget

Year →		1	2	3	4	5
•	Revenue (Sales)	245.700	326.282	417.199	516.695	550.436
•	Cost	37.312	48.634	60.315	74.161	80.148
	- Variable Cost	26.643	36.172	47.973	61.420	68.552
	- Fixed Cost	10.669	12.462	12.342	12.241	11.596
•	Profit before tax	217.662	266.624	345.674	430.844	449.856
•	Tax	55.428	71.175	95.288	121.048	126.863
•	Profit after tax	162.234	195.449	250.386	309.796	322.993

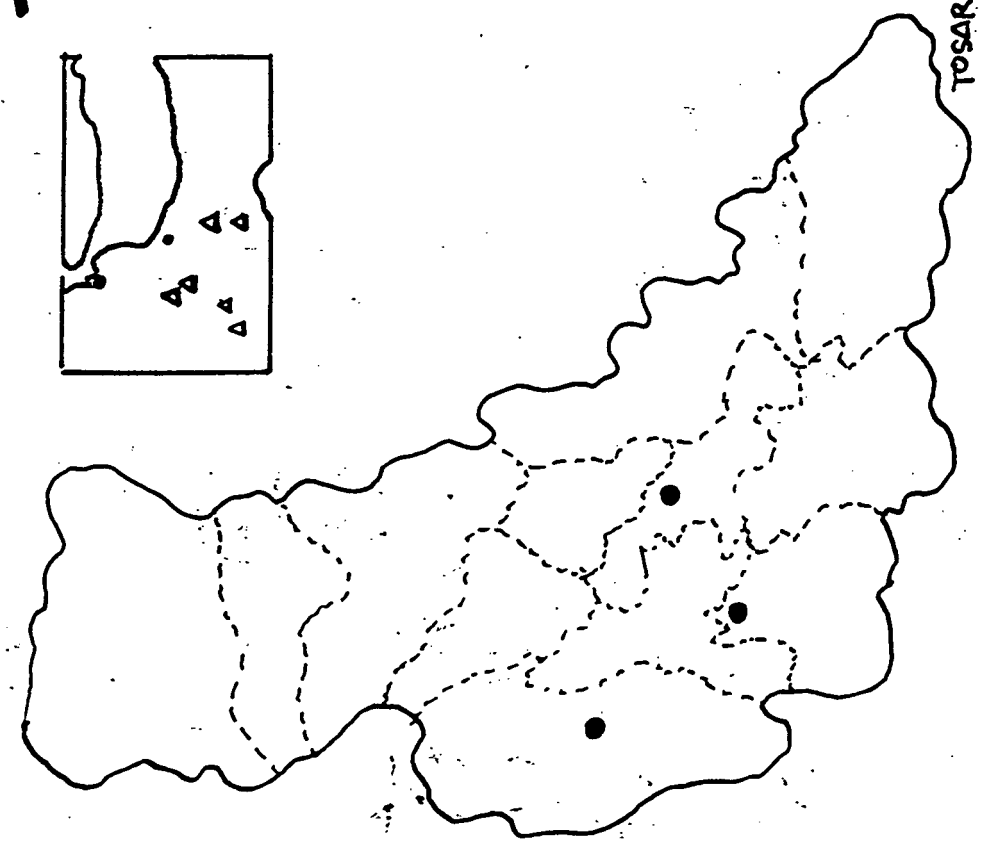
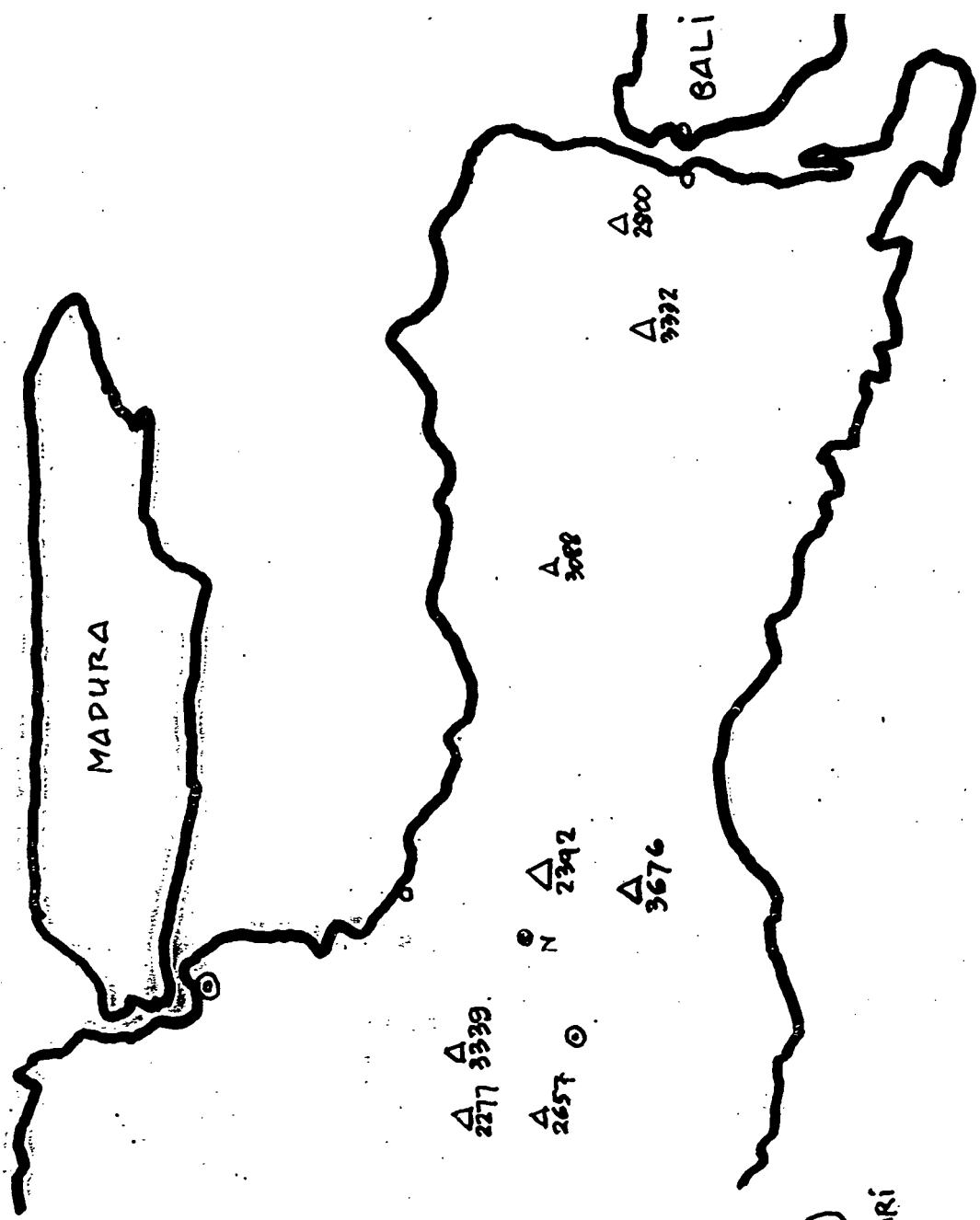
Chapter VIII Recommendation

- 8.1. The project is small part of dairy cow husbandry aspect, but the basic system go to increasing income through increasing production.
- 8.2. The project will increase production through Artificial Insemination with giving potent genetic material of Elite Straw frozen semen (top class bull) 35 %, 65 % more are management and environment.
- 8.3. The cooperative supporting members with input farm supply and technical services.
- 8.4. Step by step the project will increasing of capacity to fulfill replacement stock demand, decreasing imported of heifers.
- 8.5. The project has opportunity to our core business, inter relation institution would give support and funds.

Appendix 1.a. Map of Indonesia

INDONESIA





VILLAGE BREEDING FOR SMALLHOLDERS
PROJECTED BALANCE SHEETS
(Rp'000)

Appendix 2

DESCRIPTIONS	PRA-OPERASI	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
A S S E T S											
CURRENT ASSETS											
Cash on hand and in banks	41,156	184,541	371,481	616,892	927,796	1,263,197	1,630,742	2,014,907	2,416,440	2,836,080	1,357,686
Accounts receivable - net	0	27,300	33,443	42,639	52,673	55,307	58,073	60,976	64,025	67,226	70,587
Inventories	0	0	0	0	0	0	0	0	0	0	0
Behan pembantu	0	0	0	0	0	0	0	0	0	0	0
Finish good	0	1,207	1,458	1,837	2,279	2,477	2,694	2,933	3,195	3,483	3,790
Total Current Assets	41,156	213,048	406,362	661,368	982,748	1,320,981	1,691,509	2,078,816	2,483,660	2,906,789	1,432,063
PLANT AND EQUIPMENT											
At cost	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700
Accumulated depreciation	0	2,540	5,080	7,620	10,160	12,700	15,240	17,780	20,320	22,860	12,700
Net Book Value	18,700	16,160	13,620	11,080	8,540	6,000	3,460	920	(1,620)	(4,160)	6,000
OTHER ASSETS											
Pre-operating expenses	2,400	4,800	3,840	2,880	1,920	960	0	0	0	0	0
Total Other Assets	2,400	4,800	3,840	2,880	1,920	960	0	0	0	0	0
TOTAL ASSETS	62,256	234,008	423,842	675,328	993,208	1,327,941	1,694,969	2,079,736	2,482,040	2,902,629	1,438,063
LIABILITIES AND EQUITY											
CURRENT LIABILITIES											
Accounts payable	0	0	0	0	0	0	0	0	0	0	0
Bank loan - net of current maturities	0	15,564	15,564	15,564	5,510	0	0	0	0	0	0
Taxes payable	0	4,788	6,235	8,457	10,847	11,523	12,130	12,734	13,362	14,015	14,817
Total Current Liabilities	0	20,352	21,799	24,021	16,357	11,523	12,130	12,734	13,362	14,015	14,817
LONG-TERM DEBT											
Investment loan	22,037	16,528	11,019	5,510	0	0	0	0	0	0	0
Working capital loan	40,219	30,164	20,109	10,054	10,054	0	0	0	0	0	0
Total Long-Term Debt	62,256	46,692	31,128	15,564	10,054	0	0	0	0	0	0
DUE FROM STOCKHOLDERS											
Total Due from Stockholders	0	0	0	0	0	0	0	0	0	0	0
EQUITY											
Capital stock	0	0	0	0	0	0	0	0	0	0	0
Retained earnings	0	166,964	370,915	635,743	966,797	1,316,418	1,692,839	2,067,002	2,468,678	2,888,614	1,409,602
Total Equity	0	166,964	370,915	635,743	966,797	1,316,418	1,692,839	2,067,002	2,468,678	2,888,614	1,409,602
TOTAL LIABILITIES AND EQUITY	62,256	234,008	423,842	675,328	993,208	1,327,941	1,694,969	2,079,736	2,482,040	2,902,629	1,424,419

VILLAGE BREEDING FOR SMALLHOLDERS
 PROJECTED STATEMENT OF INCOME
 (Rp'000)

Appendix 3

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
SALES REVENUE	273.000	334.425	426.395	526.729	553.070	580.727	609.763	640.248	672.259	705.866
COST OF GOODS SOLD	13.279	17.242	21.661	26.911	29.531	32.116	34.956	38.075	41.503	43.974
GROSS MARGIN	259.721	317.183	404.734	499.818	523.539	548.611	574.807	602.173	630.756	661.892
OPERATING EXPENSES										
General and administrative expenses	20.652	23.308	25.390	27.557	29.205	30.968	31.896	33.918	36.086	34.421
Sales expenses	2.821	3.276	4.166	5.135	5.391	5.660	5.945	6.241	6.553	6.866
Total Operating Expenses	23.473	26.584	29.556	32.692	34.596	36.628	37.841	40.159	42.639	41.287
PROFIT	236.248	290.599	375.178	467.126	488.943	511.983	536.966	562.014	588.117	620.605
Interest expenses	11.829	11.829	8.871	5.915	1.047	0	0	0	0	0
	11.829	11.829	8.871	5.915	1.047	0	0	0	0	0
PROFIT BEFORE TAX	224.419	278.770	366.307	461.211	487.896	511.983	536.966	562.014	588.117	620.605
TAX PAYABLE	57.455	74.819	101.478	130.158	138.275	145.562	152.803	160.338	168.181	177.800
NET PROFIT BEFORE TAX	166.964	203.951	264.829	331.053	349.621	366.421	384.163	401.676	419.936	442.805
RETAINED EARNING AT BEGINNING OF YEARS	0	166.964	370.915	635.743	966.797	1.316.418	1.682.839	2.067.002	2.468.678	2.966.797
RETAINED EARNING AT END OF YEAR	166.964	370.915	635.743	966.797	1.316.418	1.682.839	2.067.002	2.468.678	2.888.614	1.409.602

VILLAGE BREEDING FOR SMALLHOLDERS
PROJECTED CASH FLOW
(Rp'000)

Appendix 4

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10	
CASH IN FLOW											
Sales revenues	0	245.700	328.282	417.199	516.695	550.436	577.961	606.860	637.199	669.058	687.952
	0	0	0	0	0	0	0	0	0	0	0
Total Cash in Flow	0	245.700	328.282	417.199	516.695	550.436	577.961	606.860	637.199	669.058	687.952
CASH DISBURSTMENT											
Fixed assets investment	18.700	0	0	0	0	0	0	0	0	0	0
Work in progress expenses	0	8.542	10.961	14.642	18.947	20.844	22.928	25.221	27.742	30.518	33.569
Wages	0	1.890	2.426	3.240	4.193	4.613	5.075	5.583	6.142	6.756	7.433
Processing expenses	0	1.814	1.866	1.918	1.973	2.032	2.090	2.151	2.213	2.277	2.243
Operating expenses	0	23.173	25.324	28.296	31.432	33.336	35.368	37.541	39.859	42.339	40.987
Pre-operating expenses	2.400	2.400	0	0	0	0	0	0	0	0	0
Taxes	0	52.667	73.372	99.256	127.768	137.599	144.955	152.199	159.710	167.528	173.830
Total Cash Disbursement	21.100	90.486	113.949	147.352	184.313	198.424	210.416	222.695	235.666	249.418	258.062
NET CASH FLOW	(21.100)	155.214	214.333	269.847	332.382	352.012	367.545	384.165	401.533	419.640	429.890
Cash minimum	40.219	744	1.122	1.319	1.965	0	0	0	0	0	1.965
Cash, beginning balance	0	41.156	184.541	371.481	616.892	927.796	1.263.197	1.630.742	2.014.907	2.416.440	927.796
EXCESS OVER (SHORT) OF CASH	(61.319)	195.626	397.752	640.009	947.309	1.279.808	1.630.742	2.014.907	2.416.440	2.836.080	1.357.721
BORROWINGS											
Investment loan	22.037	0	0	0	0	0	0	0	0	0	0
Working capital loan	40.219	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
Total Borrowing	62.256	0	0	0	0	0	0	0	0	0	0
REPAYMENT LOAN AND INTEREST											
Investment loan - principal	0	0	5.509	5.509	5.509	5.510	0	0	0	0	0
Working capital loan - principal	0	0	10.055	10.055	10.055	10.054	0	0	0	0	0
Interest of loan investment	0	4.187	4.187	3.140	2.094	1.047	0	0	0	0	0
Interest of working capital loan	0	7.642	7.842	5.731	3.821	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
Total Repayment	0	11.829	27.393	24.435	21.479	16.611	0	0	0	0	0
KELEBIHAN (KEKURANGAN) KAS	937	183.797	370.359	615.573	925.831	1.263.197	1.630.742	2.014.907	2.416.440	2.836.080	1.355.721
Add: Minimum cash	40.219	744	1.122	1.319	1.965	0	0	0	0	0	1.965
CASH, ENDING BALANCE	41.156	184.541	371.481	616.892	927.796	1.263.197	1.630.742	2.014.907	2.416.440	2.836.080	1.357.686

VILLAGE BREEDING FOR SMALLHOLDERS
BREAK EVEN ANALYSIS (Rp'000)

Appendix 5

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
REVENUE SALES	273.000	334.425	426.395	526.729	563.070	580.727	609.763	640.248	672.259	705.868
VARIABLE COST										
Raw material	8.542	10.961	14.642	18.947	20.844	22.928	25.221	27.742	30.518	33.569
Wages	1.890	2.426	3.240	4.193	4.613	5.075	5.583	6.142	6.756	7.433
	0	0	0	0	0	0	0	0	0	0
Maintenance	299	314	330	347	365	383	402	422	443	365
Commissions and discount sales	2.184	2.508	3.198	3.950	4.148	4.355	4.573	4.802	5.042	5.294
Incentive	284	364	486	629	692	761	837	921	1.013	1.115
Less in stock	(1.086)	(226)	(341)	(398)	(178)	(195)	(215)	(236)	(259)	(1.360)
Total	12.112	16.347	21.555	27.668	30.484	33.307	36.401	39.794	43.513	46.416
FIXED COST										
Depreciation	2.540	2.540	2.540	2.540	2.540	2.540	2.540	2.540	2.540	2.540
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
Technical services	3.600	4.200	5.100	6.000	6.300	6.615	6.946	7.293	7.658	8.041
Amortisasi biaya pra-operasi	0	960	960	960	960	960	960	960	960	960
Insurance	75	75	75	75	75	75	75	75	75	75
Maintenance	75	79	83	87	91	96	101	106	111	111
Interest Cost	11.829	11.829	8.871	5.915	1.047	0	0	0	0	0
Miscellaneous expenses	444	483	538	596	632	671	713	756	797	841
Less in stock	(121)	(25)	(38)	(44)	(20)	(22)	(24)	(26)	(27)	(28)
Total	18.442	20.141	18.129	16.128	11.625	10.935	10.351	10.744	11.159	11.857
BREAK EVEN POINT :										
TOTAL FIXED COST	19.299	21.176	19.095	17.023	12.303	11.601	11.008	11.458	11.931	12.691
SALES PERCENTAGE	7,07%	6,33%	4,48%	3,23%	2,22%	2,00%	1,81%	1,79%	1,77%	1,80%
BERDASARKAN DARI CASH BASIS	16,562	17,417	15,329	13,249	8,520	7,808	8,227	8,668	9,136	9,892
PERSENTASE DARI PENJUALAN	6,07%	5,21%	3,60%	2,52%	1,54%	1,34%	1,35%	1,35%	1,36%	1,40%

VILLAGE BREEDING FOR SMALLHOLDERS
PROJECTED ACCOUNTS RECEIVABLES
(Rp'000)

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
TOTAL SALES REVENUE	273.000	334.425	426.395	526.729	553.070	580.727	609.763	640.248	672.259	705.866
ACCOUNTS RECEIVABLE, BEGINNING BALANCE	0	27.300	33.443	42.639	52.673	55.307	58.073	60.976	64.025	52.673
TOTAL SALES	273.000	334.425	426.395	526.729	553.070	580.727	609.763	640.248	672.259	705.866
ACCOUNTS RECEIVABLE, ENDING BALANCE	273.000	361.725	459.838	569.368	605.743	636.034	667.836	701.224	736.284	758.539
TOTAL CASH SALES	245.700	328.282	417.199	516.895	550.436	577.961	606.860	637.199	669.058	687.952

VILLAGE BREEDING FOR SMALLHOLDERS
 PROJECTED WORK IN PROGRESS
 (Rp'000)

Appendix 9

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
JUMLAH SAPI	840	880	1.190	1.400	1.400	1.400	1.400	1.400	1.400	1.400
Elite straw	7.000	7.700	8.470	9.317	10.249	11.274	12.401	13.641	15.005	16.506
Gloves	945	1.040	1.144	1.258	1.384	1.522	1.674	1.841	2.025	2.228
Liquid nitrogen	333	368	403	443	487	536	590	649	714	785
Sheet	1.890	2.079	2.287	2.516	2.768	3.045	3.350	3.685	4.054	4.459
TOTALS EXPENSES	5.880	7.546	10.079	13.044	14.349	15.784	17.361	19.097	21.007	23.108
Elite straw	794	1.019	1.361	1.761	1.938	2.131	2.344	2.577	2.835	3.119
Gloves	280	359	480	620	682	750	826	909	1.000	1.099
Liquid nitrogen	1.588	2.037	2.722	3.522	3.875	4.263	4.690	5.159	5.676	6.243
Sheet	8.542	10.961	14.642	18.947	20.844	22.928	25.221	27.742	30.518	33.568

VILLAGE BREEDING FOR SMALL HOLDERS
 PROYEKSI PRODUKSI DAN PENJUALAN BARANG JADI
 (Rp'000)

Appendix 10

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
JUMLAH PRODUKSI SAPI	840	980	1.190	1.400	1.400	1.400	1.400	1.400	1.400	1.400
ALLOCATION TO TYPE :										
Female	420	490	595	700	700	700	700	700	700	700
Male	420	490	595	700	700	700	700	700	700	700
SALES PRICE										
Female	290,00	304,50	319,73	335,72	352,51	370,14	388,65	408,08	428,48	449,90
Male	360,00	378,00	396,90	416,75	437,59	459,47	482,44	506,56	531,89	558,48
TOTAL SALES										
Female	121.800	149.205	190.239	235.004	246.757	259.098	272.055	285.656	299.936	314.930
Male	151.200	185.220	236.156	291.725	306.313	321.629	337.708	354.592	372.323	390.936
	273.000	334.425	426.395	526.729	553.070	580.727	609.763	640.248	672.259	705.866

Handwritten notes and calculations:

840 x 1/2 = 420

980 x 1/2 = 490

1.190 x 1/2 = 595

1.400 x 1/2 = 700

VILLAGE BREEDING FOR SMALL HOLDERS
ANALISA RASIO

Appendix 11

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
PROFITABILITAS										
RASIO LABA KOTOR	95,14%	94,84%	94,92%	94,89%	94,66%	94,47%	94,27%	94,05%	93,83%	93,77%
RASIO LABA BERSIH TERHADAP PENJUALAN	61,16%	60,99%	62,11%	62,85%	63,21%	63,10%	63,00%	62,74%	62,47%	62,73%
RASIO LABA SEBELUM BUNGA DAN PAJAK TERHADAP TOTAL AKTIVA	159,48%	88,35%	88,27%	55,99%	42,13%	33,87%	28,45%	24,64%	21,84%	51,05%
RASIO LABA BERSIH TERHADAP MODAL SENDIRI	200,00%	75,84%	52,62%	41,32%	30,63%	24,43%	20,49%	17,71%	15,68%	37,27%
RASIO LEVERAGE										
RASIO HUTANG ATAS MODAL	40,15%	14,27%	6,23%	2,73%	0,89%	0,72%	0,62%	0,54%	0,49%	1,05%
RASIO LIKWIDITAS										
CURRENT RATIO	1046,82%	1864,22%	2753,29%	6008,12%	11463,86%	13944,64%	16324,93%	18587,49%	20740,56%	9665,00%
ACID TEST RATIO	1040,89%	1857,53%	2745,65%	5994,19%	11442,37%	13922,63%	16301,89%	18563,58%	20715,70%	9639,42%

VILLAGE BREEDING FOR SMALLHOLDERS
 PROYEKSI PERHITUNGAN HARGA POKOK PENJUALAN
 (Rp'000)

Appendix 12

DESCRIPTION	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5	YEAR-6	YEAR-7	YEAR-8	YEAR-9	YEAR-10
WORK IN PROGRESS EXPENSES	8.542	10.961	14.642	18.947	20.844	22.928	25.221	27.742	30.518	33.569
DIRECT LABOR	1.890	2.426	3.240	4.193	4.613	5.075	5.583	6.142	6.756	7.493
OVERHEAD COST										
Transport fare	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	1.459	1.496	1.532	1.570	1.611	1.651	1.693	1.735	1.778	1.822
Maintenance	298	314	330	347	365	383	402	422	443	465
Insurance	56	56	56	56	56	56	56	56	56	56
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
Depreciation	2.240	2.240	2.240	2.240	2.240	2.240	2.240	2.240	2.240	2.240
Total	4.054	4.106	4.158	4.213	4.272	4.330	4.391	4.453	4.517	4.583
FIXED PRODUCTION COST	14.486	17.493	22.040	27.353	29.729	32.333	35.195	38.337	41.791	45.485
FINISH GOOD										
Opening stock	0	1.207	1.458	1.837	2.279	2.477	2.684	2.933	3.195	3.463
Closing stock	1.207	1.458	1.837	2.279	2.477	2.694	2.933	3.195	3.463	3.790
PROJECTED FIXED SALES COST	13.279	17.242	21.861	26.911	29.531	32.116	34.956	38.075	41.503	43.974

% KENAIKAN HARGA JUJAL	5%														
% HARGA BELI BAHAN BAKU	5%														
PERSEDIAAN AKHIR BARANG JADI	30 HARI														
PERS. AKHIR BAHAN BAKU/PEMBANTU	30 HARI														
PIUTANG AKHIR	30 HARI														
HUTANG AKHIR	30 HARI														
KAS MINIMUM	7														
% INCREASE GAJI	5%														
% BUNGA KREDIT INVESTASI	19,00%														
% BUNGA KREDIT MODAL KERJA	19,00%														
I R R						-206,25%									
GROSS MARGIN						95,14%	94,84%	94,92%	94,89%	94,66%	94,47%	94,05%	93,83%		
NET PROFIT						61,16%	60,99%	62,11%	62,85%	63,21%	63,10%	62,74%	62,47%		
SALDO AKHIR KAS DAN BANK					0	184.541	371.481	616.892	927.796	1.263.197	1.630.742	2.014.907	2.416.440	2.836.080	1.357.686
KELEBIHAN (KEKURANGAN) KAS						183.797	370.359	615.573	925.831	1.263.197	1.630.742	2.014.907	2.416.440	2.836.080	1.355.721

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN**

October 18, 1995 to April 20, 1996

Title of Project : WHOLESALE DISTRIBUTION CENTER
 IN EAST-SOUTHERN AREA OF SEOUL

Country : REPUBLIC OF KOREA

Project Prepared by : DONG YOUNG KIM

**Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and**

**Executed by the ICA in collaboration with its Member Organisations
in India, Malaysia and Japan**



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February, 1996

Dong Young, Kim

NACF, Seoul, Korea

Chapter 1. SUMMARY

◦ The project is to construct the Wholesale Distribution Center(WDC) in East-southern area of Seoul, which is the capital of Korea. It will be implemented and run by NACF.

◦ The objects of this project are to increase the income of member farmers by widening market channel, reducing distribution cost and assuring remunerative price.

◦ The target groups of this project are farmers, forwarding organization, freight house, packing center, vegetable & fruit processing center, rice processing center and farm product processing plant.

◦ Total investment of the project is 82,794 million Won (US\$ 106 million).

◦ The sources of fund are subsidy(51,000 million Won) and long-term loan(6,000 million Won) from government, and NACF' s own capital(25,794 million Won).

◦ The capacity of the project is to deal with 1,918 million Won of products a day which means 633,220 million Won a year (330 opening days).

◦ The amount of sales in the first operation year is expected to 180 billion Won.

◦ For the convenience of the customers, WDC provides one-stop shopping. WDC sells various products such as vegetable & fruit, grain, livestock & fishing, processed food, and commodities, etc.

◦ WDC procures agricultural produce from all around the country.

◦ Major customers are households, retailers, supermarkets, restaurants, etc, which are situated within a radius of 10km from the WDC.

◦ The result of financial analysis of the project are as follows.

Payback period is 9.49 years, IRR is 7.27 %, weighted average cost of

capital is 3.33 %, NPV (3.33%) is 24,226 million Won. They show the financial viability of the project during the period, which will be 11 years including 1 year of construction.

- The procurement of subsidy and long-term loan from the government will be the crucial key to the success of the project.

- The major facilities are as follows ;
gathering & delivering place, small packing room, cold storage warehouse, machine room, conference room, computer room, restaurant, and office, etc.

- 120 persons will be employed as a regular workers and 150 persons are employed temporally at the first year of the project.

- Construction period will be about 1 year from July 1, 1996 to June 30, 1997.

- The support of government such as providing subsidy, long-term loan & issuing certificates, permitting of wholesaler, etc will be required.

- Computerization is necessary for the efficient operation of WDC. The effects of computerization in WDC are as under ;

- Keeping appropriate stock
- Reduction of distribution cost by automatic issuing and receiving of order
- Collection and distribution of various information including price and stock between the place of production and consumption.

Chapter 2. BACKGROUND

2.1 Overall situation

2.1.1 Underdeveloped marketing

The agricultural market in Korea is relatively underdeveloped. Private dealers dominate the collecting activities, cooperative marketing is in its early stages, modernized wholesale markets are few, traditional retail and quasi-wholesale markets are prevalent, ununified varieties in packing, lack of grading and standardization, underdeveloped infrastructures including road facilities, gathering, storing, and distributing channels.

Marketing stages vary depending on the commodity, time, and region. The general channels for agricultural products are : producers --- assemblers --- brokers --- wholesalers(large markets) --- jobbers --- retailers(supermarkets) --- and consumers. The presence of well-established supermarkets and large-scale retailers is increasing in large cities. The problem is that consumers frequently use neighbouring dealers, who are regarded as inexpensive. Most of the products transacted by these dealers are not checked for food safety and evade regular marketing profits.

2.1.2 Marketing improvement

The government has implemented various programs to improve the agricultural marketing structure. Government policies aimed at protecting consumers and producers, and contributing to price stabilization and balanced economic growth. The major policy direction of agricultural marketing improvement are as follows : (1) to ensure a free, competitive market system, wherein prices are determined by the supply and demand mechanism, and competition prevails among traders, marketing firms and marketing channels, (2) to focus on fair competition in the private sector and on improving social infrastructure, and (3) to establish optimum allocation and distribution channels for perishable food products at minimum costs.

In 1994, the government issued a general and widespread plan 'Marketing Reform Policy' to improve agricultural marketing in several ways. The focus on the marketing policy was to restructure marketing channels which had been considered underdeveloped. To meet the rapidly increasing agricultural marketing, it is necessary to establish modernized marketing system. Behind

the government plan lay the belief that current tools, methods, and programs were no longer effective to meet the rapidly changing market situation.

The plan stressed improved efficiency and considerable improvement in marketing channels. For example, a compulsory auction system in the government-financed wholesale markets was implemented and some of the remaining government restrictions were removed. In addition, direct transaction from production to consumption area was carried out with some of the commodities. By 1998, the government will establish 34 public wholesale markets across the nation. Also, some amendments of the Agricultural Marketing Improvement and Price Stabilization Act were included in the plan.

2.1.3 Construction of large scale wholesale markets

To enable the marketing network to handle the increased volume and variety of agricultural products, the government is modernizing markets. Construction of modern market seems to be the most important factor in Korea to ensure successful marketing activities. By 1994, there were 47 wholesale markets and 127 public auctions, although most of them are old fashioned, and underdeveloped. Several modern markets equipped with developed facilities including an auction system, and an automatic distribution center were completed in recent years. According to the long term marketing improvement plan, more large-scale markets are still needed for successful marketing.

2.2 Area of the project

The population of Seoul is about 11 million as of 1995. The population of capital area including Seoul is 19 million, which stands the 4th largest city in the world in terms of population.

The government has a plan to set up 16 wholesale distribution centers in the country. Among them four WDCs will be set up in east-southern, east-northern, west-northern, and west-southern area of Seoul.

◦ The population of each area in Seoul

(unit : thousand)

Year	East-southern area	East-northern area	west-southern area	West-northern area	Total
1992	2,217	3,575	3,563	2,022	11,377
1993	2,199	3,570	3,476	1,983	11,228

* The population of each area includes only that of Seoul.

Source : '94 Administration of Seoul city.

◦ The amount of consumption of agro-fishery produce in each area (1993)

(unit : thousand ton)

	East-southern area	East-northern area	west-southern area	West-northern area	Total
Green stuff	784	1,274	1,133	708	3,900
(Vegetable)	552	896	797	498	2,744
(Fruits)	232	338	336	210	1,156
Fishery	163	266	236	148	814
Flesh & meat	41.7	67.8	60.3	37.7	207.6
(Meat)	13.2	21.4	19.0	11.9	65.6
(Fork)	28.3	46.4	41.3	25.8	142.0

Source : estimate of the KIET(Korea Industrial Research Institute)

◦ The status of market in each area

		East-southern area	East-northern area	West-southern area	West-northern area
Retail market & shop	Market	80	89	99	102
	Shop	12,634	9,961	10,603	34,414
Department store & shopping center	No. of site	15	8	7	15
	No. of store	4,417	1,470	1,561	2,684
Wholesale center	No. of site	1	-	-	-
	No. of store	1,249	-	-	-
Chainstore	Headquarter	17	13	23	10
	No. of store	1,278	1,461	4,184	4,069
Restaurant		16,251	17,806	16,817	33,754

Source : Estimate of the KIET(Korea Industrial Research Institute)

2.3 Problems faced by the existing wholesale market

Even though the existing public agricultural wholesale markets are constructed by subsidies from the central government and self-governing bodies, they have failed to function as expected by the government and farmers.

The problems exist in the wholesale market are : (1) Distribution cost of 19.3% of wholesale market is regarded as high. (2) They are practicing unfair transaction and evade taxes. (3) Because produce is packaged in consuming area, garbage entails environment problem in urban area.

There are also several changes of environment which will adversely affect the distribution market in Korea as follows ;

Complete opening of chain store enterprise are expected from January 1, 1996 under the schedule of distribution market opening policy.

Huge distribution companies are preparing to launch in Korea.

- About 10 companies including Wal-Mart, the first largest distribution company in the U. S., K-Mart, the second largest one in the U. S., Daie, the

first largest one in Japan, and Kapu of Netherlands are hastening to begin the business in Korea.

- In view of geographical condition, national income and consumption level, Korea is liable to be a battle field of foreign distribution companies.

- Foreign distribution companies may attack Korean market with not only imported industrial products but primary products.

2.4 Need and Justification for the project

To solve those problems faced by the existing wholesale market, it is essential to construct the new wholesale distribution center.

It is expected to be impossible for NACF to survive the foreign competition only with primary agricultural products. So NACF has a plan to set up WDC which is dealing not only primary agricultural products but also processed goods and commodities.

On the other hand, NACF regard the WDC as the one of the breakthrough to construct the basis of self-sustaining in the field of economic business when the prospect of banking business is not bright due to liberalization and internationalization of banking business sector (NACF composed of banking business and economic business).

In the long run, NACF is going to provide 40 million of all the city people in Korea with commodity and primary agricultural products.

By building new distribution system, which is different from the existing public wholesale market, and widening the distribution channel, NACF could construct good will competition and complementary system with the existing system and will lead to the future-oriented agricultural fishery products distribution innovation.

Reducing the marketing stages by directly linking between producer organization and retailer will make NACF (1) to raise producer's receiving price by eliminating the middleman and stabilize price in consuming area and

(2) to stabilize the income of farmers' and fishermen's through the stabilization of the price of the agro-fishery products. (3) and will make farmersto adjust the amount of production and shipment, because the change of the demand pattern of consumers are directly delivered to the producers.

It is possible to construct the consolidated distribution system by linking the production site distribution facilities such as freight house, vegetable & fruit processing center, and packing center, etc.

- They can enhance the marketing negotiation power, because they can reflect the producer's opinion in the process of the price determination through the 'transaction on reservation' with the production site distribution facilities.

- Farmers are able to receive the information quickly through the computerization of the order and deliverly of the agro-fishery products.

It is possible to adapt the change of the environment of the distribution market by introducing the advanced marketing techniques in preparation for the market opening of the agro-fishery products distribution industry.

- To raise the competitiveness of the domestic products by making the agricultural produce into industrial products through standardization, grading and packing of the agro-fishery product.

- To prepare for the rapid change of business status of retailer from wooden board, small store, and peddling to department store, supermarket, and convenience store.

To satisfy the varied consumer's need by setting up a distribution system performing wholesale and retail function, and dealing processed food and the necessaries of life besides primary agro-fishery products.

Chapter 3. PROJECT

3.1 Objectives

The main objectives of the project are to widen the market channel and to increase the income of farmers by reducing the distribution steps from the current 5 - 6 steps to 3 - 4 steps, and thus returning more benefit to the farmers.

- Reduction of distribution step from 5 - 6 to 3 - 4

Reducing current distribution step of (1) producer (2) Agricultural cooperative, Gathering & delivery company (3) Wholesale corporation (4) Agent, vendor (5) Retailer store (6) Consumer, to the distribution steps under wholesale distribution of (1) Producer (2) Wholesale distribution center (3) Retailer (4) Consumer.

- Satisfying farmers and consumers by improving distribution structure, by saving distribution cost and by rationalizing distribution.

- Reinforcement of competitive power against foreign distribution companies through mechanization and computerization of transportation, storage, cargo work of agricultural product.

- Establishment of effective sales system by reservation sales

- Reflecting producer's interest in the price negotiation stage by person-to-person transaction (within acceptable range to both producer and consumer).

- Pursuing rationalization of management of retailers by supplying the product of agriculture, stockbreeding and fishery in the small package unit which meet the desire of consumers.

- Utilizing garbages derived during the package process as a fertilizer at the farming land, as well as solving urban trash problem by standardized packing at the place of production.

◦ Contributing to the stability of price and providing consumers with the convenience of buying agricultural products by operating direct sale store.

3.2 Advantages and disadvantages of the WDC

WDC has many advantages and disadvantages over the conventional wholesale market in terms of price, quality, and convenience.

3.2.1 Price

On the traditional wholesale market, distribution margin is usually 19.3 % which is composed of 6% of commission for corporation, 12% of agent margin, and 1.3% of discharge cost. But on the WDC, the distribution margin is only 6%. And especially the price can be greatly lowered when the bargaining power of commodities is well used.

However the WDC, as being a producer's organization, is difficult to form one-sidedly favorable price to the customers only.

3.2.2 Quality

The WDC can develop strategic product, using distribution facilities in the place of production. It also can possess facilities to keep freshness of the products such as transportation in cold temperature, cold storage, and temperature control.

As a disadvantage of WDC, agricultural cooperative has low mobility in the place of production compared with gathering merchandiser.

3.2.3 Convenience

The WDC has several advantages in terms of convenience.

(1) One stop shopping is possible for retailers because the primary products of agriculture, stockbreeding, fishery, rice, processed food, and commodities are furnished altogether in one place.

(2) It is possible to establish computer information network.

(3) It can satisfy the needs of customers by providing services such as automatic subdivision of goods, small packing by retailer's unit, and

processing, etc.

(4) It can deliver the products without any delay caused by auction procedure.

(5) It can facilitate cargo work with enough parking area, deck system, and conveyer system.

But as a disadvantage, retailers might avoid using the WDC, fearing tax source is wholly exposed and can't evade the tax.

3.3 The difference between WDC and wholesale market

Distinction	WDC	Wholesale market	Remarks
1. Opening, administration, management	Administered and managed by founder	Opened by : city Administered by : administration office Managed by : corporation of wholesale market	Unification of opening, administration and management
2. Dealing products	Extended to processed food, grain, & commodities	Primary products of agriculture, stockbreeding and fishery	Enabling one stop shopping to retailer
3. Distribution step	The opener performs the role of corporation of wholesale market, wholesale dealer, and agent	opener corporation of wholesale market agent & wholesale dealer	Reduction of distribution step
4. Size of packing	Large packing or small packing	Large packing or no-packing	Rationalization of distribution, prevention of garbage pollution

Distinction	WDC	Wholesale market	Remarks
5. Forwarding person	Forwarding by previous issuing of order (restriction of forwarding person)	No restriction	
6. Pricing	Transaction of reservation & person to person	Auction	Priced within the approvable range for both producer and consumer
7. Place of sale	Restricted to affiliated store, store run by NACF and stores of registered members	No restriction	Solving of traffic congestion
8. Function of packing & processing	Simple processing, small packing	No packing & processing	Satisfying the needs of consumers
9. Distribution information	Using PC, FAX, or on-line POS	Telephone or mass media	
10. Method of delivery	Cash & carry principle Delivery is possible with purchaser's expense	Transportation of goods is purchaser's responsibility	

3.4 Analysis of producing and consuming areas

3.4.1 Producing area

WDC will procure agricultural produce all over the country.

3.4.2 Consuming area

It is situated within the radius of the 15km from the center of the Seoul city. Transportation is very convenient because it is near from the Yangjai Interchange of Seoul-Pusan expressway, Yangjai thoroughfare, and intersection of Hunrung road.

Since it is near from the resting place such as 'The wood of citizens', it is very convenient to induce the families visiting that resting place.

The expected customer within the radius of the 10 km from the WDC are as follows ;

- The whole area of Kangnam-gu, Seocho-gu, and some part of Songpa-gu, Dongjak-gu, Kwanak-gu, Yongsan-gu, Seongdong-gu, Seongnam-city, Kwachon-city.

- It has 1,150 thousand family and population of the 3,580 thousand.

- There are 1,385 retailers near the WDC(21 department store, 765 super chainstore, 404 convenience store, 195 supermarket).

3.5 General operation of wholesale distribution market

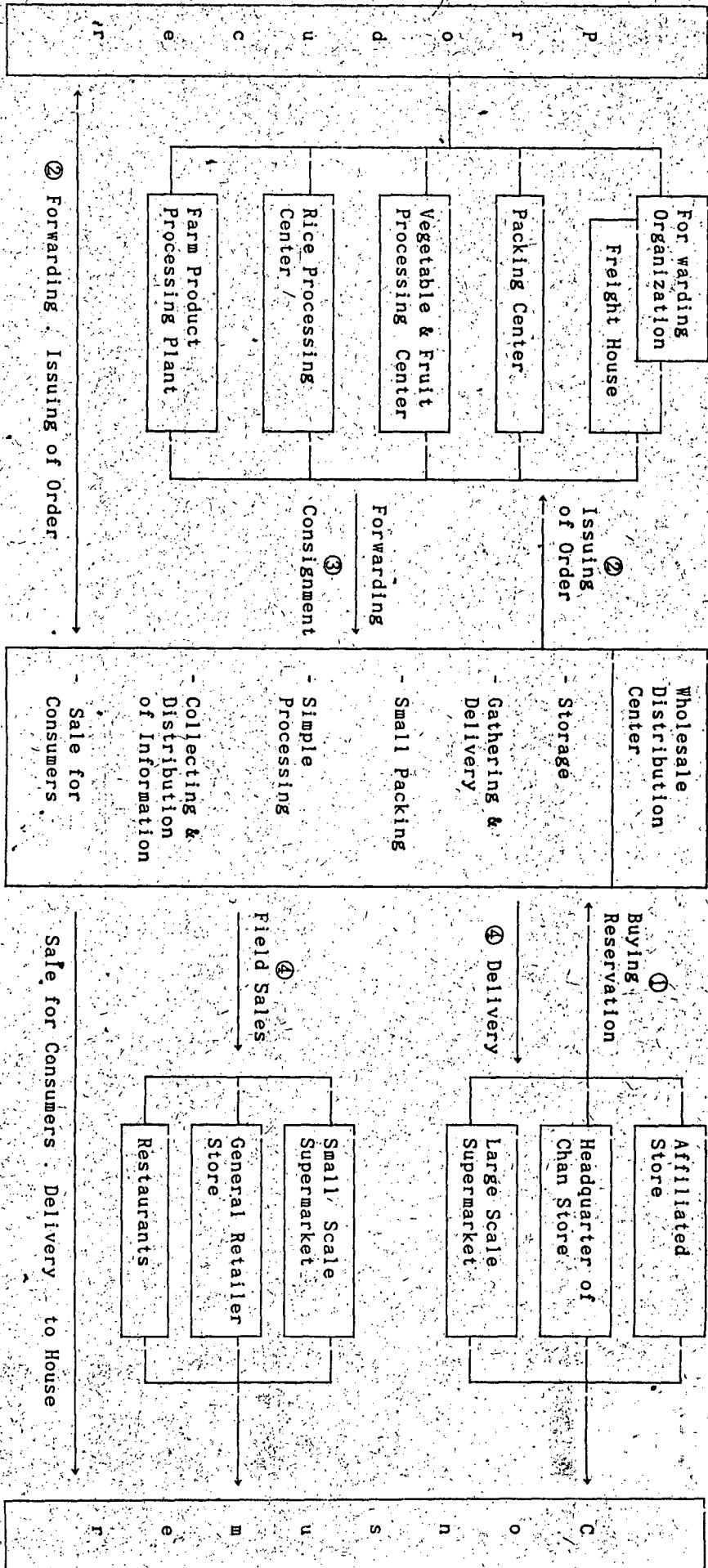
If NACF want to establish a wholesale distribution center, it should get permission from local government and be registered as a wholesaler.

By the regulation of NACF, the wholesale distribution center can pay in advance to the farmers maximum 150 days before, with no interest on condition that their agro-products should be brought to the wholesale distribution center.

The sources of the credit are ; 30% is loan from government (2% of annual interest) and 70% is NACF's own capital.

The wholesale distribution center is usually open 330 days which means 2 day's off a month.

3.6 Channel of procurement and marketing



Chapter 4. DETAILS of OPERATION

4.1 Capacity of the wholesale market

The daily capacity of fruit and vegetable is 900 ton and 347 ton respectively. And yearly capacity of those is 270,000 ton and 104,100 ton.

Parking capacity is important factor to consider in constructing the wholesale distribution center. If it has not enough space for parking, it can not perform such activities as collecting and distributing, especially during the peak time and surplus season.

So the parking space is defined by law according to use and scale of the facilities. By law these kinds of facilities are supposed to have parking space to accomodate at 500 cars. And the project, in reality, will be implemented with parking lot for 1,400 cars.

4.2 Implementation schedule of market

It will take 1 year or so to construct the wholesale distribution center. Details of the activities needed to implement the wholesale distribution center are as follows.

	Activities	Days required	Preceding Activity
A	◦ Internal decision making	30	
B	◦ Getting the Govt's support	30	A
C	◦ Draft design of building and machinery	30	A
D	◦ Getting permission of market construction from the local govt(Considering the traffic effect, beauty of market etc)	30	C
E	◦ Main design of building construction	30	C
F	◦ Making a bid for construction - Notice of tender - Inviting tenders and field explanation	30	E
G	◦ Building construction	330	F
H	◦ Procuring activities(Promoting relationships with producers, etc)	150	F
I	◦ Setting up the machinery	30	G
J	◦ Recruiting employees	30	H
K	◦ Educating the employees for the operation of wholesale market	10	J
L	◦ Organizing the steering & planning committee	20	K
M	◦ Government's confirmation of construction	30	G
N	◦ Registration of wholesaler(Government's issue of wholesaler's licence)	30	M
O	◦ Advertisement before opening	30	M

(See appendix 1 for more details of implementation duration)

4.3 Procurement of products

WDC will buy products from forwarding organization, freight house, packing center, vegetable & fruit processing center, rice processing center, and farm product processing center, etc.

4.3.1 Agro-fishery products

4.3.1.1 To select the strategic products

WDC will select the strategic products of which sales amount on the wholesale markets and NACF supermarkets are the 100 largest. The number of the strategic products will be 100 at the first year.

4.3.1.2 Designation of exclusive trade member cooperative

WDC will designate the member cooperative which are producing the strategic products through reviewing the joint market.

If the product of which the amount of sales in the joint market are not much enough, WDC will designate the member cooperative by surveying the production site.

In designating the area, the criteria are (1) whether they have distribution facilities at the production site such as freight house or packing center, and (2) the organization of producers are working actively.

The designation unit is member cooperatives, but when necessary WDC will designate farming company or a group of cultivator of a crop as a designation unit.

4.3.1.3 Quality control

To ensure good quality, WDC will grade the produce, inspect grade quality, and pay the price in a pool.

There are three types of joint grading according to the products.

	farmer	freight house	packing center	cooperatives
type1	<ul style="list-style-type: none"> ◦ harvest ◦ manual grading individually ◦ packing 	<ul style="list-style-type: none"> ◦ grading by representatives of farmers ◦ grading by cooperatives 	-	<ul style="list-style-type: none"> ◦ pay in a pool
type2	<ul style="list-style-type: none"> ◦ harvest 	<ul style="list-style-type: none"> ◦ Joint grading manually ◦ packing ◦ grading by cooperatives 	-	<ul style="list-style-type: none"> ◦ pay in a pool
type3	<ul style="list-style-type: none"> ◦ harvest 	-	<ul style="list-style-type: none"> ◦ mechanical grading ◦ packing 	<ul style="list-style-type: none"> ◦ pay in a pool

Inspection is performed by representatives from farmers first, and then by cooperatives. If grading is to be performed by machines, manual inspection is omitted.

After inspection, they transport the product with the same grading one. They pay the price in a pool, if the grade is same.

4.3.2 Industrial products.

WDC will 300 items of select strategic products by the ABC analysis according to the analysis of NACF supermarket data.

And WDC will develop private brand item based on the following criteria.

(1) High frequency product in use (2) Product of simple in use (3) Low price products (4) The product without top brand.

The products WDC will order automatically are (1) The products designated as strategic products. (2) The products expected to be sold above a certain amount daily. (3)The products requiring stock at all times to prevent out of

stock.

4.4 The decision of sales price of the WDC

The WDC will adopt 3 kinds of transaction methods ; self transaction, transaction on consignment, and transaction on reservation.

The method of sales price decision for each method of transaction

Distinction		Contents
self transaction		Merchandiser judges and decides price on the basis of expected quantity of the product and market condition
transaction on consignment		The price is settled by the negotiation with buyer on the basis of wishing price of producer, auction price of wholesale market and market condition
transaction on reservation	quantify reservation	The quantity is settled at the time of contract with flexible price(within 10% of difference with auction price of wholesale market). The price is settled at the time of delivery under the pricing method of transaction on consignment.
	price and quantity reservation	The price and the quantity of merchandise is settled the time of reservation. In this transaction price is settled by the pricing method of transaction on consignment within 5% of difference with auction price of wholesale market.

4.5 The price destruction strategy of the WDC

Price destruction is the radical cutdown(usually 20 - 50 %) of the price of goods to the extent that can destroy the existing price system by reducing the cost of manufacture or distribution.

Discount store was successfully settled in the U.S. due to the economic depression in 1980s and intensified international competition after the end of Cold War, stability of international price of raw material, and market opening.

Price destruction can be realized (1) by cutdown of buying cost through unified buying and development of P.B.(private brand) goods and (2) by reducing of distribution cost through reduction of distribution step, cutdown of facilities investment, and saving management expense.

Price destruction strategy of NACF are as follows ;

- Unification of goods supply window (1) by unification of the functions of sales distribution and buying distribution and (2) by central distribution center controls the WDC.

- Reduction of buying price through active development of merchandise (1) by active development of P.B. goods in the field of commodity and (2) by making the most of packing center in the place of production in the field of agricultural products.

- Reducing 3 - 4 steps of distribution through direct transaction with the place for production.

- Purchasing the land in a low price and minimizing investment in such a way as to omit interior design of the building.

- Computerization and mechanization of the distribution of items and introduction of cash and carry principles.

4.6 Sale of products

WDC's main customers are independent retailers, headquarters of chainstore, restaurants, and delivery companies. WDC procures agricultural produce by receiving orders by them and sells them on the basis of cash and carry.

(1) Independence retailer

They are usually managed by couples with vehicles of their own. Personnels of the WDC perform sales promotion in person.

(2) Headquarter of chain supermarket

WDC will supply goods by consortium or contract. And reservation,

receiving and issuing of order are dealt by computer. WDC will takes charge of the delivery to the depot of headquarters of chain supermarket.

(3) Restaurants

There are approximately 60 thousands of restaurants in Seoul. Products of Agriculture, Stockbreeding and Fishery Supply Center Ltd. (invested by Central Association of Restaurant Business) will take charge of delivery.

(4) Delivery companies

Approximately 100 delivery companies are now running for hotels, hospitals, and public restaurants. WDC will accomodate these companies in the WDC under the condition of providing officers, etc. and making them deliver instead of WDC.

4.7 The cargo work and delivery of the WDC

The procedures of cargo work according to the packing unit are as follows.

(1) Agricultural products transported by the unit of pallet

Vehicle -----> forklift truck

(2) Agricultural products transported by the unit of box

Vehicle ---> conveyer belt ---> palletizer ---> forklift truck

(3) Agricultural products transported without packing

Vehicle --> putting into vessel --> conveyer belt --> palletizer -->forklift truck

To reduce the cost of transportation, WDC will found subsidiary firm.

Under the principle of cash & carry delivery, customer is responsible for transportation. But for the convenience of the customer, WDC will consider setting up a subsidiary company in a way of consortium. The delivery company, daughter firm of the WDC, delivers the goods for the customer who needs and wants to do so.

For the efficient delivery of the products, NACF will physically perform (1) modernization of vehicles and cargo loading board (2) mechanization and automation of cargo work (3) use of reasonable vessels, and also perform as a

operational breakthrough (1) scheduled delivery (2) arrangement of freight in lot (3) allotting exclusive boundary for delivery.

4.8 Promotion

To increase the consumption of locally produced agro-fishery product means that the farmers can get more chances to sell their products with higher prices. So both NACF and primary cooperatives have to try to increase the sales in the light of forward integration activity and the major target area for promotion will be southern part of the Seoul, the population of which is 3 million.

These promotion activities would be easier to perform in cooperation with primary cooperatives and local Govt., because it needs much money, for example, advertising through TV, CATV, radio and newspaper.

Advertising strategy of NACF and cooperatives will be as follows.

1) Periodic special sales event connected with local government.

- Period : 2 - 3 days every month

- Place

- NACF and primary co-op stores

- NACF and primary co-op banks

- Weekend markets opened by local government

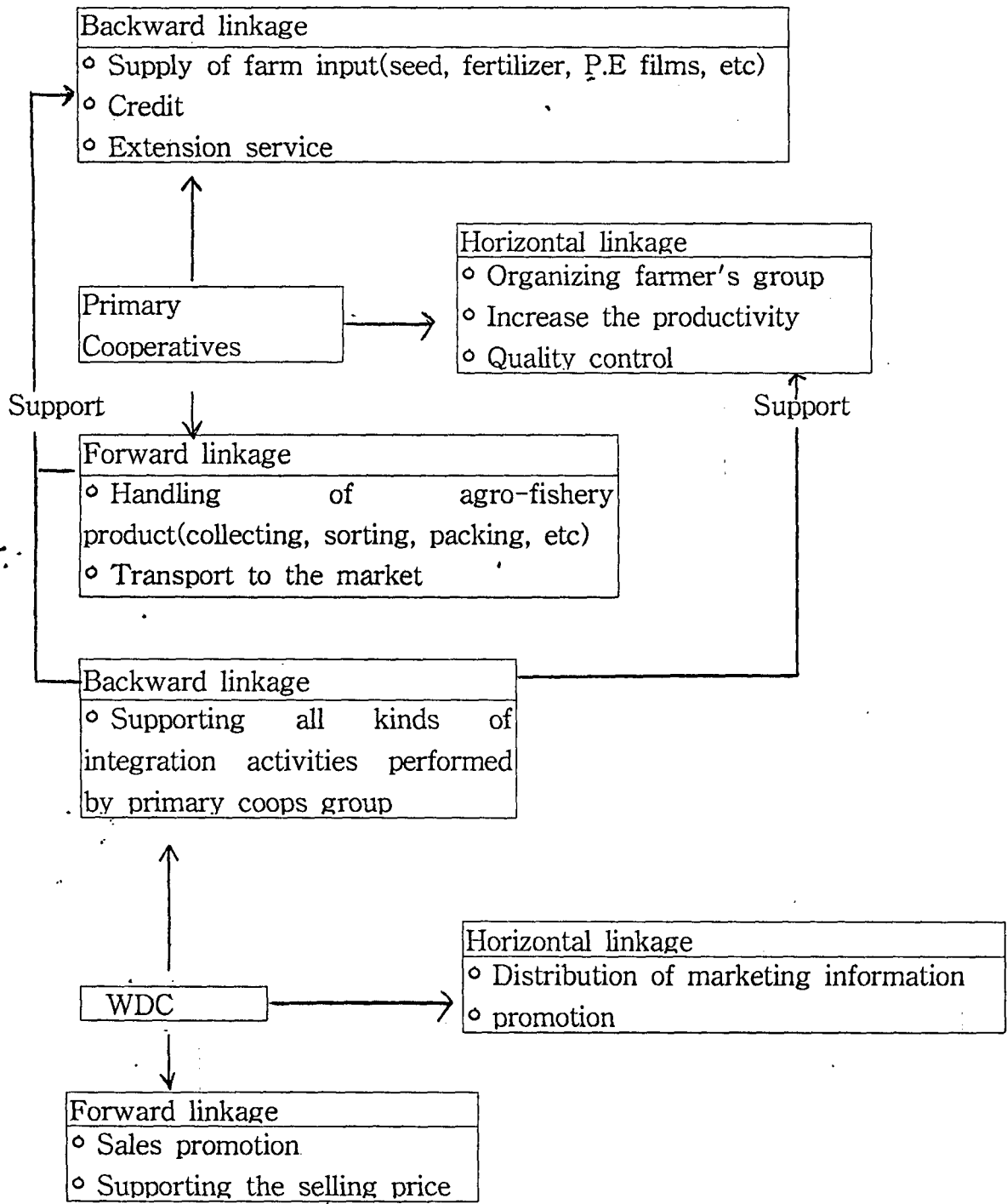
- Advertise through the TV, CATV, radio, magazines connected with local government.

2) Publishing through NACF publishing newspaper and periodicals

Advertising the activities of WDC through The Farmer's Newspaper, which is issued every day, The New Farmer, The Well of Happiness, The Garden of Children, which are issued monthly.

4.9 Integration of activities

To exploit all kinds of opportunities to increase the income of member farmers, the integration activities of the project will be implemented as follows.



Chapter 5. ORGANIZATION and MANAGEMENT

5.1 Management policy

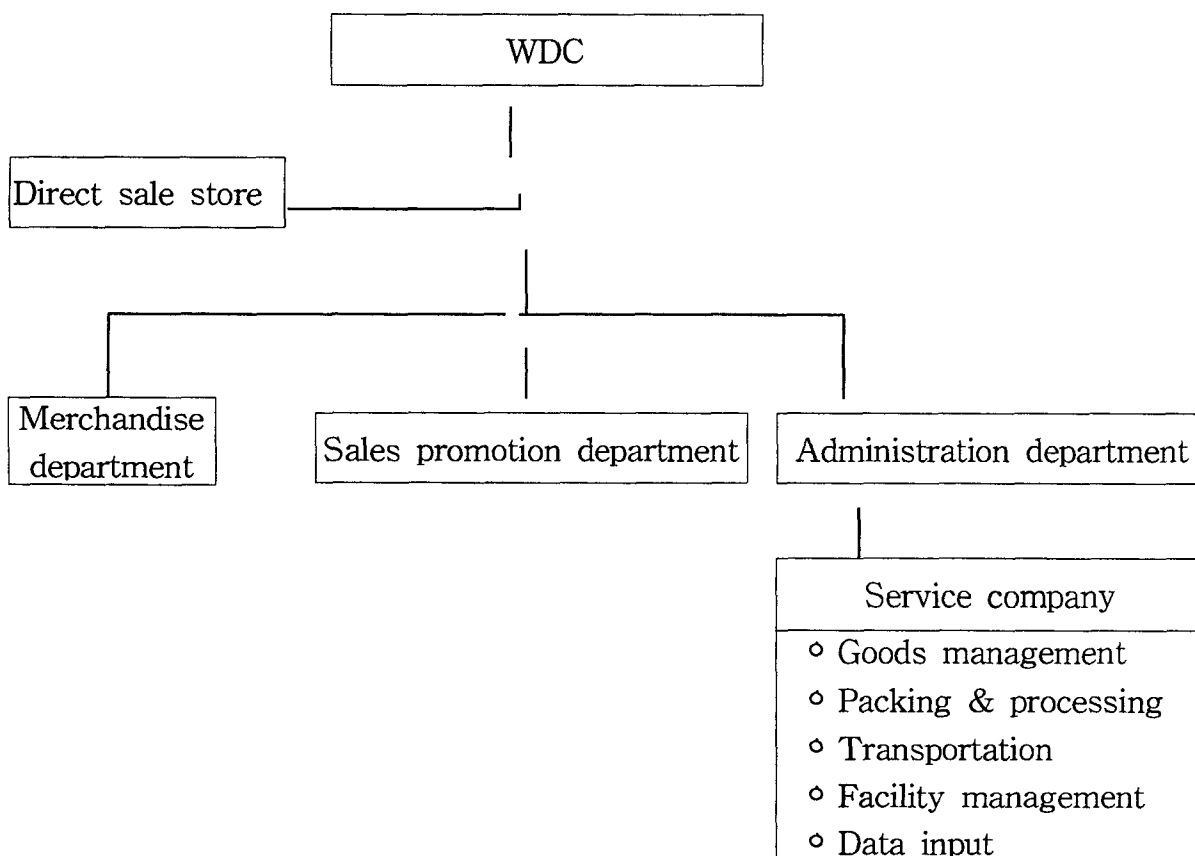
To minimize the number of full-time employees and to computerize and mechanize the work as much as possible.

The number of the first year full-time employees are 120 persons (administration : 15, sales promotion : 15, process : 15, vegetable : 30, fruits : 20, livestock & fishery : 15, direct sale : 10)

To reduce the labor cost, NACF will utilize the consignment and external service as much as possible.

5.2 Organization chart

There should be created new organization for the operation of wholesale market, the chart of which will be as follows.



Organization function

Organization	Function	
Merchandise department	product development, ordering reservation, price determination, receiving an order, sale	
Sales promotion department	recruiting member, supporting retailers, education, PR	
Administration department	computerization, general affairs, accounting, settlement of account, personnel management, credit management	
Service compa ny	Goods management	loading & unloading, receipt of goods, picking, custody, inventory management
	Packing & processing	packing, subdivision, simple processing
	Transportation	transportation, delivering, returning goods
	Facility management	building management, machine operation & management, guarding
	Data input	data input on computer

Chapter 6. FINANCIAL ANALYSIS

6.1 Basic assumption

The financial analysis of the project will be done under the following assumptions.

- Project period is 11 years including the construction period.
- Depreciation is calculated by the straight method with 10 % salvage value.

- Service life of the market facilities will be as follows on the basis of the acts of Tax-law.
 - building : ~~60~~²⁰ years
 - machinery and other fixed assets : 10 years

- Distribution margin is 6% of the total sales.
- The variable cost of the first project year will be as follows
 - EDPS service charge : 0.2% of total sales
 - Total wages of irregular is 2,400 million Won (150 persons).
 - Interest on working capital is 324 million Won.

- The amount of dealing in WDC is expected as follows.

(unit : Million Won)

Year	1997	1998	1999	2000	2001
Amount	180,000	207,000	238,050	273,758	314,822
Year	2002	2003	2004	2005	2006
Amount	362,045	416,352	478,805	550,625	<u>633,220</u>

* The WDC will be open July 1st, 1997, and the opening days in 1997 will be 6 months.

- The amount of total tax of the first project year will be 900 million Won and it will increase 5% annually.

The construction and land purchasing schedule will be as follows.

◦ Schedule of building construction

	Date	Amount to be paid(Mil. Won)	Source of fund	Remarks
Start construction	'96. 7. 1	7,280	Subsidy from Govt.	Contract Guaranty(10% of total cost)
Half-way payment	'96. 10. 31	29,120	Subsidy from Govt.	
Half-way payment	'97. 3. 31	14,600	Subsidy from Govt.	
Completion	'97 6. 30	21,800	NACF's own Capital	
Total		72,800		

◦ The schedule of land purchasing

	Date	Amount to be paid(Mil. Won)	Source of fund	Remarks
Land purchasing	<u>'96. 2. 1</u>	860	NACF's own Capital	Contract Guaranty(10% of land sales)
Half-way payment	'96. 8. 1	1,740	NACF's own Capital	
Transfer of ownership	'96. 12. 31	6,000	Long-term loan from Govt.	Annual int. of Long-term Loan 3 %
Total		8,600		

◦ The driving group of Market construction will start July 1st, 1996 and it will be composed of 7 persons of marketing experience from existing NACF wholesale market.

6.2 Investment of the project

◦ The total project cost are estimated at 82,794 million Won

(in million Won)

Classification	Size and Quantity	Amount		Remarks
		1996	1997	
1. Land	67,587 sq. m	8,600		Tax included
2. Building	61,022 sq. m	36,400	36,400	See appendix 2
3. Machinery			649	See appendix 3
4. Miscellaneous fixed asset			395	See appendix 4
5. Contingencies			52	{(3) + (4)} x 5 %
6. Pre-opening Exp				
- Salary of const. driving group			168	7 persons x 24 mil.
- Int. of Govt. Long-term loan			90	6,000 x 0.5 year x 3%
- Inauguration ceremony			30	To be amortized
- Conference exp. for market development			10	within 3 years
				2 Mil. Won x 5 times
Total		45,000	37,794	82,794

6.3 Fund source

The funds for the project cost will be raise from the following various sources. And the weighted average cost of capital is 3.33%.

(in million Won)

Sources	Amount	Interest rate	Repayment schedule
1. Government's subsidy	51,000	-	-
2. Government's loan	6,000	3%	Grace period of payment : 5.5 years
3. Share capital	25,794	10%	Repayment : 5 years in equal installment
Total	82,794		

* Estimation based on the NACF' s basic plan for the WDC construction

The weighted average cost of capital is 3.33%.

$$\frac{51,000}{82,794} * 0\% + \frac{6,000}{82,794} * 3\% + \frac{25,794}{82,794} * 10\% = 3.33\%$$

6.4 Cost analysis

The annual expenses will be classified into the variable cost and fixed cost.

(in million Won)

Year	Variable cost	Fixed cost	Total
1	3,084	6,900	9,984
2	3,472	7,353	10,825
3	3,890	7,859	11,749
4	4,343	8,440	12,783
5	4,850	9,094	13,944
6	5,398	9,846	15,244
7	6,015	10,856	16,871
8	6,681	12,019	18,700
9	7,426	13,345	20,771
10	8,233	14,889	23,112

(See appendix 6, 7 for more details)

6.5 Cash flow of the project

(in million Won)

Year	Inflow		Outflow		Net cash flow
	Sales revenue	Salvage value	Capital expenditure	Total cost	
0	-		45,000	-	-45,000
1	10,800		37,794	7,324	-34,318
2	12,420			8,210	4,210
3	14,283			9,181	5,102
4	16,425			10,275	6,150
5	18,889			11,488	7,401
6	21,723			12,843	8,880
7	24,981			14,563	10,418
8	28,728			16,488	12,240
9	33,038			18,659	14,379
10	37,993	48,744		21,111	65,626
Total	219,280	48,744	82,794	130,142	55,088

Note) ◦ Sales revenue = sales x 6 % (distribution margin)

◦ Total cost excludes depreciation, amortization, and interest on the long term loan).

6.6 Working capital requirement

The total working capital required includes accounts receivable from the supplier and operation expenses.

30% of those capital required to supply credit to the supplier will be financed by the agro-concerning loan from the government at an interest rate of 2% per annum. And 70% of them and other operation expenses will be financed by NACF bank loan at an interest of 10% per annum.

The working capital requirement during the first 5 years are estimated as follows.

(in million Won)

Year ->	1	2	3	4	5
Annual sales (A)	180,000	207,000	238,050	273,758	314,822
Credit for supplier (B) (B) = (A) X 2%	3,600	4,140	4,761	5,475	6,296
Other operation exp. (C)	504	571	643	725	815
Working cap. required (D) (D) = (B) + (C)	4,104	4,711	5,404	6,201	7,111
Loan from Govt. (E) (E) = (B) X 30%	1,080	1,242	1,428	1,463	1,889
NACF Share cap.(F) (F) = (B) X 70% + (C)	3,204 3,204	3,469	3,976	4,558	5,222
Int. on Working cap.(G) (G) = (E) X 2% + (F) X 10%	324	372	426	489	560

(See appendix 5 for more details)

6.7 Selected financial data

Year ->	1	2	3	4	5
◦ Payback period (years)	9.49				
◦ N P V (million Won)	24,226				
◦ I R R (%)	7.27				
◦ B.E sales (million Won)	160,967	170,100	180,000	191,233	203,933

See appendix 9 for more details.

6.8 Sensitivity analysis

Assumption	Payback period(years)	NPV(million)	IRR(%)	B.E Sales of 3rd yr. (mil Won)
Original	9.49	24,226 /	7.27	180,000
1. Commission rate				
--- 1% increase	9.02	52,819 .	11.56 /	170,867
--- 1% decrease	10.05	-4,367 /	2.58 /	194,567
2. Credit for farmers				
--- 2% increase	9.56	19,880 /	6.59 /	186,500
--- 4% increase	9.64	15,534 /	5.90 /	193,483
--- 4% increase	9.73	11,187 /	5.19 /	201,000
3. Inflation of var. cost				
--- 5% increase	9.52	22,121	6.94	183,433

According to the above analysis, commission rate is more sensitive to the project viability than the inflation of variable cost or credit for farmers.

Presently, the maximum commission rate is defined strictly by law(maximum 7%), it is not easy to raise the rate to get more profits. So it would be easier way to increase the dealing amount through more active procuring and promotion activities.

Because if the current commission rate of 6% is lowered by 1%, the NPV becomes negative and the IRR is lower than the weighted average cost of the capital, it is not possible to lower the commission rate.

But the increasing of credit for the farmers is less sensitive to the project viability, so it is possible to increase the credit to the farmers.

Chapter 7. BUDGET

(in million Won)

Year	1	2	3	4	5
1. Revenue (commission)	10,800	12,420	14,283	16,425	18,889
2. Cost	9,984	10,825	11,749	12,783	13,944
--- Variable cost	(3,084)	(3,472)	(3,890)	(4,343)	(4,850)
--- Fixed cost	(6,900)	(7,353)	(7,859)	(8,440)	(9,094)
3. Profit before Tax (PBT)	816 /	1,595	2,534	3,642	4,945
4. Tax	900 /	945	992	1,042	1,094
5. Profit after Tax (PAT)	- 84 /	650	1,542	2,600	3,851

(See appendix 9 for more details)

Chapter 8. RECOMMENDATIONS

1. First of all, getting the Government's support is the most urgent task for the NACF to implement the project.

NACF will suffer from heavy investment for the building and land and every year NACF has to pay great amount of money as loan interest. Therefore it is essential to get a long-term loan with low interest(3% per annum) and subsidy from the government.

2. The role of computer in WDC is so important that WDC should not spare any efforts to develop good software.

3. There are over 5 million Korean races overseas as of end of 1995. Since they are potential customers of Korean food, WDC should utilize them in exporting domestic agricultural produce.

Appendix 1

Implementation schedule of the WDC

Activities	50	100	150	200	250	300	350	400	450	480
A ◦ Internal decision making	30									
B ◦ Getting the Govt's support	30									
C ◦ Draft design of bldg. & mach.	30									
D ◦ Getting permission of construction		30								
E ◦ Main design		30								
F ◦ Making a bid for construction			30							
G ◦ Building construction						330				
H ◦ Procuring activities				150						
I ◦ Setting up machinery										30
J ◦ Recruiting employees							30			
K ◦ Educating the employees							10			
L ◦ Org. the steering & planning committee								20		
M ◦ Government's confirmation									30	
N ◦ Registration										30
O ◦ Advertisement										30

Appendix 2

List of Building Construction

unit : square feet

Floor	Facilities	Size
1st	◦ Gathering & delivery place for vegetable & fruit	103,191
	◦ Processed food, commodity	58,712
	◦ Office	3,558
	Sub-total	165,461
2nd	◦ Small packing room, subdivision room	36,100
	◦ Office of related companies, consulting room	21,650
	◦ Administrative office, convenience facilities	19,821
	Sub-total	77,571
3rd	◦ Conference room, computer room, restaurant, etc	18,850
basement	◦ Parking place, Cold storage warehouse, machine room	333,057
rooftop	◦ Sunshade	32,736
	◦ Canopy	29,178
total		656,862

Appendix 3

Details of Machinery

(currency unit : thousand Won)

Item	Qnt.	Cost per Unit	Capital investment	Remarks
◦ Lpg forklift	17	6,000	102,000	
◦ Electric pallet truck	66	1,500	99,000	
◦ Reach type forklift	7	5,000	35,000	
◦ Computer		90,000	42,000	
- HP9000/E55	1			
- Terminal	27			
- Printer	17			
- Modem	6			
◦ Computer(Console & printer included)	1	5,000	5,000	
◦ Truck	10	15,000	150,000	
◦ Car	2	10,000	20,000	
◦ Cooling-heating truck	5	12,000	60,000	
◦ Van	2	8,000	16,000	
◦ Trolley	200	100	20,000	
◦ ARS equipment	1	100,000	100,000	
Total			649,000	

Appendix 4

Details of Miscellaneous Fixed Assets

(currency unit : thousand Won)

Item	Qty.	Cost per unit	Capital investment	Remarks
◦ Unit rack - Storage rack - Stacker crane - Autolator	2	5,000	10,000	
◦ Pallet rack	10	1,000	10,000	
◦ Bar-code printer	2	500	1,000	
◦ POS - TPS-486 - LAN Card - Printer - Scanner - UPS	16	4,000	64,000	
◦ Power generator	2	30,000	60,000	
◦ Tools & accessories		100,000	100,000	60 items
◦ Office facilities		150,000	150,000	30 items
Total			395,000	

Appendix 5

Calculation of Working Capital

(3rd year)

(in thousand Won)

Item	Amount	Remarks
(1) Credit for farmers	4,761,000	Sales x 2% (yearly average ratio)
(2) Operation expenses		
◦ Salary & wage	575,000	Regular & irregular employee (1 month)
◦ Other fixed cost	28,000	
- Promotion exp	(2,000)	24,000 / 12 month
- Extension & teaching exp	(1,000)	12,000 / 12 month
- Maint. cost of bldg. & mac.	(1,700)	20,000 / 12 month
- Tel & com. exp	(16,560)	196,000 / 12 month
- Insurance premium	(5,400)	64,000 / 12 month
- Other overheads (Tea & snack, stationary etc)	(1,340)	16,000 / 12 month
◦ Other variable cost		
- EDPS exp	40,000	476,000 / 12 month
Working Cap. required	5,404,000	
(3) Loan from Govt. (2%)	1,428,000	(1) x 30%
(4) NACF Share Capital (10%)	3,976,000	(1) x 70% + (2)
(5) Int. on working capital	426,000	(3) x 2% + (4) x 10%

Appendix 6

Details of Fixed Cost

(3rd year)

(in thousand Won)

Item	Amount	Remarks
1. Salaries	3,915	◦ Regular worker
2. Depreciation	3,370	◦ Bldg. & other assets
3. Amortization on P.O Expenses	10	◦ Inauguration ceremony
4. Int. on Govt. long-term loan	180	◦ 600 x 3 %
5. Insurance Premium	64	◦ Fixed asset x 5 %
6. Extension & Teaching Exp.	12	◦ 1 x 12 month
7. Repairs & Maintenance Esp.	20	◦ Fixed asset maintenance
8. Promotion Expense	24	◦ 2 x 12 month
9. Telephone & Communication	196	◦ Regular salary x 5%
10. Other Overheads(Tea & Snacks, stationary, etc)	16	◦ Regular salary x 5%
11. Contingency	52	◦ Fixed asset x 5%
Total	7,859	

Appendix 7

◦ Details of Variable Cost

(3rd year)

(in thousand Won)

Item	Amount	Remarks
1. Wages (Irregular employee)	2,988	
2. <u>EDPS</u> Service Charge	<u>476</u>	
3. Interest on Working Capital	426	
Total	3,890	

Appendix 8

Loan Repayment Schedule

(in thousand Won)

Year ->	Interest	Principal Reimburse	Loan Left	Remarks
1	180	-	6,000	◦ Int. rate : 3% ◦ Loan term : 10.5 year ◦ Grace period : 5.5 year
2	180	-	6,000	
3	180	-	6,000	
4	180	-	6,000	
5	180	-	6,000	
6	180	1,200	4,800 /	
7	144	1,200 /	3,600 /	
8	108	1,200	2,400	
9	72	1,200	1,200	
10	36	1,200	0	
Total	1,440	6,000		

5. Long-term loan	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Principal reimburse		0	0	0	0	0	1,200	1,200	1,200	1,200	1,200
Principal residue		6,000	6,000	6,000	6,000	6,000	4,800	3,600	2,400	1,200	0
Interest (K)		180	180	180	180	180	180	144	108	72	36
6. Variable cost	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total wages of irreg.		2,400	2,686	2,988	3,306	3,660	4,032	4,444	4,876	5,352	5,850
EDPS exp. (0.2%) ***		360	414	476	548	630	724	833	958	1,101	1,266
Sub total (C)		2,760	3,100	3,464	3,854	4,290	4,756	5,277	5,834	6,453	7,116
Total depreciation (D)		3,370	3,370	3,370	3,370	3,370	3,370	3,370	3,370	3,370	3,370
Gross profit (E)=(B)-(C+D)		4,670	5,950	7,449	9,202	11,229	13,597	16,334	19,524	23,215	27,507
7. Administrative exp.	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total salary of reg.		3,000	3,432	3,915	4,480	5,104	5,820	6,816	7,956	9,252	10,754
Promotion exp. **		24	24	24	24	24	24	24	24	24	24
Amortization on P.O (30 mil)		10	10	10	0	0	0	0	0	0	0
Extension & teaching **		12	12	12	12	12	12	12	12	12	12
Maint. of building & mac **		20	20	20	20	20	20	20	20	20	20
Tel & comm. (reg. sal*5%) **		150	172	196	224	255	291	341	398	463	538
Insurance (fix *0.1%) **		70	67	64	60	57	54	50	47	44	40
Ovehead (reg. sal. 0.4%)**		12	14	16	18	20	23	27	32	37	43
Administration total (F)		3,298	3,751	4,257	4,838	5,492	6,244	7,290	8,489	9,852	11,431
Earnings before tax (G)=(E-F)		1,372	2,199	3,192	4,363	5,737	7,353	9,044	11,035	13,363	16,076
8. Working cap. required	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Credit for farmer(1) 2%		3,600	4,140	4,761	5,475	6,296	7,241	8,327	9,576	11,013	12,664
Salary 1month (2)		450	510	575	649	730	821	938	1,069	1,217	1,384
Other fixed cost (3) **		24	26	28	30	32	35	40	44	50	56
Other variable cost (4) ***		30	35	40	46	53	60	69	80	92	106
Loan from Govt. (1)*30% (H)		1,080	1,242	1,428	1,643	1,889	2,172	2,498	2,873	3,304	3,799
Share cap. (1)*0.7+(2+3+4) (I)		3,024	3,469	3,976	4,558	5,222	5,985	6,876	7,896	9,068	10,411
Total working capital required		4,104	4,711	5,404	6,201	7,111	8,157	9,374	10,769	12,372	14,210
Int. on W.C (H*2%+I*10%) (J)		324	372	426	489	560	642	738	847	973	1,117

9. Variable cost	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total wage of irreg.		2,400	2,686	2,988	3,306	3,660	4,032	4,444	4,876	5,352	5,850
EDPS exp.		360	414	476	548	630	724	833	958	1,101	1,266
Int. of W.C (J)		324	372	426	489	560	642	738	847	973	1,117
Total variable cost		3,084	3,472	3,890	4,343	4,850	5,398	6,015	6,681	7,426	8,233

10. Fixed cost	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Depreciation		3,370	3,370	3,370	3,370	3,370	3,370	3,370	3,370	3,370	3,370
Amortization		10	10	10	0	0	0	0	0	0	0
Longterm loan interest (K)		180	180	180	180	180	180	144	108	72	36
Total salary of reg.		3,000	3,432	3,915	4,480	5,104	5,820	6,816	7,956	9,252	10,754
Promotion exp.		24	24	24	24	24	24	24	24	24	24
Extension & teaching		12	12	12	12	12	12	12	12	12	12
Maint. of bldg & mac.		20	20	20	20	20	20	20	20	20	20
Tel & comm.		150	172	196	224	255	291	341	398	463	538
Insurance		70	67	64	60	57	54	50	47	44	40
Other overhead		12	14	16	18	20	23	27	32	37	43
Contingency (asset)*5% (L)		52	52	52	52	52	52	52	52	52	52
Total fixed cost		6,900	7,353	7,859	8,440	9,094	9,846	10,856	12,019	13,345	14,889
Total cost		9,984	10,825	11,749	12,783	13,944	15,244	16,871	18,700	20,771	23,122

11. Profit before tax	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
PBT (M)=(G)-(J+K+L)		816	1,595	2,534	3,642	4,945	6,479	8,110	10,028	12,266	14,871
Total tax (N)		900	945	992	1,042	1,094	1,149	1,206	1,266	1,329	1,395
Profit after tax		-84	650	1,542	2,600	3,851	5,330	6,904	8,762	10,937	13,476

12. Cash flow (orgnl)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Sales revenue		10,800	12,420	14,283	16,425	18,889	21,723	24,981	28,728	33,038	37,993
Salvage value		0	0	0	0	0	0	0	0	0	48,744
Inflow total(O)	0	10,800	12,420	14,283	16,425	18,889	21,723	24,981	28,728	33,038	86,738
Capital exp	45,000	37,794	0	0	0	0	0	0	0	0	0
Total cost	0	7,324	8,210	9,181	10,275	11,488	12,843	14,563	16,488	18,659	21,111
Outflow total(p)	45,000	45,118	8,210	9,181	10,275	11,488	12,843	14,563	16,488	18,659	21,111
Net cash flow (Q)=(O-P)	-45,000	-34,318	4,210	5,102	6,150	7,401	8,880	10,418	12,240	14,379	65,626
Payback period(9.49 year)	-66,300	-100,618	-96,409	-91,306	-85,156	-77,755	-68,875	-58,457	-46,217	-31,837	33,789
@NPV(0.0333,B145..L145)		24,226									
@IRR(0.1,B143..L143)		7.27%									

13. Sales at B.E.P	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Commision revenue(S)		10,800	12,420	14,283	16,425	18,889	21,723	24,981	28,728	33,038	37,993
Variable cost (V)		3,084	3,472	3,890	4,343	4,850	5,398	6,015	6,681	7,426	8,233
Fixed cost (F)		6,900	7,353	7,859	8,440	9,094	9,846	10,856	12,019	13,345	14,889
Rev. at B.E.P (R)=(F*S)/(S-V)		9,658	10,206	10,800	11,474	12,236	13,101	14,299	15,661	17,215	19,008
Sales at BEP/6%		160,967	170,100	180,000	191,233	203,933	218,350	238,317	261,017	286,917	316,800

TINTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996

Title of Project : CHUNGYANG MILK PROCESSING PLANT

Country : REPUBLIC OF KOREA

Project Prepared By : SUN - HAK KIM

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Sun hak KIM

CHAPTER I . SUMMARY

- 1.1. The project is to set up the milk processing plant of yearly capacity of 60,000 metric tons in Chungyang city, aiming at increasing dairy farmers' income in Korea especially Chungnam province.
- 1.2. Dairy farmers have suffered from unstable supply&demand and opening market under the WTO system. National Livestock Cooperatives Federation wanted to guarantee stable production activities for dairy farmers through strengthening milk processing and marketing by producer organization. There are also necessities for making high quality and specialization of domestic dairy products for import liberalization.
- 1.3. The demand for milk and dairy products(for example, market milk, yoghurt and other dairy products,etc) has been increased rapidly in recent years with the growth of national economy, which makes NLCF establish the milk processing plant.
- 1.4. This project will be implemented by NLCF in the area. It will collect raw milk, from dairy member farmers and produce milk processed products with the NLCF brand which can have a definite "clean, natural and fresh" dairy cooperative image.
- 1.5. Milk processed products in the plant will be sold through cooperative channel, market agency, chain store and also retail shops of NLCF and primary cooperatives.
- 1.6. It is expected that the increased and stabilized demand for raw milk by operating the plant will induce the farmers to raise more dairy cattle and protect dairy farmers from the unexpected supply&demand and opening market pressure which are the main reasons that make the farmers hesitate to keep the dairy industry.

- 1.7. Total capital investment for implementing the project will amount to 35,000 million won and be financed by Government fund(livestock development fund), OECF and NLCF jointly.
- 1.8. The operating rate of the milk processing plant will increase to 100 percent in third operating year step by step from 50 percent in the first year and 70 percent in the second year.
- 1.9. Project life is 10 years including 3 years of plant construction. Net present value(NPV) at a discount rate of 5.80 percent is estimated to be 25,645 million won. Internal rate of return(IRR) is enumerated to be about 26.18 percent, which is much higher than capital cost of investment, 5.80 percent.

CHAPTER I . BACKGROUND

2.1 Overall situation

Due to the recent increase in average per capita income with economic development, the traditional dietary pattern in Korea has been changed toward the western style, that is to say, the demand for dairy products, particularly milk processed goods, has increased substantially. In 1994, milk consumption per capita and dairy products consumption per capita have reached 46.8 kg and 15.2 kg compared to the 10.8 kg and 4.0 kg in 1980, respectively.

Year	Production of dairy products (Ton)				
	whole milk	skim milk	condensed milk	cheese	butter
1990	8,551	12,261	3,391	6,815	5,095
1991	8,237	23,514	4,145	8,536	6,266
1992	4,787	16,510	2,902	9,175	3,364
1993	4,571	22,889	2,871	12,157	3,837
1994	3,114	16,871	3,824	12,668	2,929

Year	Consumption of dairy products (Ton)				
	whole milk	skim milk	condensed milk	cheese	butter
1990	9,385	7,869	3,339	4,774	7,254
1991	5,090	7,270	3,965	5,778	4,805
1992	2,222	4,025	3,069	6,779	4,580
1993	1,798	3,720	2,855	8,811	4,067
1994	1,411	3,402	3,295	9,767	3,034

2.2 Present situation of dairy industry

- ① The supply and demand for milk and milk processed products are increasing every year.
- ② The annual consumption of milk including dairy products is 46.8 kg per capita in 1994 which is under the level of that of advanced countries.
- ③ Milk production has been increased from 1,741 thousand M/T in 1991 to 1,990 thousand M/T in 1995.
- ④ The number of dairy cattle has been increased from 180 thousand heads in 1980 to 552 thousand heads in 1994.
- ⑤ But nowadays, Korea is under the pressure of opening livestock market from the foreign countries under the WTO system. Government and NLCF are striving to keep our domestic livestock industry from opening market. Therefore the integrated business of livestock & dairy industry in Korea is very important.
- ⑥ Due to the stable production activities of milk and dairy products, and preparation for the opening domestic dairy market, the government and NLCF are endeavoring to support for establishing the milk processing plant and developing new products which is expected to reduce the production cost (marketing cost and farmers' production cost) and increase the value addition

2.3. Area of project

The area of project is located in the west-southern part of Korea.

This province has 5 specialized cooperatives and 22 local cooperatives which are member cooperatives of NLCF. NLCF consists of 190 primary cooperatives, 44 specialized and 146 local cooperatives. The project city is Chung yang where is situated to the west of Chung nam province. The site of city is about 469 square km and population is about 54 thousands as of the end 1990.

2.4. Problems faced by farmers

One of the difficult problems existed over the last 30 years has been its instability in supply and demand of milk. Generally the consumption decreases sharply in winter, and showed up and down in other seasons according to years. These phenomena prove that patterns of consumption have not stabilized yet. Nevertheless, its consequence had brought the industries considerable economic loss and difficulties in their production plan. Such uncertainty in supply and demand seems to be the reasons why mainly the market-milk-oriented consuming pattern was prevail while dairy products have not yet become the daily necessary food for Korean people.

However, this problem of instability in supply and demand of milk will be softened with the change of consuming pattern from market milk to processed dairy products in the future. In spite of such problems, the dairy industry in Korea has made a great progress, although some technical deficiencies still exist.

Counterplans and technical development, which can elevate quality of milk and products, are essential to develop this field more efficiently. Especially the improvement of product

quality and processing technique for less cost and the extension of milk consumption are the master keys to the development of dairy industry in Korea.

2.5. Need and justification of the project

It is very urgent task for the livestock cooperatives to find out the solution of problems faced by its member farmers in Korea. One of the most effective way for the livestock cooperatives to contribute to their member farmers is to add value to their products through processing and marketing, that is to say, the integrated business.

- ① NLCF will establish the milk processing plant in Chung yang, which capacity is 200 M/T of milk processed products per day.
- ② This milk processing plant will produce market milk, yogurt and other dairy products, etc., which makes member farmers increase the income by enhancing the value addition of milk.
- ③ It is expected that the expansion of employment in this area will be effected.
- ④ This milk processing plant will be rearranged the milk processing industry in Korea so that NLCF may play the leading role, that is to say,
 - Increase of the participation of producers in processing and marketing milk for the purpose of continuous development of dairy industry.
 - Stabilization and development of the milk processing industry by participation of producers in the reorganization of marketing system.
 - Protection of both producers(farmers) and consumers by reducing marketing cost
 - Improvement of people's dietary pattern by suppling good quality of milk and dsiry products.

CHAPTER III PROJECT

3.1. Objectives

The main objective of this project lies in enhancement of member farmers' income in this area and building of member farmers' raising basis steadily.

The objectives of establishment of milk processing plant are :

- To increase the income of farmers by stabilizing the raw milk price and balancing the supply and demand of milk and dairy goods.
- To protect the dairy farmers from price fall when it is oversupplied by p rocessing all the raw milk produced by members, that is to say, to give the farmers the remunerative price.

- To induce the farmers to keep the dairy industry by providing secure market
- To provide farmers with extension services to increase productivity.
- To generate employment opportunity for member farmers.
- To play a role in the anchor activity of the livestock cooperatives.

3.2. Area of operation

This plant will be operated in the area of Chung yang city and will be cover Chung nam province and 1 big city(Taejoen city) as the area of raw milk procurement. The consuming area will be whole nation of Korea for market milk and Chung nam province (including Taejeon city) for other dairy products. And marketing channel will be made use of cooperatives' marketing channel and organization.

3.3. Project component

① Implementation of project

This project will be implemented by NLCF with aid of the Government and the integration among NLCF, primary cooperatives and member farmers.

② Construction of the plant

- Location of the plant will be Chung yang city, Chung nam province.
- The site of plant will be 12,600m² of building and 72,600m² of land.
- This milk processing plant of yearly capacity of 60,000 M/T will require 3 years in construction for the cost of about 35,000 million won.
- The major parts of construction of the plant are
 - ▣ Building construction for factory, attached office and chilling storage
 - ▣ Raw milk storage and product storage
 - ▣ Water purifier facility
 - ▣ Set up machinery and equipment of the plant

③ Procurement of raw material

The milk processing plant will purchase raw milk from Chung nam province and process it. Also the plant set up the plan to enhance the quality of milk and induce the dairy farmers to produce the good quality of milk. The collected raw milk will be transported by NLCF's trucks. Procurement prices will be the price level including proper profit in addition to farm production cost. All raw milk will depend on the product of member farmers in the plant.

④ Processing of milk

The plant has the capacity of processing 200 M/T for 8 hours per day. But in case the demand for milk & dairy products increase, the plant would be operated over the normal operating hours. There is some process loss which is approximately 1 % out of total. The maximum utilization of the available capacity in processed milk has assumed 100 % on the 3rd year.

The chief product items will consist of market milk, yoghurt (liquid & solid), processed milk and whole milk powder using NLCF's brand. All of product items will be produced after strict test and appraisal is finished by NLCF's skill team itself.

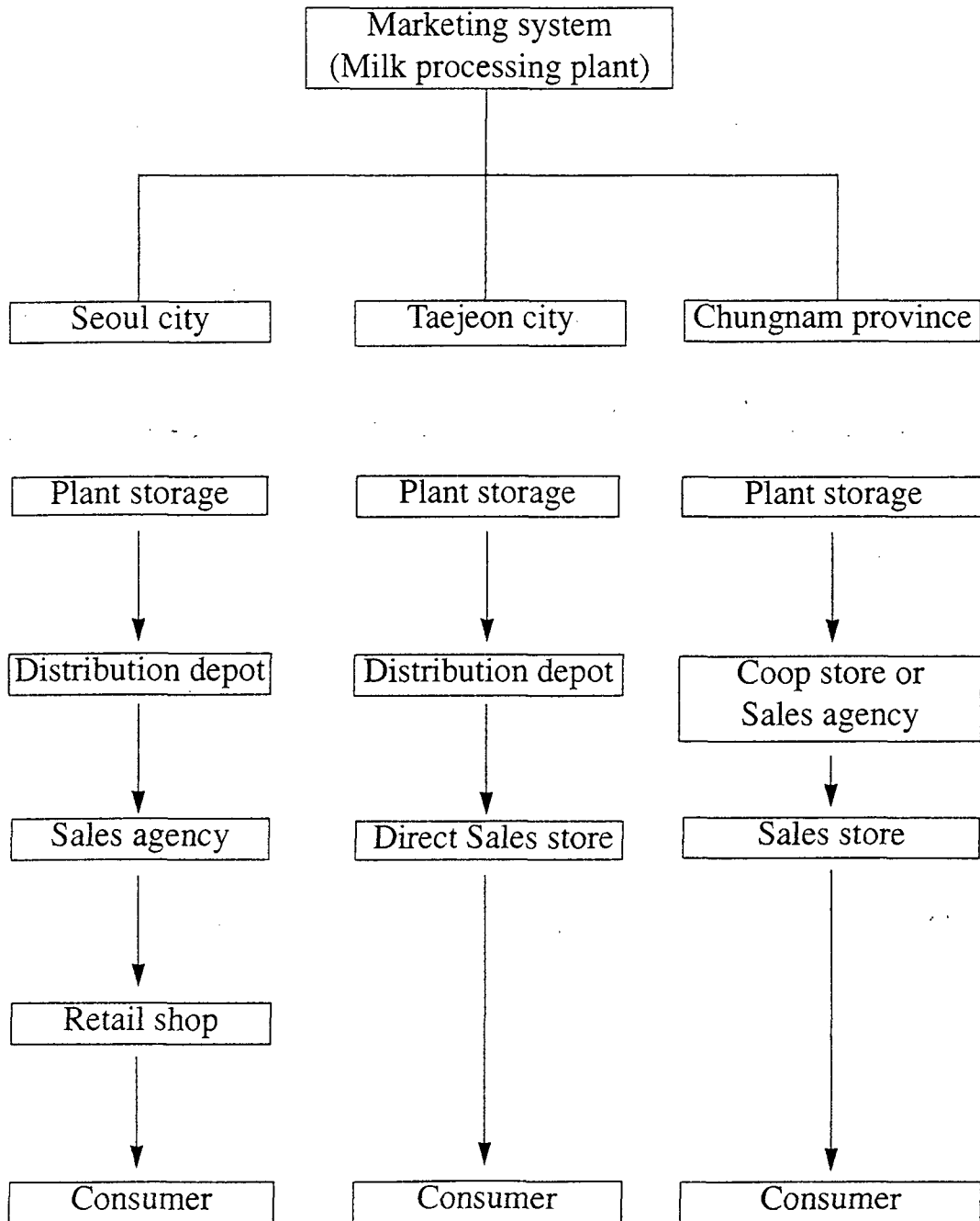
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⑤ Marketing

Market milk and milk processed products will be sold marketing agency, supermarket and chain store through cooperatives channel.

The advertisement for sale promotion will be put in the newspaper publication and T.V. and done through exhibitions. NLCF has already retained their name value of reliability to public consumers in Korea.

Consumers will prefer good quality of NLCF's products. Therefore it is expected that there is no problem in marketing of market milk and milk processed goods.



⑥Extension

The extension division of plant will make efforts not only to expand the herd size of dairy farmers but also to induce the farmers to get into the dairy industry through proper guidance and education to member farmers. The Extension services contain education for management and technology on dairy farming, information on feed supply, credit to its members, etc.

Finally, the Chung yang milk processing plant will provide dairy farmers with extension services mainly to increase the productivity of dairy farming, the cost down of products and marketing cost in integration with the about 27 primary cooperatives of Chung nam province.

CHAPTER IV . DETAILS OF OPERATION

4.1. Capacity of the plant

The capacity of the plant is 200 M/T of market milk and milk processed products per day 8 working hours. This means the plant can produce around 60,000 M/T of final products per year of ~~300 working days~~.

< Construction of plant >

Land	Building				
	Total	Processing facilities	Environment facilities	Office	Others
72,600m ²	12,600m ²	9,500m ²	1,700m ²	1,200m ²	200m ²

4.2. Means of financing

The total capital requirement for the project will be 35,000 million won.

About 28% out of this will be financed by NLCF itself and other 72% will be financed by Government(the fund of livestock development) and OECF.

< Fund of investment >

Total investment (million won)	Loan		NLCF	Remarks
	OECF	Government		
35,000	8,000	17,000	10,000	

4.3. Implementation schedule of the plant

It will take 36 months to implement this project and project life will be 10 years that is 3 years of construction and 7 years of formal operation.

- ① Preparation of general plan
 - preparation of official proposal
 - approval by NLCF representatives and board of directors

- ② Purchase of land
 - selecting site for milk processing plant
 - feasibility study
 - acquisition of the land

- ③ Building construction
 - design and preparation of building site
 - construction of building

- ④ Ordering machinery and equipment
 - ordering the machinery
 - purchasing the equipment

- ⑤ Education and training manual
 - preparation of operation manual
 - training of staff

- ⑥ Test working

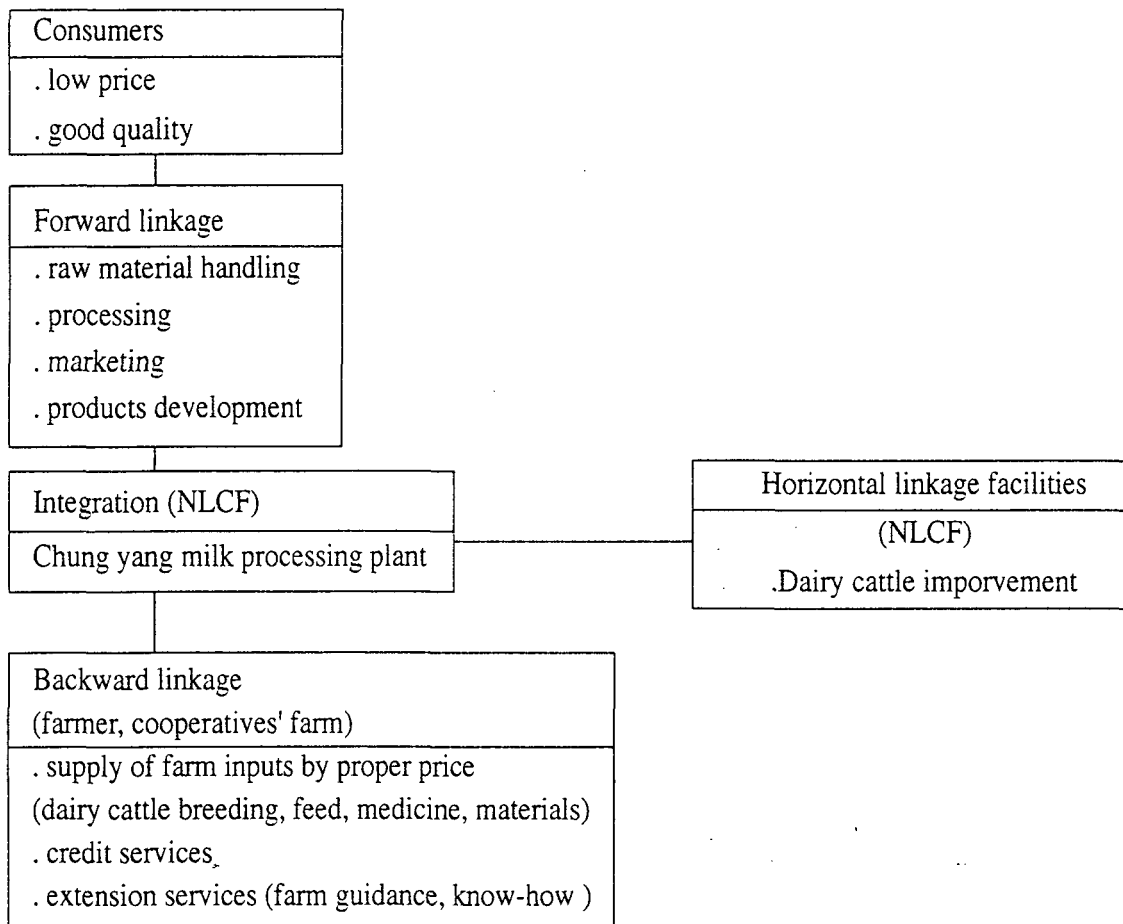
- ⑦ Formal operation

< Progress of work >

Item	Period	First year	Second year	Third year
		2 4 6 8 10 12 (months)	2 4 6 8 10 12 (months)	2 4 6 8 10 12 (months)
1. Preparation of general plan		—		
2. Purchase of land		—		
3. Land development		—		
4. Survey		—		
5. Basic layout		—		
6. Details of draft		—		
7. Ordering purchase machinery			—	
8. Construction facilities			—	
- Building				
- Machinery				
- Electricity				
9. Recruiting manpower and Education & Training manual			—	
10. Test working and registrations of factory, enterprise, etc.				—

4.4 Intergration of activities

To exploit all kinds of opportunities to increase the income of member farmers, the integration activities of the project will be implemented as follows :



CHAPTER V . ORGANIZATION AND MANAGEMENT

5.1 Management of policy

NLCF will implement the project in collaboration with primary livestock cooperatives in province. The plant will be set up by NLCF's staff and be integrated between NLCF and member farmers(primary coops).

The major management policy of the plant will be controled by the existing decision making system i.e the board of directors, president and managing director. The NLCF will newly implement a chief department to manage the plant and appoint a managing director in charge of the overall management.

5.2. Classification of management

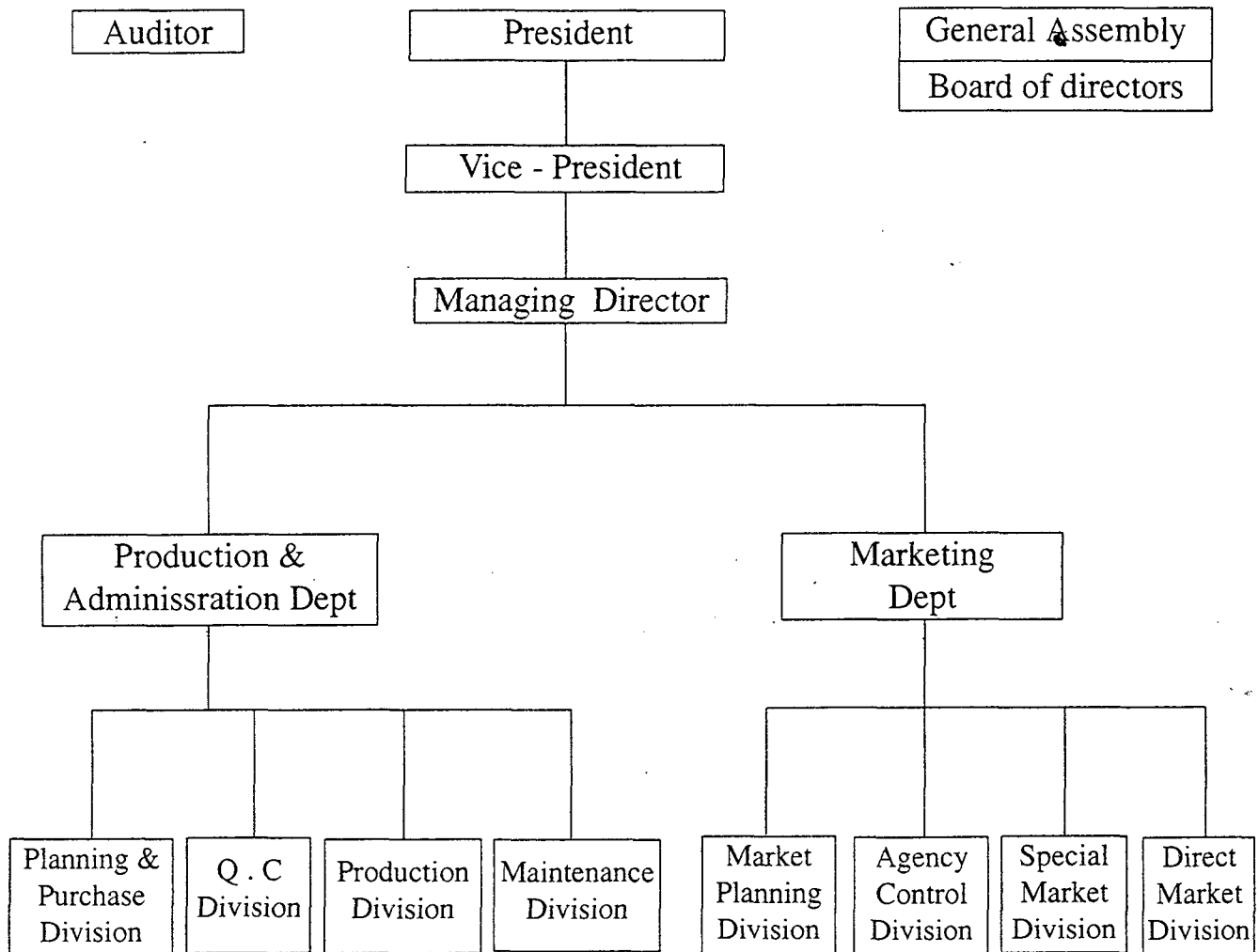
The function of management will be classified as follows

- 1) Administration and general affairs
- 2) Accounting and fiancing
- 3) Procurement of raw material

- 4) Processing and quality control
- 5) Maintenance of machinery and plant
- 6) Production
- 7) Marketing and survey

5.3. Organization and tasks

5.3.1. Organization(130 staffs in the 3rd year)



5.3.2. Tasks of department

① Managing Director

The managing director will be in charge of the overall operation of the 2 departments following the instruction of managers and the managing director will be vested by the power to control all activities related to the milk processing plant.

② Administration & production department

This department is in charge of general affairs related to the operation of the plant. And they administrate the salary of employees and staffs and manage the welfare facilities. They plan to rationalized the function of work and make out the financial statement. Another task is to assist

other department for administrative affairs in order to achieve the whole target of the plant.

Moreover, their task encourages the farmers to raise dairy cattle and guide the dairy farmers to adopt new technology and management dairy farming and is to assist the dairy farmers to improve milk quality and is to manage the integrated business efficiency.

Meanwhile the work of production department is to collect milk and to process it. And in order to accommodate the consumers' desire, they research the development of new products, packing material and quality control.

③ Marketing department

The work of marketing department is to achieve the sales target according to the plan while expanding market share.

It takes charge of sales promotion such as advertisement in order to maintain and increase market share. Also It observes the market trend and reflect it for the development of new products.

CHAPTER VI . FINANCIAL ANALYSIS

6.1. Basic assumption

Project life is 10 years including 3 years of construction period and service life of fixed assets are 40 years for building, 10 years for plant and equipment and 7 years for other assets respectively.

Procurement prices of raw material will be supposed 420 thousand won per metric ton.

Price of market processed milk(weight average) will be 970 thousand won per metric ton.

Income tax will be imposed at the rate of 10.75 % on gross profit of the plant.

Salary is 3,000 million won in the first year, 4,200 million won in the second year and 6,000million won from the third year. 1 % loss is wasted in the process of producing meat products.

6.2. Capital investment of the plant

The capital investment of the project is estimated to be 35,000 million won on the basis of 1996 year current prices.

(Unit : million Won)

Item	Land	Building	Machinery and plant	Equipment	Others assets	Total
Investment	7,000	13,000	12,000	700	2,300	35,000

The amount of investment cost required for the project will be financed by NLCF itself, Government and OECF. The capital cost of the total investment, which will be used as the discount rate in the financial analysis is assumed to be 5.80 percent annum which covers the weighted average cost of capital investment.

(Unit : million Won)

Source of fund	Amount	Interest rate
OECF	8,000	4% ✓
Gov't term loan	17,000	3% ✓
NLCF	10,000	12% ✓
Total	35,000	5.80% ✓

32,000
5,000
12,000

6.3. Working capital

Total working capital requirement will be around 4,038 million won for the first year. It will increase annually as the operating rate goes up from the level of the first year. The details of working capital requirement is shown in appendix 7.

Working capital requirement excluding payables working capital requirement will be financed by NLCF at an interest rate of 12 percent annum. Working capital requirement for loan and its interest are estimated in the project period as follows.

(unit : million won)

Item \ Year	1	2	3	4	5	6	7
Working capital	4,038	5,454	7,577	7,577	7,577	7,577	7,577
Interest on working capital	422	566	783	783	783	783	783

6.4. Production cost

Production cost, the sum of fixed cost and variable cost, is calculated annually as follows. The details of those are shown in appendix 7.

(unit : million won)

Item \ Year	1	2	3	4	5	6	7
Fixed cost	8,820	10,220	12,320	12,320	12,320	12,256	12,193
Variable cost	17,072	23,876	34,083	34,083	34,083	34,083	34,083
Total	25,892	34,096	46,403	46,403	46,403	46,339	46,276

6.5. Cash flow

The annual cash flow from the project is estimated as follows. The details is given in appendix 5, 7.

(unit : ^{million} thousand won)

Item \ Year	0	1	2	3	4	5	6	7
Investment cost	35,000							22,651
Inc. working capital		-3,513	-1,205	-1,808				6,526
Operating cash flow		6,398	9,360	13,803	13,803	13,803	13,796	13,790
Net cash flow	-35,000	2,885	8,155	11,995	13,803	13,803	13,796	42,968
Present value	-35,000	2,726	7,285	10,129	11,016	10,412	9,837	28,956

Note : 1) Salvage value : 22,651 million won. 2) discount factor : 5.80 %.

6.5.1. Net present value

$$\begin{aligned}
 \text{NPV} &= \text{sum of discounted present value} - \text{investment cost} \\
 &= 60,645 - 35,000 \\
 &= \underline{25,645} \text{ million won}
 \end{aligned}$$

6.5.2. Internal rate of return

IRR in the project is calculated to be approximately 26.18% which is much higher than the capital cost initial investment, that is 5.80 percent.

6.6. Sensitivity analysis

Item \ Assumption	NPV (million won)	IRR	Discounted payback period	Break-even point(1st year)
Original calculation	25,645	26.18%	4.35 years	75.14%
With 5% fall in sale price	15,861	20.96%	5.18 years	85.54%
With 5% rise in raw material price	21,243	23.83%	4.69 years	79.43%

According to the sensitivity analysis, changes in final product prices are more sensitive rather than changes in raw material prices.

6.7. Financial viability

On the basis of the above financial analysis, the project is said to be financially viable.

CHAPTER VII. BUDGET

The budget for the operating year is estimated as follows

(unit : million)

Item \ Year	1	2	3	4	5	6	7
1. Revenue	28,809	40,332	57,618	57,618	57,618	57,618	57,618
2. Expense	25,892	34,096	46,403	46,403	46,403	46,340	46,276
3. Gross income	2,917	6,236	11,215	11,215	11,215	11,278	11,342
4. Interest long - term loan	2,030	2,030	2,030	2,030	2,030	1,966	1,903
5. Tax(10.75%)	314	670	1,206	1,206	1,206	1,212	1,219
6. Net income	2,603	5,566	10,009	10,009	10,009	10,066	10,123

CHAPTER VIII. RECOMMENDATIONS

8.1. Necessity of the project

The farmers in Korea are suffering from the fall down or fluctuation in the price of existing dairy products. It is going to be opened domestic market of dairy products gradually by the WTO(world trade organization) system. Therefore, it is natural and inevitable duty for the NLCF to suggest to farmers the solutions to cope with the difficulties, as an organization of producers.

The Korea Government has been promoted the livestock cooperatives to participate in the agro processing business, as one of solutions to increase the farmers' income. Unfortunately, there is no milkprocessing plant run by NLCF not only in the project area but also in Korea. This project will provide the farmers in the Korea(project area) with the stable and remunerative price, which finally increase the farmers' income.

8.2. Recommendation

- ① It is recommended that NLCF implement the milk processing plant project in order to increase the farmers' income and to strengthen the production bases of the dairy industry, as financial analysis indicates that this project is economically feasible and viable.
- ② The milk processing plant should expand the market share of NLCF through advertisement and promotion for more processed milk consumption in the rural and urban area, emphasizing the dairy products with NLCF brand contains necessary nutrients for improving human health.
- ③ The plant should develop various dairy products in short time for its international and domestic competitiveness.
- ④ Marketing system of milk should be improved efficiently in order to reduce marketing cost for the benefit of both producer(member farmers) and consumers.
- ⑤ The Government should make more investment in improving the weak structure of the dairy industry in order to increase and stabilize the farmers' income and to supply reasonable and good quality of dairy products for consumers.

CHAPTER IX . APPENDICES

Appendix 1 Number of dairy cattle & household

(unit : Head, household)

Year	Dairy cattle	Household
1985	390,135	43,760
1990	503,947	33,277
1991	495,772	30,150
1992	508,241	27,965
1993	553,343	28,219
1994	552,139	25,667

Source:Dairy statistics, 1995, MAFF

Appendix 2 Status of Land Area in project Area

Forest Lands 4,563.1(54.9)

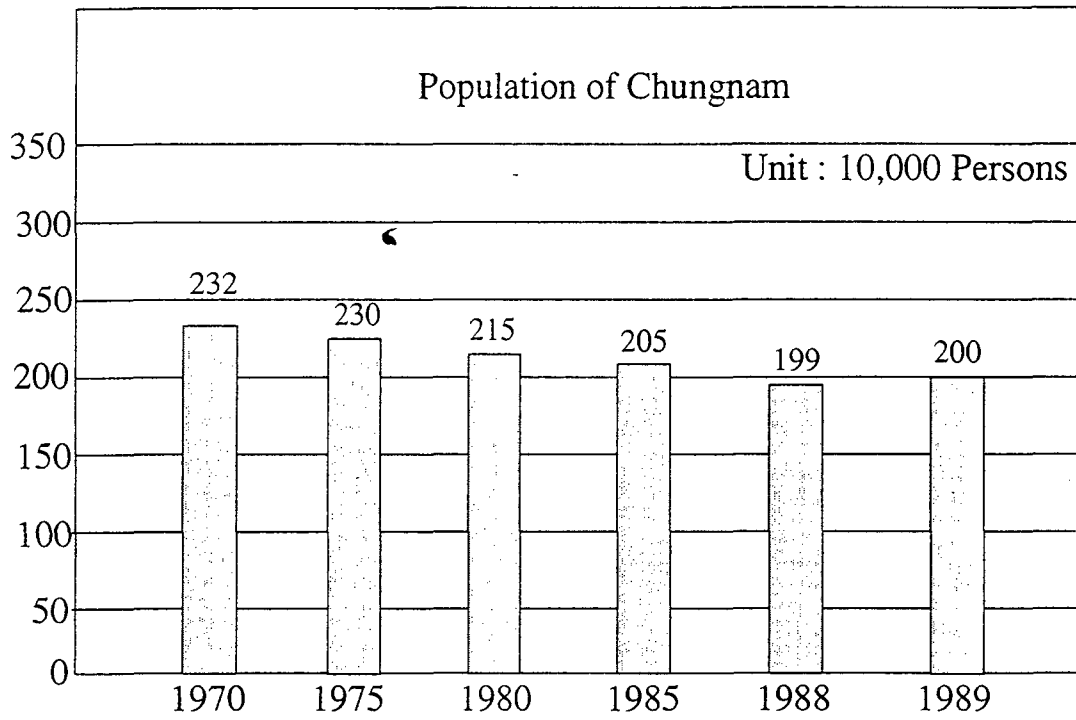
Miscellaneous 1,094.0(13.1)

Cultivated Lands 2,659.6 (32.0) (Dry Fields 906.8 (10.9) +Rice Paddies
1,752.8 (21.1)

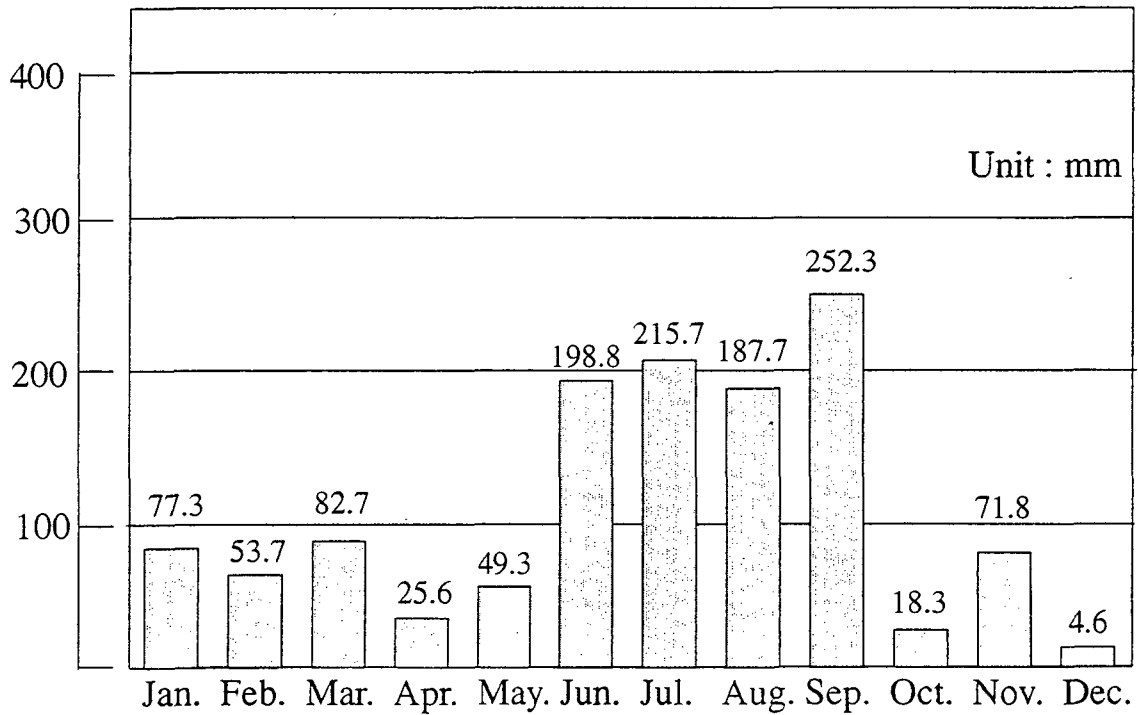
Total Area 8,316.7km² (100%)

Appendix 3. Population trend & Precipitation by month in Project Area

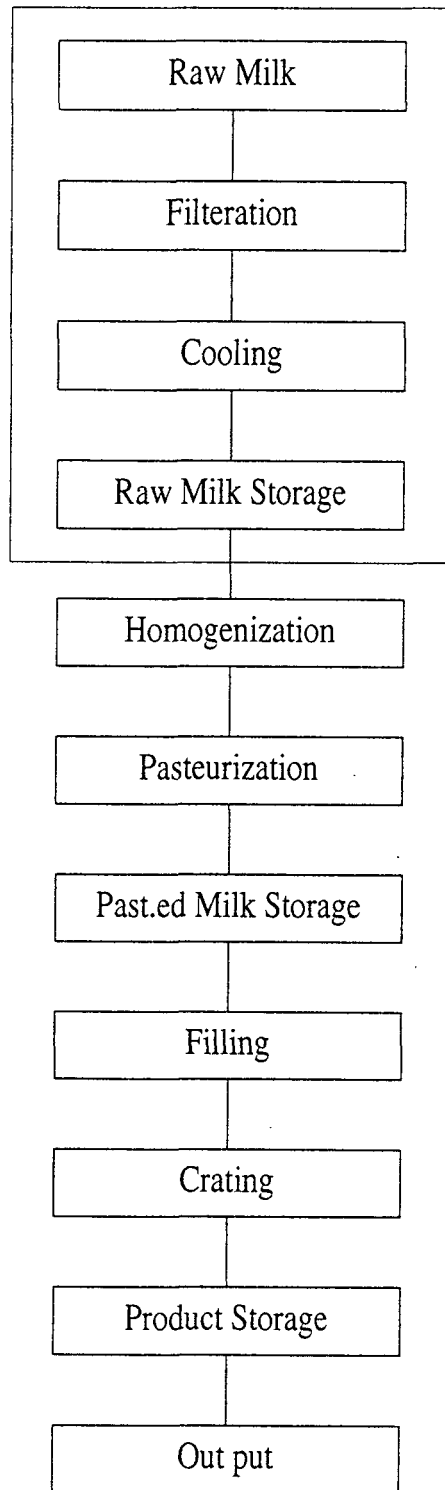
Population Trend



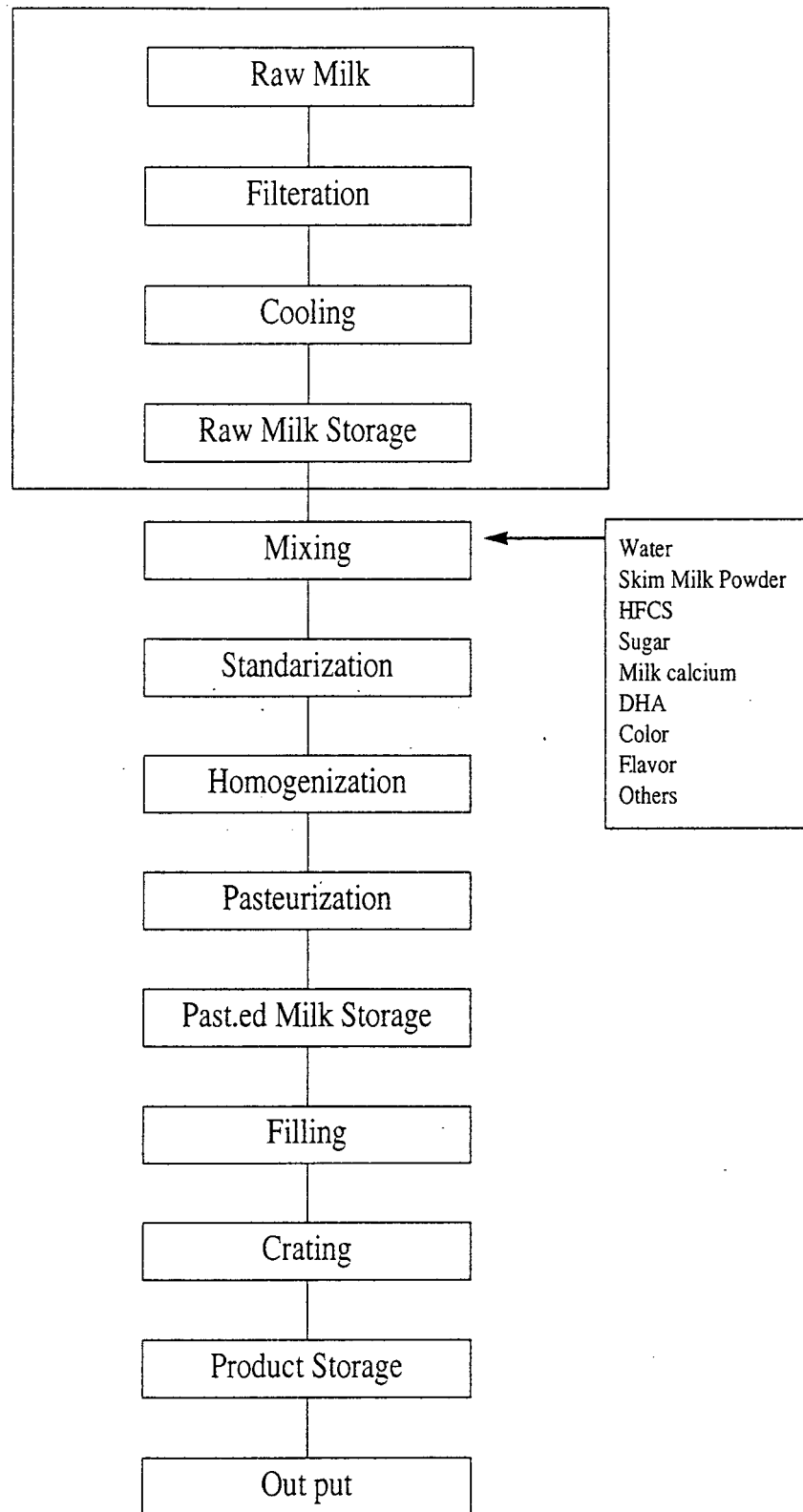
Precipitation by Month



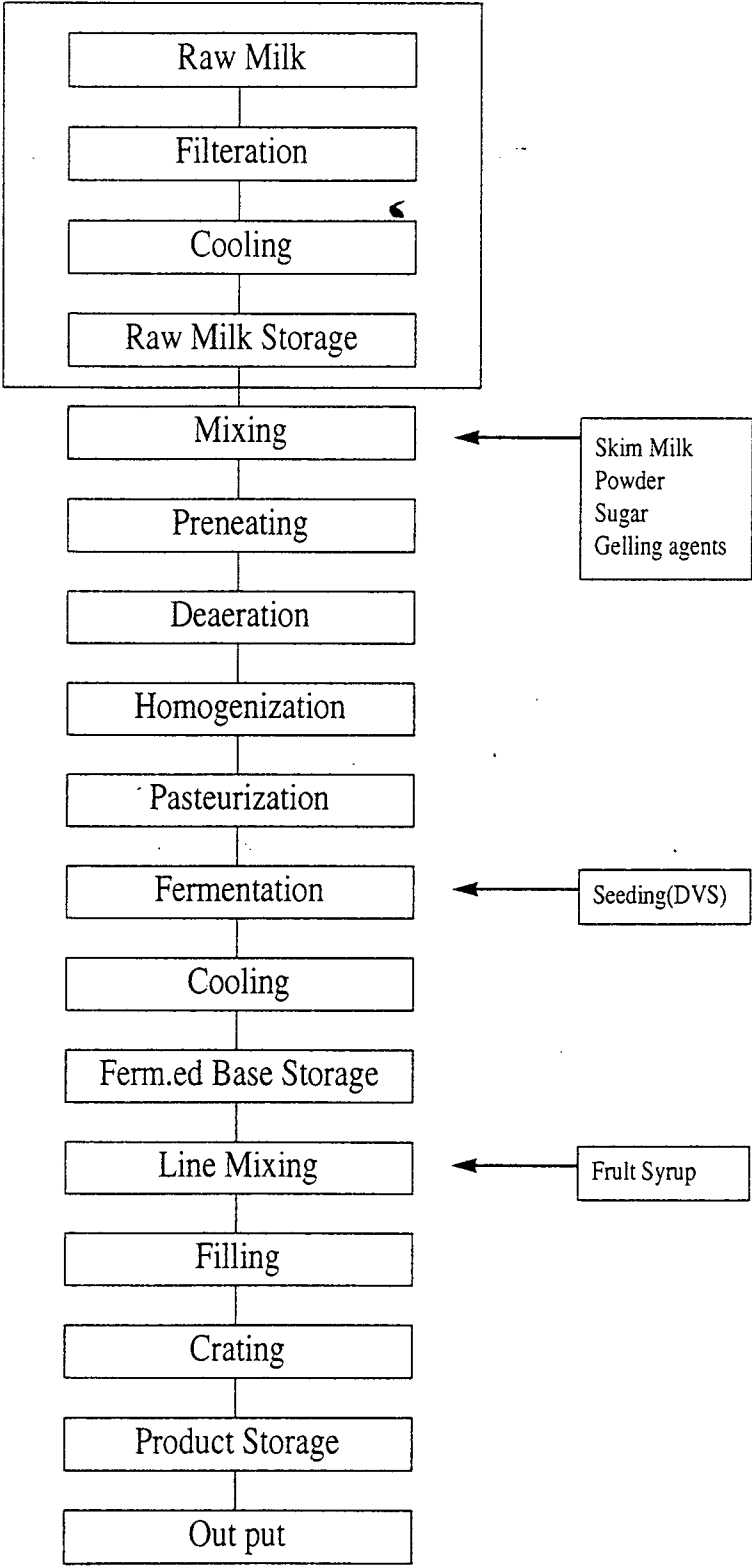
Market Milk Processing Diagram



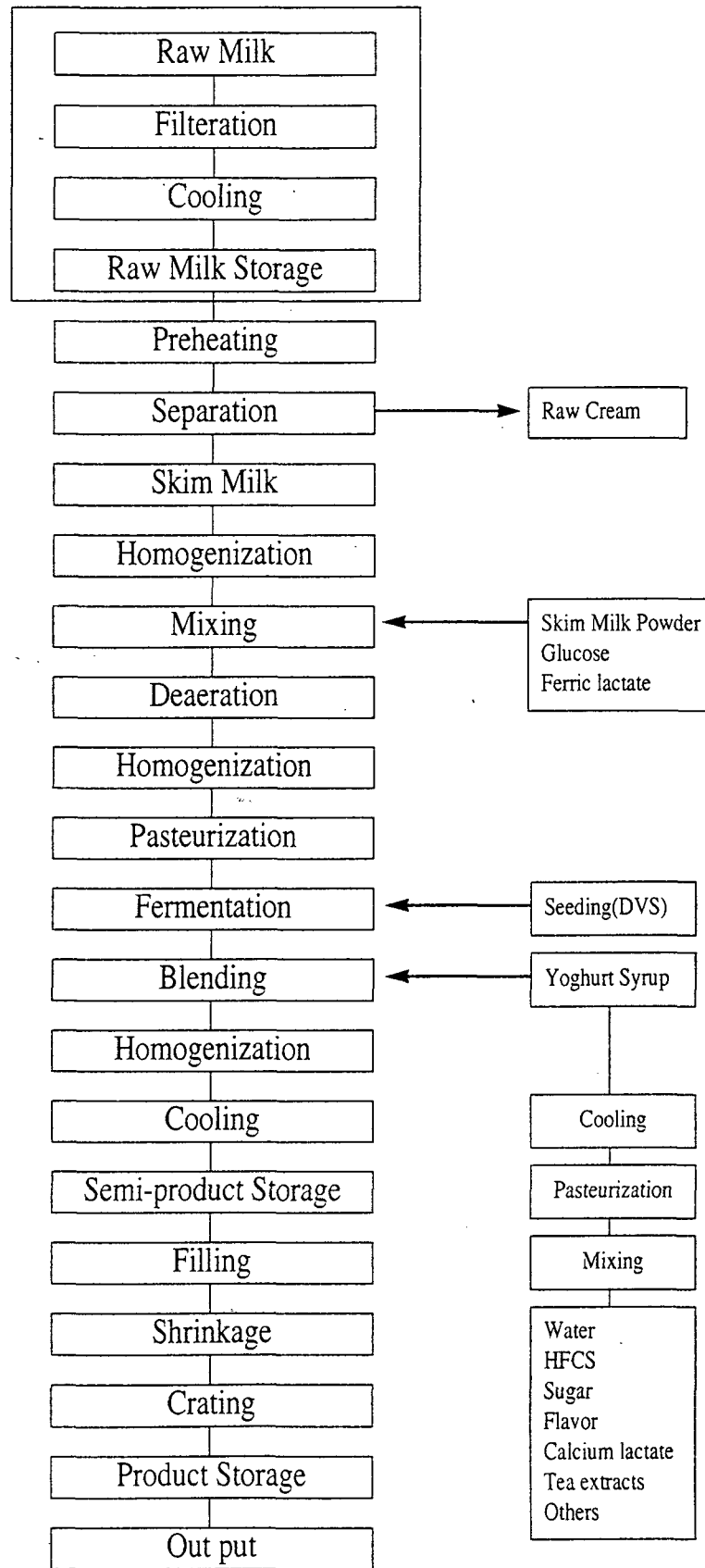
Flavoured Milk Processing Diagram



Stirred Yoghurt Processing Diagram



Liquid Yoghurt Processing Diagram



Appendix 5 Depreciation

(unit : thousand won)

Item	Investment cost	Service life	Salvage value	Annual depreciation
Land	7,000,000	-	7,000,000	-
Building	13,000,000	40	10,952,500	292,500
Machinery and plant	12,000,000	10	4,440,000	1,080,000
Equipment	700,000	10	259,000	63,000
Other assets	2,300,000	7	-	328,571
Total	35,000,000	-	22,651,500	1,764,071

Note : 1. Building, machinery and equipment of annual depreciation = investment cost * (1-10%) / life year

2. Other assets of annual depreciation = investment cost / life year

Appendix 6 Interest and repayment of long-term loan

(unit : thousand won)

Source Year	OECF (Interest)	Government (Interest)	NLCF (Interest)	Interest (Total)
1	320,000	510,000	1,200,000	2,030,000
2	320,000	510,000	1,200,000	2,030,000
3	320,000	510,000	1,200,000	2,030,000
4	320,000	510,000	1,200,000	2,030,000
5	320,000	446,250	1,200,000	1,966,250
6	320,000	382,500	1,200,000	1,902,500
7	320,000	318,750	1,200,000	1,838,750
Total	2,240,000	3,187,500	8,400,000	13,827,500

☞ Interest rate

1. NLCF : 12 % of interest rate

2. OECF : 4 % for a term of 18 years inclusive of a grace period of 7 years

3. Gov't loan : 3 % for a term of 11 years inclusive of a grace period of 4 years

Appendix 7.
Financial analysis

1. Investment cost (1,000 won)

Land	7000000
Building	13000000
Plant, machinery	12000000
Equipment	700000
Other assets	2300000
Total	35000000

2.A. Plant capacity(tons/year)

Milk processing	60000
Output	0.99
Processing loss	0.01

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
2.B. Capacity utilisation	0	0.5	0.7	1	1	1	1	1	
3. Sales prices (1,000won/ton)		970	970	970	970	970	970	970	970
4. Raw material prices (1,000won/ton)		420	420	420	420	420	420	420	420
5. Packing material (1,000won/ton of milk)		35	35	35	35	35	35	35	35
6. Labour (1,000won/year)		3000000	4200000	6000000	6000000	6000000	6000000	6000000	6000000
7. Annual depreciation (1,000won)									
									SALVAGE VALUE
Land < 0 year >	0	0	0	0	0	0	0	0	0 7000
Building < 40 years >	292500	292500	292500	292500	292500	292500	292500	292500	10950
Plant, machinery < 10 years >	1080000	1080000	1080000	1080000	1080000	1080000	1080000	1080000	4440
Equipment < 10 years >	63000	63000	63000	63000	63000	63000	63000	63000	250
Other assets < 7 years >	328571	328571	328571	328571	328571	328571	328571	328571	
Total	1764071	1764071	1764071	1764071	1764071	1764071	1764071	1764071	22650

* depreciation formula

1. building, plant and equipment : investment cost * (1-10%)/life year
2. other assets : investment cost / life year

8. Project life (year) 7

9. Working capital requirement (1,000won)

Cash and bank	500000
Receivables (months)	1
milk products	
Inventories (months)	1
milk and packing	
Payables (months)	0.5

10. Annual interest rate (%)

Long-term loans	
OECF	4
Gov't loan	3
NLCF funds	12
Total (weight average)	5.8
Cost of working capital	12

11. Amount of long-term loans

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
OECF	8000000	8000000	8000000	8000000	8000000	8000000	8000000	8000000
Gov't loan	17000000	17000000	17000000	17000000	17000000	14875000	12750000	10625000
NLCF funds	10000000	10000000	10000000	10000000	10000000	10000000	10000000	10000000
Total	35000000	35000000	35000000	35000000	35000000	32875000	30750000	28625000

Solution (1,000won)

Schedule 1 : Estimated production and revenues

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Production (tons)	0	29700	41580	59400	59400	59400	59400	59400
Sale prices (1,000won/ton)	0	970	970	970	970	970	970	970
Revenue (1,000won)	0	28809000	40332600	57618000	57618000	57618000	57618000	57618000

Schedule 2 : Estimated inputs and costs (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total variable cost	0	17071590	23876226	34083180	34083180	34083180	34083180	34083180
Raw material		12600000	17640000	25200000	25200000	25200000	25200000	25200000
Packing material		1050000	1470000	2100000	2100000	2100000	2100000	2100000
Power & fuel		1000000	1400000	2000000	2000000	2000000	2000000	2000000
Transportation		1000000	1400000	2000000	2000000	2000000	2000000	2000000
Int. on w.c 12%		421590	566226	783180	783180	783180	783180	783180
Casual labors		500000	700000	1000000	1000000	1000000	1000000	1000000
Contingency		500000	700000	1000000	1000000	1000000	1000000	1000000
Total fixed cost	0	8820071	10220071	12320071	12320071	12320071	12256321	12192571
Salaries		3000000	4200000	6000000	6000000	6000000	6000000	6000000
Insurance		140000	140000	140000	140000	140000	140000	140000
Repairs & maintenance		128000	128000	128000	128000	128000	128000	128000
Basic charge of electricity		210000	210000	210000	210000	210000	210000	210000
Telephone charge		48000	48000	48000	48000	48000	48000	48000
Advertisement		1000000	1000000	1000000	1000000	1000000	1000000	1000000
Interest on term loan		2030000	2030000	2030000	2030000	2030000	1966250	1902500
Depreciation		1764071	1764071	1764071	1764071	1764071	1764071	1764071
Contingency		500000	700000	1000000	1000000	1000000	1000000	1000000
Total cost	0	25891661	34096297	46403251	46403251	46403251	46339501	46275751

Schedule 3 : Working capital requirement (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total current assets		4038250	5453550	7576500	7576500	7576500	7576500	7576500
Cash		500000	500000	500000	500000	500000	500000	500000
Receivables		2400750	3361050	4801500	4801500	4801500	4801500	4801500
Inventories		1137500	1592500	2275000	2275000	2275000	2275000	2275000
Total current liabilities		525000	735000	1050000	1050000	1050000	1050000	1050000
Payables		525000	735000	1050000	1050000	1050000	1050000	1050000
Net working capital		3513250	4718550	6526500	6526500	6526500	6526500	6526500
Incremental working capital		3513250	1205300	1807950	0	0	0	-6526500

Schedule 4 : Income statement (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sales of revenue		28809000	40332600	57618000	57618000	57618000	57618000	57618000
Total cost of sales		25891661	34096297	46403251	46403251	46403251	46339501	46275751
Gross profit		2917339	6236303	11214749	11214749	11214749	11278499	11342249
Profit before tax		2917339	6236303	11214749	11214749	11214749	11278499	11342249
Tax (10.75%)		313614	670403	1205585	1205585	1205585	1212439	1219292
Profit after tax		2603725	5565900	10009163	10009163	10009163	10066060	10122957
Retained earnings		2603725	5565900	10009163	10009163	10009163	10066060	10122957
Accumulated earnings		2603725	8169625	18178788	28187951	38197114	48263174	58386131
Operating cash flow		6397796	9359971	13803235	13803235	13803235	13796381	13789528
Profit after tax		2603725	5565900	10009163	10009163	10009163	10066060	10122957
Add : depreciation		1764071	1764071	1764071	1764071	1764071	1764071	1764071
Add : interest long-term		2030000	2030000	2030000	2030000	2030000	1966250	1902500

Schedule 5 : Balance sheet (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Land	7000000	7000000	7000000	7000000	7000000	7000000	7000000	7000000
Building	13000000	13000000	13000000	13000000	13000000	13000000	13000000	13000000
Plant, machinery	12000000	12000000	12000000	12000000	12000000	12000000	12000000	12000000
Equipment	700000	700000	700000	700000	700000	700000	700000	700000
Other assets	2300000	2300000	2300000	2300000	2300000	2300000	2300000	2300000
Less : Accumulated depreciation	0	1764071	3528143	5292214	7056286	8820357	10584429	12348500
Net fixed assets	35000000	33235929	31471857	29707786	27943714	26179643	24415571	22651500
Cash	0	500000	500000	500000	500000	500000	500000	500000
Receivables	0	2400750	3361050	4801500	4801500	4801500	4801500	4801500
Inventories	0	1137500	1592500	2275000	2275000	2275000	2275000	2275000
Securities	0	854546	6979218	16944502	28717737	38365971	48071103	57833131
Current assets	0	4892796	2432768	24521002	36294237	45942471	55647603	65409631
Total assets	35000000	38128725	43904625	54228788	64237951	72122114	80063174	88061131
Retained earnings	0	2603725	8169625	18178788	28187951	38197114	48263174	58386131
Long-term loan	35000000	35000000	35000000	35000000	35000000	32875000	30750000	28625000
Payables	0	525000	735000	1050000	1050000	1050000	1050000	1050000
Current liabilities	0	525000	735000	1050000	1050000	1050000	1050000	1050000
Total liabilities	35000000	38128725	43904625	54228788	64237951	72122114	80063174	88061131
Balancing asset/liability								
Cash	0	854546	6979218	16944502	28717737	38365971	48071103	57833131

Schedule 6 : Financial rate of return analysis (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Investment cost	-35000000							22651500
Inc. working captial	0	-3513250	-1205300	-1807950	0	0	0	6526500
Operating cash flow	0	6397796	9359971	13803235	13803235	13803235	13796381	13789528
Net cash flow	-35000000	2884546	8154671	11995285	13803235	13803235	13796381	42967528
IRR	26.18							
NPV	25644883							

Schedule 7 : Payback period analysis (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Net cash flow	-35000000	2884546	8154671	11995285	13803235	13803235	13796381	42967528
Cumulative cash flow	-35000000	-32115454	-23960782	-11965498	1837737	15640971	29437353	72404881
Discount factor (5.8%)	1.00	0.95	0.89	0.84	0.80	0.75	0.71	0.67
Present value	-35000000	2726414	7285094	10128696	11016362	10412440	9836740	28956142
Discount cumulative cash flow	-35000000	-32273586	-24988492	-14859796	-3843434	6569006	16405746	45361888
Payback period (year)	3.87							
Discount payback period (year)	4.35							

Schedule 8 : Break-even point (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Revenue (1,000won)	0	28809000	40332600	57618000	57618000	57618000	57618000	57618000
Total variable cost	0	17071590	23876226	34083180	34083180	34083180	34083180	34083180
Contribution	0	11737410	16456374	23534820	23534820	23534820	23534820	23534820
Total fixed cost	0	8820071	10220071	12320071	12320071	12320071	12256321	12192571
B. E. P (capacity used, %)		75.14	62.10	52.35	52.35	52.35	52.08	51.81

Appendix 8.
Sensitivity analysis (5% fall in sales price)

1. Investment cost (1,000 won)

Land	7000000
Building	13000000
Plant, machinery	12000000
Equipment	700000
Other assets	2300000
Total	35000000

2.A. Plant capacity (tons/year)

Milk processing	60000
Output	0.99
Processing loss	0.01

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	SALVAGE VALUE
2.B. Capacity utilisation	0	0.5	0.7	1	1	1	1	1	1
3. Sales prices (1,000won/ton)		921.5	921.5	921.5	921.5	921.5	921.5	921.5	921.5
4. Raw material prices (1,000won/ton)		420	420	420	420	420	420	420	420
5. Packing material (1,000won/ton of milk)		35	35	35	35	35	35	35	35
6. Labour (1,000won/year)		3000000	4200000	6000000	6000000	6000000	6000000	6000000	6000000
7. Annual depreciation (1,000won)									
Land < 0 year >		0	0	0	0	0	0	0	0
Building < 40 years >		292500	292500	292500	292500	292500	292500	292500	1095000
Plant, machinery < 10 years >		1080000	1080000	1080000	1080000	1080000	1080000	1080000	4440000
Equipment < 10 years >		63000	63000	63000	63000	63000	63000	63000	252000
Other assets < 7 years >		328571	328571	328571	328571	328571	328571	328571	328571
Total		1764071	1764071	1764071	1764071	1764071	1764071	1764071	22651000

* depreciation formula

1. building, plant and equipment : investment cost * (1-10%)/life year
2. other assets : investment cost / life year

8. Project life (year) 7

9. Working capital requirement (1,000won)

Cash and bank	500000
Receivables (months)	1
milk products	
Inventories (months)	1
milk and packing	
Payables (months)	0.5

10. Annual interest rate (%)

Long-term loans	
OECF	4
Gov't loan	3
NLCF funds	12
Total (weight average)	5.8
Cost of working capital	12

11. Amount of long-term loans

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
OECF	8000000	8000000	8000000	8000000	8000000	8000000	8000000	8000000
Gov't loan	17000000	17000000	17000000	17000000	17000000	14875000	12750000	10625000
NLCF funds	10000000	10000000	10000000	10000000	10000000	10000000	10000000	10000000
Total	35000000	35000000	35000000	35000000	35000000	32875000	30750000	28625000

Solution (1,000won)

Schedule 1 : Estimated production and revenues

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Production (tons)	0	29700	41580	59400	59400	59400	59400	59400
Sale prices (1,000won/ton)	0	921.5	921.5	921.5	921.5	921.5	921.5	921.5
Revenue (1,000won)	0	27368550	38315970	54737100	54737100	54737100	54737100	54737100

Schedule 2 : Estimated inputs and costs (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total variable cost	0	17057186	23856060	34054371	34054371	34054371	34054371	34054371
Raw material		12600000	17640000	25200000	25200000	25200000	25200000	25200000
Packing material		10500000	14700000	21000000	21000000	21000000	21000000	21000000
Power & fuel		1000000	1400000	2000000	2000000	2000000	2000000	2000000
Transportation		1000000	1400000	2000000	2000000	2000000	2000000	2000000
Int. on w.c 12%		407185.5	546060	754371	754371	754371	754371	754371
Casual labors		500000	700000	1000000	1000000	1000000	1000000	1000000
Contingency		500000	700000	1000000	1000000	1000000	1000000	1000000
Total fixed cost	0	8820071	10220071	12320071	12320071	12320071	12256321	12192571
Salaries		3000000	4200000	6000000	6000000	6000000	6000000	6000000
Insurance		140000	140000	140000	140000	140000	140000	140000
Repairs & maintenance		128000	128000	128000	128000	128000	128000	128000
Basic charge of electricity		210000	210000	210000	210000	210000	210000	210000
Telephone charge		48000	48000	48000	48000	48000	48000	48000
Advertisement		1000000	1000000	1000000	1000000	1000000	1000000	1000000
Interest on term loan		2030000	2030000	2030000	2030000	2030000	1966250	1902500
Depreciation		1764071	1764071	1764071	1764071	1764071	1764071	1764071
Contingency		500000	700000	1000000	1000000	1000000	1000000	1000000
Total cost	0	25877257	34076131	46374442	46374442	46374442	46310692	46246942

Schedule 3 : Working capital requirement (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total current assets		3918212.5	5285497.5	7336425	7336425	7336425	7336425	7336425
Cash		500000	500000	500000	500000	500000	500000	500000
Receivables		2280712.5	3192997.5	4561425	4561425	4561425	4561425	4561425
Inventories		1137500	1592500	2275000	2275000	2275000	2275000	2275000
Total current liabilities		525000	735000	1050000	1050000	1050000	1050000	1050000
Payables		525000	735000	1050000	1050000	1050000	1050000	1050000
Net working capital		3393212.5	4550497.5	6286425	6286425	6286425	6286425	6286425
Incremental working capital		3393212.5	1157285	1735927.5	0	0	0	-6286425

Schedule 4 : Income statement (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sales of revenue		27368550	38315970	54737100	54737100	54737100	54737100	54737100
Total cost of sales		25877257	34076131	46374442	46374442	46374442	46310692	46246942
Gross profit		1491293	4239839	8362658	8362658	8362658	8426408	8490158
Profit before tax		1491293	4239839	8362658	8362658	8362658	8426408	8490158
Tax (10.75%)		160314	455783	898986	898986	898986	905839	912692
Profit after tax		1330979	3784056	7463672	7463672	7463672	7520569	7577466
Retained earnings		1330979	3784056	7463672	7463672	7463672	7520569	7577466
Accumulated earnings		1330979	5115035	12578707	20042379	27506051	35026620	42604085
Operating cash flow		5125050	7578128	11257743	11257743	11257743	11250890	11244037
Profit after tax		1330979	3784056	7463672	7463672	7463672	7520569	7577466
Add : depreciation		1764071	1764071	1764071	1764071	1764071	1764071	1764071
Add : interest long-term		2030000	2030000	2030000	2030000	2030000	1966250	1902500

Schedule 5 : Balance sheet (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Land	7000000	7000000	7000000	7000000	7000000	7000000	7000000	7000000
Building	13000000	13000000	13000000	13000000	13000000	13000000	13000000	13000000
Plant, machinery	12000000	12000000	12000000	12000000	12000000	12000000	12000000	12000000
Equipment	700000	700000	700000	700000	700000	700000	700000	700000
Other assets	2300000	2300000	2300000	2300000	2300000	2300000	2300000	2300000
Less : Accumulated depreciation	0	1764071	3528143	5292214	7056286	8820357	10584429	12348500
Net fixed assets	35000000	33235929	31471857	29707786	27943714	26179643	24415571	22651500
Cash	0	500000	500000	500000	500000	500000	500000	500000
Receivables	0	2280712.5	3192997.5	4561425	4561425	4561425	4561425	4561425
Inventories	0	1137500	1592500	2275000	2275000	2275000	2275000	2275000
Securities	0	-298162	4092681	11584496	20812240	27914983	35074623	42291160
Current assets	0	3620050	9378178	18920921	28148665	35251408	42411048	49627585
Total assets	35000000	36855979	40850035	48628707	56092379	61431051	66826620	72279085
Retained earnings	0	1330979	5115035	12578707	20042379	27506051	35026620	42604085
Long-term loan	35000000	35000000	35000000	35000000	35000000	32875000	30750000	28625000
Payables	0	525000	735000	1050000	1050000	1050000	1050000	1050000
Current liabilities	0	525000	735000	1050000	1050000	1050000	1050000	1050000
Total liabilities	35000000	36855979	40850035	48628707	56092379	61431051	66826620	72279085
Balancing asset/liability								
Cash	0	-298162	4092681	11584496	20812240	27914983	35074623	42291160

Schedule 6 : Financial rate of return analysis (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Investment cost	-35000000							22651500
Inc. working capital	0	-3393213	-1157285	-1735928	0	0	0	6286425
Operating cash flow	0	5125050	7578128	11257743	11257743	11257743	11250890	11244037
Net cash flow	-35000000	1731838	6420843	9521816	11257743	11257743	11250890	40181962
IRR	20.96							
NPV	15861156							

Schedule 7 : Payback period analysis (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Net cash flow	-35000000	1731838	6420843	9521816	11257743	11257743	11250890	40181962
Cumulative cash flow	-35000000	-33268162	-26847319	-17325504	-6067760	5189983	16440873	56622835
Discount factor (5.8%)	1.00	0.95	0.89	0.84	0.80	0.75	0.71	0.67
Present value	-35000000	1636898	5736153	8040124	8984805	8492255	8021819	27078928
Discount cumulative cash flow	-35000000	-33363102	-27626950	-19586825	-10602020	-2109765	5912054	32990982
Payback period (year)	4.54							
Discount payback period (year)	5.18							

Schedule 8 : Break-even point (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Revenue (1,000won)	0	27368550	38315970	54737100	54737100	54737100	54737100	54737100
Total variable cost	0	17057186	23856060	34054371	34054371	34054371	34054371	34054371
Contribution	0	10311365	14459910	20682729	20682729	20682729	20682729	20682729
Total fixed cost	0	8820071	10220071	12320071	12320071	12320071	12256321	12192571
B. E. P (capacity used, %)		85.54	70.68	59.57	59.57	59.57	59.26	58.95

Appendix 9.
Sensitivity analysis(5% rise in raw material price)

1. Investment cost (1,000 won)

Land	7000000
Building	13000000
Plant, machinery	12000000
Equipment	700000
Other assets	2300000
Total	35000000

2. A. Plant capacity(tons/year)

Milk processing	60000
Output	0.99
Processing loss	0.01

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
2. B. Capacity utilisation	0	0.5	0.7	1	1	1	1	1	
3. Sales prices (1,000won/ton)		970	970	970	970	970	970	970	
4. Raw material prices (1,000won/ton)		441	441	441	441	441	441	441	
5. Packing material (1,000won/ton of milk)		35	35	35	35	35	35	35	
6. Labour (1,000won/year)		3000000	4200000	6000000	6000000	6000000	6000000	6000000	
7. Annual depreciation (1,000won)									SALVAGE VALUE
Land < 0 year >		0	0	0	0	0	0	0	0 7000
Building < 40 years >		292500	292500	292500	292500	292500	292500	292500	10952
Plant, machinery < 10 years >		1080000	1080000	1080000	1080000	1080000	1080000	1080000	4440
Equipment < 10 years >		63000	63000	63000	63000	63000	63000	63000	259
Other assets < 7 years >		328571	328571	328571	328571	328571	328571	328571	
Total		1764071	1764071	1764071	1764071	1764071	1764071	1764071	22651

* depreciation formula

1. building, plant and equipment : investment cost * (1-10%)/life year
2. other assets : investment cost / life year

8. Project life (year) 7

9. Working capital requirement (1,000won)

Cash and bank	500000
Receivables (months)	1
milk products	
Inventories (months)	1
milk and packing	
Payables (months)	0.5

10. Annual interest rate (%)

Long-term loans	
OEFC	4
Gov't loan	3
NLFC funds	12
Total (weight average)	5.8
Cost of working capital	12

11. Amount of long-term loans

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
OEFC	8000000	8000000	8000000	8000000	8000000	8000000	8000000	8000000
Gov't loan	17000000	17000000	17000000	17000000	17000000	14875000	12750000	10625000
NLFC funds	10000000	10000000	10000000	10000000	10000000	10000000	10000000	10000000
Total	35000000	35000000	35000000	35000000	35000000	32875000	30750000	28625000

Solution (1,000won)

Schedule 1 : Estimated production and revenues

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Production (tons)	0	29700	41580	59400	59400	59400	59400	59400
Sale prices (1,000won/ton)	0	970	970	970	970	970	970	970
Revenue (1,000won)	0	28809000	40332600	57618000	57618000	57618000	57618000	57618000

Schedule 2 : Estimated inputs and costs (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total variable cost	0	17704740	24762636	35349480	35349480	35349480	35349480	35349480
Raw material		13230000	18522000	26460000	26460000	26460000	26460000	26460000
Packing material		1050000	1470000	2100000	2100000	2100000	2100000	2100000
Power & fuel		1000000	1400000	2000000	2000000	2000000	2000000	2000000
Transportation		1000000	1400000	2000000	2000000	2000000	2000000	2000000
Int. on w.c 12%		424740	570636	789480	789480	789480	789480	789480
Casual labors		500000	700000	1000000	1000000	1000000	1000000	1000000
Contingency		500000	700000	1000000	1000000	1000000	1000000	1000000
Total fixed cost	0	8820071	10220071	12320071	12320071	12320071	12256321	12192571
Salaries		3000000	4200000	6000000	6000000	6000000	6000000	6000000
Insurance		140000	140000	140000	140000	140000	140000	140000
Repairs & maintenance		128000	128000	128000	128000	128000	128000	128000
Basic charge of electricity		210000	210000	210000	210000	210000	210000	210000
Telephone charge		48000	48000	48000	48000	48000	48000	48000
Advertisement		1000000	1000000	1000000	1000000	1000000	1000000	1000000
Interest on term loan		2030000	2030000	2030000	2030000	2030000	1966250	1902500
Depreciation		1764071	1764071	1764071	1764071	1764071	1764071	1764071
Contingency		500000	700000	1000000	1000000	1000000	1000000	1000000
Total cost	0	26524811	34982707	47669551	47669551	47669551	47605801	47542051

Schedule 3 : Working capital requirement (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total current assets		4090750	5527050	7681500	7681500	7681500	7681500	7681500
Cash		500000	500000	500000	500000	500000	500000	500000
Receivables		2400750	3361050	4801500	4801500	4801500	4801500	4801500
Inventories		1190000	1666000	2380000	2380000	2380000	2380000	2380000
Total current liabilities		551250	771750	1102500	1102500	1102500	1102500	1102500
Payables		551250	771750	1102500	1102500	1102500	1102500	1102500
Net working capital		3539500	4755300	6579000	6579000	6579000	6579000	6579000
Incremental working capital		3539500	1215800	1823700	0	0	0	-6579000

Schedule 4 : Income statement (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sales of revenue		28809000	40332600	57618000	57618000	57618000	57618000	57618000
Total cost of sales		26524811	34982707	47669551	47669551	47669551	47605801	47542051
Gross profit		2284189	5349893	9948449	9948449	9948449	10012199	10075949
Profit before tax		2284189	5349893	9948449	9948449	9948449	10012199	10075949
Tax (10.75%)		245550	575113	1069458	1069458	1069458	1076311	1083164
Profit after tax		2038638	4774779	8878990	8878990	8878990	8935887	8992784
Retained earnings		2038638	4774779	8878990	8878990	8878990	8935887	8992784
Accumulated earnings		2038638	6813417	15692408	24571398	33450388	42386276	51379060
Operating cash flow		5832710	8568851	12673062	12673062	12673062	12666209	12659356
Profit after tax		2038638	4774779	8878990	8878990	8878990	8935887	8992784
Add : depreciation		1764071	1764071	1764071	1764071	1764071	1764071	1764071
Add : interest long-term		2030000	2030000	2030000	2030000	2030000	1966250	1902500

Schedule 5 : Balance sheet (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Land	7000000	7000000	7000000	7000000	7000000	7000000	7000000	7000000
Building	13000000	13000000	13000000	13000000	13000000	13000000	13000000	13000000
Plant, machinery	12000000	12000000	12000000	12000000	12000000	12000000	12000000	12000000
Equipment	700000	700000	700000	700000	700000	700000	700000	700000
Other assets	2300000	2300000	2300000	2300000	2300000	2300000	2300000	2300000
Less : Accumulated depreciation	0	1764071	3528143	5292214	7056286	8820357	10584429	12348500
Net fixed assets	35000000	33235929	31471857	29707786	27943714	26179643	24415571	22651500
Cash	0	500000	500000	500000	500000	500000	500000	500000
Receivables	0	2400750	3361050	4801500	4801500	4801500	4801500	4801500
Inventories	0	1190000	1666000	2380000	2380000	2380000	2380000	2380000
Securities	0	263210	5586260	14405622	25048684	33566746	42141704	50773560
Current assets	0	4353960	11113310	22087122	32730184	41248246	49823204	58455060
Total assets	35000000	37589888	42585167	51794908	60673898	67427888	74238776	81106560
Retained earnings	0	2038638	6813417	15692408	24571398	33450388	42386276	51379060
Long-term loan	35000000	35000000	35000000	35000000	35000000	32875000	30750000	28625000
Payables	0	551250	771750	1102500	1102500	1102500	1102500	1102500
Current liabilities	0	551250	771750	1102500	1102500	1102500	1102500	1102500
Total liabilities	35000000	37589888	42585167	51794908	60673898	67427888	74238776	81106560
Balancing asset/liability								
Cash	0	263210	5586260	14405622	25048684	33566746	42141704	50773560

Schedule 6 : Financial rate of return analysis (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Investment cost	-35000000							22651500
Inc. working capital	0	-3539500	-1215800	-1823700	0	0	0	6579000
Operating cash flow	0	5832710	8568851	12673062	12673062	12673062	12666209	12659356
Net cash flow	-35000000	2293210	7353051	10849362	12673062	12673062	12666209	41889856
IRR	23.83							
NPV	21242611							

Schedule 7 : Payback period analysis (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Net cash flow	-35000000	2293210	7353051	10849362	12673062	12673062	12666209	41889856
Cumulative cash flow	-35000000	-32706790	-25353740	-14504378	-1831316	10841746	23507954	65397810
Discount factor (5.8%)	1.00	0.95	0.89	0.84	0.80	0.75	0.71	0.67
Present value	-35000000	2167495	6568954	9161091	10114371	9559897	9030933	28229890
Discount cumulative cash flow	-35000000	-32832505	-26263551	-17102460	-6988089	2571808	11602741	39832631
Payback period (year)	4.14							
Discount payback period (year)	4.69							

Schedule 8 : Break-even point (1,000won)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Revenue (1,000won)	0	28809000	40332600	57618000	57618000	57618000	57618000	57618000
Total variable cost	0	17704740	24762636	35349480	35349480	35349480	35349480	35349480
Contribution	0	11104260	15569964	22268520	22268520	22268520	22268520	22268520
Total fixed cost	0	8820071	10220071	12320071	12320071	12320071	12256321	12192571
B. E. P (capacity used, %)		79.43	65.64	55.33	55.33	55.33	55.04	54.75

**TENTH ICA/JAPAN TRAINING COURSE FOR
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INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : **ESTABLISHMENT OF
RUBBER NURSERY**

Country : **M A S I**

Project Prepared by : **NEE MOED NABIL
NEE MANSOR**

**Funded by the Government of Japan
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and
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in India, Malaysia and Japan**



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ACRONYMS

- RISDA** - Rubber Industry Smallholders Development Authority.
- RRIM** - Rubber Research Institute of Malaysia.
- RSSB** - RISDA Skim Sembilan Belas Lima Puluh Enam Sdn. Bhd.
(RISDA Scheme Nineteen Fifty Six Private Limited)
- PB** - Prang Besar Estate (Clone)
- GT** - Gondang Tapen (Indonesia)

CHAPTER 1 : SUMMARY

1. The proposed project is to establish a Rubber Nursery for the production of quality rubber seedlings or planting materials at Kg. Tok Dor, Besut, Terengganu.
2. The project will be undertaken by Besut District Rubber Smallholders Cooperative as an addition to the existing activities.
3. The main objective of this project is to supply healthy and vigorous rubber seedlings to the smallholders at the appropriate time.
4. The estimated ^{working capital} cost for establishing a nursery is RM108,792. The sum of RM21,758 will be ^{contribution} from ^{Cooperative} and the balance of RM87,034 will be financed by the Cooperative Department with the interest rate of 6%.
The loan will be repaid within 5 years.
5. The project viability is proven with details of financial analysis as

follows : NPV = RM 339,692
 BCR = 10.40

CHAPTER 2 : INTRODUCTION

2.1.1 Natural Rubber is one of the main crop produced by Malaysia. Currently, Malaysia is the third world production of Natural Rubber. It produced one million metric tonne. The smallholders sector played dominant position in the production of rubber. Most of the rubber estates have been converted into industrial areas.

2.1.2 RISDA a quasi-government agency responsible for the replanting of rubber smallholders land is given the task to undertake Replanting Programme of 100,000 hectares under the Seventh Malaysian Plan (1996 -2000). The government has allocated RM 190 million for the Replanting Programme.

2.1.3 RSSB (RISDA Scheme Nineteen Fifty Six Sdn. Bhd), a RISDA subsidiary is responsible for producing planting materials or rubber seedlings throughout the country. Currently, there are 3 RSSB's Central Nurseries which are located at :-

- (i) Changkat Sulaiman - for West Coast States i.e. Perak, Kedah, Penang and Perlis.
- (ii) Sekijang - for Southern States i.e. Selangor, Malacca, Negeri Sembilan and Johor.
- (iii) Kg. Awah - for East Coast States i.e. Pahang, Terengganu and Kelantan.

2.1.4 RSSB which has to produce 8 million of rubber seedlings per year will be unable to fulfill the quota given by RISDA. Thus the Rubber Smallholders Cooperatives are given the opportunities to participate in the preparation of the rubber seedlings.

2.2 Area of Project

2.2.1 Under the Seventh Malaysian Plan, the State of Terengganu is given an allocation of 2,200 hectares per year for Replanting Programme. The State RISDA Director will proportionate the allocation to the districts according to rubber areas due for replanting.

2.2.2 There are 7 districts in the State of Terengganu, namely;

- (i) Besut
- (ii) Setiu
- (iii) Marang
- (iv) Kuala Terengganu
- (v) Hulu Terengganu
- (vi) Dungun
- (vii) Kemaman

2.2.3 Presently there are 2 districts which are densely populated rubber areas, and normally they are given more areas for replanting. The distribution of the Replanting Programme according to the districts are as follows.

TABLE 1

Districts	Hectares
Besut	350
Setiu	500
Marang/Kuala Terengganu	370
Hulu Terengganu	550
Kemaman	200
Dungun	230
Total	2,200

Source : RISDA Terengganu

2.3 Existing Supply of Planting Materials

2.3.1 For the State of Terengganu, the planting materials are supplied by 2 RSSB's Nursery; namely:

- (i) RSSB's Central Nursery in Kg. Awah.
- (ii) RSSB's Sub. Nursery in Bt. 17, Marang.

2.3.2 RISDA's transportations are being used to transport the planting materials to the individual smallholders. Normally, it takes 2 days for the planting materials to reach the smallholders.

2.4 Problems faced by Smallholders

- (i) Supply of the planting materials are not at the appropriate time.
- (ii) Delay in supplying of planting materials due to the demand by other districts and states.
- (iii) By the time the planting materials reach the smallholders, 30 - 40% will deteriorated due to the transplanting shock or dieback.

2.5 Needs and Justification for the Project

- (i) The need to supply quality planting materials to the smallholders at the appropriate time. The planting season in East Coast is from October to January and from March to May.
- (ii) To encourage the cooperative to venture into business which is more challenging.
- (iii) To create employment to the smallholders in rubber nursery.
- (iv) To create awareness to the cooperative members so as to have the feeling of self-belonging to the cooperative.

CHAPTER 3 : PROJECT

3.1 The proposed project is to establish Rubber Nursery at Kg. Tok Dor, Besut, Terengganu. The 13 acres or 5.2608 hectares of land is capable in producing 403,000 rubber seedlings. The labour will be drawn from the smallholders within the area. One acre of land can accommodate 31,000 rubber seedlings.

3.2 Objectives

- (i) To produce quality planting materials as required by RISDA.
- (ii) To ensure quality planting materials are supplied to the smallholders at the appropriate time.
- (iii) To enable the cooperative to participate in the Government's Privatisation Programme.
- (iv) To promote better linkage between the cooperative and smallholder in providing services.

3.3 Area of Operation

3.3.1 The establishments of the Rubber Nursery is to fulfill the requirement of the smallholders in the district Besut and Setiu. For both districts, the total replanting areas will be 850 hectares per year.

3.4 Nursery Location

3.4.1 Kg. Tok Dor has been proposed as the site for nursery due to the following criteria:-

- (i) It is flat land, available of water supply and favourable soil condition.**
- (ii) It is situated near the main road to facilitate the transportation of planting materials to the smallholders.**
- (iii) It is beyond the reach of flood during the rainy seasons.**
- (iv) It is a border between the districts of Besut and Setiu.**
- (v) The land belongs to the Cooperative.**

CHAPTER 4 : DETAILS OF OPERATION

4.1 Implementation and Extension

4.1.1 The project will be implemented by the Besut District Rubber Smallholders Cooperative. RISDA will provide backward linkages such as budwood, technical know-how and close supervision to ensure the cooperative will produce only recommended or approved clone. Thus these will ensure smallholders to tap rubber tree within 4 1/2 years. The profile of recommended clone is shown in table 2.

4.2.1 The cooperative will buy the rubber seeds from individual smallholders, private estate and from RISDA Group Replanting Schemes. The recommended clones for the stocks are the RRIM 623, PB 5/51, GT 1, PB 235, RRIM 605 and RRIM 712.

4.2.2 For the budwoods, the cooperative has to procure from RISDA's Central Nursery so as to ensure the recommended clones are used for budding. The recommended clones are the timber latex clones such as PB 235, PB 260, PB 350, PB 355, RRIM 936, RRIM 937, RRIM 938.

TABLE 2**RECOMMENDED CLONES**

Type of Clones	YIELD ACCORDING TO YEAR (kg / hec / yr)										Average Yield	Timber Ton / Hec	Girth Increment cm / Yr
	1	2	3	4	5	6	7	8	9	10			
RRIM 937	1890	2630	3830	2610	2330	3140	2350	2410	1980	1660	2483	135	10.2
RRIM 938	1350	2220	2310	2310	1910	3640	1920	1930	2360	1660	2292	170	10.6
RRIM 936	1280	1800	2700	2670	2080	2690	2060	2220	2350	2150	2168	131	10.0
PB 350	1192	2270	2374	3385	2755	3083	3578				2662	206	11.5
PB 235	1370	1870	2300	2300	2000	2060	3230	2530	2560	2530	2273	165	10.2
PB 260	1180	1820	2220	2220	1960	2370	2760	2530	2390	2230	2168	191	10.6
PB 355	652	871	1485	1823	2108	2136	1792	2506	2657	2800	1884	482	11.0
PB 359	828	1358	1517	2130	2629	2948	2800	2584	2629	3029	2245	254	10.0

4.3 Technical Aspects

4.3.1 The cooperative must be cautious ^{in selecting the budders} and intensive care should be taken during the budding so as to ^{ensure} more than 80% success. Planning and procurement of seeds should be done properly for the production of healthy and vigorous planting material.

4.4 Marketing

4.4.1 Under RISDA's Act 85 and Regulation of Replanting Schemes and Nineteen Fifty Six Schemes, all smallholders involved in replanting or new planting programmes must procure all their planting materials either from RSSB Central Nurseries or any bodies or Cooperatives that are being ~~appointed~~ by RISDA.

4.4.2 RISDA at any time can terminate the cooperatives from producing planting materials if they are found violating any technical specification procedures.

4.4.3 RISDA will fix the price of the planting materials so as to avoid any malpractices by the Cooperatives. The cost of planting materials is uniform throughout the country, irrespective whether the land under replanting is far or within the nursery locations.

CHAPTER 5 : ORGANISATION AND MANAGEMENT

5.1 The overall management policies will be regulated by the Board of Directors, RISDA District Officer and RISDA's Technical Committee from Head Quarters will act as Advisory to this project. The Technical Committee will promptly visit the project so as to provide technical advice and to ensure the cooperative and comply to technical specification in producing vigorous^{and} quality planting materials.

5.2 Nursery techniques and other related aspects will be undertaken by RISDA. The training of supervisions and workers will be done by cooperatives in collaboration with RSSB's Central Nursery.

5.3 Management and Organisational Structure. The structure for the management of the nursery is presented in Appendix 1.

5.3.1 Manager

Besides his current responsibilities, nursery activities is part and parcel of his duty to ensure smooth progress in implementation of the nursery. Thus, this will not involve any additional expenditure of the project. The manager will be assisted by:

5.3.2 Executive (i)

He is fully hold responsible and answerable day .to day running of the nursery. Besides his duty in procurement of seed and other related materials, he should keep proper records of the nursery activities.

5.3.3 Supervisor (ii)

The supervisor will be responsible for the smooth running of the daily operation of the nursery. He is also responsible for planning, budding and culling so as to produce quality planting materials.

5.3.4 General Labour (iii)

Distribution of job is given according to the necesisty of the job. The skilled worker will only involvedin buddingand fertilizer applications the unskilled worker involved in filling of soil to polybag, arranging and maintenance of polybag. All the workers are on contract basis.

5.3.5 Finance and Accounts

The Finance and accounts will be managed by the Account Division of the cooperative. This would involving additional work for the cooperative which could be worked after by the existing staff.

6.1 It is prepared to study the financial viability of the project. Various measures of the investment worth are being used to justify the project viability.

6.2 Capital Cost

6.2.1 The details of Capital Cost of the project is shown on Table 3, while the working capital is shown in ⁱⁿ Table 4. Sources of fund as in Table 7 for this project will be funded from Cooperative Department and contribution from the cooperative itself.

6.2.2 The term loan for the working capital would come from the Cooperative Department at the interest rate of 6%. Since the Cooperative Department would provide maximum 80% of the loan, thus the cooperative would use this opportunity in securing the loan. The loan repayment will be paid in 5 equal instalments as in shown in Table 8.

6.3

6.3.1 RSSB is providing advance or progress payment to the cooperative base on the job done.

The cooperative will get advance payment from RSSB when 80% of the seedlings have been budded. Each payment is 35 cents per polybag.

6.4 Recurring Cost

6.4.1 Table 4 and 5 provide both recurring costs for ^{Variable} and ~~fixed~~ ^{Fixed} costs over the entire project life.

6.4.2 Table 9 shows the estimation cost for the establishments of the project.

6.5 Measures of Investment Worth

6.5.1 Table 10 provides the summary cash-flows for entire project while the yearly cash-flows is shown in appendix 4, 5, 6, 7 and 8.

6.5.2 Table provides the investments analysis on profit before depreciation and interest on term loan. It is estimated that :-

$$\text{NPV} = \text{RM } 3,39,692$$

$$\text{BCR} = 0.40 (\text{Table })$$

$$\text{BEQ} = 112,884 \text{ polybag (Table })$$

6.6 Sensitivity Analysis

Assuming that 75% of the seedlings have been budded success fully, thus the investment worth would be:-

$$\text{NPVi} = 10\% = 63,861$$

$$\text{BCR} = 0.94$$

TABLE : 3

Capital Cost of the Project

1.	CAPITAL COST. Site Preparation		
	a) Clearing & levelling (13 acres - 5.2608 hec @ RM 500/acre	6500	
	b) Fencing 130 x 60	7800	14300
2.	Store 16' x 9' @ RM 70 (144 x 70)		10080
3.	Equipments		
	a) Water pump (Diesel (1.5hp)	2000	
	b) Sprinkler	5000	
	c) Ponds 10' x 20'	1500	8500
			<u>32880</u>
4.	Contingency 10% TABLE 4: WORKING CAPITAL TOTAL		<u>3288</u>
	a) Rubber seeds		<u>Rm 36168</u>
	748,000 @ 0.005 cent	3740	
	b) Soil		
	208 lorries @ RM 40	8320	
	c) Polybag		
	374,000 @ 0.063 cent	23562	
	d) Fertilizer - Nurseryace		
	374,000 @ 0.07cent	26180	
	e) Budsticks		
	400,000 @ 0.05	20000	
	f) Salaries (12 months)		
	RM 1200 x 12	14400	
	g) Watering		
	RM 225 x 12	2700	98902
	h) Contingency 10%		9890
	Total Cost:	Rm	108792

TABLE : 7

SOURCES OF FUNDS FOR WORKING CAPITAL

ITEM		RM
a)	Cooperative Contribution	21758
b)	Loan form cooperative Department @ 6%	87034

Notes:

Loan taken from Cooperative Department will be paid in 5 instalments.

TABLE : 8

Repayment Schedule for WORKING CAPITAL Loan

Year	Loan (RM)	Repayment (RM)
1	87034	17406
2		17406
3		17406
4		17406
5		17410

TABLE 15

Recurring Cost

ITEM	YEARS				
	1	2	3	4	5
A. Fixed cost					
a) Salary	14400	15120	15876	16670	17503
b) General Administrative	3600	3600	3600	3600	3600
c) Depreciation					
i) Equipment (20%)	1700	1360	1088	870	696
ii) Store (10%)	1008	907	817	735	661
d) Contingency	900	936	974	1013	1055
Total	21608	21923	22355	22888	23515

TABLE 16**Recurring Costs****B. Production Cost (per polybag)**

a) Materials	Cents
1. Soil	2.2
2. Rubber seeds	0.5
3. Polybag	6.3
4. Budsticks	5.0
5. Fertilizer Nurseryace	7.0
6. Polythene tape	0.3
7. Fungicide/Foliage	1.5
8. Weedsicide	1.5
	24.3
b) Labour	
1. Filling & Arranging Polibag	5.0
2. Planting & Applying Fertilizer	3.0
3. Replanting seedling	3.0
4. Culling	3.0
5. Budding	12.0
6. Cutback	3.0
7. Watering	0.06
8. Pest & Disease Control	1.5
9. Weed control	1.5
10. Pruning	3.0
11. Miscellaneous	4.0
12. Nursery loss 15 %	4.6
	43.66
Total cost per polybag	67.96

TABLE 18

Recurring Costs

Year	Annual Production	Variable Cost/Polybag cents	Total Variable Cost (RM)
1	340,000	67.96	231,064
2	357,000	67.96	242,617
3	374,000	67.96	254,170
4	391,000	67.96	265,724
5	391,000	67.96	205,724

TABLE 19

Establishment cost of the Project

ITEM	Monthly Amount (RM)	Annual Amount (RM)
1. Personnel Executive Supervisor	700 500	8400 6000
2. General Administrative included: Telephone Travelling Allowances Stationary	 300	 3600
3. Contingency 5%		900
Total:		18900

Note:

Emolument the personnel will be increased by 5% annually

TABLE 10

SUMMARY OF CASH FLOW

A. Income	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Sales	340,000	357,000	374,000	391,000	391,000
B. CAPITAL Cost					
1. Site Preparation	14,300				
2. Sprinkler	8,500				
3. Stone	10,820				
3. Soil Variable Cost	8,228	8,640	9,051	9,462	9,462
4. Rubber seeds	3,740	3,927	4,114	4,301	4,301
5. Polybag	23,562	24,740	25,918	27,096	27,096
6. Fertilizer	26,180	27,498	28,798	30,107	30,107
7. Filling & Arranging Polybag	18,700	19,635	20,570	21,505	21,505
8. Planting & Apply Fertilizer	11,220	11,781	12,342	12,903	12,903
9. Replanting Seedlings	4,488	4,712	4,937	5,161	5,161
10. Culling	12,000	12,600	13,200	13,800	13,800
11. Budsticks	20,000	21,000	22,000	23,000	23,000
12. Polythene Tape	1,200	1,260	1,320	1,380	1,380
13. Budding	40,000	42,840	44,880	46,920	46,920
14. Cutback	10,200	10,710	11,220	11,730	11,730
15. Watering	2,025	2,124	2,223	2,332	2,332
16. Weed Control	11,220	11,781	12,342	12,903	12,903
17. Pest & Disease Control	11,220	11,781	12,342	12,903	12,903
18. Pruning	11,220	11,781	12,342	12,903	12,903
20. Miscellaneous	13,600	14,280	14,960	15,640	15,640
TOTAL	229603	241081	252559	264036	264036

TABLE 11

COMPUTATION OF MEASURE OF INVESTMENT WORTH

Years	Sale / (RM)	TFC (RM)	TVC (RM)	Profit (RM)	Depreciation (RM)		Profit Before Depreciation & Interest on Term Loan (RM)
1.	340,000	21608	229603	88789	2,708		91497
2.	357,000	21923	241081	93996	2,267		96263
3.	374,000	22355	252559	99086	1,905		100991
4.	391,000	22888	264036	104076	1605		105681
5.	391,000	23515	264036	103449	1,357		104806

TABLE 12

**COMPUTATION OF NET PRESENT VALUE (NPV)
AND BENEFIT COST RATIO (BCR)**

YEAR	PROFIT	DISCOUNT FACTOR i = 10%	PRESENT VALUE i = 10%
1	91497	0.9091	83180
2	96263	0.8264	79552
3	100991	0.7513	75874
4	105681	0.6830	72180
5	104806	0.6209	65074
Total			375860

Note:

Profit before depreciation and Interest on term loan

Calculation:

$$\begin{aligned} \text{(i) NPV} &= \text{PV - Capital cost} \\ &= 375860 - 36168 \\ &= 339692 \end{aligned}$$

$$\begin{aligned} \text{(ii) BCR} &= \frac{\text{PV}}{\text{capital cost}} \\ &= \frac{375860}{36168} \\ &= 10.40 \end{aligned}$$

TABLE : 13

CALCULATION OF INTERNAL RATE OF RETURN (IRR)

YEAR	PROFIT	DFi=30%	PVi=30%	DFi=40%	PVi=40%
1	90036	0.7692	69256	0.7143	64313
2	94763	0.5917	56071	0.5102	48348
3	99454	0.4552	45271	0.3644	36241
4	104108	0.3501	36448	0.2603	27099
5	103280	0.2693	27813	0.18593	19203
Total		234859			195204

Calculation:

NPV 30% = 234859 - 144960
= 89899

NPV 40% = 195204 - 144960
= 50244

IRR = $\frac{40 - 30 \times 50244}{89899 + 50244}$
= 502440

140143

= 3.59

∴ IRR = 40 - 3.59

= 36.41 %

TABLE 14

Calculation of Break Even Quantity

1. Salvage value (Assume at the end of Project Life)

Item	RM
a) Site preparation	14300
b) Equipment 20%	1700
c) Store 10%	1008
d) Margin of working capital (98902 + 9890)	108792
Total	125800

$$BEQ = \frac{TFC}{P-AVC}$$

Where TFC = TFC Capital cost + TFC Yearly

$$PV = 125,800 \times DF \text{ for 5 years and i assume } 10\%$$

$$= 125800 \times 0.6209$$

$$= 78109$$

$$\text{Capital cost} = 14496 - 78109$$

$$= 66851 \text{ (for 5 years)}$$

Annualised cost (i = 10%, T = 5 years)

$$= 66851 \times \text{capital recovery cost}$$

$$= 66851 \times 0.621$$

$$= 41514$$

$$\therefore BEQ = \frac{TFC}{P-AVC}$$

$$= \frac{41514 + 28568}{1 - 0.6796}$$

$$= \frac{70082}{0.3204}$$

BEQ = 218733 polybags

$$BEQ = \frac{\text{CAPITAL COST}}{SP - VC}$$

$$= \frac{36168}{1 - 0.6796}$$

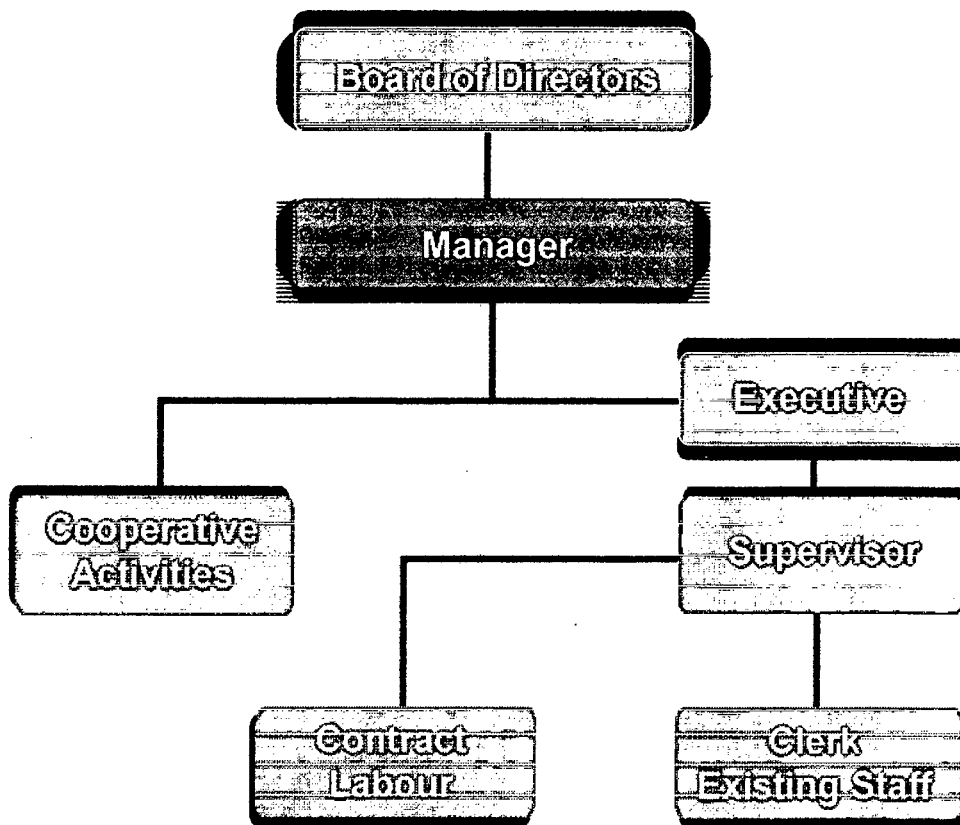
$$= \frac{36168}{0.3204}$$

BEQ = 112884 POLYBAGS.

- 7.1 The implementation of the project is in line with the Government Privatisation Policy.
- 7.2 The financial analysis of the project has shown that the proposed project is viable.
- 7.3 The cooperative will be able to provide better services to the smallholders by supplying vigorous and healthy planting materials at the appropriate time.
- 7.4 The cooperative will not face any marketing problems as the demand for rubberwood is increasing and thus this will encourage more smallholders to replace old rubber trees.

APPENDIX 1

Management and Organisational Structure



APPENDIX 2

JOB SCHEDULE FOR RUBBER NURSERY

BIL.	ITEM	MONTHS
1.	Filling and arranging polibag	January
2.	Planting and applying fertilizer	February - April
3.	Budding	Jun - July
4.	Cutback	September/October
5.	Young budding ready to be supplied	October to December

APPENDIX 3

Young Budding / Fertilizer Experiment

Treatment	slurry	Nurseryace	
		1pellet	2 pellet
1. Buddability (%)	84.5	92.5	83.0
2. Budding Success (%)	94.60	91.00	87.70
3. Die. back (%)	15.50	6.60	19.60
4. Recovery 2 whorl (%)	83.80	90.90	79.10
5. Height (cm) 2 whorl	28.7	28.7	26.4

YEAR 1
CASH FLOW

APPENDIX 4

	MONTHS												TOTAL					
	1	2	3	4	5	6	7	8	9	10	11	12						
A Income																		340000
Sales @ RM 1.00	340000																	340000
B Production Cost																		14300
1 Site Preparation	14300																	14300
2 Sprinkler	8500																	8500
3 Soil	4114	4114																8228
4 Rubber seeds			1870	1870														3740
5 Polybag	11781	11781																23562
6 Fertilizer			13090	13090														26180
7 Filling & Arranging Polybag		9350	9350															18700
8 Planting & Apply Fertilizer			5610	5610	4488													11220
9 Replanting seedlings																		4488
10 Culling						6000	6000											12000
11 Budsticks						10000	10000											20000
12 Polythene tape						600	600											1200
13 Budding										20400								40800
14 Cutback										5100								10200
15 Watering			225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	2025
16 Weed Control					5610								5610					11220
17 Pest & Disease Control				3740		3740							3740					11220
18 Pruning																		11220
19 Salary	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	14400
20. Unforeseen Circumstance																		13600
Total	39895	26445	31345	25735	11523	27375	23635	10775	26925	26925	1425	14800	14800	266803				
Acc Gain/Loss	(39895)	(66340)	(97685)	(123420)	(134943)	(50318)	(73953)	(84728)	(111653)	(80578)	87997	73197	73197	(73197)				
Loan Repayment												30160	30160					
Cash Available												43037	43037					

APPENDIX 5
YEAR 2
CASH FLOW

	MONTHS												TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12		
A Income						117600				60900	178500			357000
Sales @ RM 1.00 x 357,000														
B Production Cost														
1 Site Preparation														
2 Sprinkler														
3 Soil	4320	4320												8640
4 Rubber seeds		1963	1964											3927
5 Polybag	12370	12370	13744	13745										24740
6 Fertilizer			13744											27489
7 Filling & Arranging Polibag		9817	9818	5891										19635
8 Planting & Apply Fertilizer			5890											11781
9 Replanting seedlings					4712									4712
10 Culling							6300							12600
11 Budsticks							10500							21000
12 Polythene tape							630							1260
13 Budding									21420	21420				42840
14 Cutback									5355	5355				10710
15 Watering			236	236	236	236	236	236	236	236	236			2124
16 Weed Control					5890			5891						11781
17 Pest & Disease Control				3927		3927		3927						11781
18 Pruning							5891							11781
19 Salary	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260			15120
20 Unforeseen Circumstance														14280
Total	17950	29730	32912	25059	12098	28743	24817	11314	28271	28271	1496	15540	256201	
Acc Gain/Loss	(17950)	(47680)	(80592)	(105651)	(117749)	(28892)	(53709)	(65023)	(93294)	(60665)	116339	100799	100799	
Loan Repayment												28768	28768	
Cash Available												72031	72031	

APPENDIX 6

YEAR 3 CASH FLOW

	MONTHS												TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	
A Income						115192				71808	187000		374000
Sales @ RM 1.00 x 374,000													
B Production Cost													
1 Site Preparation													
2 Sprinkler													
3 Soil	4525	4526											9051
4 Rubber seeds		2057											4114
5 Polybag	12959	12959											25918
6 Fertilizer			14399										28798
7 Filling & Arranging Polybag		10285	10285										20570
8 Planting & Apply Fertilizer			6171	6171									12342
9 Replanting seedlings					4937								4937
10 Culling						6600							13200
11 Budsticks						11000							22000
12 Polythene tape						660							1320
13 Budding									22440	22440			44880
14 Cutback									5610	5610			11220
15 Watering			247	247	247	247	247	247	247	247	247		2223
16 Weed Control								6171		6171			12342
17 Pest & Disease Control				4114		4114		4114		4114			12342
18 Pruning													12342
19 Salary	1323	1323	1323	1323	1323	1323	1323	1323	1323	1323	1323	1323	15876
20 Unforeseen Circumstance												14960	14960
Total	18807	31150	34482	26254	12678	30115	26001	11855	29620	29620	1570	16283	268435
Acc Gain/Loss	-(18807)	-(49957)	-(84439)	-(110693)	-(123371)	-(38294)	-(64295)	-(76150)	-(105770)	-(63582)	121848	105565	105565
Loan Repayment												27376	27376
Cash Available												78189	78189

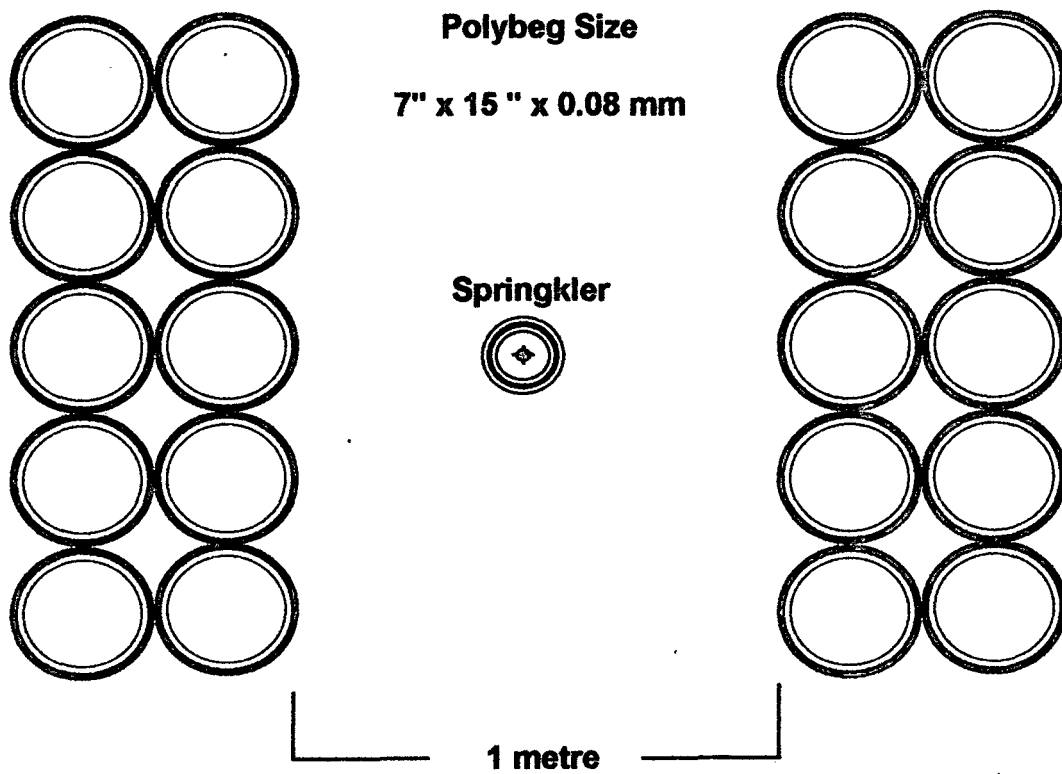
APPENDIX 7

YEAR 4 CASH FLOW

	MONTHS												TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	
A Income										75072	195500		391000
Sales @ RM 1.00 x 391,000					120428								
B Production Cost													
1 Site Preparation													
2 Sprinkler		4731											9462
3 Soil	4731												4301
4 Rubber seeds		2150	2151										27096
5 Polybag	13548	13548											30107
6 Fertilizer			15053	15054									21505
7 Filling & Arranging Poiibag		10752	10753	6452									12903
8 Planting & Apply Fertilizer			6451		5161								5161
9 Replanting seedlings													13800
10 Cuffling					6900								23000
11 Budsticks					11500								1380
12 Polythene tape					690								46920
13 Budding									23460				11730
14 Cutback									5865				2322
15 Watering			258	258	258				258	258			12903
16 Weed Control					6451				6452				12903
17 Pest & Disease Control				4301					4301				12903
18 Pruning													12903
19 Salary	1389	1389	1389	1389	1389				1389	1389			16668
20 Unforeseen Circumstance													15640
Total	19668	32570	36055	27454	13259	31489	27189	12400	30972	30972	1647	17029	280704
Acc Gain/Loss	(19668)	(52238)	(88293)	(115747)	(129006)	(40067)	(67256)	(79656)	(110628)	(66528)	127325	110296	110296
Loan Repayment												25984	
Cash Available												84312	

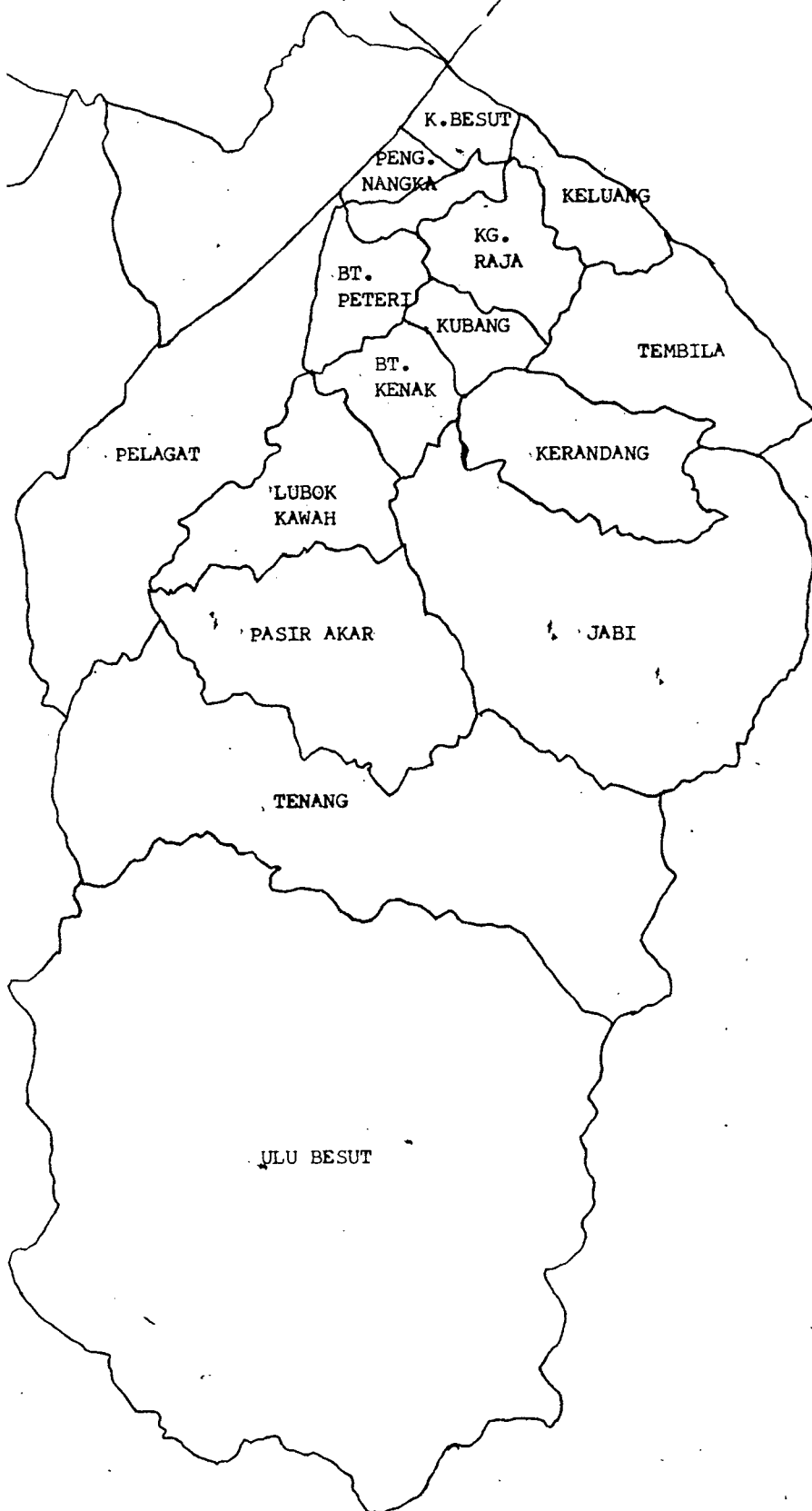
APPENDIX 9

Arrangement of Polybag in Young Budding Nursery



APPENDIX 10

DISTRICT OF BESUT



G
25/12/95

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : **RICE MILL PROCESSING**

Country : **UNION OF MYANMAR**

Project Prepared by : **DAW KHIN KHIN NYUNT**

**Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and**

**Executed by the ICA in collaboration with its Member Organisations
in India, Malaysia and Japan**



ICA Management Training Project for Agricultural Cooperatives in Asia

INTERNATIONAL COOPERATIVE ALLIANCE

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Geneva, Switzerland

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'Bonow House'
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CHAPTER(1)

(SUMMARY)

- 1.1 This project is to establish rice mill in Hinthada Township Cooperative Society.
- 1.2 The project will be undertaken by the Hinthada Township.
- 1.3 The objective is to increase income of the farmers by processing and marketing of their products.
- 1.4 The capital investment of the whole project is kyats twenty seven (27) lakhs.
- 1.5 Loan from government
This is estimated that the total amount would be kyats twenty seven (27) lakhs.
- 1.6 the necessary finance, technology, machinery, for the project will be augmented by Cooperative Department and State.
- 1.7 Capital, machinery and technical know how can be procured within the country.
- 1.8 Those Rice produce care already in domestic and foreign markets.
- 1.9 Financial management of the project and economic potential and success are calculated on the following basis.

- B.E.P (capacity)	43.12%
- pay back period	1.99
- NP V	6910
- cost and benefit ratio	1.12
- I R R	58 ⁺ / _e

CHAPTER (II)

(AGRICULTURAL BACK GROUND OF MYANMAR)

2.1 INTRODUCTION

Agriculture condition in Myanmar plan for 1994/95 the net output value of the agriculture sector was projected at kyats 23687 million. Agriculture research works are extended, demonstration plots carried out and extension services on modern methods of cultivation disseminated. Imported and local quality seeds are distributed and arrangements have been made for systematic utilization of chemical fertilizers and pesticides. Moreover an increasing amount of agricultural loans are disbursed annually.

Agricultural production of paddy, cultivation of summer paddy, monsoon paddy. As a result the production not only meets domestic requirements but also give surplus for export. According to the 1994/95 provisional data, paddy is cultivated on 15.2 million acres, production 901.6 million baskets. According to the 1994/95 provisional data the sown acreage of monsoon paddy was 12.0 million acres, production 697.2 million baskets. The cultivation of summer paddy was estimated at 3.2 million acres with the production of 204.5 million baskets.

2.2 BACKGROUND OF HINTHADA TOWNSHIP COOPERATIVE

Hinthada Township Cooperative Society is situated at Ayeyarwady Division. This society was registred and established since 1972. Number of member is 86 and total amount of shares is 86000 kyats at that time. The total areas of land holding is 530 areas. The members are usually conventional famers who depend on cattle and buffaloes for ploughing and cultivation. As their cultivated area is usually in monsoon paddy and summer paddy. There are 530 acres arable land including thirty acres for fishery.

2.3 AREA OF PROJECT

The Hinthada agriculture cooperative society besides gaining mellow experiences of (122) years, it is in a good position with regard to finance, labour management and guidance of excutive committee numbers when compare with other agricultural cooperative societies. As a single cooperative, if has a large area of land holding and it has other three cooperative societies engaged in the similar business in its proximity. Moreover the climate condition and soil type are suitable for growing monsoon paddy and summer paddy. There are 530 acres arable land including thirty acres for fishery. So it is the most suitable and favourable site for Hinthada agriculture cooperative society to implement Rice mill process project.

2.4 GOVERNMENT POLICIES

The government have played a important role to increase the agriculture production by:

1. Extension of cultivated area.
2. Provision of sufficient water supply.
3. Encouragement of agricultural mechanization.
4. Increase use of agro-practices
5. Increase production by using high yielding seeds.

The government is in view to promote multiple cropping by increasing amount of investment for extension of irrigation and flood protection embankment facilities.

2.5 PROBLEMS FACEDS BY FARMERS.

1. In aduquate income to buy fertilizer and pesticides.
2. Net undertaking processing and marketing activities.
3. Exploitation by middlemen in determining the price of paddy.

2.6 NEED AND JUSTIFICATION FOR THE PROJECT

1. The need of the farmers for better price in paddy.
2. The need for Rice Mill is to process the paddy thus rice can be produced and marketed to Yangon.
3. To create employment among the farmers.

CHAPTER (III)

(PROJECT)

3.1 OBJECTIVES

1. To increase income of the farmers by processing and marketing of their products.
2. To encourage non members to participate in the cooperative movements.
3. To promote inter-trade among cooperatives.
4. To curb the exploitation by the private or middlemen traders in the society.

3.2 AREA OF OPERATION.

The project will cover the total area of the three village with an area of 500 acres. The plant will be located in Natmaw Village 10 miles from Hinthada Township. This project will procure raw materials from:

Natmaw village	100 acre
Naitban village	100 acre
Kyaing Kwin village	300 acre

3.3 PROCUREMENT

There are two season in the cultivation of paddy namely

1. Monsoon paddy (July to October)
2. Summer paddy (March to June)

All the farmers or cooperative members will supply their paddy to the cooperative mill for processing and marketing.

The cooperative mill pay the price of paddy according to the above market price or at market price, thus ensuring better price to the farmers and also create then the sense of belonging to the cooperative.

3.4 RICE PROCESSING STEPS OF HINTHADA CO-OPERATIVE RICE MILL.

Initially,, paddy are poured down into the pouring basis and screened with vibrating sieves to remove the dusts and refuse of paddy.

Then, cleaned paddy are conveyed into the machine with husking stone to get rice. The rice together with husks are send to the screening units to divide into husks and unpolished rice (grain which is only husked but not polished).

The unpolished rice and by products are conveyed to another screening units to remove by products unpolished rice are send to the pinding mill to polish rice to become white rice.

Then white rice and by products such as broken rice and rice bran are divided sifting.

The production rate of this mill is one ton per hour (1 ton/hr) or 24 tons per day (24 tons/day). There are four labours for production stage (from paddy to white rice), two off day and two of right. Similarly we use four labours for packing process.

The power consumption of the motors using is this mill are thirty horse power (30 Hp) we use two motors for husking and pounding respectively. The electrick power of transformer is one thousand two hundreds Kilo walt. (1200 kilo)

3.5 MARKETING

The rice will be packed in the sunny sacks and will be transported by motor boat to the trading cooperation in Yangon or to the government agencies which ever provide better price.

3.6 FARM DEVELOPMENT

The government has set up cooperative department, agriculture department and mechanization department in all respective townships for the development of cooperative works and development of agriculture and to encourage utilization of machine in order to receive technology information and other supports.

For this purpose, we will make effort to the best of our ability but it also depends on the efficiency and experience of administrative committee and members, it will take some period of time to accomplish.

3.7 STORAGE BUILDING

As for storage building, we have a godown which can hold 3000 basket of paddy. There will be another one more project building with walls of bamboo matting corrugated zine sheat roofing and brick flooring.

CHAPTER (IV)

4.1 DETAILS OF OPERATION

The unit for the consideration of the board of will have effective processing and milling capacity of 1000 ton (30,000 baskets) of paddy per annum. The cooperative will not faced any problems in processing paddy as there are 500 acres under paddy cultivation which is enough to operate satisfactorily.

Since there are two seasons in paddy cultivation its annual rated milling capacity of the project on the basis of double shift operation is estimated 2000 ton (60,000 baskets). The cooperative have skilled and semi-skilled opertors/personal for operating the rice mill.

4.2 STORAGE

1. Storage building (paddy) = 80' x 40' maximum capacity is estimated at about 3000 baskets
2. Storage building (Rice mill) = 68' x 40' maximum capacity is estimated at bout 1200 bags (Gunny sacks)

100T^{on}

3. Temporary storage = 10000 baskets capacity

4.3.1 PADDY VARIETY

- Requirement of seed for growing is as follows:
- Shwe war Htun (monsoon paddy) 500 acres x $\frac{1}{2}$ = 250 baskets
- Shwe war Htun (summer paddy) 500 acres x $\frac{1}{2}$ = 250 baskets

4.3.2 FISH VARIETIES

As for kinds of fish there are red eyes gudgeon and golden gutzeon of which we breed farmer species. These fingerlings can be bought easily in Natmaw 3 miles away from the society.

4.3.3 FERTILIZERS

The requirement of fertilizer, their types and volume are as follows:

Sr No.	Particulars	Amount
1.	T. super - 250 x 2 time	500 bag (50 Kg = 1bag)
2.	Urea - 500 x 2 time	1000 bag (50 Kg = 1 bag)
3.	Bio - fertilizer 500 x 2 time	1000 bag (50 Kg = 1 bag)

aboved mentioned fertilizers can be bought from a griculture department and private dealer.

4.3.4

Sr No.	Insecticide	Unit	Amount
1.	5% Aldrin	lbs	250 x 1 time = 250
2.	Sumethum	gall	2 x 2 time = 4
3.	Marpathion	gall	4 x 2 time = 8

4.4 TRANSPORTATION AND COLLECTION

As paddy for cultivation are kept at the store house there is noneed for transportation. Insecticides and fertilizers are to be purchased at Hinthada two miles away from the village and transportation can be made either by tractors or bullock carts and lorry.

4.5 PRODUCTION OR PROCESS

Technology and Machinery

At the present positon, the application of insecticides, fertilizers and scientific cultivation methods is done in recordance with the proper instruction from township agricultural department. There is no difficulty in our methods of application.

As for the handling and maintenance of agricultural machinery. We have one technician trained at township agriculture mechanization department and we have five more experienced who has taken crash course from the technicians.

4.6 QUALITY STANDARD AND QUALITY CONTROL

In the matter of paddy, puring moisture content, paddy colour and paddy size can be judged by sight and make good sales at reasonable prices paddy quality depends on following factors. They are use of good quality paddy, reaping is done at the time the ears are ripe, to dry them properly in the sun, systematic threshing and winnowing , paddy are to be kept and stored free from destruction by insects. Thus paddy quality can be maintained.

If there is good quality of paddy, yielding rate of rice will increase and quality of rice will be good quality.

4.7 MARKETING FOR THE PRODUCTS

4.7.1

The following is the expected annual production volume of sales for paddy and rice.

Sr No.	Paddy	Production	Reduced seed variety	Supply amount
1	Monson rice	30000 basket	250	29750
2	Summer paddy	30000 basket	250	29750

Sr No.	Paddy	Production	Supply amount
1	Monson rice	8925	8925
2	Summer paddy	8925	8925

4.7.2 PRICING

Variation in price depends on the following factors. Rise and fall in domestic agricultural produce is main determinant. Border trade recession is not possible to take place. Import also is not taking place.

It is customary that just after the harvesting the new paddy and Rice are given high process by the buyer to increase supply. As the trend of supply rises, the buyer used to pay below the existing price. To get better prices for agricultural produce the executive committee is ever watching the above mentioned conditions.

The prices for paddy and Rice in the project are expected lower than the prices for basic year 1994/95 it does not in any way keep our prices low in actual sales as estimated in the project.

The following is the chart showing the comparison table between prices of basic year and prices on the present project.

(8)

Sr No.	Paddy/Rice	Price per unit	
		basic year 1994/95	project year
1	Paddy (one basket)	350 kyats	240 kyats
2	rice (one bag)	1350 kyats	950 kyats
3.	rice brow (bag)	600 kyats	400 kyats

1 basket = 46 lbs

1 bag = 50 kg

4.7.3 SALE PROMOTION

When the sales are made for all kinds of Rice for local consumption and export, we always keep the quality appeal in view, on which sale promotion depends. That is why all agricultural processing are personally supervised by the executive committee.

4.7.4 TRANSPORTATION TO THE MARKET

For the sale of rice we will use door in door trucks for transportation. At Hinthada where the cooperative is situated there is transportation cooperative which runs TE 11, ISUZU, curry which we can utilize for our purpose.

Sometimes the wholesaler buyers make their own arrangement for transportation when they make their transaction at cooperative whether we should send the produce to the market or sell the produce at the agricultural cooperative society depend on the prices offered and transportation charges. So, prices are fixed accordingly.

4.7.5 MARKETING CHANNEL

The marketing channels for the products are as follows:

Marketing	Channel
1. paddy 100%	Direct to Hinthada Rice Mill
2. Rice 30%	Local consumption
3. Rice 70%	Direct to private whole sale dealer

CHAPTER (V)

ORGANIZATION AND MANAGEMENT

5.1 MANAGEMENT POLICY

According to the Myanmar Cooperative law, general assembly has the highest outhority. Those business and finicial matters carried out by the administrative committee have to approved and future policies and regarding finicial matters are to be decided by the general assembly. So this project has to be forwarded to the administrative committee to have its approval.

5.2 CLASSIFICATION OF MANAGEMENT

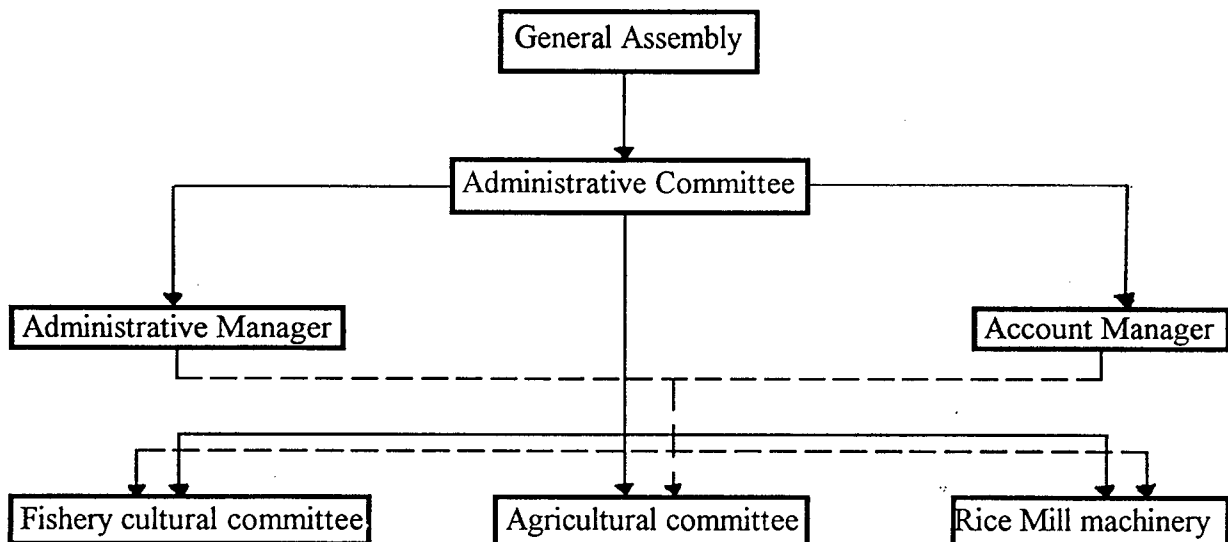
The function of management will be classified as follows:

1. Administrative committee
2. Fishery culture committee
3. Agricultural committee
4. Rice mill machinery committee

5.3 ORGANIZATION CHART

The organization chart of Hinthada agricultural cooperative society is as follows:

Organization Chart of Hinthada Agricultural Cooperative Society



5.4.1 ADMINISTRATIVE COMMITTEE

1. Planning and reporting record
2. Co-ordinating and adjusting under other committee
3. Performing operating all management and administrative affairs over the under other committee.
4. Under the management committee two managers are appointed for general administration and the other for account department. Their duty is to keep records and accounts in proper order according to prescribed rules and regulations to help management committee to make their works smooth and systematic.

5.4.2 FISHERY CULTURE COMMITTEE

1. Arrangement and supervision on fishery culture.
2. Purchasing fish and feeds.
3. Supervision on feeding and culturing.
4. Marketing and distribution.

5.4.3 AGRICULTURAL COMMITTEE

1. Arrangement and supervision on paddy cultivation.
2. paddy varieties storage.
3. land preparation
4. Transportation, storage and rice mill.
5. Co-ordination with other committee.

5.4.4 RICE MILL MACHINERY COMMITTEE

1. Arrangement and supervision on operating by rice mill machines.
2. Maintenance and repairing.
3. Raw material and others purchasing and collection.
4. Co-ordinating with other committee.

5.5 MAN POWER PLANNING

We especially use the labour of members. For calculation of necessary statistics, we employ administration manger and an recount manager to help the administrative committee. The following division of labour among the members in each section of the Hinthada agricultural cooperative society. If may work is necessary to be done by all members their collection labour's used for any work without discrimination.

Sr No.	Task Division	Division of labour
1	Fishery culture	15 person
2	Agriculture	15 person
3	Rice mill machinery	5 person

5.6 RICE MILL STRUCTURE

Rice mill the functions and duty of each level of management

Duty of	Executive committee	3 person
	Manager	1 person
	Accountant	1 person
	Watchman	1 person
	Other labour	4 person

CHAPTER (VI)

FINANCIAL ANALYSIS

6.1 BASIC ASSUMPTION

The financial analysis of the project has been performed under the following assumptions.

1. Project period is about 10 years including construction period and period of purchaing machines.
2. Depreciation is done by the straight line method with 10% of fixed assets.
3. Working capacity life of fixed assets is set for 10 years.
4. All the works include in the project, methods of rice mill processing prices are based on 10 years experience of Hinthada agricultural cooperative society. Pracial performances actual results statistics are compiled and calculated in consultation with the excecutive committee.
5. Investment contained in the project and process for carrying out the business are put forward by excutive committee.
6. The value of the project is accessed and calculatated on the basic of correct information and statistic put forward by the executive committee.

6.2 INVESTMENT OF THE PROJECT

The total project investment costs are estimated at 29,30,000 kyats.

The funds for the project cost will be raised from two types of source as follow.

Sr No.	Source	Amount (kyats)
1	Government short term loan	2,700,000
2	Society own	230,000
	Total	2,930,000

Calculation of Capital Investment (in 000 Kyats)

Sr No.	Item	Units	Investment (000 Kyats)	Remarks
1	Transformer	1	500	cost estimation
2	Electric motor	2	160	
3	Husking stone	1	60	
4	Screening units	1	100	
5	Another screening units	1	60	
6	Pounding mill	2	120	
7	paddy storage building	80 x 40	700	
	rice mill building	200 x 50	1000	
8	rice mill and storage land	2 acres	200	
9	Furniture	1	30	
			2930	

Detail of Fixed cost and variable cost 600

Sr No.	Item	Amount	Remark
1	Fixed cost		
	- Salaries	109	
	- Loan interest	405	
	- maintenance and repair	300	
	- depreciation cost	207	
	- insurance	100	
	- unforeseen expense	200	
	Total fixed cost	1321	
2	Variable cost		
	Raw materials	14280	
	Gunny bags	405	
	Electricity	60	
	wages	40	
	Transport charges	61	
	Total variable cost	14846	

$$\begin{aligned}
 \text{B.E.P (Capacity)} &= \frac{\text{Fixed cost}}{\text{sale} - \text{variable cost}} \\
 &= \frac{1321}{17909 - 14846} = \frac{1321}{3063} \\
 &= 43.12\%
 \end{aligned}$$

Government Loan Repayment Schedule (in Kyats)

No.	Principle	interest	total	Remark
0	-	-	-	
1	0	405000	405000	
2	500000	330000	830000	Short term loan
3	500000	255000	755000	Grace period - 1year
4	500000	180000	680000	interest rate 15%
5	1200000	-	1200000	
	<u>2700000</u>	<u>1170000</u>	<u>3870000</u>	

Depreciation Cost 1 year

No.	Item	Depreciation cost (Kyats)	Remark
			Straight lin method
1	Husking stone	6000	
2	Sereening units	10000	10% Depreciation
3	Another sereecring units	6000	rate
4	Pounding mill	12000	
5	Storage building	170000	
6	rice mill building	100000	
7	Furniture	3000	
	Total	<u>307000</u> ✓	

Salvage valaue Rice mill = 2040

Total salvage value = 2040

Calculation of Management and Administrative costs. (One Year)

No.	Particular	Kyats
1	Manager <u>1000 Ks</u> x 12 months ✓	12000
2	Accountant 900 Ks x 12 months	10800
3	Watch man 600 Ks x 12 months	7200
4	Other labour 800 Ks x 12 months x 4 men	38400
5	Executive committee charges	
	Chariman <u>1200 Ks</u> x 12 months ✓	14400
	Secretary <u>1100 Ks</u> x 12 months ✓	13200
	committee member 1100 Ks x 12 months	13200
	Total	109200

6.3 PRODUCTION COST

The annual production cost which is classified into the variable cost and fixed cost is calculated as follows:

(See annexure (a) more in details)

Year	Variable cost	Fixed cost	Total cost
1	14846	1321	16167
2	14846	1246	16092
3	14846	1171	16017
4	14846	1096	15942
5	14846	916	15762
6	14846	916	15762
7	14846	916	15762
8	14846	916	15762
9	14846	916	15762
10	14846	916	15762

6.4 CASHFLOW OF THE PROJECT

Year	Inflow		Outflow			Net cash flow
	Sales Revenue	Salvage value	Capital expenditure	Operating expenditure	Total	
1	17909		2930	16167	19097	1188
2	17909			16092	16092	1817
3	17909			16017	16017	1892
4	17909			15942	15942	1967
5	17909			15762	15762	2147
6	17909			15762	15762	2147
7	17909			15762	15762	2147
8	17909			15762	15762	2147
9	17909			15762	15762	2147
10	17909	2040		15762	15762	4187
	179090	2040	2930	158790	161720	19410

6.5 WORKING CAPITAL REQUIREMENT

This calculation was done for two seasons.

Calculation of working capital (1st year)

Item	Amount (Kyats)
Operating costs	
- Administrative and salaries	109,000
- other fix costs	1,212,000
- variable costs	14,846,000
Total working capital	16,167,000 /

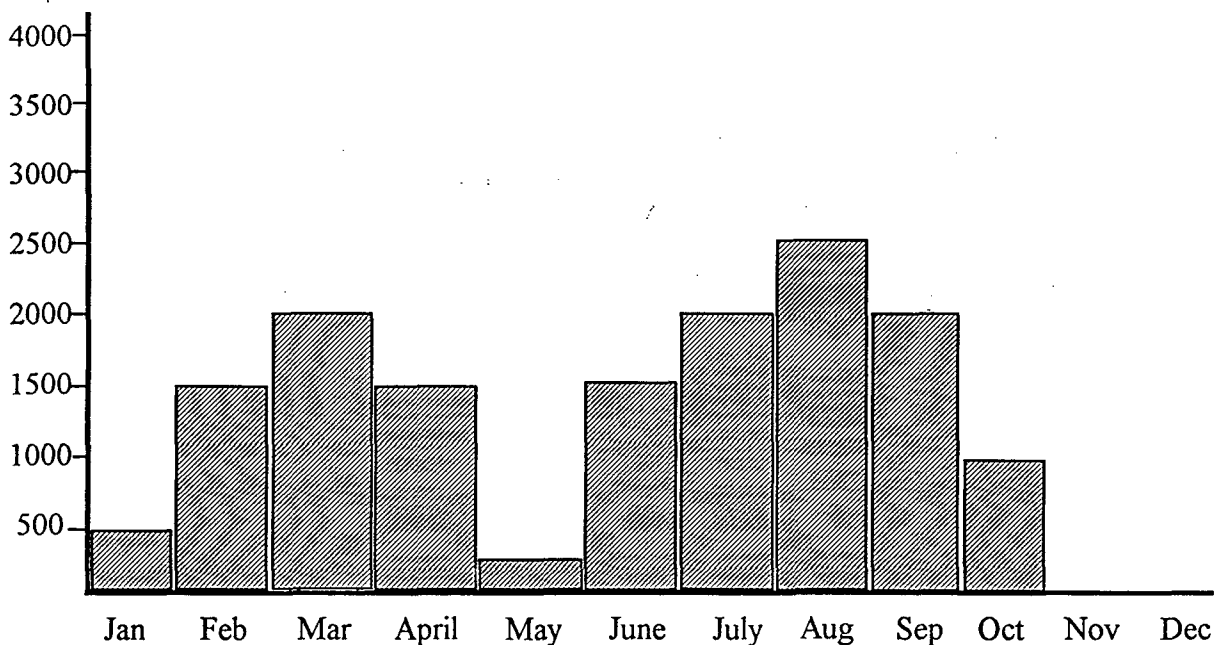
6.6 SELECTED FINANCIAL

Financial Analysis	First Year
Pay Back Period	1.99 yr
NPV (000Ks)	+6910
Benefit Cost Ratio	1.12
IRR	58%
Breakeven (capacity utilized)	43.12%

6.7 SENSITIVITY ANALYSIS

Assumption	B/C Ratio	Pay Back Period (yr)	NPV (000 Ks)	IRR %	BEPC %
Original	1.12	1.99	+6910	58	43.12%
1. Price of input					
10% increase	1.06	2.2	+6646	56	47.43
10% decrease	1.18	1.79	+7126	60	38.8
2. Price of output					
10% increase	1.22	1.59	+7955	69	32.4
10% decrease	1.00	2.32	+6055	53	48.62

Project Implementation For 1st Year
Rice processing Bar Chart



1.5 cm = 500 bags

1 bag = 50 Kg

Jan	-	At this month the moisture contents of paddy are higher. Therefore decrease in yield percent of rice.
Feb	-	As paddy begin to dry yield percent increase.
March, April	-	Amount of paddy increase therefore yielding rate also increase (these months are optimal period of monsoon paddy).
May	-	The lost period of monsoon paddy.
June	-	Starting summer paddy period. Yield percent of summer paddy is better than monsoon paddy because of the less moisture content.
July, Aug, Sep	-	At these months all of paddy are summer paddy.
Oct	-	Lost period of summer paddy.
Nov, Dec	-	Maintaing period.

CHAPTER (VII)

RECOMMENDATION

7.1 PROBLEM (NECESSARY OF THE PROJECT)

7.1.1

Main inputs for the successful implementation of the project is the sufficient supply of raw material-paddy. For this purpose advance method of cultivation must be disseminated to the formers and necessary form implement, such as machineries and fertilizers must be readily available. Although the state and the cooperatives are reuderung the almost assistance to the formers it is still for from their needs.

7.1.2

For the production of good quality rice, the need of the day for the country is good country elevators and rice mills and also spare parts for the rice mills which are not readily available. The last and not the least the management of these facilities. The management and the technical personnal lacks modern techniques and expertise.

7.2 RECOMMENDATION

Myanmar is an agricultural country and all out efforts have been utilised for the development of agriculture. Rice is the staple food of the country and also the major export of the country. In the old days we have only on crop of paddy. But, since 1994 the farmers are cultivating 2 to 3 crops of paddy annually. Total avreage has also rices to 12 million acres and summer paddy cultivation is over 4 million acres. Therety increasing the productions up to 716 million baskets which is equivalent to 14.7 million metrric ton.

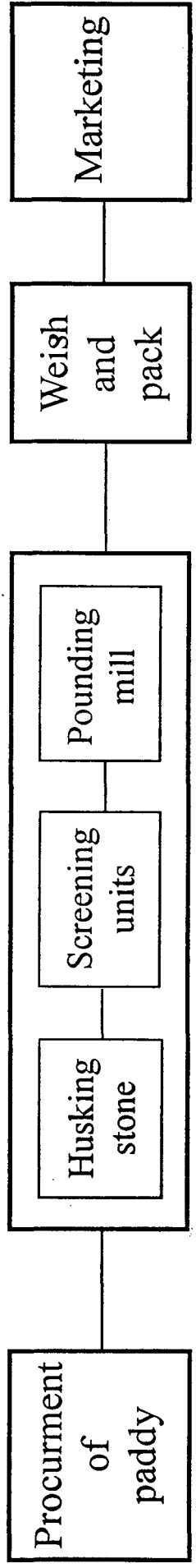
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With the increase of population and the need of hard currency, production of paddy will increase year by year, where a number of rice mills and country elevators will be in demand. Therefore our society in its general meeting had deliberated to implement this project.

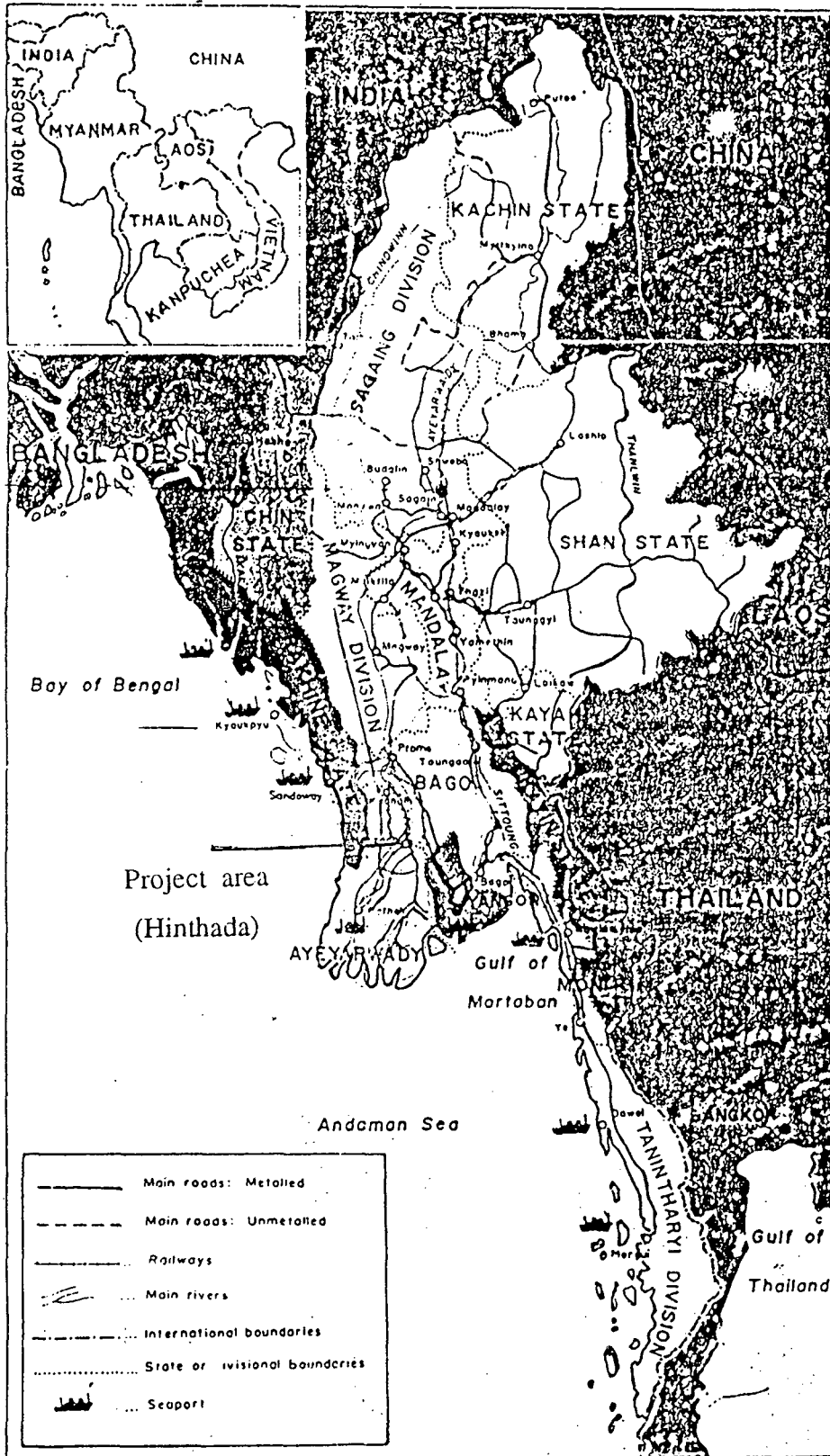
Chapter (VII) Budget

Year	1	2	3	4	5
1. Revenue	17909	17909	17909	17909	17909
2. Cost					
- variable	14846	14846	14846	14846	14846
- fixed cost	1321	1246	1171	1096	916
3. Profit before tax (PBT)	1742	1817	1892	1967	2147
4. Tax (30% of PBT)	523	545	568	590	644
5. Profit after tax (PAT)	1219	1272	1324	1377	1503

PROCESS FLOW CHART



UNION OF MYANMAR



**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : POULTRY PROJECT

Country : PAKISTAN

Project Prepared by : RIAZ AKHTAR

**Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and**

**Executed by the ICA in collaboration with its Member Organisations
in India, Malaysia and Japan**



ICA Management Training Project for Agricultural Cooperatives in Asia

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ACKNOWLEDGEMENT

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- V. ORGANIZATION & MANAGEMENT
- VI. FINANCIAL ANALYSIS
- VII. BUDGET
- VIII. RECOMMENDATIONS

ANNEXURES

ACKNOWLEDGEMENT

The Project proposal is one of the requirement of the tenth ICA/Japan Training Course for strengthening Management of Agricultural Cooperatives in Asia funded by the Government of Japan and executed by International Cooperative Alliance in collaboration with its Member Organizations in India, Japan and Malaysia.

The Project is to be undertaken in order to increase farmers income through cooperative movement, which would serve as Model Project for the cooperatives in the region.

I would like to take the opportunity to express my gratitude to Mr.Daman Prakash, ICA Project Director, Mr.Ganesan and faculty members of IRMA, ~~Amam~~ (India) for their guidance.

I am also grateful to the Managing Director of Federal Bank for Cooperatives for giving me the opportunity to participate in this programme.

February 1996

(RIAZ AKHTAR)
FBC, ISLAMABAD

CHAPTER 1

SUMMARY

Name of project	Poultry Project
Project Area	The project is to be located in village Jang Bahtar situated at 40 KM from Rawalpindi in Punjab Province.
Objective	To provide a regular source of and increased income to member farmers
Total Project Cost	Rs. 1,800,000
Source of Funds	Equity Rs. 540,000 30% Loan from PPCB Rs. 1,260,000 70%
Installed Capacity	10,000 Birds (60,000 Birds Yearly)
Capacity Utilization	Ist Year 92% From 2nd Year onward 100%
Product	Broiler
Preoperational Period	1 Year
Financial Analysis	i) Pay Back Period 3.12 ii) NPV @ 15% (In Rs. 000) 773 @ 20%(In Rs.000) 288 iii) BC Ratio @ 15% 1.43 @20% 1.16 iv) IRR 24%

2.1 Overall Situation

Pakistan is basically an agricultural country , Its economy has undergone considerable diversification over the years, yet the agriculture sector is still its backbone. With its present contribution to GDP at 24 percent it accounts for half of the total employed labour force and is the largest source of foreign exchange earnings.

The contribution of livestock to value addition in the agriculture sector is 7.95 percent of GDP . Small farmers and landless livestock producers derive around 10-25 percent of their income from this sub-sector.

The Government has launched a comprehensive livestock development in all provinces to enhance milk and meat production in the country. The government has also taken a number of measures to enhance and streamline the capabilities of this sub-sector.

The table below shows livestock population during last five years.

LIVESTOCK POPULATION

(Million Nos.)

Year	Buffaloes	Cattle	Goats	Sheep	Poultry
1990-91	17.8	17.7	37.0	26.3	146.9
1991-92	18.3	17.7	38.7	27.4	156.2
1992-93	18.7	17.8	40.2	27.7	182.6
1993-94	19.2	17.8	42.0	28.3	250.0
1994-95	19.7	17.8	43.8	29.0	318.0

Source: Economic Survey 1994-95

The livestock products are shown in the table below

(000 tones)

Year	Milk	Beef	Mutton	Poultry Meat
1990-91	15481	765	665	151
1991-92	16280	803	713	156
1992-93	17120	844	763	188
1993-94	18006	887	817	268
1994-95	18936	931	875	321

Source: Economic Survey 1994-95

2.2 Area Of Project

Keeping in view of the Government Policy and that of increasing demand for poultry, there is need to streamline and improve the system of poultry and it's marketing in the large urban centre.

The village of Jang Bahtar is about 40Km away from twin cities of Islamabad-Rawalpindi and is situated about 10Km from Taxila.

The majority of the population belongs to farming community. The major crops grown by them are wheat and maize.

During Winter the temperature in village may drop to freezing point. From March onwards the temperature rises. In Summer, the temperature may rise to 40°C.

The aforesaid village is selected because it has good infrastructure (access roads), good supply of energy (electricity), abundant water supply and existence of veterinary services and marketing avenues being adjacent to twin cities of Islamabad/Rawalpindi.

2.3 Problems Faced By Farmers And Cooperatives Of The Area.

The majority of farmers are illiterate and as such they lack knowledge and expertise to market their product and obtain remunerative price. They are at the mercy of traders, who pay much less amount than market prices and that too at their own will. Further farmers are not able to replace existing method due to lack of knowledge and limited financial sources.

So it is very difficult for the farmers and cooperatives of the area to increase their income. In that area, most of farmers sell their birds to traders, which are exploiting them. As such coming under cooperative umbrella they may be in a better position to compete with traders for fetching better prices.

2.4 Need And Justification For The Project

For the betterment of the economic condition of the grower farmers, facilities for processing and marketing of their products are badly needed. This

project will save farmers from exploitation by private traders, ensure incentive price and create in them the sense of cooperative ownership. The project will be beneficial not only for the cooperative members but also it will produce quality birds for the people at reasonable prices.

In Pakistan, provision of foods of animal origin for the human population is increasing at an annual rate of about 3 percent. The gaps between supply and requirement of animal proteins which was 28 gm per capita per day in early sixties has narrowed down to a level of about 10gm. However many factors such as reductions in livestock population due to agricultural mechanization and large scale shifting of human population from rural to urban areas, shortage of fodder crops and non development of range lands and change in life style and socioeconomic conditions have made the problem more complex.

Through implementation of the project, the farmer members will get higher price of their produces as well as additional benefit out of the profit of the project. It will also develop cooperative sense in the people and thereby promote cooperative leadership.

From various analyses, it has been observed that the poultry is quite needed base and justifiable project for this area.

CHAPTER 3

THE PROJECT

3.1 Objectives

The main objective of the project is to provide members of the cooperative society with a regular source of and increased income. The project aims at improving the standard of living of the farmer's community.

The other objectives of the project are as follows:

- To stimulate systematic cooperative activities
- To reduce the exploitation by the private traders

3.2 Area Of The Operation

The product of the project will be marketed to the following nearby sales centres.

Market Segment	Distance from the project
Lalarukh	5 Km
Aslam Market	10 Km
Taxila	10 Km
Islamabad-Rawalpindi	40 Km

3.3 By Product

The main by product of the poultry is faeces. Generally, it is used as organic fertilizer as a substitute of inorganic fertilizers. This will be sold in the market.

Empty bags of the feed will also be sold in the market.

3.4 Project Components

Procurement

The poultry farm will be situated in village Jang Bahter that is 40 Km away from District Rawalpindi. Chicks will be purchased from public and private hatchery.

② The feed bags will also be purchased from wholesale market of the Rawalpindi.

Processing/Plant Operation

③ Plant operation will include the following activities :

- Food preparation
- Feeding, drinking,
- Medical care
- Cleaning

Marketing

④ Marketing of the broilers plays an important role for achieving laid down objectives of increasing farmer's income. The finished product (optimum size birds) will be sold to private traders in Rawalpindi, Islamabad, Taxila, Wah Cantt, where there is large demand for birds. The Manager will ensure timely sale

of the product.

The finished product will be transmitted from poultry farm to concerned market through hired transport and transportation expenses are to be borne from concerned customers.

Training And Extension

Most of farmers would find poultry farming as a new farm of livestock. However, none of the technology involved in the project is at a level that would require extensive training of employees. Instructions for use of feed, medicine , cleaning and maintenance of birds would be provided by the supplier (Hatchery).

However, the farmer of this area, who intends to join the society/project may be provided some knowledge of poultry farming, along with the expected benefits of the project so that farmers could start the project in confidence and with great devotion.

CHAPTER 4

DETAILS OF OPERATION

4.1 The Farm Capacity

The annual capacity of the farm is rearing of 60000 birds with production cycle. Production covers 50-55 days (5- 10 days for cleaning of sheds). Each cycle contains 6 batches of 10,000 birds each. Proper measures have been incorporated in planning the batches, production cycle and yearly capacity.

The project envisages setting up of a poultry farm with all sorts of facilities. The total cost of the project has been estimated at Rs. 1,800,000

4.2 Technology And Process

The basic raw materials of the poultry are chicks and feed of the birds. Chicks will be purchased from hatchery plant which are running under both public and private ownership. Annual requirement at 100% capacity is 60,000 birds. The present rate of chick is Rs. 12 per head.

First 20 days' chicks are placed in brooder sheds after that

these birds are shifted in rearing sheds. Normally , after 15 days the medicine is provided to the birds.

4.3 Project Cost Components

Land

The price of land measuring eight kanals including development cost has been estimated Rs. 320,000 according to present market value. The location is considered suitable and the area of land is adequate to implement the proposed project.

Building And Civil Works

The construction will include bird's house (sheds), office, store room ,guardroom, etc. The cost of construction including electrification , water line, and sanitation has been estimated at Rs. 823,000 Details of the construction with specification has been shown in Annexure II.

Machinery And Equipment

The estimated cost of required feeder, drinker, air cooler , electric heater etc. is Rs 51000 and these are locally available. The

cost of installation of water tank, electric installation, sanitation etc. has been included in construction cost. Details of the machinery and equipment have been shown in Annexure III.

Furniture And Fixture

The cost of furniture and fixture has been estimated at Rs. 6000 .

Details may be seen at annexure IV.

4.4 Implementation Of Project

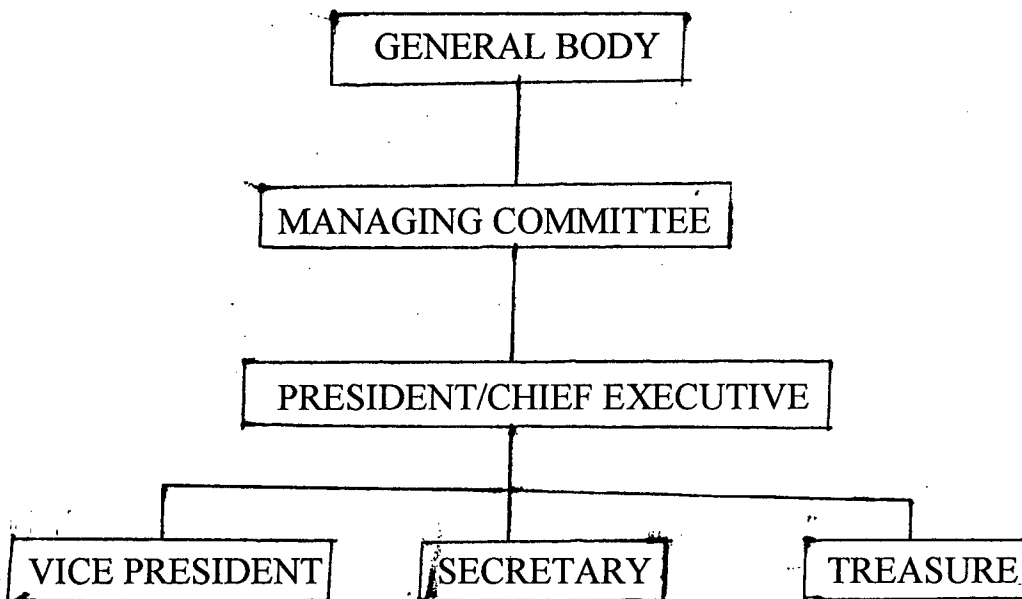
It will take one year or so to start the project. Details of the activities needed to implement the project are as follow.

S. NO.	ACTIVITIES	TIME REQUIRED (DAYS)	PRECEDING ACTIVITIES
A.	Internal Decision Making	30	A
B.	Formation of Society	30	B
C.	Acquisition of Land	30	C
D.	Map of Building	30	C
E.	Construction of Building	215	D
F.	Recruitment of Staff	30	E
G.	Procurement of Equipment	30	F

5.1 Organizational Structure Of Society

The organizational set up of the society would be as under :-

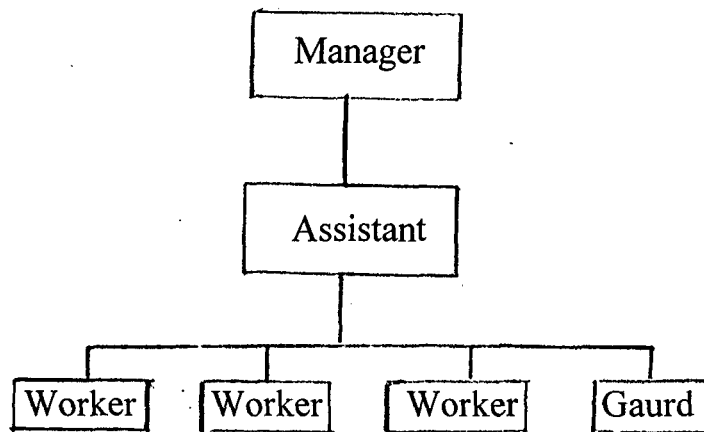
- i) The General Body which comprises all members
- ii) The Managing Committee, which consists of 4 members
(President , vice President, Secretary, Treasures).



5.2 The Managing Committee is responsible for the overall operation of business of the society. Its duties are to maintain accounts and upto date records of the society. The Managing Committee can also propose new members. Admission of new members, is however subject to approval by the General Body. The members of the Managing Committee would be elected by the farmer

members during the annual general meeting of the society.

5.3 For smooth business working , the operation of the project will be managed by the following staff under the guidance of the Managing Committee.



5.4 Staff position with their estimated salaries.

S. NO.	POSITION	NUMBER	SALARY PER MONTH
01.	Manager	01	Rs. 4,000
02.	Assistant	01	Rs. 2,400
03.	Worker	03	Rs. 2,150
04.	Gaurd	01	Rs. 2,150

6.1 Basic Assumption

While preparing the financial analysis of the project , the following assumptions were made:-

- i) The project period is fixed for 11 years including one year of construction and other works.
- ii) The capacity of the project would be 60,000 birds per year with 6% mortality rate. The project would run on 1st July 1997 at the estimated capacity of 100%.
- iii) Initial investment is Rs. 1,800,000 out of which Rs.1,260,000 would be loan from the Federal Bank For Cooperatives through Punjab Provincial Cooperative Bank. The term loan will be repayable in 14 equal installments falling due at the end of second operating year. The mark up (interest) on the term loan will be 14 percent.
- iv) Requirement of feed for 1000 birds is 70 Bags. The prices of one beg is Rs. 410.

v) The average sales realization one Kg of the broiler will be Rs.

40.

vi) Wages and salaries are expected to be Rs. 180,000 for the first two years ~~each~~. Thereafter, they would rise at the rate of 15 percent per year.

vii) Administrative expenses will be Rs. 2000 per year.

viii) 10% of the net profit are paid as dividend from the second ~~second~~ year of production onward. This is the maximum allowed under cooperative law.

ix) The project is exempted from taxes.

x) The depreciation rates will be as follows, under the written down value method:-

Building and civil works	5%
--------------------------	----

Plant and office equipment	10%
----------------------------	-----

XI) Electricity installation will be paid as Rs. 50,000.

XII) The faeces will be sold Rs. 1000/- per Truck and empty bag of / bag of feed will be sold Rs. 4 per bag.

6.2. INVESTMENT OF THE PROJECT

i) The total project costs are estimated at Rs.1,800,000.

(In Rupees)

No..	Classification	Amount
1.	Land and land development	320,000
2.	Building and Civil Works	823,000
3.	Machinery and Equipment	51,000
4.	Furniture and Fixture	6,000
5.	Working Capital	450,000
6.	Electricity Installation	50,000
7.	Miscellaneous	100,000
	TOTAL	1,800,000

ii) The funds for the project costs will be raised from the Federal Bank for Cooperatives through Provincial Cooperative Bank.

(In Rupees)

No.	Classification	Amount	%age share
1.	Equity of Members	540,000	30%
2.	Loan from Bank	1,260,000	70%
	TOTAL	1,800,000	100%

6.3 Working Capital Requirement

The total working capital required for first complete cycle (two months) estimated as follows.

Medicines'

Requirement of feed for 1,000 birds. = 70 Bags

Requirement of feed for 10,000 birds. = 700 Bags

Cost of one bag of feed = Rs. 410

i) Cost of 700 bags of feed = Rs. 287,000

ii) 10,000 chicks @ Rs. 12/- per head = Rs. 120,000

iii) Other expenses = Rs. 43,000

Total

Rs. 450,000

6.4 Selected Financial Data

- Pay back period (Years) 3.12

- NPV (In Rs. 000) 288

- IRR (%) 24

6.5 Sensitivity Analysis

Assumption	Pay Back Period (Year)	NPV(Rs. 000)	IRR%
Original	3.12	288	24.00
i- Selling price			
- 5% Increase	2.12	69	33.38
- 5% Decrease	6.1	202	14.59
ii- Variable Cost			
- 5% Increase	6.2	96	14.08
- 5% Decrease	3.5	324	29.33
iii- Investment			
- 5% Increase	4.2	288	24.00
- 5% Decrease	3.10	18	25.33

See annexure VII for more details

CHAPTER VII**BUDGET**

The society's Budget for the first five years would be as under:-

YEARS	1	2	3	4	5
Revenue	3,154	3,437	3,437	3,437	3,437
Cost	2,890	2,967	2,974	2,980	2,988
- Variable Cost	(2,540)	(2,622)	(2,622)	(2,622)	(2,622)
- Fixed Cost	(350)	(345)	(352)	(358)	(366)
Profit	264	470	463	457	449
Repayment	-	180	180	180	180
Net Profit	264	290	283	277	269

(See Annexure-VII for more details)

CHAPTER VIII

RECOMMENDATIONS

The proposed project described in this report appears to be in line with present Government policy for livestock.

The project would provide the members society with a regular source of income. In its present design the project provides reasonable good returns for the society as well as for the members.

It would serve as a Model Project and livestock would develop through cooperative movement.

According to the financial analysis, the project is feasible.

ANNEXURE I

S. NO.	ITEM	ESTIMATED COST
01.	Cost for 8 Kanals land @ Rs. 30,000 per Kanal	Rs. 240,000
02.	Development Expenses	Rs. 80,000
Total:-		Rs. 320,000

ANNEXURE II

S. NO.	PARTICULARS	SIZE / AREA	RATE	ESTIMATED COST
01.	Office, Store, Gaurdroom, Toilet	500 Sq. Ft.	Rs. 200 Sq. Ft.	Rs. 100,000
02.	Broiler House	125 x 40 5000 Sq. Ft.	Rs. 90 Sq. Ft.	Rs. 450,000
03.	Brooder House	30 x 70 2100 Sq. Ft.	Rs. 90 Sq. Ft.	Rs. 189,000
04.	Water Tank	5000 Gln.	Lumsum	Rs. 40,000
05.	Boundary Wall		Lumsum	Rs. 20,000
06.	Other Renovation			Rs. 24,000
Total:-				Rs. 823,000

Annexure III

ESTIMATED COST OF MACHINERY

(In Rupee)

Sr No	ITEM	ESTIMATED COST
1.	3 Air Cooler @ Rs.2500	7500
2.	3 Heater (electric) @ Rs. 1000	3000
3.	100 Small Feeder @ Rs.50	5000
4.	25 Small Drinker @ Rs.50	1250
5.	200 Big Feeder @ Rs.100	20000
6.	25 Big Drinker (automatic) @Rs.500	12500
7.	Miscellaneous	1750
	TOTAL	51000

Annexure IV

ESTIMATED COST OF FURNITURE AND FIXTURE

(In Rupee)

Sr. No.	ITEM	QUANTITY	COST	TOTAL COST
1	Manager Chair	1	600	600
2	Assistant Chair	1	500	500
3.	Office Table	2	1000	2000
4.	Visitors Chairs	4	400	1600
5.	Guard Chair	1	300	300
6.	Miscellaneous			1000
	TOTAL			6000

Annexure V

DEPRECIATION

(In Rupees)

Year	Building and Civil work Rs. 823,000 @ 5%	Equipment, Furniture & fixture (51000 + 6000) = 57,000 @ 10%	Total
1	41,150	5,700	46,850
2	39,093	5,130	44,223
3	37,138	4,617	41,755
4	35,281	4,155	39,436
5	33,517	3,740	37,257
6	31,841	3,366	35,207
7	30,249	3,029	33,278
8	28,736	2,726	31,462
9	27,299	2,454	29,753
10	25,938	2,208	28,146
	330,242	37,125	367,367

Undepreciated Value	492,758	19,875	Rs. 512,633
	Undepreciated Capital (Land)		Rs. 240,000
	Working Capital		Rs. 450,000
	Salvage Value		Rs. 1,202,633

Annexure VI

LOAN REPAYMENT SCHEDULE

(In Rupees)

Year	Markup (Interest)	Principal Reimburse	Balance
1	-	-	-
2	25,200	180,000	1,080,000
3	25,200	180,000	900,000
4	25,200	180,000	720,000
5	25,200	180,000	540,000
6	25,200	180,000	360,000
7	25,200	180,000	180,000
8	25,200	180,000	-
Total	176,400	1,260,000	

(In Rs. 000)

SL.No.	DETAIL	YR 0	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10
A.	INVESTMENT	-1800	-	-	-	-	-	-	-	-	-	-
1.	REVENUE											
	Capacity Utilization		92%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Production (Birds)		55000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Average Weight of each Birds 1.5 kg		82500	90000	90000	90000	90000	90000	90000	90000	90000	90000
	Mortality Rate 6%		77550	84600	84600	84600	84600	84600	84600	84600	84600	84600
	i) Selling Price Rs.40/-		3102	3384	3384	3384	3384	3384	3384	3384	3384	3384
	ii) Faeces		36	36	36	36	36	36	36	36	36	36
	iii) Empty Bag		16	17	17	17	17	17	17	17	17	17
B.	Total Revenue (i+ii+iii)		3154	3437	3437	3437	3437	3437	3437	3437	3437	3437
2.	VARIABLE COST											
	i) Chicks		720	720	720	720	720	720	720	720	720	720
	ii) Feed		1640	1722	1722	1722	1722	1722	1722	1722	1722	1722
	iii) Husk		60	60	60	60	60	60	60	60	60	60
	iv) Medicine		120	120	120	120	120	120	120	120	120	120
C.	Total Variable Cost (i+ii+iii+iv)		2540	2622	2622	2622	2622	2622	2622	2622	2622	2622
3.	FIXED COST											
	i) Electricity		60	60	60	60	60	60	60	60	60	60
	ii) Administrative Exp.		24	24	24	24	24	24	24	24	24	24
	iii) Salary		180	180	189	198	208	219	230	241	253	253
	iv) Miscellenous		12	12	12	12	12	12	12	12	12	12
D.	Total Fixed Cost (i+ii+iii+iv)		276	276	285	294	304	315	326	337	349	349
E.	PBDI [E=B-(C+D)]		338	539	530	521	511	500	489	478	466	466
F.	Mark-up on Term Loan		25	25	25	25	25	25	25	25	25	25
G.	PBD [G=E-F]		313	514	505	496	486	475	464	453	441	441
H.	Depreciation		49	44	42	39	37	35	33	31	30	30
I.	Profit [I=G-H]		264	470	463	457	449	440	431	422	411	411
J.	Net Salvage Value of F.A		-	-	-	-	-	-	-	-	-	-
K.	Profit + Dep. + S.V		313	514	505	496	486	475	464	453	441	441
	Net Cash Flow	-1800	311	512	503	494	484	473	462	451	439	439
	Discounted Cash Flow at 15%	1	0.869	0.756	0.657	0.572	0.497	0.432	0.376	0.326	0.284	0.284
	NPV at 15% 773	-1800	272	388	331	283	241	206	175	148	126	126
	B/C Ratio 1.43											
	Discounted Cash Flow at 20%	-1800	260	356	293	239	195	159	130	106	86	86
	NPV at 20% 288											
	B/C Ratio 1.16											
	Discounted Cash Flow at 25%	-1800	249	328	250	204	160	125	97	76	55	55
	NPV at 25% -72											

IRR 24%

Pay Back Period 3.12 years

ANNEXURE VIII

(In Rs. 000)

INTERNAL RATE OF RETURN

YEAR	NCF	NPV AT 20%	NPV AT 25%
0	-1,800	-1,800	-1,800
1	313	260	249
2	514	356	328
3	505	293	258
4	496	239	204
5	486	195	160
6	475	159	125
7	464	130	97
8	453	106	76
9	441	86	55
10	1,631	<u>264</u>	<u>176</u>
		<u>288</u>	<u>-72</u>

$$\text{IRR} = 20 + (25-20) \times \frac{288}{288 - (-72)}$$

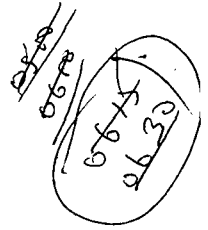
$$= 24\%$$

ANNEXURE / X

(In Rs. 000)

SL.No.	DETAIL	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR
1.	Profit	264	470	463	457	449	440	431	422	411	
2.	Loan Investment	-	180	180	180	180	180	180	180	-	
3.	Profit after payment of loan	264	290	283	277	269	260	251	242	411	
4.	Dividend Proposed @ 10%	-	29	28	27	27	26	25	24	41	
5.	Net Profit	264	259	253	248	240	232	224	216	368	

TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996



ORGANIC FERTILIZER PRODUCTION

Title of Project

PHILIPPINES

Country

Project Prepared by:

MR. CLAUDIO OFRANCIA

Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and

Executed by the ICA in collaboration with its Member Organisations
in India, Malaysia and Japan



ICA Management Training Project for Agricultural Cooperatives in Asia

INTERNATIONAL COOPERATIVE ALLIANCE

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P R E F A C E

ORGANIC FARMING is the solution to some serious problems confronting the Filipino farmer of today. First, the high cost of chemical fertilizer; second, the unabated conversion of ricefields into acidic soil as a result of continuous use of chemical fertilizers; third, the indiscriminate pollution of water sources and rivers due to excessive use of pesticides; and fourth, inorganic farming is not environmentally advantageous.

The Philippines, at present, is not capable of producing chemical fertilizer at a reasonable cost because its chemical components are mostly imported. Urea, for example, is 100% imported. Nitrogen, Phosphorus, Potassium and other chemicals are mostly imported. Sometimes, there is a shortage of chemical fertilizer supply, and if price hoarding arises, it usually give undue burden of additional expenses to the farmer which lessens his income to some extent.

The results of some various experiments and farm demonstrations of Filipino agriculturists and technicians in the efficacy of organic fertilizer proved that it can be as good, if not even better, than chemical fertilizer. Through proper formulation with some inoculants and complexes, rock phosphate, guano ore (bat manure deposits in mountain caves), compost materials, seaweeds and animal manure, the NPK requirements of Philippine soil can be met.

The Western Pangasinan Federation of Cooperatives, of which I am one of the Directors, is an organization which will undertake the production of organic fertilizer. It is strategically operating and doing business in an area where rock phosphate and guano ore are very much in abundance. Composed of 54 primary cooperatives, mostly engaged in agriculture, with 10,000 farmers tilling more than 15,000 hectares of riceland, organic fertilizer production has an immediate market. The members alone need more than 180,000 bags of organic fertilizer every cropping season (1 year). This means, a savings of more than P360,000 every harvest.

Considering the great economic effects of establishing an ORGANIC FERTILIZER PRODUCTION in Western Pangasinan, and the favorable considerations in using organic fertilizer in rice paddy production, this endeavor will not particularly benefit members of the proponent organization (WFFC), but to the farmers of the whole province and the whole region, in general.

I am honored to have been given this rare opportunity to prepare this PROJECT PROPOSAL on ORGANIC FERTILIZER PRODUCTION. It gives me great pleasure to express my sincere gratitude to ICA-JAPAN AGRICULTURAL COOPERATIVE MANAGEMENT TRAINING for ASIA and the PACIFIC, with Regional Office at NEW DELHI, INDIA to have qualified me to attend its 10th TRAINING COURSE.

I am cordially thankful to Mr. Tutsuro Oikawa, General Manager of IDACA, Mr. Yukio Abe, Programme Coordinator, IDACA-Japan, Dr. Daman Prakash, Project Director, and Mr. A.H. Ganesan, Programme Officer, both of the ICA, Professor G. Krishnamurthi, MPD/ Programme Coordinator of IRMA, for having inculcated in my eager mind, the tenets of efficient agricultural cooperative management and the necessary knowledge in the preparation of this PROJECT PROPOSAL.

Finally, I am also very grateful to my beloved wife, AURING, for her inspiring motivations, and to my dear sons and daughters, for their whole-hearted support. And also, my sincere thanks to Mr. Felix A. Borja, and his staff of CUP, AND TO MY fellow-Directors of the Western Pangasinan Federation of Cooperatives, the Pangasinan Cooperative Union, and finally to my fellow-Directors of the Regional Cooperative Union.

Notwithstanding the insurmountable tasks, problems, and requirements in establishing, and implementing this PROJECT PROPOSAL, especially on the budgetary aspect, I am deeply wishing and hoping anytime and somehow, any agency, organization, or any group, national or international, to extend their generous assistance. I am inviting any sympathetic and generous agency or group to kindly visit the site of the proposed project. and enjoy the friendliness and hospitality of my organization and that of its members. The proposed site is just a few kilometers away from the famous HUNDRED ISLANDS NATIONAL PARK.

This project, if realized, will served as a lasting memory of the economic cooperation and cooperative endeavor of all who have devoted their efforts and sacrifices for the progress and development of the cooperative movement.

ODI OFRANCIA
Philippines
1995-1996

PROJECT RATIONALE

The Filipino farmer has been using chemical fertilizer for quite sometime making him dependent perennially on it, as if chemical fertilizer is the only farm input that can provide him better production. Chemical fertilizer is easy to apply and is adapted to high-yielding variety rice (HYV). Without proper soil analysis, however, the use of chemical fertilizer is commonly of little effect because the NPK requirement of the soil is not adequately supplied. The inert material used in the production of chemical fertilizer in the Philippines by multinational manufacturers is lime or sand, usually the by-product of cement manufacturing. The lime-based of chemical fertilizer is 75% in weight against only 25% of the chemical component. When not properly applied, chemical fertilizer evaporates in the air, since it is volatile, or is washed out when the ricefield is flooded.

The use of chemical fertilizer is expensive. One bag (50 kg.) of complete chemical fertilizer is more than P300.00 (\$12.00) in the retail outlet, while organic fertilizer costs only P150.00 (\$6.00), or even less. A bag of urea costs more, because it is 100% imported, as with the other chemical components of the in-organic fertilizer like nitrogen, phosphorus and potassium. The accumulation of the lime component of the fertilizer converts the soil arid and acidic. Plants are more susceptible to plant diseases and are prone to infestations due to the soft tissues of plants fertilized with chemicals. Crops produced with in-organic fertilizer are not as nutritious as organically-produced crops. The use of chemical fertilizers and insecticides oftentimes leave poisonous chemical residues in crops which are in turn consumed. This fact has been the findings of experts. The use of chemicals has been giving more disadvantages to the human body since it is not conducive to good health. At times the grains contain poisonous residues which are destructive to the human body.

The use of chemical fertilizer has gradually deteriorated the productivity of the soil. Every cropping season, the expenses of the Filipino farmer has increased gradually, since he has to increase his farm input now and then in order to improve his yield. The high cost of fertilizer, seeds and labor, plus his problem on irrigation, compounded by his loans from informal money lenders, of which he has to pay an exorbitant interest, makes the Filipino farmer of today the most miserable farmer among ASEAN farmers. Another problem besetting farmers is the lack of proper technology in agriculture, and the use of antiquated method of farming. The lukewarm attitude of the government on agricultural progress and development also adds to the woes of the farmer.

Organic farming has been gaining attention in many agricultural countries, like Japan, Korea and India. Organic farming is environmentally friendly. It offers ecological stability and genetic diversity, promoting the complex natural system and increasing the fertility of the soil thereby improving its productivity and its organic matter content.

In Western Pangasinan, the area of responsibility of the Western Pangasinan Federation of Cooperatives, there is a great abundance of phosphate rock, and there are many mountain caves that yield guano ore (bat manure), which are very rich in Nitrogen, Phosphorus and Potassium. The Bureau of Mines of the Philippines can certify this fact. There are several primary cooperative-affiliates of the Federation who are on hand to supply raw materials for organic fertilizer production, through manual mining. Some have already secured their small-mining permits, and have already identified their quarries. The Department of Science

and Technology of the Philippines (DOST) is also available for technical and laboratory assistance and services. Several agricultural cooperatives of the region have expressed their support to the idea of establishing an organic fertilizer manufacturing in Western Pangasinan. Almost all of the farmer-cooperators of the Federation are very enthusiastic and hopeful to the realization of this noble idea of organic fertilizer production. Farmers have already realized the unfavorable effects of using chemical fertilizer. Recently, pests are rampant and it is believed that the scrupulous use of pesticides have made destructive pests and insects more invulnerable to the effects of chemicals. It is indeed high time that farmers must have to resort to the natural process of fertilizing the soil. Crops fertilized naturally are more sturdy, the stems are stronger and healthier and more resistant to plant and diseases and pests.

PROJECT AREA

Western Pangasinan is composed of eleven (11) towns, composed of the whole first district and a part of the second district of Pangasinan. There are 54 primary cooperatives in the Federation (WPFC) with a total farmlands of 15,000 hectares, owned by 10,000 cooperators. More than one-half of this area is irrigated and is planted mostly with rice. The Western Pangasinan Federation of Cooperatives, which holds office at the premier town of Alaminos, Pangasinan, the commercial and trading center of Western Pangasinan, has bought a one (1) hectare lot at Tagudin, Alabini, Pangasinan, five (5) minutes ride from the Federation office. In this lot, an Agricultural Complex has been envisioned by the members of the Federation, where 1,200 sq.m. concrete solar dryer is now existing, a multi-purpose warehouse of 375 sq.m. area has been built, housing two (2) mechanical dryers for paddy and maize, and a sack-making factory. Another smaller warehouse with a rice mill has also been established to serve the Federation members. The following have been planned to be built, depending on the availability of funding: Agricultural and Manpower Training Center, Farm machineries and Implements Display Center, and finally an ORGANIC FERTILIZER PRODUCTION PLANT.

This Agricultural Complex owned by the Federation is strategically situated at the heart of Western Pangasinan. It is accessible to all municipalities of the area, situated beside the national highway going to Olongapo City and Subic Bay in Zambales province. It lies just a few kilometers away from the world-famous 100 ISLANDS, a renowned tourist spot of the country where there is an abundance of multi-colored corals and colorful marine life conducive to scuba diving and sight-seeing.

The soil texture of the agricultural lands of Western Pangasinan is favorable for rice, corn, root crops, and vegetables. If fully utilized and developed, and the irrigation facilities are improved, a farmers' household can easily double his present income of P5,000.00 to P10,000 monthly. Farmers along the shoreline of Western Pangasinan are also proficient fishermen. When not busy in the rice fields, these farmers go to the sea for gainful fishing. Farmers of Western Pangasinan are slightly above the average Filipino farmer, considering his natural environment where rice, fish and vegetables are abundant. But due to the gradual rise of the inflation rate, the periodic increase of prices of commodities and the growing expenses in the living standards of the Filipino household, this average income of P5,000 a month of our farmers in our area is becoming insignificant. Two (2) years back, sugar cost only P12.00 per kg., today, it has spiralled to P25.00 per kg. The same is true with other prime commodities. There is, therefore, a need of improving the farmers' farm yield. By using the proper technology of farming and utilizing organic fertilizer, the yield can be increased and the natural productivity of the soil can be restored. Production expenses is also reduced remarkably.

THE PROJECT

The Western Pangasinan Federation of Cooperatives has the determination to supply its members with quality, low-cost, and natural organic fertilizer, by establishing an ORGANIC PRODUCTION PLANT, which will cost around 12.5 Million Pesos (\$500,000.00) with a production capacity of 5,000 tons of organic fertilizer annually. The general objective of this project is to produce quality organic fertilizer through the use of raw materials which abound in the area like rock phosphate, guano ore, sea-weeds, animal manure and plant residues, in combination with bacteria and fungi complexing inoculants. The project is to be established in one hectare lot owned by the Federation located at Tagudin, Mabini, Pangasinan, a very accessible place for all the 54 primary cooperative affiliates.

The proposed project is to be built in an underground complex to avoid pollution. The buildings are composed of two (2) warehouses, one for raw materials and another for finished products, and another building to house the plant. The three (3) structures will cost around 4.0 million pesos (\$160,000). The plant, machinery, equipment and laboratory (see annex pages of underground lay-out and manufacturing flow chart), will cost more or less 8.0 million pesos (\$320,000.00). The project is to be constructed in a period of 120 days (4 months), since the land is already developed, with an access road from the national highway. The Federation has accumulated more than 4.0 million pesos as equity to acquire around 8.0 million pesos financing loan for the project. The project can be operational after 4 months of construction and installation and can be ready for utilization to produce 75% of its capacity or a total of 3,750 tons production for the first year of operation. The recovery period is scheduled to 5 years since its financial rate of return is quite positive, considering the Federation's members as the captive market for its production. Around 15,000 hectares of ricelands, needing a fertilizer minimum requirement of 3,000 tons every year is awaiting the production of the supposed project.

The project total investment cost is P12,500,000 broken down to land investment of 2.0 million pesos, Plant, Machinery and Equipment, 5.0 million pesos, Buildings, 4.0 million pesos, and provision for raw materials and working capital of 1.5 million pesos. 8.0 million pesos is to be financed by a long-term loan with an interest of 10% p.a., and 1.5 million short-term loan (working capital) with an interest of 14% p.a. The remaining 4.0 million pesos is the equity of the Federation in the form of share capital and land cost. The ~~provision of raw materials~~ at the start of the project is necessary because the mining and gathering of raw materials is only possible during dry season (from December to April). The supply of raw materials for production for the whole year should be stored during the dry season. As much as possible construction period should start at December which is most adequate and timely.

The Federation owns two vehicles for hauling raw materials and for delivery of finished products to its members and outlet stores. These hauling trucks were acquired through Federation's Funds to the amount of 1.5 million pesos.

ORGANIZATION AND MANAGEMENT

The Western Pangasinan Federation of Cooperatives (WPFC) was organized on March 9, 1992 with an initial membership of 15 primary cooperatives and was registered with the Cooperative Development Authority (CDA) under registry no. DAG 2042 on June 9, 1992. The area of operation of the Federation is composed of eleven (11) towns of Western Pangasinan where the famous Hundred Islands tourist spot is found. These towns are: Agno, Alaminos, Anda, Bolinao, Burgos, Dasol, Infanta, Labrador, Mabini, Baui and Sual. The total farmlands covered by the Federation is approximately 15,000 hectares with almost 8,000 hectares irrigated.

To date, after four years of organization, the Federation has 54 primary cooperative members, with a total individual membership of 10,000 cooperators. Most of the coop members are engaged in farming, while some are fishermen, considering the long coastline covered by the Federation overlooking the China Sea (see accompanying Map).

The WPFC is directed and supervised by five (5) members of the Board of Directors, elected during annual general assemblies, and assisted by a set of committees, namely the Credit, Education and Training, Audit and Election Committees (See Organizational Structure). The Board of Directors is headed by the Chairman, who is the presiding officer. The rest of the four Directors are assigned specific directorship, as on Education and Training, Procurement and Marketing, Administration and Field Services. The officers are chosen from a cluster of primary cooperatives for equal representation in the Federation. Every primary cooperative member, through a Board of Directors, appoints five (5) delegates as representatives to the general assembly. These representatives take part in the democratic deliberations and elect the officers of the Federation. The Board of Directors elect among themselves the Chairman and Vice-Chairman, after the General Assembly. The Federation has approved the organization of a Project Management Committee, specifically to look after the projects of the Federation, as the Organic Fertilizer Production Project.

The WPFC holds office at 110 Quezon Avenue, Alaminos, Pangasinan, Philippines. The office is managed by a full-time Manager, assisted by a Management staff. The Federation has acquired a one-hectare lot at Tagudin, Mabini, Pangasinan, some 5 minutes ride from its Office. In this lot, the Federation has planned to establish an INTEGRATED AGRICULTURAL COMPLEX, wherein an existing building, housing two mechanical dryers for paddy and maize, a sack-making factory, and garage has been built. Another building, a rice paddy warehouse and rice mill is also being built. There is also a concrete solar dryer with an area of 1,200 sq. meters. The following structures are programmed to be established subject to the availability of financing: AN ORGANIC FERTILIZER PRODUCTION PLANT, A TRAINING CENTER FOR AGRICULTURAL TECHNOLOGY AND MANPOWER DEVELOPMENT, A SALT-IODIZING FACTORY, and a DISPLAY CENTER FOR FARM IMPLEMENTS.

The WPFC is destined to help and assist particularly thousands of farmers of Western Pangasinan, and of the whole province of Pangasinan, in general. Although it is still in its pioneering years of development, its officers and members are enthusiastic in its progress, and are united in developing it into a viable and fully-operating organization for production, processing and marketing. The Federation was primarily founded to uplift the socio-economic condition and quality of life of the farmers of Western Pangasiann, thru sustainable and equitable distribution of resources.

More specifically, the objectives of the Federation are the following:

1. Development and utilization of human resources;
2. Organization and promotion of farmers' cooperatives as instruments for better productivity;
3. Promotion of self-reliance, development of more livelihood projects, and encouragement of more agricultural activities to spur economic growth;
4. Promotion and establishment of cooperative activities, linkages, and other business ventures with other cooperatives and federations to enhance maximum production and systematic marketing of agricultural products and inputs;
5. Adoption and utilization of modern and appropriate agricultural technology;
6. Education and Training of cooperative members in all aspects of the cooperative movement;
7. Encouragement in the use of organic fertilizer and other environment-friendly agricultural inputs and methods of farming to promote ecological stability and help preserve mother Earth.

The Federation has been undertaking a continuous education and training of cooperative leaders and members. It also serves its members with post-harvest facilities, and help them market their produce. The members are provided with financial assistance thru distribution of farm inputs (seeds, fertilizer and cash for labor).

Due to the use of expensive inorganic fertilizer and chemical pesticides, farmers are incurring so much expenses in their agricultural productions, spending a sizeable part of their income, and only a meager part of it is left for their families.

The immediate concern of the Federation is financing. This is the common problem of cooperatives. Sourcing out funds from financial institutions in the Philippines is a very tedious and discouraging exercise, requiring a litany of requirements and the stringent policies of Banks, at times, lead to so much waste of precious time and money. The government is not quite enthusiastic in assisting cooperatives financially, primarily because of the tight economic situation of the country, and secondarily, because of the extra-focus of attention of the government to industrialization. The cooperative sector believes that agricultural development should be promoted simultaneous with industrialization, otherwise, an economic debacle will take place once a country rely on food importation to feed her population.

The Philippines has a vast agricultural potential with a total land area of 14.73 million hectares available for agriculture. Only 1/2 of this area is being utilized fully for production, while the other half is either planted for one cropping only due to lack of water supply or because farmers insist on the antiquated method of farming.

The Project Management Committee charged with the implementation of this project, has a strong organizational composition, composed of the Board of Directors and representatives from the Department of Science and Technology and from the financing institutions concerned in extending loan assistance. This Committee is assisted by a Project Manager and staff. There is an adequate coordinating relationship among the different departments that have specific roles and functions in relation to the project. (see annex Project Management Committee). Adequate policies are formulated and addressed to the committee for proper implementation.

PRODUCTION AND MARKETING

The ORGANIC FERTILIZER PRODUCTION PROJECT is designed to produce 5,000 tons of quality organic fertilizer annually. On its year of operation, it is expected to produce 75% of its capacity or 3,750 tons capable of providing fertilizer to a 10,000 hectare farmland for 3 croppings. The total cost of production for the first year of operation is P7,500,000 increasing by 10% on the succeeding years. Total sales revenue for the first year is P11,250,000. This is expected to increase by 10% correspondingly as the production capacity increases at the same rate.

The provision of raw materials, more particularly on rock phosphate and guano ore (bat manure) will start simultaneously with the construction and installation of the plant. Mining takes place from the month of December to the month of April, of which during these months the season is favorable for mining and quarrying. The supply of these minerals should be provided during these months to last for the whole year of operation. An adequate budget should be provided to procure 5,000 tons of minerals with an approximate cost of P1,500,000 production during the rainy season (May to November) will be continuous with the availability of enough supply of raw materials. This will ensure adequate supply of fertilizer for the on-coming cropping season.

The marketing aspect is quite systematic. Every primary coop-affiliate is required to formulate a policy, requiring all member farmers to use organic fertilizer produced by the Federation. This can be implemented through a credit scheme by distributing organic fertilizer payable every after harvest either in cash or in rice paddy. Other coop organizations who are non-members, may secure organic fertilizer by establishing a credit line with the Federation by proper negotiation and agreement.

BENEFITS AND JUSTIFICATION

As has been discussed in the previous sections of this proposal about the favorable and outstanding effects of the project, particularly on the remarkable reduction of the cost agricultural inputs in farming, it should be emphasized that the ill-effects of chemical fertilizer is threatening and is damaging crop production to a considerable degree year after year. The numerous benefits of using organic fertilizer should be given attention and importance. The soil must have to regain its natural productivity by improving its texture and matter content with organic farming, thus promoting the complex natural system of the environment. Organically-produced crops are conducive to better health, and a healthy citizenry builds a strong and robust national economy.

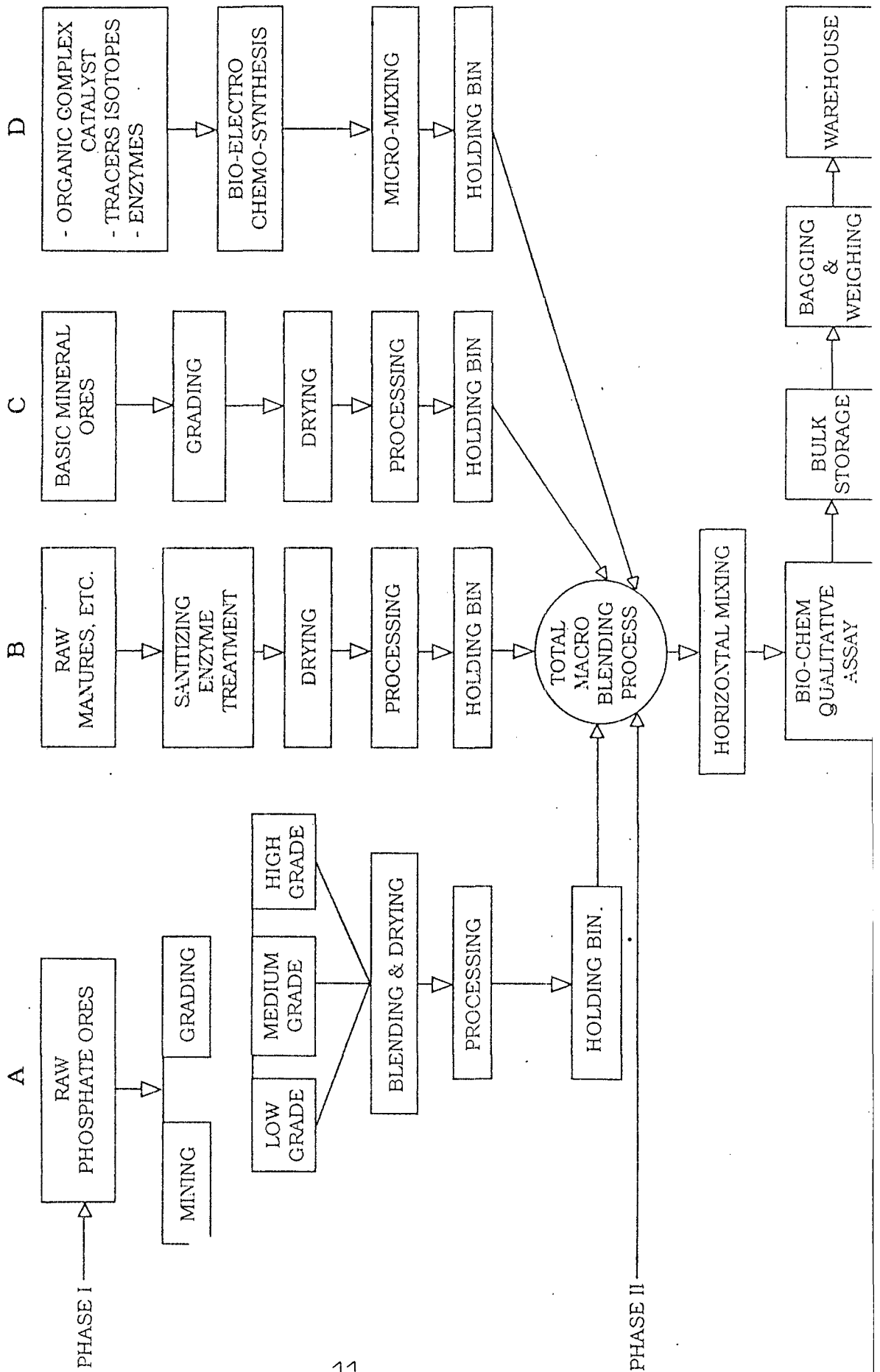
Aside from the above-mentioned benefits of the project, it is also labor intensive, considering the system of gathering minerals as guano ore and rock phosphate which are done manually. Manual mining is undertaken by cooperators. Also the supply of animal manures, plant residues and seaweeds is done by cooperators. This will provide additional activity and income to members of cooperatives.

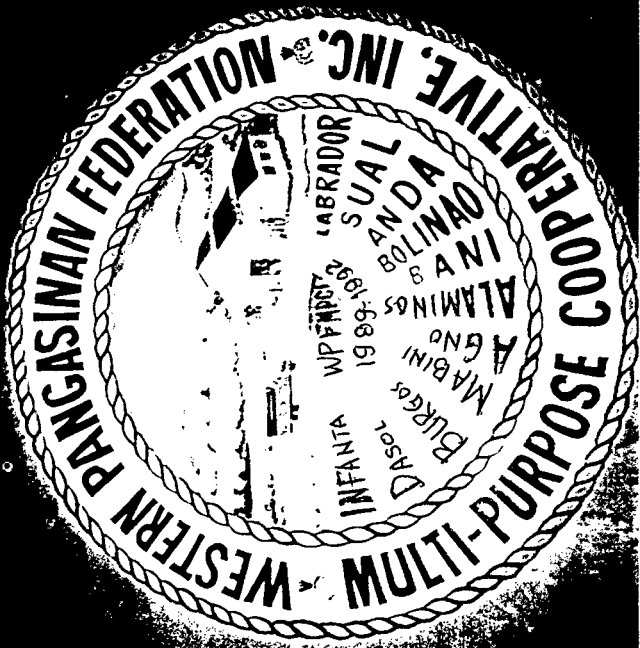
The desirability and significance of the organic fertilizer production is so outstanding and noteworthy, especially so when organic farming is gaining momentum in developing countries. Developed countries need organically-produced crops. The degree of importance of this endeavor is so remarkable that environmentalists, scientists, nutritionists, nature lovers and agriculturists are recommending the popular use of organic farming.

WESTERN PANGASINAN FEDERATION OF MULTI-PURPOSE COOPERATIVES
 ORGANIC FERTILIZER MANUFACTURING PROCESS

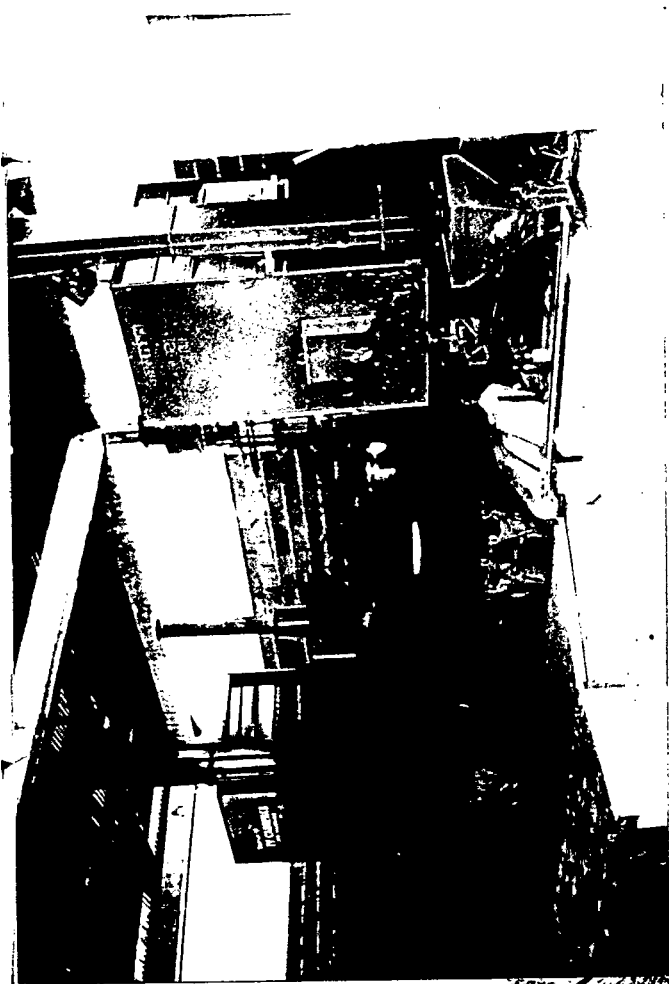
FLOW CHART

PROCESS & SYSTEMS
 DESIGN & FORMULATION



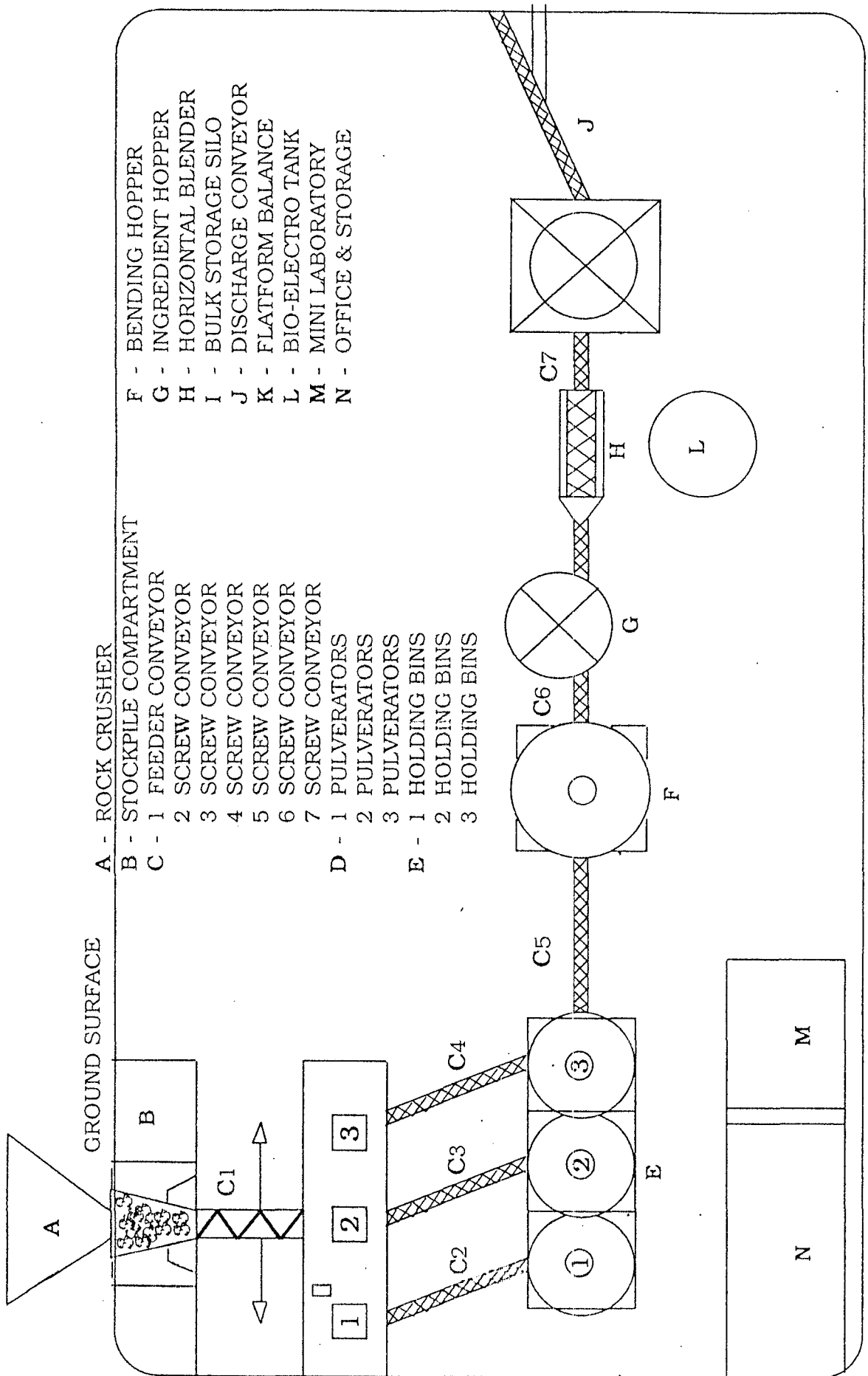


WPF ORGANIC FERTILIZER PRODUCTION - COMPOSED MATTERS W/ TRICHO DERMA



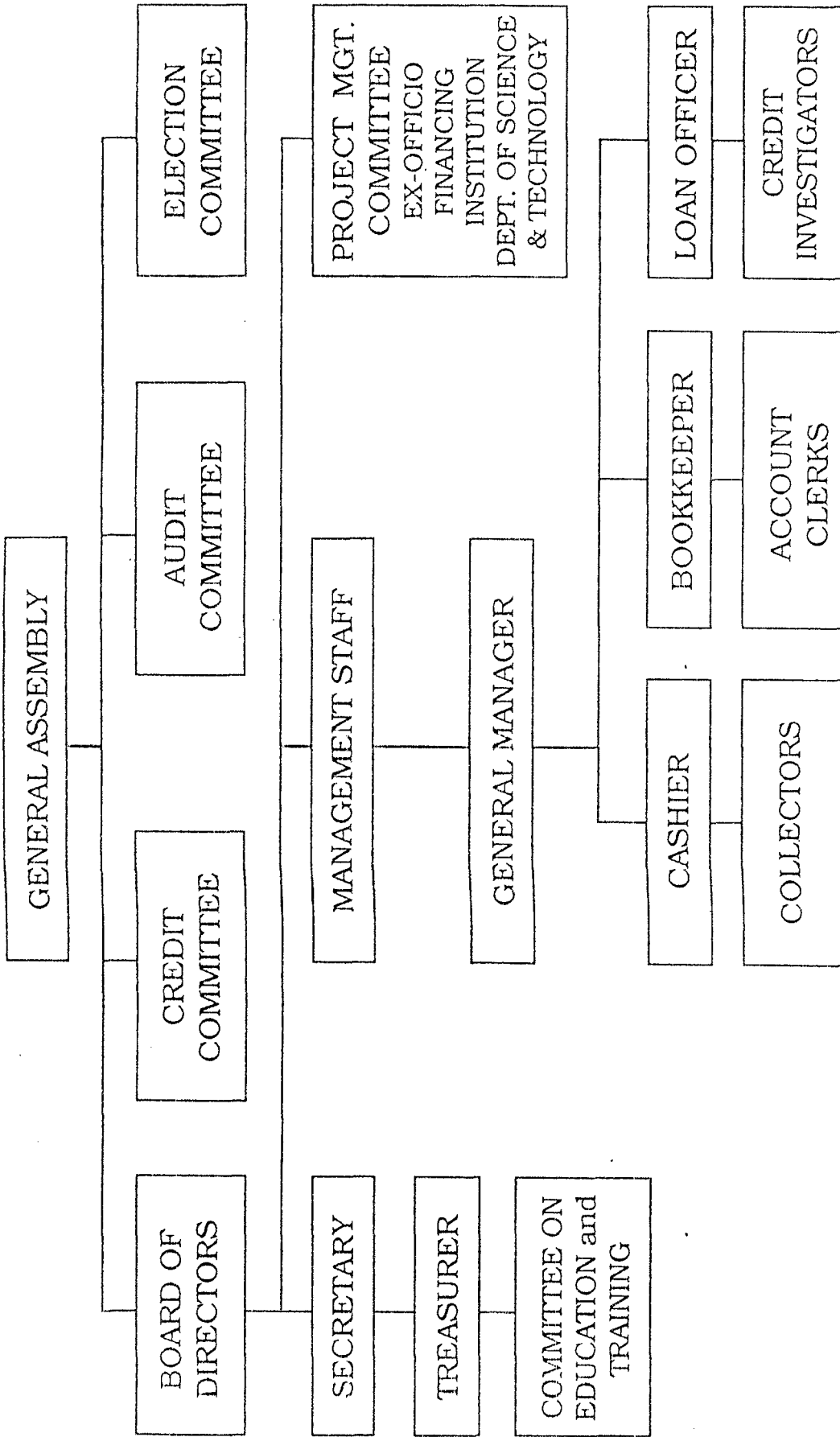
SOME OTHER FACILITIES OF WPFC - PRODUCTION - ORGANIC FERTILIZER

UNDERGROUND LAY-OUT OF ORGANIC FERTILIZER
MANUFACTURING COMPLEX ON A 500 SQ.M. AREA

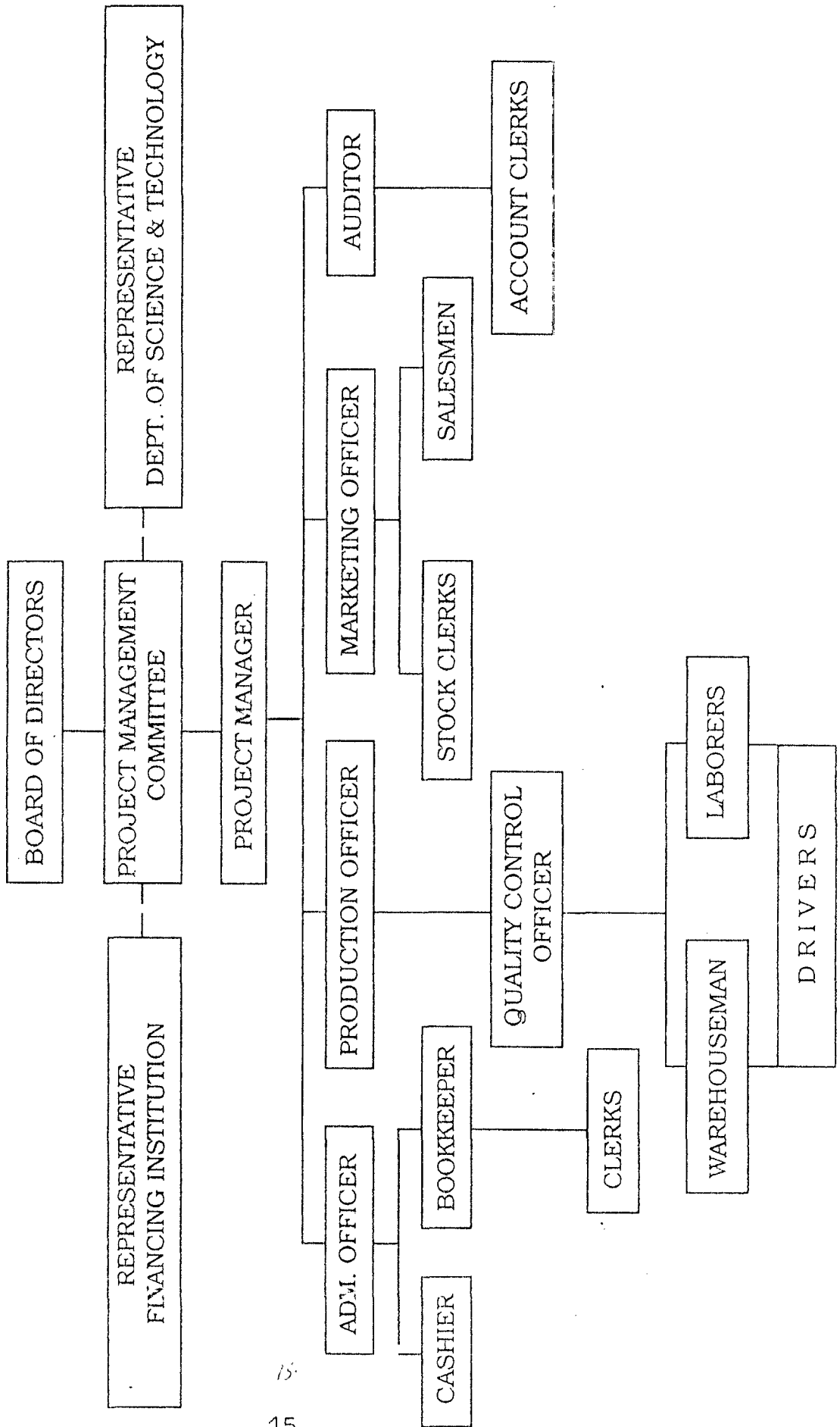


- A - ROCK CRUSHER
- B - STOCKPILE COMPARTMENT
- C - 1 FEEDER CONVEYOR
2 SCREW CONVEYOR
3 SCREW CONVEYOR
4 SCREW CONVEYOR
5 SCREW CONVEYOR
6 SCREW CONVEYOR
7 SCREW CONVEYOR
- D - 1 PULVERATORS
2 PULVERATORS
3 PULVERATORS
- E - 1 HOLDING BINS
2 HOLDING BINS
3 HOLDING BINS
- F - BENDING HOPPER
- G - INGREDIENT HOPPER
- H - HORIZONTAL BLENDER
- I - BULK STORAGE SILO
- J - DISCHARGE CONVEYOR
- K - PLATFORM BALANCE
- L - BIO-ELECTRO TANK
- M - MINI LABORATORY
- N - OFFICE & STORAGE

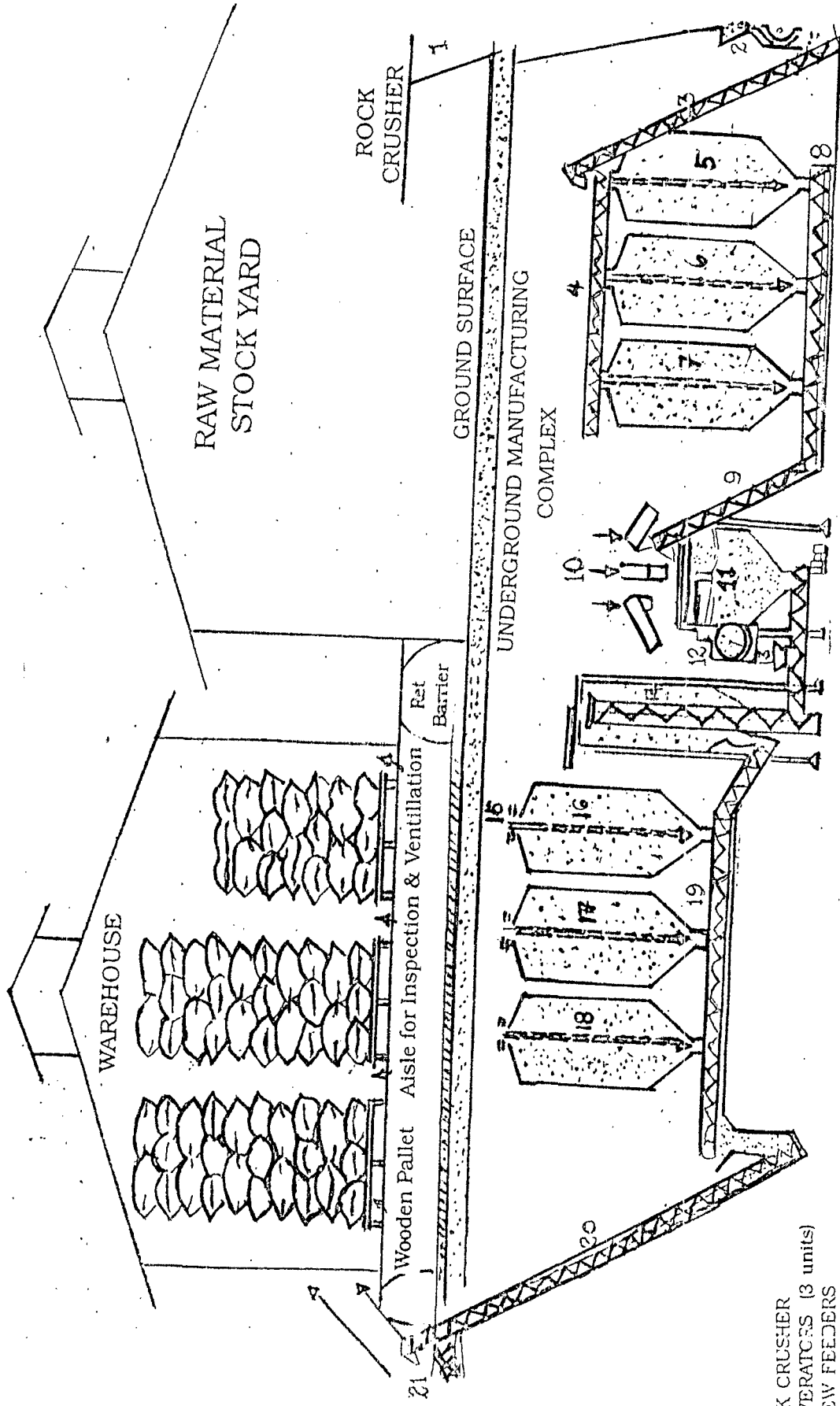
WPFC ORGANIZATIONAL STRUCTURE



WPFC PROJECT MANAGEMENT COMMITTEE



COMPREHENSIVE ILLUSTRATION OF THE ORGANIC FERTILIZER PRODUCTION PROJECT



- 1 ROCK CRUSHER
- 2 PULVERIZERS (3 units)
- 3 SCREW FEEDERS
- 3 pcs w/ elect motors
- 4 SCREW CONVEYORS W/ MOTOR
- 5-7 HOLDING BIN FOR PROCESSED ORES
- 8-9 SCREW CONVEYORS W/ MOTOR
- 10 ATOMIZER
- 11 BLENDING HOPPER
- 12 SCALE
- 13 INGREDIENT HOPPER
- 14 VERTICAL/HORIZONTAL BLENDER
- 15 AUGER DRIVE
- 16-18 BULK STORAGE BINS
- 19 SCREW CONVEYOR W/ MOTOR
- 20 SCREW DISCHARGE CONVEYOR W/ MOTOR
- 21 WEIGHING/PACKAGING PLATFORM
- 22 DUST COLLECTORS PROVISION (not shown)
- 23 BIO ELECTROLYTES STORAGE TANK (not shown)

FINANCIAL ANALYSIS OF THE PROJECT

1. Investment Costs for the first year (1997):

Land	-	P 2,000,000.00
Building	-	4,000,000.00 ✓
Plant, Machinery & Equipment	-	5,000,000.00 ✓
Raw Materials & Working Capital	-	1,500,000.00 ✓
Total	-	P12,500,000.00

II Plant capacity : processing of 5,000 tons of organic raw materials to produce with a yearly increase of 10%. In year 1, 75% of capacity is expected to be used for only 8 months operation. It will take 4 months for construction and installation of the plant. Mining and gathering of raw materials start simultaneous with the construction of the plant.

III Sales Prices : P3,000 per ton of organic fertilizer.

IV Raw Materials prices per ton
 Guano ores, Phosphate rocks, Animal Manures, Plant Residues and Bio-chemical complexing Inoculants - 1,400.00 ✓

V Packing Materials : P180.00 per ton

VI Labor Cost : P400.00 per ton

VII Water, Fuel & Electricity : P20.00 per ton

VIII Overheads : Administrative and Marketing Costs are estimated at P386.00 per ton

IX Depreciation Rates:
 Buildings - 10% P.A.
 Plant, Machinery & Equipment - 10% P.A.

X Project Life is assumed at 10 years

XI Working Capital Requirements

Cash and Bank	-	P50,000
Receivables	-	30 days sales
Inventories	-	30 days requirements (raw materials for processing and packing materials)

XII Interest:
 Long term Loan - 10% P.A.
 Short term Loan - 14% P.A.

XIII Distribution of Net Surplus (Dividends) shall be at the end of the 3rd year of operation. 60% shall be allocated for Net Surplus distribution and 40% shall be retained for project expansion and operation.

WPFC ORGANIC FERTILIZER PRODUCTION
Projected Income Statement
5 Years of Operation

	Year 1	Year 2	Year 3	Year 4	Year 5
SALES	11,250,000	18,150,000	21,961,500	26,573,415	32,153,853
Less: Cost of Sales	7,500,000	12,100,000	14,641,000	17,715,610	21,435,588
Gross Income from Sales	3,750,000	6,050,000	7,320,500	8,857,805	10,717,944
Less Expenses					
Administrative and Marketing	1,447,500	2,335,300	2,825,713	3,419,113	4,137,126
Interest Expenses	870,000	700,000	600,000	500,000	400,000
Depreciation Expense	1,170,000	1,170,000	1,170,000	1,170,000	1,170,000
Total Expenses	3,487,500	4,205,300	4,595,713	5,089,113	5,707,126
NET SAVINGS (LOSS)	262,500	1,844,700	2,724,787	3,768,692	5,010,818

CONTRIBUTION OF NET SAVINGS:

10% Reserve	26,250	184,470	272,479	376,869	501,082
10% CETF	26,250	184,470	272,479	376,869	501,082
10% Land and Building Fund	26,250	184,470	272,479	376,869	501,082
30% Interest on Capital	78,750	553,410	817,436	1,130,608	1,503,245
10% Patronage Refund	105,000	737,880	1,009,915	1,507,477	2,004,827
TOTAL	262,500	1,844,700	2,724,787	3,768,692	5,010,818

WPFC ORGANIC FERTILIZER PRODUCTION

Projected Balance Sheet 5 Years of Operation

A S S E T S

	Year 1	Year 2	Year 3	Year 4	Year 5
Current Assets					
Cash	382,500	1,648,325	2,854,667	4,389,816	6,208,689
Accounts Receivable	900,000	1,452,000	1,756,920	2,125,873	2,572,307
Total Current Assets	1,282,500	3,100,325	4,611,587	6,515,689	8,780,997
Property, Plant and Equipment					
Land	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Building	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Plant and Machinery Equipment	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Other Equipment	100,000	100,000	100,000	100,000	100,000
Intangible Assets	50,000	50,000	50,000	50,000	50,000
Total Property, Plant and Equipment	11,150,000	11,150,000	11,150,000	11,150,000	11,150,000
Less: Accumulated Depreciation	1,170,000	2,340,000	3,510,000	4,680,000	5,850,000
Net Book Value	9,980,000	8,810,000	7,640,000	6,470,000	5,300,000
TOTAL ASSETS	11,262,500	11,910,325	12,251,587	12,976,689	14,160,987

LIABILITIES, SHARE CAPITAL AND RESERVES

Current Liabilities					
Loans Payable - Current Portion	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Due to Apex Organization	13,125	92,235	136,239	168,435	250,541
Interest on Capital	78,750	553,410	817,436	1,110,608	1,500,245
Patronage Refunds	105,000	737,880	1,069,915	1,407,377	2,004,127
Total Current Liabilities	1,196,875	2,383,525	3,043,590	3,626,519	4,758,112
Long-Term Liabilities:	6,000,000	5,000,000	4,000,000	3,000,000	2,000,000
Total Liabilities	7,196,875	7,383,525	7,043,590	6,626,519	6,758,112
Members' Equity:					
Share Capital	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Reserves:					
Reserve Fund	26,250	210,720	483,199	860,068	1,361,150
Cooperative Education and Training Fund	13,125	105,360	241,599	430,034	680,575
Land and Building Fund	26,250	210,720	483,199	860,068	1,361,150
Total Reserves	65,625	526,800	1,207,997	2,150,170	3,402,875
TOTAL LIABILITIES, MEMBERS' EQUITY & RESE	11,262,500	11,910,325	12,251,587	12,976,689	14,160,987

WPFC ORGANIC FERTILIZER PRODUCTION
Projected Cash Flow Statement
5 Years of Operation

	Year 1	Year 2	Year 3	Year 4	Year 5
INFLOWS:					
Cash Sales	10,350,000	16,698,000	20,204,580	24,447,542	29,581,526
Loan Proceeds	8,500,000	0	0	0	0
Collections from Accounts Receivables	0	900,000	1,452,000	1,756,920	2,125,873
Total Receipts	18,850,000	17,598,000	21,656,580	26,204,462	31,707,399
OUTFLOWS:					
Acquisition of Assets	11,150,000	0	0	0	0
Production Costs	7,500,000	12,100,000	14,641,000	17,715,610	21,425,888
Repayment of Loans	1,500,000	1,000,000	1,000,000	1,000,000	1,000,000
Interest on Loans	870,000	700,000	600,000	500,000	400,000
Loan to Apex Organization	0	13,125	92,255	136,379	180,435
Patronage Refund	0	105,000	737,880	1,009,915	1,507,477
Interest on Capital	0	78,750	553,410	817,436	1,130,608
Administrative and Marketing	1,447,500	2,335,300	2,825,713	3,419,113	4,137,126
Total Expenses	22,467,500	16,332,175	20,450,238	24,678,313	29,799,534
Balance	(3,617,500)	1,265,825	1,206,342	1,526,149	1,907,865
Add: Beginning Balance	4,000,000	382,500	1,648,325	2,854,667	4,380,816
Cash Balance, End	382,500	1,648,325	2,854,667	4,380,816	6,288,681

Cost of Sales:

Raw Materials	5,250,000 /	8,470,000	10,248,700	12,400,927	15,000,000
Labor Cost	1,500,000 /	2,420,000	2,928,200	3,543,122	4,287,000
Overheads	750,000 /	1,210,000	1,464,100	1,771,561	2,143,000
Total Costs	7,500,000 /	12,100,000	14,641,000	17,715,610	21,429,000

Production Costs Per Ton

Raw Materials	1,400	1,540	1,694	1,857	2,029
Labor Cost	400	440	484	532	583
Overheads	200 /	220	242	266	291
Admin and Marketing Expenses	386	425	467	514	563
Total Production in ton	3,750 /	5,500 /	6,050 /	6,655 /	7,313 /
Selling Price per ton	3,000 /	3,300 /	3,630	3,993	4,383
Total Sales per year	11,250,000	18,150,000	21,961,500	26,573,415	32,153,199
Recatables: - 8% of Total Sales	900,000	1,452,000	1,756,920	2,125,873	2,572,256

SCHEDULE OF LOAN AMORTIZATION:

Long Term Loan: P8,000,000.00

Year	Annual			Total
	Principal	Amortization	Interest	Amortization
1	8,000,000 ✓	1,000,000	800,000	1,800,000
2	7,000,000	1,000,000	700,000	1,700,000
3	6,000,000	1,000,000	600,000	1,600,000
4	5,000,000	1,000,000	500,000	1,500,000
5	4,000,000	1,000,000	400,000	1,400,000
6	3,000,000	1,000,000	300,000	1,300,000
7	2,000,000	1,000,000	200,000	1,200,000
8	1,000,000	1,000,000	100,000	1,100,000
		<u>8,000,000</u>	<u>3,600,000</u>	<u>11,600,000</u>

B Short Term Loan - P500,000.00

<u>500,000</u>	<u>500,000</u>	<u>70,000</u>	<u>570,000</u>
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SCHEDULE OF DEPRECIATION:

	Total Cost	Est. Life	Percentage	Depreciation
Land	2,000,000	N/A	0%	N/A
Building	4,000,000	16 ✓	16% ✓	640,000 ✓
Machinery and Equipment	5,000,000	10 ✓	10%	500,000
Office Equipment	100,000	5 ✓	20%	20,000
Furniture and Fixtures	50,000	5 ✓	20%	10,000
	<u>11,150,000</u>			<u>1,170,000</u> ✓

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

**WASTELAND DEVELOPMENT : DRY ZONE :
NORTH-WEST OF SRI LANKA**

Title of Project :

SRI LANKA

Country :

R.B. GAMINI BANDARA

Project Prepared by :

**Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and
Executed by the ICA in collaboration with its Member Organisations
in India, Malaysia and Japan**



ICA Management Training Project for Agricultural Cooperatives in Asia

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First of all, I would like to express my gratitude to ICA ROAP and Japanese Government which provide me this very good opportunity to learn about the agricultural cooperative movement in Asian region.

And I would like to thank Dr. Daman Prakash, Project director of this programme, Mr. Ganasan and other staffs of ICA ROAP, ~~Mr. Prakash~~ and ~~the~~ faculty of IRMA for helping and sincere teaching for the successful gaining of objects, and I would like to specially thanks to Prof. Krishna Moorthi for his guidens in this project.

Through the training programme, I could gain ^{lots} ~~lots~~ of knowledges and important Concepts to improve management of agricultural cooperatives, and I could exchange very useful experiences with the other participants from other countries in Asia. Moreover I could enjoy sharing the real friendships with the participants during the training course in India.

I am also grateful to the NCC for giving me this good opportunity to participate in this training programme, and I would like to specially thanks to Ms. Jayanthi Nawarathna for giving valuable guidens and supporting very much in preparing this project.

February, 1996

R.B. Gamini Bandara

National Co-operative Council of Sri Lanka.

Chapter I. Summary

- 1.1 The project is to establish an Analog Forest (Agro Forestry System) in Maho AGA Division. The project will be implemented and conducted by the NCC and MPCS of Maho.
- 1.2 The object of this project is to increase the income of member farmers by introducing a new permanent sustainable cropping system and connecting the market channel to assure reasonable prices.
- 1.3 The target groups of this project are farmers in the Maho AGA division who are suffering from low harvest and low market facilities and many other problems.
- 1.4 Total investment of the project is about Rs. 3.13 millions.
- 1.5 The sources of fund from the People's Bank and NCC's own funds.
- 1.6 The capacity of the project is to develop 100ac. of wasteland belonging to dry-zone farmers in the North-west of Sri Lanka.
- 1.7 The products will be marketed through MPCS's and a private company which exports agricultural products.
- 1.8 The results of the financial analysis of the project are as follows :
B/C Ratio is 2.73 IRR is 54.22% NPV is 7,799,460.00 SLRs. They show the financial viability of the project during the project period which will be 10years.
- 1.9 The major components of the project are as follows :
Perennial fruit crops, timber trees of commercial value, annual crops, etc.
- 1.10 One person will be newly employed as a regular worker
- 1.11 The establishment period of the project will be one year from June 1st, 1996 to May 30th, 1997.

Project on the Wasteland Development

Dry Zone :- North-West of Sri Lanka

Chapter II. Back Ground Information.

According to the climatic conditions of Sri Lanka; the temperature and the annual rain fall, Sri Lanka is divided mainly in to two zones. They are known as the dry zone and the wet zone. In the rural areas of the dry zone, agriculture is the main income generating system. But the agriculture in rural areas can be divided in to two sections. They are:-

- (a). The Paddy Farming.
- (b). The Chena Cultivation.

This project is purely based on the system of Chena Cultivation in the dry zone of Sri Lanka.

Almost all the people of the dry zone are made to select chena cultivating. because they have of proper and systematic irrigation system. Therefore their cultivation is completely a rainfed system, and the harvest is always uncertain. Therefore the farmers who depend on the above system are embraced by poverty forever. This problem is made worse and more critical by the following conditions:

(a). Increasing Population.

Earlier with a small population farmers could cultivate their crops in a vast area of land. But with the increasing population they have to limit their land to one or two acres. Then they can not get a big harvest and it affects their income and lives.

(b). Continuous Cultivation.

With the increasing population the farmers had to limit their land area and cultivate the same plot of land continuously every season. So, the condition of the land deteriorates and thereby the harvest is reduced. It also finally affect the farmers.

(c). Irregular Management.

Even for the little land that each house hold owns, a regular and correct management system is not applied. They never apply conservation system to protect or develop the quality of the soil. So with the decrease in the quality of the soil, the amount of the harvest decreases. and it also affects the farmers lives.

(d). Drought.

Constant drought is a common incident in the dry-zone. Because the chena cultivation fully depends on rain water, the drought destroys fully or partially the farmers production. Thereby the farmers fall deeper in to poverty.

(e). Less Marketing Facilities.

Even for the little production they get, they do not have a proper marketing system. Most of the time the profit of their production is taken by the middle agent. So, they are still drawn into the depth of poverty.

(f). Unselable Crops.

The farmers in these areas are not sophisticated in the marketing system. They do not know about marketing crops. So, they never change their traditional marketless crops into new income generating, marketing crops. So, they can not sell their products and get a profit.

The National Co-operative Council of Sri Lanka (NCC) identified the above problems identified and implemented a project called "Sustainable Agriculture Through Environmental Conservation". This project is in its 5th. year of operation. This project was started as a pilot effort. But it has become a very successful and sustainable system to develop the standard of living of the dry-zone farmers of Sri Lanka. Therefore the National Co-operative Council has decided to expand the project to all over the dry-zone. The NCC expects to widen the catchment area while re-arranging and re-correcting the errors and mistakes they have found in the pilot project.

Under this project, the NCC is going to establish a forest model called “Analog Forestry”, which is very similar to the National Forest System in Sri Lanka in structure. For this purpose the NCC has selected perennial crops and fruits plants which are suitable for the environment of the dry-zone.

E.g.:- Mango, Cashew, Coconut, Teak, Jack fruits.....etc.

The NCC has introduced above crops, because they have a higher demand in the market than the traditional short-term crops. Thereby the NCC hopes and expects to uplift the standard of the chena cultivators of the dry-zone.

In addition to the NCC such projects have been implemented in the dry-zone by institutions such as the Ministry of Agriculture, the Animal Production and Health Department and the various non-governmental organizations.

Chapter III

PROJECT RATIONALE.

The Chena cultivation in the dry-zone of Sri Lanka has always been a loss for several reasons such as the increasing population, continuous cultivation, the irregular land management, the drought or less rain, less marketing facilities and the cultivation of marketless crops. These points are discussed in detail under the project back ground.

As a result of the above reason, the dry-zone chena cultivation are always poverty-stricken. They are socially backward. They have on social contacts or the urban society has no linkages with these people. Most of the state organizations have no direct link with them, because of several reasons. Mainly these villages are in the remote areas where there are no proper roads or transport facilities. So, these people are socially isolated or forgotten.

Not only that, but, also resources of modern technology do not flow to these villages because there not so much of valuable raw materials. The lack of transport facilities also contribute to this factor, to a certain level. So, these villages can not be technically developed.

After taking all above point into consideration the NCC decided to introduce "Analog Forestry" system to cope with these problems.

Instead of short-term traditional crops such as Mung-beans, Cowpea, Maize...etc., Under the Analog forest system perennial crops are introduced and cultivated. Thereby the NCC expects to develop two factors. The economical condition of the dry-zone farmers, and the environmental condition of the dry-zone.

(a). Economic Conditions.

Short term traditional crops; Mung-beans, Cowpea, Maize...etc., have no demand in the market. There is no stabilized market for those crops and so the farmer is always subjected to the exploitation of the black market or the middle agents. But for the perennial crops such as fruits and trees which have timber value there is very good demand in the market. This demand is always increasing. therefore by introducing this system the NCC expects to raise the economic condition of chena cultivation.

(b). Environmental Conditions.

As a result of clearing away the forests for chena cultivation in the dry-zone, the forest reserve of the dry-zone is highly decreased and it has been a reason for soil erosion, and the drought. Because the forest cover conserves soil, water and favorable climatic conditions. The NCC expects the Analog forest system might control the situation at least to a certain level.

3.1 Analog Forestry.

Analog forestry is a forestry technique that allows the development of a physical structure similar to the climax forest, and recreates a similar modified environment allowing many species of the original forests to extend their ranges, (Senanayake, 1989).

The project was started as a pilot effort a few years ago. At that period the NCC faced many difficulties when it went into operation. Poor farmers always expects not advice but some kind of monitory assistance or instant development. They either think or are made to think by social and economical factors, that perennial crops won't serve their purposes. But after working with them a few years, we have found that their negative attitude could change into the positive. So, finally the project has been successful and has become a model project among the farmers in The dry-zone. Now the NCC hopes to widen its area by another hundred acres in future.

Though the NCC needs to expand the Analog forestry project all over the dry-zone, at present, according to the available resources such as finance and the staff. The area of expansion has to be limited to maximum hundred acres.

3.2 Possible Risks and Alternatives.

The main risk that this project has to face is the market. But NCC has identified several market areas and they have been linked with the farmers. Specially the NCC has links with several companies. By whom such products are purchased and exported. So, the risk of the market can be minimized or stopped.

3.3 Area of the Project.

Situation.

Project area is Maho AGA's Division. This is situated in the Kurunegala district in the dry-zone, North Western Province of Sri Lanka.

Climatic Conditions.

Annual rain fall of this area is 1700mm. The rainy season is from December to January. The driest month is August. This is one of the areas in Sri Lanka which gets severely affected by drought.

Temperature.

Main annual temperature is 29.5°C and this is one of the relatively hot areas in the country.

Topography.

The land is mainly flat in this area. The total land area is 6250 acres.

Land Use.

Paddy farming, Chena cultivation and forestry are the main types of activities in this area. 37% of the total land area is agricultural land, 9% is forest land and 22% is used for paddy cultivation. Agricultural practices are mainly by using rain water.

Population.

The population in this area is 62,480 and 85% of the people live in rural areas. The main occupation of the people is paddy and chena cultivation. There are two cultivating seasons, Yala and Maha. Cultivation is done mainly during the Maha season. Some times these cultivations, including paddy are destroyed due to drought.

Administration.

There are 291 villages in this AGA Division and 52 schools and 26 religious centers. This AGA division consists of 104 village level administrative ("Gramasevaka") divisions.

Co-operative Movement in the Maho AGA Division.

There are two main types of Co-operative societies in this AGA's division.

(I). Multi-Purpose Co-operative Societies. (MPCS)

The only MPCS in the Maho AGA division is the Maho Multi Purpose Co-operative Society Ltd. This MPCS consists of 4300 members and 27 branch societies, and supplies consumer goods for the members and non-members through its retail outlets in these branches. It also provides transport services, and have a Rural Bank, Fuel Stations and Consumer Stores.

(II). Thrift and Credit Co-operative Societies.

There are 50 primary TCCS's, consisting 4806 members. Out of these 48 primary societies 23 have women's committees. These TCCS's supply loans, agricultural inputs and other various types of services to their members.

3.4 Problems Faced by Farmers in the Dry-zone.

Dry-zone chena cultivators are poverty-stricken because of several reasons :

1. **Limited land area :-** Many years ago, with less density of population the farmers had a chance to cultivate many acres of lands each season. But now, because the population is so big, that each farmer has to limit his land area to one or two areas. So, their harvest in comparison to the earlier, is very little, just enough for their home consumption.
2. **Less fertility of the soil :-** The farmers have to cultivate the same plot of land continuously, because of the shortage of land. But , they do not use proper agricultural practices to conserve the soil. So, the soil fertility is decreasing rapidly and it directly affects the harvest and finally the economy of the farmers.

3. **Periodical Drought :-** As a result of clearing the forest area for chena cultivation the forest cover has been reduced badly. This has affected the annual rainfall, and creates periodical droughts in the dry-zone. So, yearly most of the crops are destroyed and it affects the farmers economy.
4. **Low market Facilities :-** There are no proper market facilities for these farmers. Private traders and the middle men are the agents, who dominate the market and the price. Under this system profit goes not to the farmer but to the trendier.
5. **Less Demand for their Products :-** These farmers cultivate traditional crops such as Mungbean, Cowpea, Maize...etc. and those crops have no demand in the market. Sometimes these crops have alternatives and the price of them affect the price and demand of farmers products.

3.5 Need and Justification for the Project

To solve those problems of low harvest, limited land, devising soil fertility, periodical drought, low market facilities, low demand it is essential to have a Project which can assist to over come these difficulties.

The main role of this project is to introduce modernized, sustainable, cropping systems instead of traditional, unprofitable chena cultivation and linking proper market channels for the products.

Under this project sustainable perennial crops suited to the climatic conditions of the dry-zone will be planted according to organic farming system.

Organic garden products have a higher demand in the market. But farmers have no links with these marketing channels. Hereby it's expected to connect such marketing channels with the farmers directly and stop interference of middlemen.

Because this project will be conducted by the NCC, it's will be easy to keep in contact with other marketing organizations. Therefore the marketing risk can be reduced and the farmer can get a regular income.

The objective of the government is also to increase the income of the farmers, by means of such projects. So, it is easy for NCC to coordinate with the assistance of the government or any other organizations.

Chapter IV

THE PROJECT.

4.1 OBJECTIVES

To establish an Analog forestry model (Agro Forestry Models) to conserve soil, water and enhancing micro-climatic conditions while obtaining sufficient income; to be implemented by the primary TCCS members and MPCS members of the Maho AGA's division.

The specific goals would be to :-

- (a). Introduce an Analog Forestry Model as a sustainable cultivation practice for primary TCCS members and MPCS members as an alternative to the traditional unsustainable chena cultivation method.
- (b). Cultivate economically valuable mixed crops and trees in an environmentally sustainable Analog Forest.
- (c). Make way for the participants to earn sufficient income throughout the year.
- (d). Generate self-employment opportunities for primary level TCCS members and MPCS members.
- (e). Supply firewood and timber from analog forestry systems for participants and introduce fuel conservation methods to them.
- (f). Encourage the participants to minimize the usage of agro-chemicals and inorganic fertilizer and educate them on safe handling methods, when using agro-chemicals.

Location

:
Maho AGA's Division situated in the Kurunegala district in the dry-zone of North Western Province of Sri Lanka.

Area of Operation

:
The NCC hopes to establish hundred acres of Analog forestry on farmer's lands.

4.2 Components of the Projects.

1. Land area :-

The farmers lands which are marginal or abandoned due to low production.

2. Farmers :-

Primary and branch level Co-operative members who are interested in the project and own at least one acre of land

3. Educational Programmes :-

Training and educating the selected farmers to achieve the project objectives.

4. Plants :-

Perennial, economically valuable trees suitable for the area.

4.3 Detailed Features.

1. Meeting and holding sessions with Co-operative officers in the area.

- Meeting and holding sessions with Co-operative officers in the area. Thereby the NCC expects and wishes to enhance the officers awareness about the project portfolio and its new trend. The officers can understand their field problems and weaknesses and find remedies for them, according to the principles and the objectives of the NCC.

2. Organize meetings with the farmers in the dry-zone and discuss about the present agriculture situation.

- Organize meetings with farmers in the dry-zone and discuss about the present agriculture situation with the help of these meetings the NCC expects to study the on-going agricultural practices, the problems of the farmers.

3. Understand their social, economic and environmental conditions.

- Understand the farmers social, economical and environmental conditions. Thereby the NCC can understand the farmers problem, difficulties and attitudes and design the project to over come them.

4. Introduce the proposed project to farmers, Co-operative officers.
 - Introduced the proposed project. The participants or the involved people should have a proper understanding about the project before it is implemented. If not the project will be a failure here the NCC can make possible alternatives as to meet the need of the farmers before it is considered non-functional.

5. Hold educational programmes with the interested farmers (in stages).

Stages :-

 - i. Current agricultural situation.
 - ii. Introduce the proposed project.
 - iii. Introduce new methods for agriculture, such as
 - * Selection of suitable crops for the area.
 - * Soil conservation methods.
 - * Usage of organic manure.
 - * Soil moisture conservation.
 - Hold educational programmes with the interested farmers. These programmes are design for several purposes. The NCC can learn about the current agricultural practices in the area and the good points and the bad points of them. NCC can introduce the proposed project to farmers in these programmes for their approval and awareness. And also the NCC can introduce modern methods of agriculture, such as selection of suitable crops, soil conservation methods, organic manuring system and moisture-conservation etc.

6. Land preparation and soil conservation.
 - * Clearing the land.
 - * Contour marking
 - * Planting tree legumes based on contour lines.
 - * Planting perennial crops.
 - Land preparation and soil conservation. Here the NCC expects to educate the farmers in the correct methods of land preparation, contour marking, planting tree and legumes on contour lines and planting perennial crops.

7. Cultivating short-term crops along with the perennial crops.
 - Cultivating short-term crops with the perennial crops. By introducing the perennial crops, the NCC can not stop short-term crops cultivation. Until the farmers get the harvest of the perennial crops after about three or four years, farmers should have a way of income. Therefore the farmers have to be persuaded to grow short-term crops in a correct way without damaging the soil and environment.

8. Linking the farmers with the marketing channels.

- **Linking the farmers with the marketing channels.** Thereby the NCC expects to protect the farmer from the private traders and middlemen and give the full profit to the products to the farmers. Then the living standard of the dry-zone farmers will improve.

4.4 Supporting Services.

As supporting services, the NCC will organise training programmes and sessions to educate farmers in new agricultural practices, crop recommendations of the government departments, supply necessary instructions and information such as; animal husbandry, training and pruning, budding, integrated pest management and organic fertilizer preparation...etc. To hold these training programmes the officers of the NCC Regional Co-operative development centers and project officers will be available.

3. **Planing and Research Officer.**
 - (a). Planing and implementing.
 - (b). Reporting and analyzing.
 - (c). Organizing educational programmes.
 - (d). Publishing periodicals and documents on the project.
 - (e). Preparation of documentaries and slides.

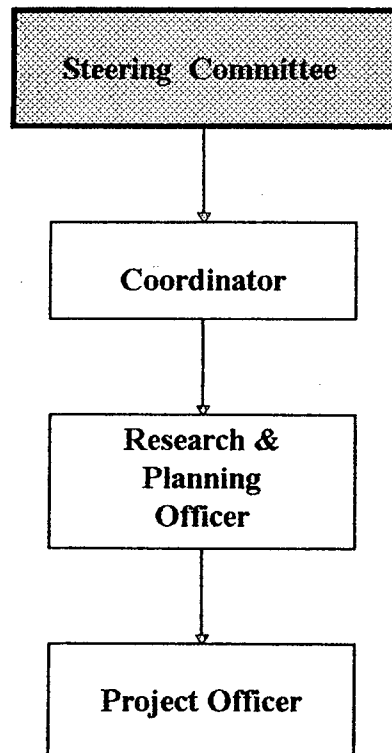
4. **Project Officer.**
 - (a). Handling all the field activities with farmers.
 - (b). Collecting of data and statistics.

5.4 Employment and Manpower.

The NCC has to recruit one Project Officer. The rest of the staff required for the project could be covered by the available staff of the NCC at present.

5.5 Organization Chart.

There should be created new organization for the operation of the project. The chart of which will be as follows :-



5.6 Recommendation.

Because this project requires funds for its implementation, it has to get the Co-operation of the Government or any other organization which can provide funds for the Project.

Chapter VI.

Financial Analysis.

6.1 Basic Assumptions.

Following assumption were made for the financial analysis of the project.

1. Assumed that 100ac., area of cultivable land could be accommodate for the project.
2. Total project life is 10 years including implementation year.
3. Funds will be given to the farmers as loan basis, and that money will be utilized for the continuation of the project. (as revolving fund)
4. Only few capital items were included of the project, because existing facilities in the National Co-operative Council will be utilized.
5. Used inputs and outputs prices are given bellow:

	Item	Input price/ Unit (Rs.)	Output price/ Unit
1.	Organic Fertilizer	2.50 /Kg	-
2.	Labour	100.00/Man/Day	-
3.	Plants		
	Coconut	35.00/Plant	4.00/Nut
	Mango	65.00/Plant	2.00/Fruit
	Cashew	20.00/Plant	35.00/Kg
	Woodapple	15.00/Plant	.50/Fruit
	Jackfruit	20.00/Plant	3.00/Fruit
	Banana	10.00/Plant	80.00/Bunch
	Lime	22.00/Plant	.50/Fruit
	Orange	65.00/Plant	3.00/Fruit
	Guava	65.00/Plant	.50/Fruit
	Pomegrante	30.00/Plant	10.00/Fruit
	Teak	15.00/Plant	-
	Magosa	15.00/Plant	-
	Halmilla	15.00/Plant	-
	Burutha	15.00/Plant	-
	Chilly	1050.00/Kg	100.00/Kg
	Greengram	45.00/Kg	20.00/Kg
	Gingerly	30.00/Kg	20.00/Kg
	Ginger	12.00/Kg	12.00/Kg
	Termaric	12.00/Kg	12.00/Kg

6. As discount factor 16% values were used for the calculation, because interest rate for the loan facility under the project expected to be 18%. 16%.
7. Sensitivity analysis was calculated considering 1%, 5%, and 10% cost over run values and 10% output price reduction.
8. Depreciation is calculated by considering 5% salvage value.
9. Traveling and field allowances will be paid by the NCC to the project officer.

6.2 Investment of the Project.

Project has to bear the first two years total cost of the project and project officer's salary in the rest of the year.

Total Project Cost Requirement

Item	Quantity	Amount (Rs.)		
		Year 1	Year 2	Year 3 - 10
1. Morder Bike	One	75,000.00	-	<i>Total</i> -
2. Agricultural Loan	100 Farmers	1,211,250.00	1,041,550.00	;
3. Salaries	1 Officer	60,000.00	66,000.00	679,536.00
Total		1,346,250.00	1,107,550.00	679,536.00

6.3 Cash Flow of the Project

Year	INFLOW		OUTFLOW		
	Sales	Salvage value	Capital Expenditure	Total Cost	Net Cash Flow
1.	375000.00	-	75000.00	1271250.00	- 971250.00
2.	450000.00	-	-	1107550.00	- 657550.00
3.	1005000.00	-	-	305889.00	699111.00
4.	3903000.00	-	-	1269457.00	3097265.00
5.	3939000.00	-	-	805735.00	3133765.00
6.	4060500.00	-	-	733014.00	3324486.00
7.	277720.00	-	-	288015.00	2489185.00
8.	2770000.00	-	-	308015.00	469985.00
9.	3487500.00	-	-	308015.00	3179485.00
10.	3811500.00	47273.00	-	308015.00	3550758.00

6.4 Working Capital Requirement.

4 Main concern of the project is to change the annual crop cultivation practice in to perennial based crop models. This would help to farmers to get continuous income from their farms.

So, that working capital requirement is to provide agricultural credit and to pay salaries to the project officers. This is the main portion of the project cost.

6.5 Calculated Financial Parameters.

NPV	7799460.00 7,750,612.00-Rs.
IRR	53.45 %
B/C Ratio	2.7

6.6 Sensitivity Analysis.

Assumptions	NPV	IRR %	B/C Ratio
1 % Total cost over run	7704955.00	52.68	2.67
5 % Total cost over run	7522326.00	49.75	2.57
10% Total cost over run	7294039.00	46.38	2.45
10% Output price reduction	6818978.00	45.67	2.43

6.7 Financial Viability of the Project.

Project analysis were conducted considering tow years investment period. Three economic factors were calculated to find viability of the project.

1. NPV (Net Present Value).
2. IRR (Internal Rate of Return).
3. B/C Ratio (Benefit Cost Ratio).

According to the calculated results NPV is positive in all levels including cost over run and price reduction levels. IRR is above 45.67% this shows that interest rate of the repayments increased up to this level with out harming to the repayment capacity of the interest. Also benefit cost ratio is above one is every level. This implies that project yield is higher than the project cost.

6.8 Re-payment Capacity.

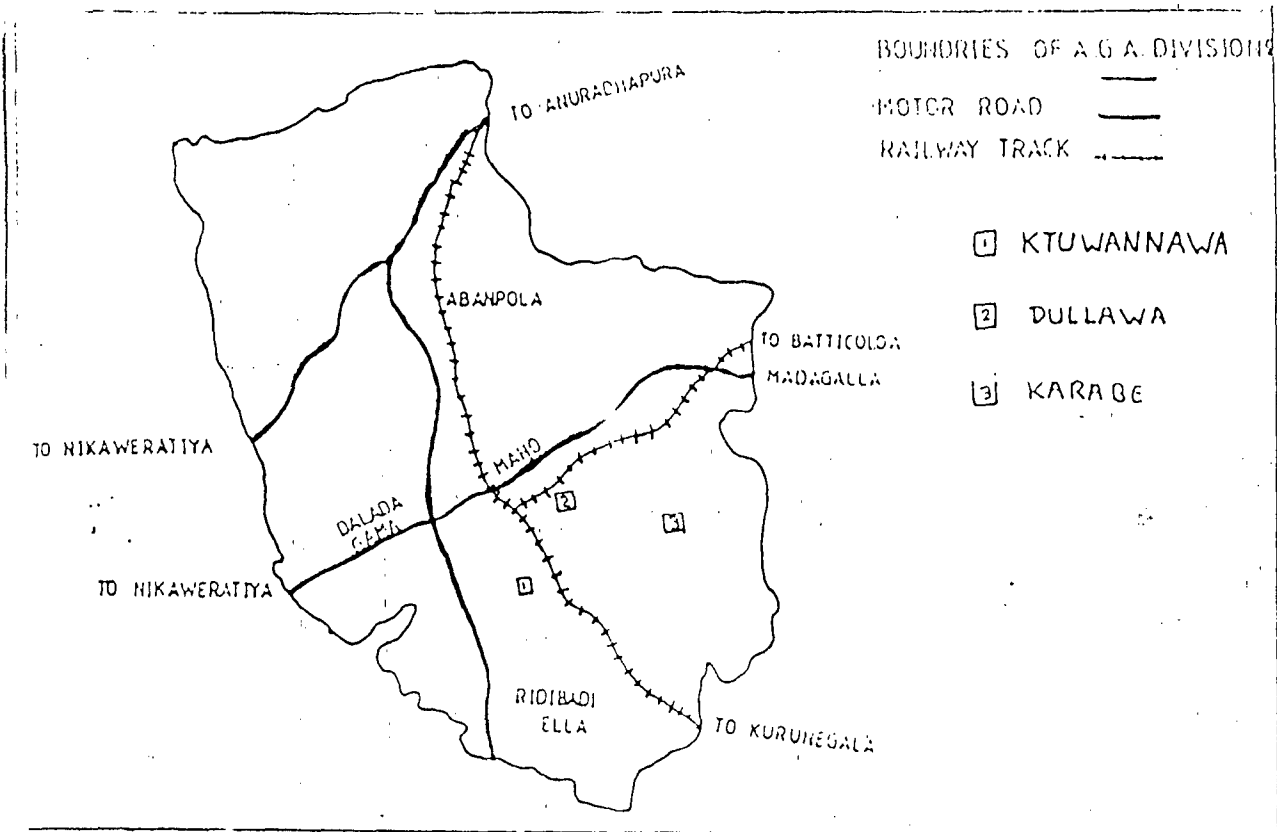
With out considering first two years income have to invest about 3.13 million of initial capital required. If consider this can not as loan that can be repay within fire years period allowing two year investment period and one year grace period.

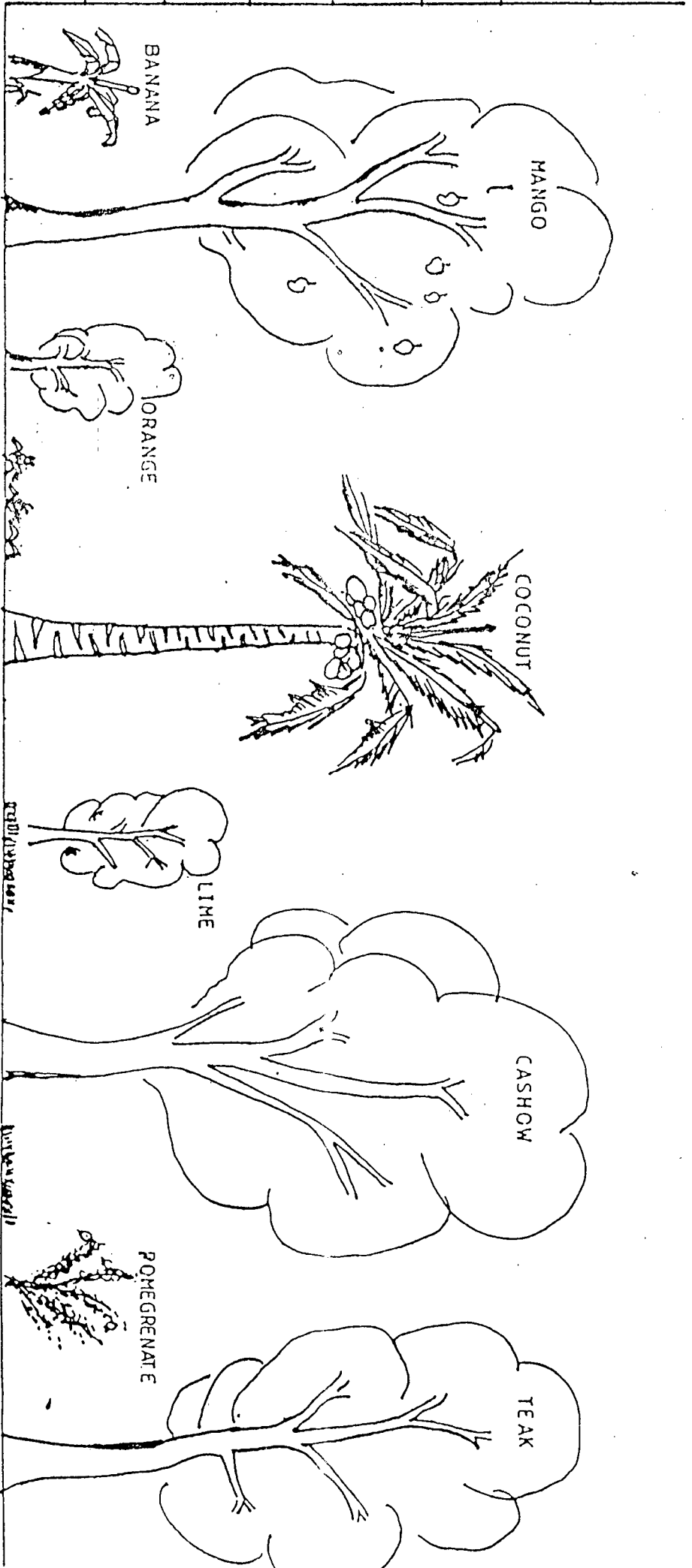
Loan Re-payment Schedule.

Year	Interest	Loan left	Installment
1.	215400.00	-	-
2.	501334.00	-	-
3.	501343.00	-	-
4.	501334.00	1450618.00	1951952.00
5.	269235.00	1682717.00	1951952.00

Appendix 1

MAP OF MAHO A.G.A. DIVISION





ANNEX 2

Appendix 3

Implementation Schedule of the Project.

	Activities	Time Requirement (Days)	Preceding Activity
A.	Internal decision making	30	-
B.	Getting the support from Funding agent	30	A
C.	Designing the Education Programme	5	A
D.	Selecting the Farmers	20	B
E.	Educating the Farmers	30	D
F.	Land Preparation	50	D
G.	Planting the Perennial Crops	20	F
H.	Cultivating the Annual Crops	10	F
I.	Linking the Farmers with Market Channel	30	H

Appendix 4

Activity	20	40	60	80	100	120	140	160	180	200
A. Internal decision making	30									
B. Getting the support from Funding agent		30								
C. Designing the Education Programme		5								
D. Selecting the Farmers			20							
E. Educating the Farmers				30						
F. Land Preparation				50						
G. Planting the Perennial Crops							20			
H. Cultivating the Annual Crops							10			
I. Linking the Farmers with Market Channel								30		

Appendix 5

List of Plants.

Canopy

- A. Mango
- B. Cashew
- C. Coconut
- D. Jakfruit
- E. Beli
- F. Woodapple

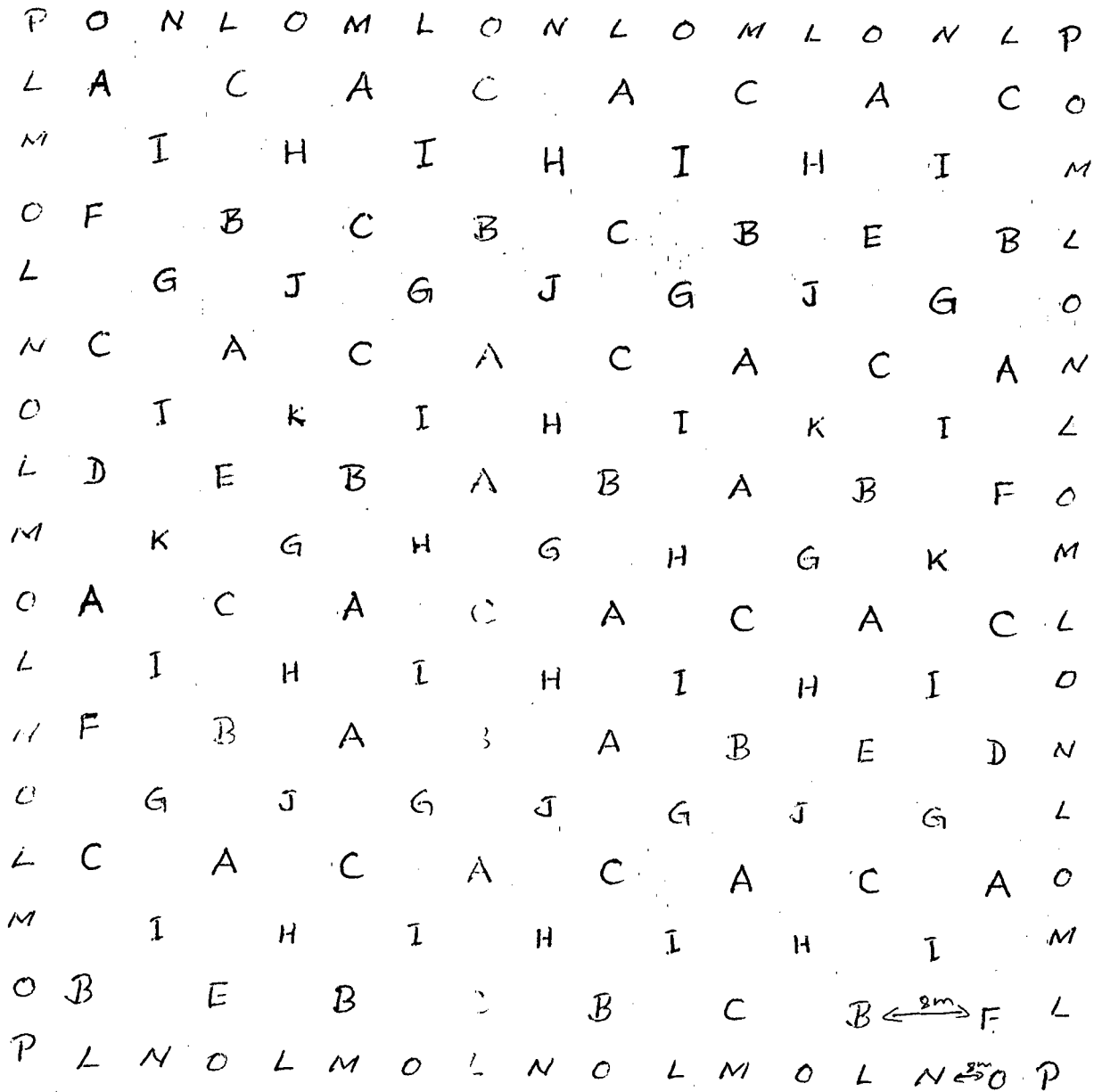
Sub Canopy

- G. Pomegranate
- H. Lime
- I. Orange
- J. Guava
- K. Other

Fence

- L. Teak
- M. Magosa
- N. Mahogani
- O. Halmilla
- P. Pihimbiya

Perennial Crops Modle of the Project.



- | | | |
|--------------|----------------|--------------|
| A. Mango | G. Pomegranate | L. Teak |
| B. Cashew | H. Lime | M. Magosa |
| C. Coconut | I. Orange | N. Mahogani |
| D. Jakfruit | J. Guava | O. Halmilla |
| E. Beli | K. Other | P. Pihimbiya |
| F. Woodapple | | |

Appendix 7

ITEM	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
INITIAL COSTS										
LAND CLEARING	100000.00									
PLOUGHING	250000.00									
MOTER BIKE	75000.00									
MATERIAL REQUIREMENTS FOR COCONUT										
SEEDLINGS	45500.00	4550.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ORGANIC MANURE	26000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOUR REQUIREMENTS FOR COCONUT										
DIGGING OF HOLES	40000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	10000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTANENCE	40000.00	50000.00	50000.00	50000.00	50000.00	50000.00	50000.00	50000.00	50000.00	50000.00
HARVESTING	0.00	0.00	0.00	0.00	10000.00	20000.00	30000.00	30000.00	30000.00	30000.00
MATERIAL REQUIREMENTS FOR MANGO										
SEEDLINGS	84500.00	8450.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ORGANIC MANURE	13000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOUR REQUIREMENTS FOR MANGO										
DIGGING OF HOLES	10000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	5000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTANENCE	15000.00	15000.00	10000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00
HARVESTING	0.00	0.00	0.00	0.00	10000.00	30000.00	30000.00	50000.00	50000.00	50000.00
MATERIAL REQUIREMENTS FOR CASHEW										
SEEDLINGS	26000.00	2600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FERTILIZER	13000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOUR REQUIREMENTS FOR CASHEW										
DIGGING OF HOLES	10000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	5000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTANENCE	15000.00	15000.00	10000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00
HARVESTING	0.00	0.00	0.00	0.00	10000.00	20000.00	30000.00	30000.00	30000.00	30000.00
MATERIAL REQUIREMENTS FOR WOOD APPLE/BELI/JACK FRUIT										
SEEDLINGS - WOOD APPLE	6000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- BELI	8000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- JACK FRUIT	4000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOUR REQUIREMENTS FOR WOOD APPLE/BELI/JACK FRUIT										
DIGGING OF HOLES	10000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	5000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTANENCE	10000.00	10000.00	8000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00
HARVESTING	0.00	0.00	0.00	0.00	10000.00	20000.00	25000.00	25000.00	25000.00	25000.00
MATERIAL REQUIREMENTS FOR BANANA										
SEEDLINGS	0.00	100000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FERTILIZER	0.00	100000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOUR REQUIREMENTS FOR BANANA										
DIGGING OF HOLES	0.00	60000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	0.00	10000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTANENCE	0.00	20000.00	10000.00	10000.00	10000.00	7500.00	0.00	0.00	0.00	0.00
HARVESTING	0.00	0.00	5000.00	5000.00	5000.00	2500.00	0.00	0.00	0.00	0.00
MATERIAL REQUIREMENTS FOR LIME/ORANGE										
SEEDLINGS - LIME	33000.00	3300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- ORANGE	97500.00	9750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FERTILIZER	30000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOUR REQUIREMENTS FOR LIME/ORANGE										
DIGGING OF HOLES	20000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	5000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTANENCE	20000.00	15000.00	15000.00	15000.00	15000.00	15000.00	15000.00	15000.00	15000.00	15000.00
HARVESTING	0.00	0.00	0.00	0.00	25.00	50.00	50.00	50.00	50.00	50.00

MATERIAL REQUIREMENTS FOR GUAVA\POMAGANATE

SEEDLINGS - GUAVA	26000.00	2600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- POMAGANATE	33000.00	3300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ORGANIC MANURE	15000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LABOUR REQUIREMENTS FOR GUAVA\POMAGANATE

DIGGING OF HOLES	10000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	3000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTENANCE	10000.00	10000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00
HARVESTING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATERIAL REQUIREMENTS FOR TEAK\MARGOSA\HALMILLA\BURUTHA

SEEDLINGS - TEAK	7500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- MARGOSA	7500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- HALMILLA	3750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- BURUTHA	3750.00										

LABOUR REQUIREMENTS FOR TEAK\MARGOSA\HALMILLA\BURUTHA

DIGGING OF HOLES	10000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FILLING OF HOLES WITH ORGANIC MANURE	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTENANCE	5000.00	5000.00	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HARVESTING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATERIAL REQUIREMENT FOR CHILLI

SEEDS	0.00	10500.00	0.00	10500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FERTILIZER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LABOUR REQUIREMENTS CHILLI

BED PREPARATION	0.00	50000.00	0.00	50000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ESTABLISHMENT OF PLANTS	0.00	15000.00	0.00	15000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTENANCE	0.00	450000.00	0.00	450000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HARVESTING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DRYING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATERIAL REQUIREMENT FOR GREEN GRAME

SEEDS	11250.00	0.00	11250.00	0.00	11250.00	0.00	0.00	0.00	0.00	0.00	0.00
FERTILIZER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LABOUR REQUIREMENTS

BED PREPARATION	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ESTABLISHMENT OF PLANTS	5000.00	0.00	5000.00	0.00	5000.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTENANCE	25000.00	0.00	25000.00	0.00	25000.00	0.00	0.00	0.00	0.00	0.00	0.00
HARVESTING	5000.00	0.00	5000.00	0.00	5000.00	0.00	0.00	0.00	0.00	0.00	0.00
DRYING THE HARVEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATERIAL REQUIREMENT FOR GINGERLY

SEEDS	15000.00	15000.00	15000.00	15000.00	15000.00	0.00	0.00	0.00	0.00	0.00	0.00
FERTILIZER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LABOUR REQUIREMENTS

BED PREPARATION	30000.00	30000.00	30000.00	30000.00	30000.00	0.00	0.00	0.00	0.00	0.00	0.00
ESTABLISHMENT OF PLANTS	1500.00	1500.00	1500.00	1500.00	1500.00	0.00	0.00	0.00	0.00	0.00	0.00
MAINTENANCE	10000.00	10000.00	10000.00	10000.00	10000.00	0.00	0.00	0.00	0.00	0.00	0.00
HARVESTING	15000.00	15000.00	15000.00	15000.00	15000.00	0.00	0.00	0.00	0.00	0.00	0.00
DRYING THE HARVEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATERIAL REQUIREMENT FOR GINGER

SEEDS	0.00	0.00	0.00	90000.00	90000.00	90000.00	0.00	0.00	0.00	0.00	0.00
FERTILIZER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LABOUR REQUIREMENTS

BED PREPARATION	0.00	0.00	0.00	50000.00	50000.00	50000.00	0.00	0.00	0.00	0.00	0.00
ESTABLISHMENT OF PLANTS	0.00	0.00	0.00	20000.00	20000.00	20000.00	0.00	0.00	0.00	0.00	0.00
MAINTENANCE	0.00	0.00	0.00	50000.00	50000.00	50000.00	0.00	0.00	0.00	0.00	0.00
HARVESTING	0.00	0.00	0.00	20000.00	20000.00	20000.00	0.00	0.00	0.00	0.00	0.00
DRYING THE HARVEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATERIAL REQUIREMENT FOR TURMERIC

SEED	0.00	0.00	0.00	90000.00	90000.00	90000.00	0.00	0.00	0.00	0
FERTILIZER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0

LABOUR REQUIREMENTS

BED PREPARATION	0.00	0.00	0.00	50000.00	50000.00	50000.00	0.00	0.00	0.00	0
ESTABLISHMENT OF PLANTS	0.00	0.00	0.00	20000.00	20000.00	20000.00	0.00	0.00	0.00	0
MAINTENANCE	0.00	0.00	0.00	50000.00	50000.00	50000.00	0.00	0.00	0.00	0
HARVESTING	0.00	0.00	0.00	20000.00	20000.00	20000.00	0.00	0.00	0.00	0
DRYING THE HARVEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0

SALARIES

FIELD OFFICER	60000.00	66000.00	72600.00	79860.00	87846.00	87846.00	87846.00	87846.00	87846.00	87846.00
INTEREST	0.00	0.00	39.56	97.32	114.50	118.28	119.11	119.29	119.33	119.
TOTAL COST	1346250.00	1107550.00	305889.56	1236957.30	805735.50	733014.28	288015.11	308015.29	308015.33	308015.

RETURNS

COCONUT	0.00	0.00	0.00	0.00	52000.00	78000.00	104000.00	104000.00	104000.00	104000.00
MANGO	0.00	0.00	0.00	0.00	208000.00	520000.00	832000.00	1040000.00	1560000.00	1560000.00
CASHEW	0.00	0.00	0.00	45500.00	136500.00	455000.00	455000.00	546000.00	546000.00	682500.00
WOOD APPLE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10000.00	10000.00
BELI	0.00	0.00	0.00	0.00	75000.00	90000.00	90000.00	90000.00	90000.00	90000.00
JACK FRUIT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BANANA	0.00	0.00	800000.00	1600000.00	1600000.00	800000.00	400000.00	0.00	0.00	0.00
IME	0.00	0.00	0.00	37500.00	75000.00	187500.00	281200.00	375000.00	562500.00	750000.00
ORANGE	0.00	0.00	0.00	45000.00	112500.00	225000.00	450000.00	450000.00	450000.00	450000.00
GUAVA	0.00	0.00	10000.00	10000.00	15000.00	15000.00	15000.00	15000.00	15000.00	15000.00
PEACH	0.00	0.00	70000.00	150000.00	150000.00	150000.00	150000.00	150000.00	150000.00	150000.00
CHILLI	0.00	300000.00	0.00	300000.00	0.00	0.00	0.00	0.00	0.00	0.00
GREEN GRAM	175000.00	0.00	0.00	175000.00	0.00	100000.00	0.00	0.00	0.00	0.00
GINGERLY	200000.00	150000.00	125000.00	100000.00	75000.00	0.00	0.00	0.00	0.00	0.00
GINGER	0.00	0.00	0.00	720000.00	720000.00	720000.00	720000.00	720000.00	720000.00	720000.00
TURMERIC	0.00	0.00	0.00	720000.00	720000.00	720000.00	0.00	0.00	0.00	0.00

SALVAGE VALUES OF EQUIPMENTS

MOTER BIKE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47273
TOTAL BENIFITS	375000.00	450000.00	1005000.00	3903000.00	3939000.00	4060500.00	2777200.00	2770000.00	3487500.00	3858773
DISCOUNTED BENIFITS (16%)	375000.00	387900.00	746715.00	2501823.00	2174328.00	1932798.00	1138652.00	980580.00	1063687.50	1014857
DISCOUNTED BENIFITS (16%)	375000.00	387900.00	746715.00	2501823.00	2174328.00	1932798.00	1138652.00	980580.00	1063687.50	1014857
DISCOUNTED BENIFITS (16%)	375000.00	387900.00	746715.00	2501823.00	2174328.00	1932798.00	1138652.00	980580.00	1063687.50	1014857
DISCOUNTED BENIFITS (16%)	375000.00	387900.00	746715.00	2501823.00	2174328.00	1932798.00	1138652.00	980580.00	1063687.50	1014857
DISCOUNTED BENIFITS 10% PRICE REDUCTION	337500.00	349110.00	672043.50	2251640.70	1956895.20	1739518.20	1024786.80	882522.00	957318.75	913371
TOTAL COST	1346250.00	1107550.00	305889.56	1236957.32	805735.50	733014.28	288015.11	308015.29	308015.33	308015.
DISCOUNTED COST (16%)	1346250.00	954708.10	227275.94	792889.64	444765.99	348914.80	118086.19	109037.41	93944.68	81006.
DISCOUNTED COST (16%) AT 1% COST OVER RUN	1359712.50	964255.18	229548.70	800818.54	449213.65	352403.94	119267.06	110127.79	94884.12	81815.
DISCOUNTED COST (16%) AT 5% COST OVER RUN	1413562.50	1002443.51	238639.74	832534.12	467004.29	366360.53	123990.50	114489.28	98641.91	85058.
DISCOUNTED COST (16%) AT 10% COST OVER RUN	1480875.00	1050178.91	250003.54	872178.60	489242.59	383806.27	129894.81	119941.15	103339.14	89102.
NET CASH FLOW	-971250.00	657550.00	699110.44	2666042.68	3133264.50	3327485.72	2489184.89	2461984.71	3179484.67	355075.
DISCOUNTED NCF AT 16%	-971250.00	566808.10	519439.06	1708933.36	1729562.01	1583883.20	1020565.81	871542.59	969742.82	93384.
DISCOUNTED NCF AT 1% COST OVER RUN	-984712.50	576355.18	517166.30	1701004.46	1725114.35	1580394.06	1019384.94	870452.21	968803.38	93303.
DISCOUNTED NCF AT 5% COST OVER RUN	-1038562.50	614543.51	508075.26	1669288.88	1707323.71	1566437.47	1014661.50	866090.72	965045.59	92975.
DISCOUNTED NCF AT 10% COST OVER RUN	-1105875.00	662278.91	496711.46	1629644.40	1685085.41	1548991.73	1008757.19	860638.85	960348.36	92574.
DISCO. NCF AT 10% OUTPUT PRICE REDUCTION	-1008750.00	605598.10	444767.56	1458751.06	1512129.21	1390603.40	906700.61	773484.59	863374.07	83236.

INTERNAL RATE OF RETURN AT 16%	54.22
INTERNAL RATE OF RETURN AT 1% COST OVER RUN	53.44
INTERNAL RATE OF RETURN AT 5% COST OVER RUN	50.49
INTERNAL RATE OF RETURN AT 10% COST OVER RUN	47.10
INTERNAL RATE OF RETURN AT 10% OUTPUT PRICE REDUC	46.39

NET PRESENT VALUE AT 16%	7799460.01
NET PRESENT VALUE AT 1% COST OVER RUN	7754291.20
NET PRESENT VALUE AT 5% COST OVER RUN	7573615.97
NET PRESENT VALUE AT 10% COST OVER RUN	7347771.93
NET PRESENT VALUE AT 10% OUTPUT PRICE REDUCTION	6567825.93

	DF 16%	1% COST INCREMENT	5% COST INCREMENT	10% COST INCREMENT	10% PRICE REDUCTION
SUMMATION OF DISCOUNTED COST	4516880.79	4562049.60	4742724.83	4968568.87	4516880.79
SUMMATION OF DISCOUNTED BENEFIT	12316340.80	12316340.80	12316340.80	12316340.80	11084706.72
NET PRESENT VALUE	7799460.01	7754291.20	7573615.97	7347771.93	6567825.93
BENEFIT COST RATIO	2.73	2.70	2.60	2.48	2.45

LOAN REQUIRED EXCLUDING INCOME	1346250.00	1787086.00							
TOTAL LOAN AMOUNT	3133336.00								
EQUATED INSTALMENTS	0.00	0.00	0.00	1951952.00	1951952.00	0.00	0.00	0.00	0.00
CAPITAL	0.00	0.00	0.00	1450618.00	1682717.00	0.00	0.00	0.00	0.00
TEREST	215400.00	501334.00	501334.00	501334.00	269235.00	0.00	0.00	0.00	0.00

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : **MARKETING OF ORGANIC FARM PRODUCTS**

Country : **SRI LANKA**

Project Prepared by : **CHANDRIKA SAMANTHI RAMANAYAKE EPAGE**

**Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and
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in India, Malaysia and Japan**



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MARKETING OF ORGANIC FARM PRODUCTS

The Development Project proposal
presented by

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C O N T E N T S

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CHANDRIKA SAMANTHI RAMANAYAKE EPAGE

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INTRODUCTION

Development of a marketing system for organic Farm Product has been a long felt need specially for the cooperative sector. Many scholars emphasised the necessity of an effective marketing strategy but, so far no one has been able to develop a system. So the time is opotune to develop a marketing system which will certainly brings about multiple benefits to the farmer, trader, and the consumer. The learning experience I gained from the first phase of the course motivated me to write a project document on this issue. The project document I submit includes the following.

The First and the Second chapters are devoted to an overview of Organic Farming in Sri Lanka. The Third and Fourth chapters discusses the need and objectives of the project. Chapter Five is totally devoted to explain the components of the project and the final chapter describes the management policy of the project and gives recommendation and conclusions.

Each chapter is supported by appendices and they are annexed to the project document.

CHAPTER I

SUMMARY

1.1 The project is to develop an affective marketing strategy for marketing of organic farm products. The project will be implemented and jointly run by National Cooperative Council and Swedish Cooperative Centre in the interest of Agriculture Cooperatives in Sri Lanka.

1.2 The terminal objective of this project is to strengthen the Socio Economic Condition of Organic Farmers in Agriculture Cooperatives.

1.3 The target group of this project are Organic Farmers in Agriculture Cooperatives, Youth Cooperators, Staff. and cooperators at "Pannala" Organic Farm Centre who are facing the problems of marketing their products.

1.4 The total initial investment of this project amounted to Rs. 3500,000.

1.5 The sources of funds are:

50% from the Youth Project administered by the SCC

30% from Peoples Bank Funds under the
institutional Development

20% from Agriculture Cooperatives.

1.6 Capacity of the project is to deal with almost all the items produced by "PANNALA Organic Farming Centre and other Agricultural Cooperatives.

1.7 The market share for organic Farm Products by Agriculture Cooperatives during the project period will be around 60%.

1.8 The capital city of Colombo, Major Provincial cities such as Kandy, Nuwara Eliya, Badulla, Matale, Anuradhapura, Kurunegala, Ratnapura, Galle, Matara will be the most important market places.

1.9 The major components of the marketing system are marketing centre , and Exhibition area in Colombo, distribution channel , long -term preserving storage system at PANNALA, vehicles for transportation , parking facilities at the marketing centre , packaging plant. Display racks Audio visual equipment etc.

1.10 The results of financial analysis of the project are as follows. Surplus for the Second half of the first year is Rs. 1546,000.

1.11 There will be a project staff initially for a contract period of three years (3). Staff will be as follows:

Marketing Manager	1
Exhibition Coordinator	1
Sales Assistant	2
Cashier	1
Driver	1
Security Officer	1
Field Executive	1
Purchasing Officer	1
Total	9

=====

1.12 The project will begin in July 1996 and will finishes by July 199⁹. During this period all the Physical resources and equipment will be assets of the SCC . Thereafter the project will run as an independent and viable business unit by the NCC.

CHAPTER II

BACKGROUND

In the good olden days farmers never used fertilizer to fertile their lands. The system adopted was well balanced with pattern of rainfalls , seasonal nature of climate, and the environment. We have heard that man had been dealing with its environment very friendly manner.

Recently
~~Reasonably~~ man has broken most of the connection with environment according to his views and his own benefits.

What was the final result? Any one of the living organism cannot get the best out of the natural environment. The people who understand the condition follow various methods as remedies to solve this problem of them Agriculture cooperatives in Sri Lanka have selected Organic Farming as their way to destination. That is of course a genuing attempt and they are making every possible efforts to put this system into operation once again.

What is "Organic Farming?" It is nothing but the "sustainable agriculture" which prevailed in all countries long, long time ago. The term sustainable agriculture is well defined by National Association for Sustainable Agriculture Australia Limited (NASAA) as follows.

"A SYSTEM OF AGRICULTURE ABLE TO BALANCE PRODUCTIVITY WITH LOW VULNERABILITY TO PROBLEMS SUCH AS PEST INFESTATION AND ENVIRONMENTAL DEGRADATION , WHILE MAINTAINING THE QUALITY OF THE LAND FOR FUTURE GENERATIONS".

"In practice this involves a system which avoids or largely excludes the use of synthetically compounded fertilisers, pesticides, growth regulators, livestock feed additives and other harmful or potentially harmful substances. It includes the use of technologies such as crop rotations mechanical cultivation and biological residues, animal manures, green manures , compost other organic wastes and mineral bearing rocks. The intention is to encourage natural biological systems."

The importance of organic Agriculture was put forward by the Swedish cooperative centre through National Cooperative Council. The Swedish Cooperative Centre in collaboration with the National Cooperative Council has launched a Youth Project in which organic farming is an important component. The broad objectives of this area of activity established under this project are training and Extension works, Entrepreneurship and income generating activities by youth farmers and cooperators.

There are organic farming Centres run by both Agricultural Department and some Non-Governmental Organizations (NGO's). On the one hand the Government particularly, the Agricultural Development Authorities play a very little role in popularising this system. On the other hand farmers attitudes towards the system is also not so positive.

But it is interesting to note that cooperative sector has taken steps to look after the Organic Farming System in several ways.

Firstly, the Agriculture cooperatives in Sri Lanka have taken a keen interest in introducing the system to their members. At present there are around 15 agricultural cooperative Societies, which are directly engaged in organic farming.

The National Cooperative Council of Sri Lanka in Colloboration with Swedish Cooperative Centre play a very important role in providing visionary guidance. necessary funds , Training and Extention. The National Cooperative Council runs an organic Farming Centre and it is located in "PANNALA" in the North Western Province of Sri Lanka.

It is a remote area but closer to the capital city of colombo. It has an area of 6 1/2 Hectares together with a training centre. The centre is jointly run by the National Cooperative Council and Swedish Cooperative Centre. Most of the activities are funded by the Swedish Cooperative Centre under the Youth Project.

Some of agricultural products and the services rendered by the Centre are as follows:

Cultivation of paddy, a variety of Vegetable, and fruit, Green Leaves. Livestock and Bee Keeping and Production of Bio Gas etc. Services rendered by the centre are Training and extension work for youth cooperators who are engaged in Organic farming and Research work. Farmers faced a series of problems when following the Organic Farming System depending on the province they cultivate and resources available. Lack of water, transportation, Labour, Technical know-how are some of the problems they face. Above all the most serious problem they face is the marketing of their products.

In general farmers have to face the problem of selling their products in any field of cultivation. We find in Sri Lanka the same problem has in the case of paddy, grain vegetable, fruit etc. moreover this problem becomes more critical in the case of organic farm products for many reasons.

CHAPTER III

NEED AND JUSTIFICATION FOR THE PROJECT

In chapter two I briefly explained the scope of my project, and also, I was made an attempt to introduce the most serious problem faced by organic farmers. In this chapter in keeping this situation in (my) mind I shall make an attempt to justify the need for this project.

As I mentioned in the previous chapter marketing of organic farm products becomes very importance when it compares with other probems faced the farmers. Therefore my justifacation for a need for an efective marketing strategy can be sumarized as follows.

Setting up of a maketing strategy is on important component of organic farming. Any farmer today is generally a specilist in growing products but not a specialist in marketing them. To fill the gap knowledge and skill of marketing one should have to develop a marketing system, So that their products are marketed in the most profitable way.

The topic of my project is also very relevant to my organization for a number of reasons. First, the organization I work for has taken a keen interest to introduce and promote organic farming throughout the country. Being the apex organization NCC (National Cooperative Council) has been able to implement this system through agriculture cooperatives. On the other hand my organization (NCC) and Swedish Cooperative Centre (SCC) jointly run a project for youth cooperators.

Organic farming is a major component of this project and therefore our organization has a bigger responsibility to develop a marketing strategy for organic farming products. Therefore this is a splendid opportunity for me to write a project report which would be of immense benefit to the organization and the country as well.

An added advantage of selecting of this particular topic is that there are several Non Governmental organizations which are interested in supporting organic farming. Thus chances of implementing the project are greater since they are willing to provide funds.

The Swedish Cooperative Centre is the oldest major donor for the cooperative sector in Sri Lanka and at present it has come to an agreement with the NCC to financially support the Organic farming Centre situated at " PANNALA".

CHAPTER IVOBJECTIVES(A) DEVELOPMENT OBJECTIVE

- To strengthen the socio economic conditions of organic farmers in Agricultural cooperatives by developing and implementing an effective marketing system for their products.

(B) PROJECT OBJECTIVES

- To widen the marketing channels for organic farm products.
- To strengthen the socio Economic condition of organic farmers in an open market environment
- To raise the income levels of organic farmers by increasing the productivity and allied activities.
- To develop a marketing strategy through which not only the uninterrupted supply of organic farm products is ensured but also the continuous selling of products is ensured.
- To increase the level at consumption of organic farm products by raising the level of confidence for such products.
- To increase the number of organic farm cooperators and to promote the interest in organic farming among them.

CHAPTER VCOMPONENTS OF THE PROJECT

The main components of the project are as follows:

1. Diversification of organic farm products.
2. Setting up of an information system for marketing of organic farm products.
3. Formulation of a Marketing policy.
4. Expansion Programme for "PANNALA" organic farm centre.
5. Distribution system for marketing of organic farm products.
6. Purchasing and development of a Marketing Center in Capital city of Colombo.

V (1) DIVERSIFICATION OF ORGANIC FARM PRODUCTS :

At present a variety of organic farm products are produced by farmers in Sri Lanka. A good illustration is that members of Agriculture cooperatives and the organic farming centre at PANNALA itself produce the following varieties.

GRAIN PRODUCTS : Paddy, Mace, Cowpea, Greengrams,
Blackgrams.

VEGETABLES : Brinjols, Green leaves, Karavila,
pumpking, carrot, cabbage and a
variety of yams. bittergoat.

FRUIT : Pineapple, pappo, passion fruit, Mango,
Jack fruit, cashu-Nut, Anoda, Orange,
Rambutan, Butterfruits, Lemon.

However the quantities of production are not sufficient to meet the demand of consumers. Further the product range are not diversified enough to suit the needs of consumers. A planned diversification programme will be launched throughout the project period and at it will be as follows :

(01) Since the demand for vegetable products under organic Agriculture system has a growing demand the product range will be diversified as given in the table below.

(02) Fruit cultivation will also be diversified. However climatic conditions of each area will be taken into consideration when selecting the types of plant.

(03) There is a big demand for livestock and poultry products and therefore the area will be spanned with by increasing numbers of animals and the area of cultivating gran.

It is planned to implement a diversification programme as per details given below :- TABLE 1

CROP	area cultivated to be increasing by	Crops under Diversification
Grain	10%	Black Gramme, Green Gramme, Soya bean
Vegetable	30%	Carrot, Beet root, Cabbage, Green Leaves
Fruits	50%	Orange mango, Rambutan Butter fruit, Anoda
Livestock & Poultry	10%	Meet, Curd

V(2) SETTING UP OF AN INFORMATION SYSTEM FOR MARKETING OF ORGANIC FARM PRODUCTS : -

At present there is no proper information system to gather information regarding organic farm products. a new system will be devised and will include the followings:

- (1) Communication facilities for pannala organic farm centre.
- (2) Maintaining of all data pertaining to crops, quantity produced quality of products yield per hectare etc.
- (3) A computer will be used to tabulate and analyze data.
- (4) All the agriculture cooperatives who are engaged in organic farming activities will be requested to send marketing information on the following basis in order to plan, sales.

- (1) expected yield for week ahead
 - (2) Crop-wise Quantities of production
 - (3) Cost of production
 - (4) Breakdown of cost
- (5) The Demand for organic farm products will be analysed through a market survey and the information revealed from this study will be used to plan production and sales.

V(3) MARKETING POLICY

Present Market for Organic Farm Products :

Published data not available, pertaining to the present market for organic farm products, but PANNALA and NAWALAPITIYA FARMS. maintain data but, that is not the overall picture of the total sales. An outstanding feature of the demand for these products is that middle class, upper middle class, and Interlectuals, scientists, their associated family members, and friends have shown a great interest in buying these products. Since they know the value of these products.

Market for Organic farm products is expandable for many reasons :

- (1) Today there is a wide spread awareness among people regarding the harmful nature of chemical fertilizer and pesticide.

- (2) There are evidence and real incidents for the above one (1).
- (3) There is and an increasing awareness about the environment conservation.
- (4) There is a well planned publicity campaign is carried out in almost major towns favorable to organic farm products.
- (5) Government Media such as T.V. Radio also publicise the importance of Organic Agriculture.
- (6) Not only the organization in the cooperative sector but also some other institutions, Semi-Governmental institution and NGOS have also shown keen interest in supporting organic farming system. The marketing policy for organic farm products will be determined by a series of factors which can be tabulated as follows:

TABLE 2

Marketing Factor	Consumer Analysis
(1) Who are the potential customers	upper middle class. Professionals. Intellectuals, family members and their associated friends.
(2) Why would the consumers buy organic farm products	for long living, High Nutrition Value, Durability and more tasty.

Contd..

-
- (3) Where would consumers by the products Super markets, Coop-city Markfed, and proposed marketing centre in Colombo.
-
- (4) What is the most appropriate pricing policy Mark up price
-
- (5) To what extent packaging necessary To a certain extent only
-
- (6) What is the acceptable Quality of products and will their be different levels of quality Freshness of product will be secured through to a series of quality checks. The Quality will be assured not only at farm gate, but also at the selling point. There want be different quality levels.
-
- (7) How does the profit is determined profits are to be earned but not abnormal profit.
-
- (8) How the distribution channels are operating There will be uninterupted supply of products to the market. The field Executive's main task is to ensure that products are distributed without any break.
-
- (9) Promotional Strategy A planed promotional strategy will be implemented, and will include contest, prizes for winners who participate in Exhibition.
-

V.(4) EXPANSION PROGRAMME FOR ' PANNALA" ORGANIC FARM CENTRE.

There are four (4) major organic farms in Sri Lanka. The one situated at pannala in North Western Province belongs to the NCC. Other two are located in Nawalapitiya and Galaha, in the hill country. The organic farm at Peradeniya which is ^{close} ~~does~~ to the world famous botanical Garden is run by an Agriculturist. all these farms have training facilities and sufficient land, plants for Training and extension works. The centre provides Training and extension work to members of Agriculture cooperatives and youth cooperators.

The main course on Organic farming is conducted in four stages. The first programme will be 5 days residential programme and other three (3) in three days each residential Training. Trainees who will be selected for this training should meet the following minimum requirements.

- (1) A Trainee should have one hectare of land
- (2) Should possess or agree to ^{have} ~~include~~ two cows, two goats or two pigs.
- (3) Availability of raw material to organic fertilizer within the locality of his or her land.

Geographical background of the centre are given below.

- 1) District - Kurunegala (North western Province)
- 2) Electorate - Katugampola
- 3) A G A Division - Pannala
- 4) Grama Sewa Division - Mellawalana

Climate

- 1) Annual Rainfall - 122 mm (within the wetzone)
- 2) Elevation - 50 Mtrs. (from the sea level)
- 3) Soil colour - Red
- 4) Temperature - Maximum 35.6F (September)
Minimum 18.9 (February)

The crops which are grown in the area

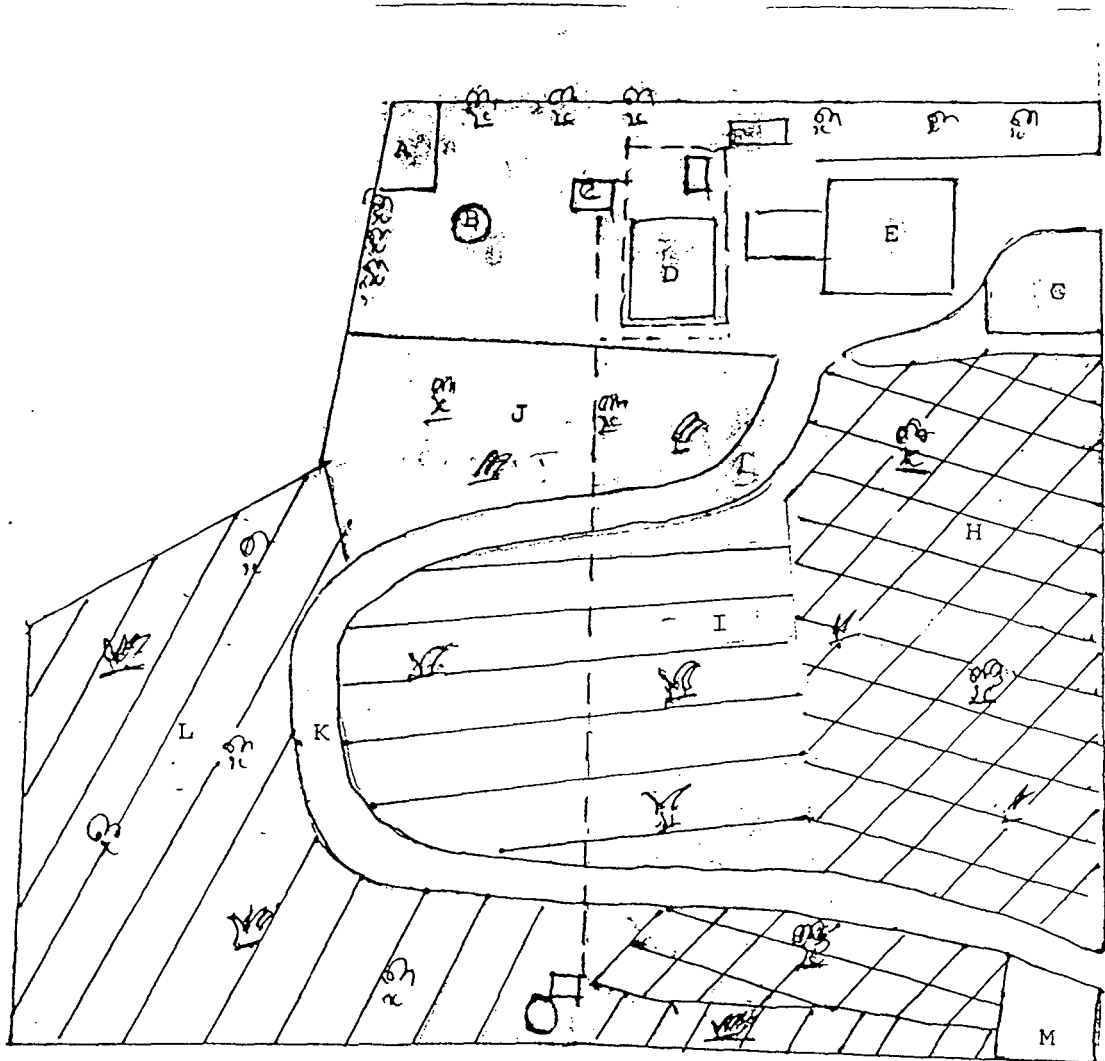
- 1)) Fruits
- 2) Vegetable
- 3) Economical Crops

Fruits - Pineapple, Gaslabu, WoodApple, Passion fruit, Mango, Jack fruit, Cashunut, Anoda, Orange

Vegetable - Gotukola, Brinjols, Green leaves, Watakolu, Pathala and variety of yams

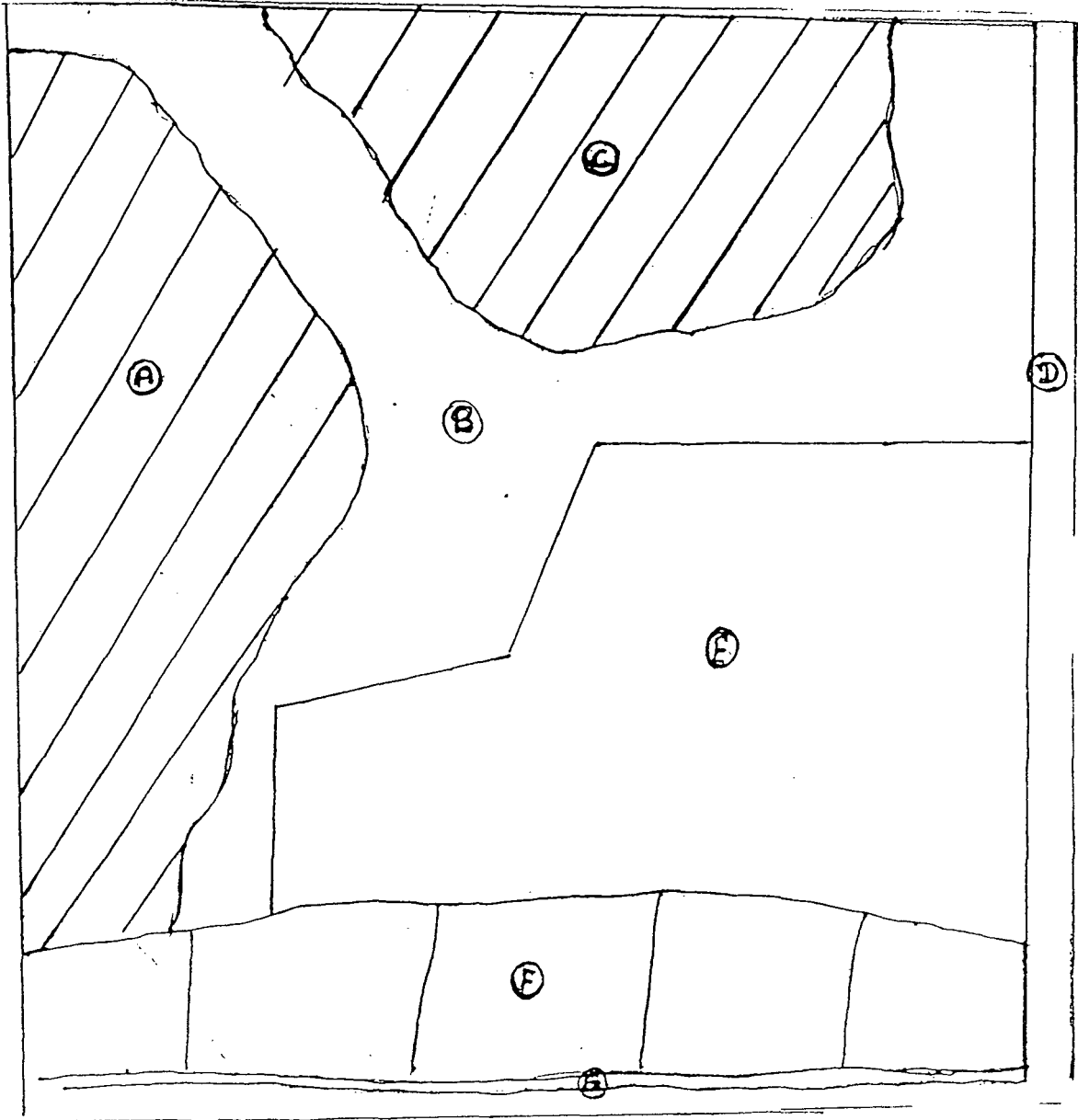
Economic crops - Coconut, Rubber, Beetle, spice etc

THE PLAN OF THE FARM



- A - Cattle Houses
- B - Bio Units
- C - Water tank and Pump line
- D - Paddy Processing Unit
- E - Permanent House
- F - Small Nursery
- G - House Garden
- H - Mix crops - Banana, Podder, Passion Fruit, Coconut
- I - Mix crops
- J - Mix Crops - Papaya, Banana and Citrus
- K - Inside Farm Road
- L - Mix crops - Pineapple, Coconut, Banana
- M - Kamatha

AN OVERVIEW OF THE AREA WITH THE FARM



- A - Rock (Govigala)
- B - Feeding area for Cattles
- C - Daluk Gala
- D - Main Road
- E - Farm
- F - Paddy Field
- G - Canal

The expanding activities of Pannala Farm will include the followings.

TABLE 3

TYPE OF EXPANSION	NATURE/SIZE OF EXPANSION	TIMING
(01) The total area of the centre will be expanded as follows.		
1) Area for Vegetable	by 1 hectare	12 months
2) Area for fruit	by 1 hectare	
3) Area for <u>economic</u> ? crops	by 1 hectare	
4) Grass land	by 1 hectare	

Total Land expanded	4 hectares	
	=====	
(02) Water	Another well will be d ug and constructed	03 months
(03) Livestock		
Cows	from 10 to 20	03 months
Goats	from 15 to 30	
Fowl	100	

Total	150	
	=====	
(04) Communication facilities	A transreceiver equipment to be ^{added} instead and transmission to be connected to	01 month
(05) Training and Extension service be expanded	50 programmes to be annually. Each course intake 1 x 20 and thus 1 x 20 x 50 = 1000 will be trained Annually	12 months

(V)5

PURCHASING AND DISTRIBUTIONSYSTEM FOR MARKETING OF ORGANIC FARM PRODUCTS(A) Purchasing Procedure:

Purchases have been planned by taking into consideration the availability of products in each farm, agri-coops, and the seasonal nature of the cultivation. With the Diversification Programme, the expansion programme of the Pannala Farm and the wide interest to be generated among Agri-Coops and farmers, a good yield is expected annually as per details given in Table 4 below.

TABLE 4 (Year 1) Value In Rs' 000

ITEM	Pannala Farm	Other Farms Own by NGOS	Agri - Coops
Rice	864 692	230.4	230.4
Other Grain	138	46.2	46.2
Vegetable	553	184.3	184.3
Fruits & Honey	222 208	74 69	74 69
Livestock Poultry	207	69	69
Total	1984 1798	603.9 599.9	603.9 599.9

Purchasing will be done at the farm gate by the purchasing officer, Checking of quality of the product will be an essential part of the purchasing procedure and he is responsible for the quality of product until they are received by the marketing Centre.

Purchasing prices are determined by at the weekly meeting held at the centre together with marketing manager, Field Executive and the purchasing Officer. Perishable items will be sold ~~in~~^{at} auction but the policy of project is that they will not be sold at the centre.

(b) Market requirement of products:

Through experience farmers could be made aware about the requirements of products^s and the Field Executives task is to inform them the quantity and the quality required in respect of each product. His responsibility is to visit all these farms and Agri - Coops, and the Purchasing Officer can prepare his itinerary and plan the purchases in the most suitable manner. In this process he is required to ~~raise~~^{raise} a series of questions such as

What to purchase?

Where to purchase?

When to purchase?

In what quality?

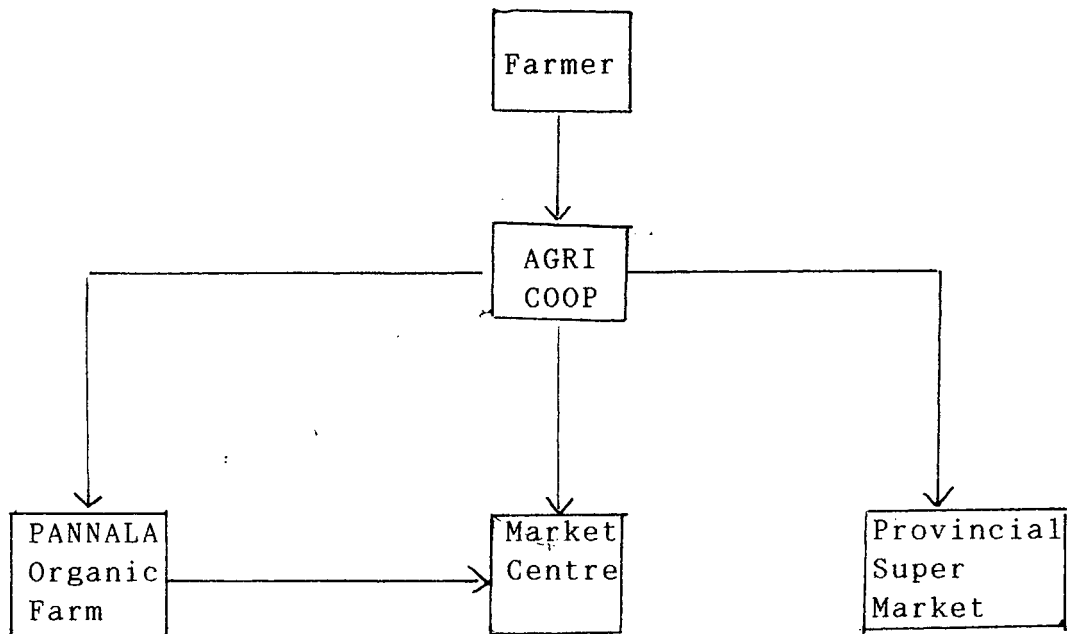
(B) DISTRIBUTION SYSTEM

At present there is no proper distribution system for Organic Farm Products. Distribution within a real marketing setup can be briefed as follows. Distribution means " right products , at right quantities, at right quality, at right place, and at right time".

The above statement implies that distribution requires a lot of information on the product , quantity , quality, place available. Modes of transport etc. . The information system setup will provide necessary information to plan an efficient distribution network among the farmers , farms, collecting points , marketing Centre in Colombo and in outstation.

The main task of the field Executive is to implement and monitor the distribution system and in this respect he is required to have enclose contact with distribution is done according to the plan. It has planned in such a way that it will take three key features.

1. Use of Agri-Cooperatives as collecting Centres.
2. Open air storage system at Pannala for vegetable
3. Small packaging plant at the marketing centre.
4. A Distribution network connecting all distribution points is depicted in the diagram given below.



V(6) MARKETING CENTRE IN CAPITAL CITY OF COLOMBO

Establishment of Marketing Centre in Colombo is the major component of this project and is interconnected to all other components of the project. It has linkages with expansion programme for Pannala centre, distribution system, Diversification Programme and even with the Marketing Setup of Organic farm Products in Super Market and finally it is followed by the Marketing policy.

(A) FUNCTIONS OF THE PROPOSED MARKETING CENTRE FOR ORGANIC FARM PRODUCTS.

The main purpose of the Marketing Centre is to market farm products at the centre to engage in any other activities pertaining to marketing, in accordance with the marketing policy of the project. The main activities at the centre are follows.

- To maximize Retail and Wholesale of organic farm products.
- To earn reasonable profits from selling products.
- To maintain excellent PR with customers.
- To organize exhibitions, seminars with view to educate consumers.

- To organize any suitable programme for sales promotions.
- To promote the image of NCC and SCC by providing an excellent service to the customers.
- To establish close links with other centre and outside Institutions regarding marketing of products.
- To participate in international trade fares in the field of Organic Agriculture and Marketing.
- To publish any literature on organic farm products.
- To establish a good rapport with Governmental Institutions and Non-Governmental Institutions concerned.

TURNOVER (In Rs 000)

<u>YEAR</u>	<u>TURNOVER</u>
First year	3744,000
Second year	4680,000
Third year	5850,000

(B) PUBLICITY WORK

The Marketing Centre itself has a separate area to hold a small exhibition and a space to conduct a small type educational programmes.

(C) EXHIBITION :

Two major exhibitions can be held annually, one in the centre and other in a province. Objectives of exhibitions are :

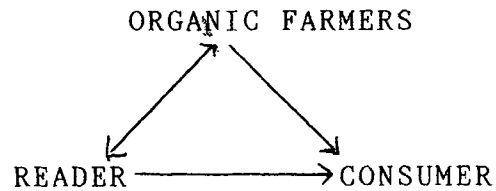
- To produce adequate organic farm products for a target market.
- To provide wide publicity to such products.
- To gain experience for an uninterrupted supply products.
- To gain confidence of the consumer
- To establish a better price such products and thereby to create a permanent market
- To expand sales

Further more objectives are established in the case of Provincial exhibitions. They are;

- To gain confidence of consumers by real live demonstration at the farming center.
- To utilize income gained from Exhibitions for the development of farms.
- To motivate youth co-operators / farmers
- To gain assistance from various Government Institutions.

(D) PUBLICATIONS

The project also includes a half-yearly publication on Organic Agriculture.

EXPECTATIONS

- To popularise organic farm products and to achieve a better market.
- To use as a valuable literature for Trainees
- To promote the image
- To tell the value of organic farm products

TABLE 5

<u>READERS</u>	<u>FIRST YEAR</u>	<u>SECOND YEAR</u>	<u>THIRD YEAR</u>
Trainees	1000	1300	1600
Organic Farmers	100	200	400
Co-operatives	60	60	70
Libraries	50	50	60
General Readers	200	300	400
Other organizations	40	50	100
TOTAL	1450	1960	2630
	====	====	====

Contd..

TABLE 9

<u>READERS</u>	<u>FIRST YEAR</u>	<u>SECOND YEAR</u>	<u>THIRD YEAR</u>
Selling price Rs. 20	21750	29400	39450
Cost per magazine Rs. 15	29000	39200	52600
Income	-----	-----	-----
Profit	7,250	9,800	13,150
	-----	-----	-----

(E) FEATURE OF THE MARKETING CENTRE

Location : Colombo the capital city

Type of ownership : By rental agreement initially for a period of 3 years

Staff required : 8

Sections : Sales Area

Manager's Office

Exhibition Area

Stores

Toilets

Carpark

: Table 6 gives and a list of the furniture,

equipment that are needed for the centre

Annexure V (6) EI, II shows the plan of the proposed

Marketing centre.

TABLE 6

FURNITURE & EQUIPMENTS		
ITEM	NOS.	COST IN RS.
Tables	03	7500
Chairs	05	5000
Executive table	01	7500
Executive chair	01	6000
Cabinet	02	12000
Safe	01	7500
Refrigerator	01	29000
Cooler	01	28000
Cash Register	01	22000
Magi Board	01	3500
OHP	01	17500
Slides projector	01	28000
Screen	01	4000
Small chair (for visitors)	25	10000
Floor polisher	01	17500
Notice Board	01	2000
Processing Plant	1	2000
Cleaning Equipment	16	8000
Display Rack	6	30000
TOTAL		215,000 247,000

(F) MANPOWER REQUIREMENTS FOR THE MARKETING CENTRE

The Marketing Centre is headed by a manager of who has sufficient qualifications and experience in Marketing and Management. He should be a dynamic person and a go-getter.

Head of the centre is assisted by the following staff:

Sales Assistant	02	Security Officer	01
Exhibition Coordinator	01	Driver Cum Messenger	01
Field Executive	01	Purchasing Office	01
Cashier	01		

Annexure I shows the organization chart, of the proposed Marketing Centre, and the relevant Job Descriptions are attached to the project document.

(Please see Annexure V (6) F II, III, IV, V, VI, VII , VIII and IX.)

Recruitment will be done two weeks before the commencement of the centre in order to train the staff recruited.

All the staff including Manager will be subjected to a comprehensive induction and training programme of ten days. The programme necessarily include vision of NCC and SCC, Organic Agriculture in general. Display of Organic Farm Products, Public Relations and Field visits to Organic Farms-etc.

CHAPTER v111

FINANCIAL ANALYSIS

A] BASIC ASSUMPTION

- 1] The period of the Project is $10\frac{1}{2}$ Years including 6 months preparation period. (construction)
- 2] The sales will increase every year by 25% and the production of the Farms also will increase correspondingly.
- 3] Considering the demand of the customers other items like confectionary etc, sell in this unit.
- 4] The unit is expected to function 24 days in a month, 9.00 hours per day.
- 5] One month stock will retain in the Pannala Farm except perishable.
- 6] Depreciation is calculated straight line method.
Furniture & Equipment 10%
Communication Equipment 20%
Storage Equipment (write off the whole value within year)
- 7] Two major Exhibitions held annually. (Main cost of the exhibitions are Plants, publicity cost, etc)

B] INITIAL INVESTMENT OF THE PROJECT

IN RS '000

Furniture & Equipment	247
Communication Equipment	20
Storage Equipment	5
Pre Operational Expenditure	62
	<u>334</u>

WORKING CAPITAL OF THE PROJECT

1] PURCHASING COST

Rice	250kg *20/= *24*2	=240,000
Vegetable	120kg *32/= *24*1	= 92,160
Fruit & Honey	Rs 1200/=(Perday)*26*1=	31,200
Other Grains	Rs 800/=(perday)*26*2	= 41,600
Weststock	Rs 1200/=(perday)*26*1	= 31,200

		436,160
		=====

2] OTHER OPERATIONAL COST

UNIT - 000

Building ^{Rent} cost	40
Exhibition ^{expenditure} cost	1
Packaging Materials	1,000
Salary	54
Transpotation	17
Cleaning	1
Telephone	1
Electricity	2
Water	1
Stationary	1
Repairs	1
Insurance	1
Micelanious	1

one month

122

40

TABLE 7

(A) INITIAL INVESTMENT OF THE PROJECT

IN RS.'000

ITEMS	AMOUNT
Building Rent	480 ✓
Furniture & Equipment	215
Communication Equipment	20
Storage facilities at Pannala	5
Publicity work	25
Publications	21.75
Inauguration Expenses	10
Repairs & Maintenance	15
Purchasing cost	1797.6
Salary & wages	321.35
Insurance	5
Transportation cost	100
Hygienic and cleaning	6
Telephone	4
Electricity	12
Water	4
Miscellaneous	3
Stationary and Postal	3

	3047.7
10% contingencies	304.77

	3352.47
	=====

TABLE 7

(B) SOURCES OF FUNDS

The funds for the project cost will be received from the following various sources.

In Rs. 000			
Source	%	Amount	Remarks
1. Swedish Cooperative Centre	50% ✓	1750,000 167,000	To be allocated from the youth project
2. Peoples Bank	30% ✓	1050,000 1002,000	Under the insti- tutional development
3. Agriculture Cooperatives	20% ✓	700,000 668,000	Collective fund of Agri-crops
		----- 334,060 ----- 3500,000 =====	

TABLE 8

<u>(A) DETAILS OF FIXED COST</u>		
IN RS. ' 000		
<u>ITEM</u>	<u>AMOUNT</u>	<u>REMARKS</u>
- Furniture & Equipment	215	Tables, Chairs, Audio Aid cabinet, safe, cooler & equipment etc.
- Communication equipment	20	Transreceiver set at Pannala Farm
- Storage facilities	5	Open storage system at Pannala farm (made of bamboos)

	240	
	=====	
<u>(B) OTHER INITIAL EXPENDITURE</u>		
<u>ITEM</u>	<u>AMOUNT</u>	<u>REMARKS</u>
- Inauguration	10	Inaugurational ceremony
- Publicity work	25	Two exhibition and others
- Publication	21.75	Describe of Organic farming
- Contingencies 10%	304.77	

	361.52	

(C) OPERATIONAL EXPENDITURE

IN RS '000

ITEM	AMOUNT	REMARKS
- Purchasing stock	3595.2	
- Salaries and wags	642.7	
- Insurance premium	5	
- Repairs and maintainace	15	
- Transportation Expenses	200	
- Hygienic and Cleaning Expenses	12	
- Telephone charges	8	
- Electricity	24	
- Water	8	
- Miscellaneous	6	
- Stationary	6	

	4521.9	

TABLE 9

(A) INCOME & EXPENDITURE ANALYSIS

Income of first year	-	3797
Cost of the second half of the first year	-	2251
Surplus	-	1546

(B) Cost for 6 months operations

Purchasing cost	1797.6
Salary and wages	321.35
Transportation cost	100
Hygienic and cleaning	6
Telephone	4
Electricity	12
Water	4
Miscellaneous	3
Stationary and Postal	3

	2250

(C) PURCHASING COST ANALYSIS

	IN Rs' 000
-----	-----
ITEM	COST
-----	-----
Rice	1728
Vegetable	921.6
Fruit Honey	369.6
Others grains	230.4
Livestock & Pantry	345.6

Annual cost	3595.2

ANALYSIS OF REVENUE(A) 1ST YEAR

<u>(1) SALES INCOME</u>		In Rs.000
- Rice	1440	(Rs. 25/- x 200 kg x 24 days x 12 months)
- Vegetable	1152	(Rs. 4000/- (sales per day) x 24 days x 12 months)
- Fruits & Honey	432	(Rs. 1500/- (sales per day) x 24 days x 12 months)
- Other Grains	288	(Rs. 1000/- (sales per day) x 24 days x 12 months)
- Livestock & Poultry	432	(Rs. 1500/- (sales per day) x 24 days x 12 months)
ANNUAL INCOME	<u>3744</u>	3744

(2) EXHIBITIONS

24

(2 major exhibitions for each year)
(Rs. 12,000 x 2)

- Tickets
- Selling Organic Plants
- Selling photographs
- selling of publications

(3) SELLING OF PUBLICATIONS

29

3797 000

(B) 2 ND YEAR

In Rs.000
(increase in 25%)

1. Sales Income

- Rice	1800	(1440 + 360)	
- Vegetable	1440	(1152 + 288)	
- Fruits & Honey	540	(432 + 108)	
- Other Grains	360	(288 + 72)	
- Livestock	540	(432 + 108)	

ANNUAL INCOME	4680		4680
	=====		

2. Exhibitios 30
(Rs. 15,000 x 2)

3. Selling of Publications 32

4742
=====

(C) 3RD YEAR

In Rs.000
(25% increase)

- Rice	2250	(1800 + 450)	
- Vegetable	1800	(1440 + 360)	
- Fruit & Honey	675	(540 + 135)	
- Others grains	450	(360 + 90)	
- Livestock	675	(540 + 135)	

	5850		5850

(2) Exhibition 39
(Rs. 19,500/= x 2)

(3) Selling of publication 35

5924

CHAPTER VII

THE CONCLUSIONS AND RECOMMENDATION

The Conclusions and recommendations of this project are confined to a few points which I should like to emphasize

(A) CONCLUSIONS :-

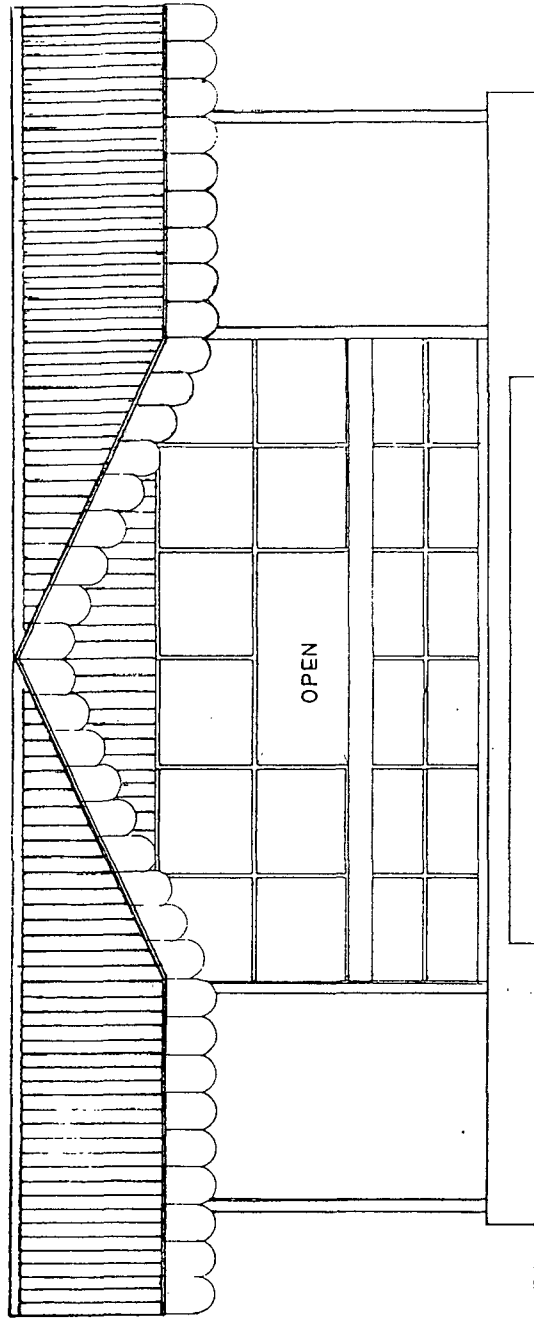
- 1) First I would like to emphasize that the project will bring about multiple benefits to the identified beneficiary groups. On the one hand farmer is greatly benefited and on the other hand consumer is benefited as a result of an uninterrupted supply of high quality Organic Farm Products. Another ^{distinctive} ~~destructive~~ benefit which the society could gain in the long run is that environment is conserved as a result of increasing of the Organic Farming activities.
- 2) Second the project is feasible and implementable in many respects. In addition to the financial and technical support provided by the SCC, NCC will take great care in implementing this project since the development of youth cooperators and conservation of environment are of national level interest to the NCC.

- 3) Finally the successful implementation of project is a cooperative effort of the all staff, beneficiary groups, comes under the purview of this project.

(B) RECOMMENDATIONS : -

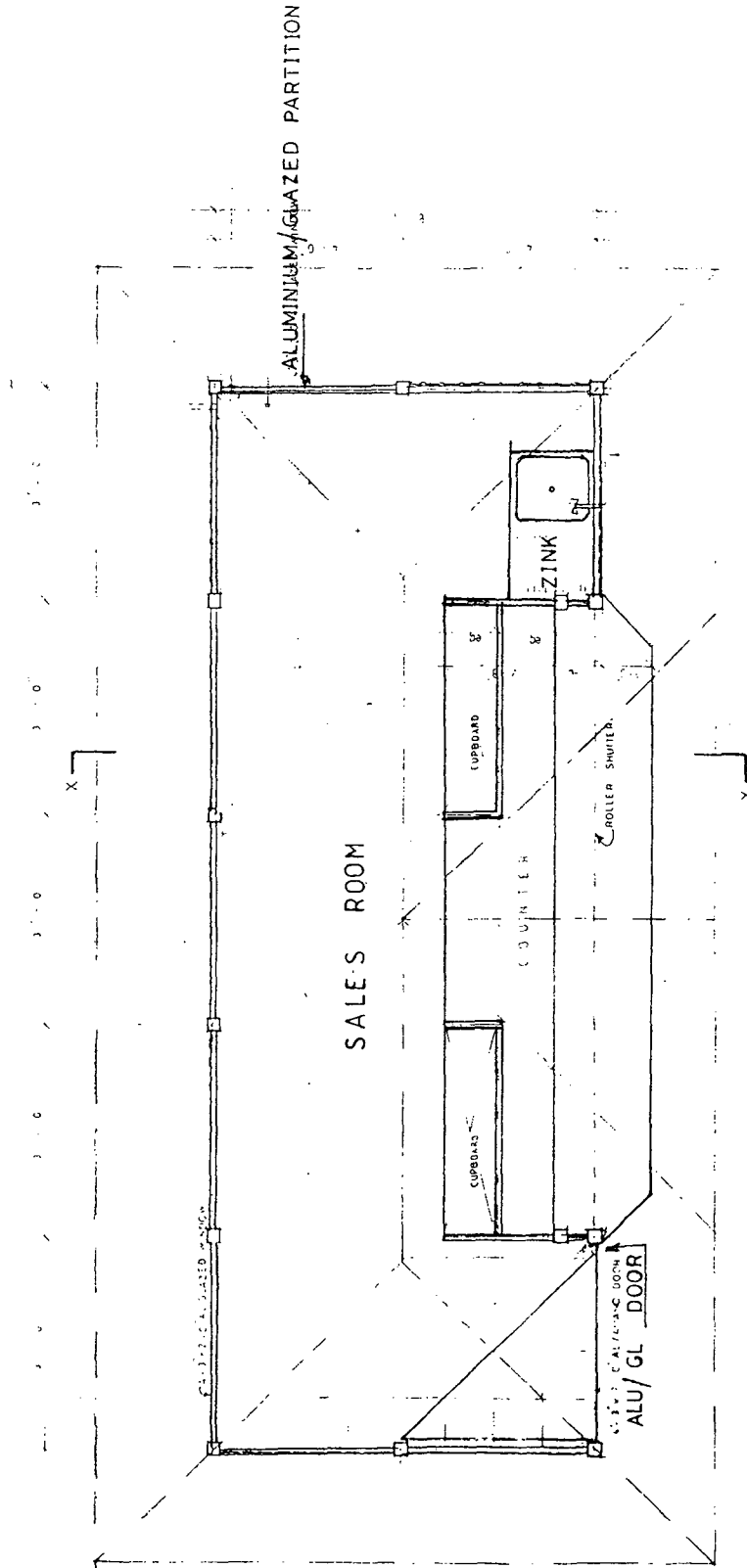
- 1) Although the project is feasible and implementable it requires constant monitoring of the progress. Therefore a management information and reporting system that would enable monitoring project performance is an absolute must for a project of this nature. Therefore I recommend that Management Information system proposed under Chapter V (2) is properly implemented.
- 2) I also recommend that decision with regards to policy formulation, organization and implementation of the project should be made in terms of are made interms of the policy of the major partner (SCC). It is also advisable to liaise more closely with SCC to get the maximum technical support.
- 3) It is recommended that the next major partner. The NCC should provide all Infrastructure facilities and other necessary services. The NCC should directly involve in organizing Steering Committees and other meetings.

- (4) I recommend that the Chief Executive officer (NCC) has a special role in coordinating the project activities among the parties concerned.
- (5) Also I recommended that the activities of the project should be given maximum publicity, so that a widespread interest towards Organic Agriculture is generated within a short period of time.
- (6) Although the project period is confined to a period of ^{ten} ~~three~~ years, it should continue as a viable project and also as a business unit of the NCC.



ELEVATION

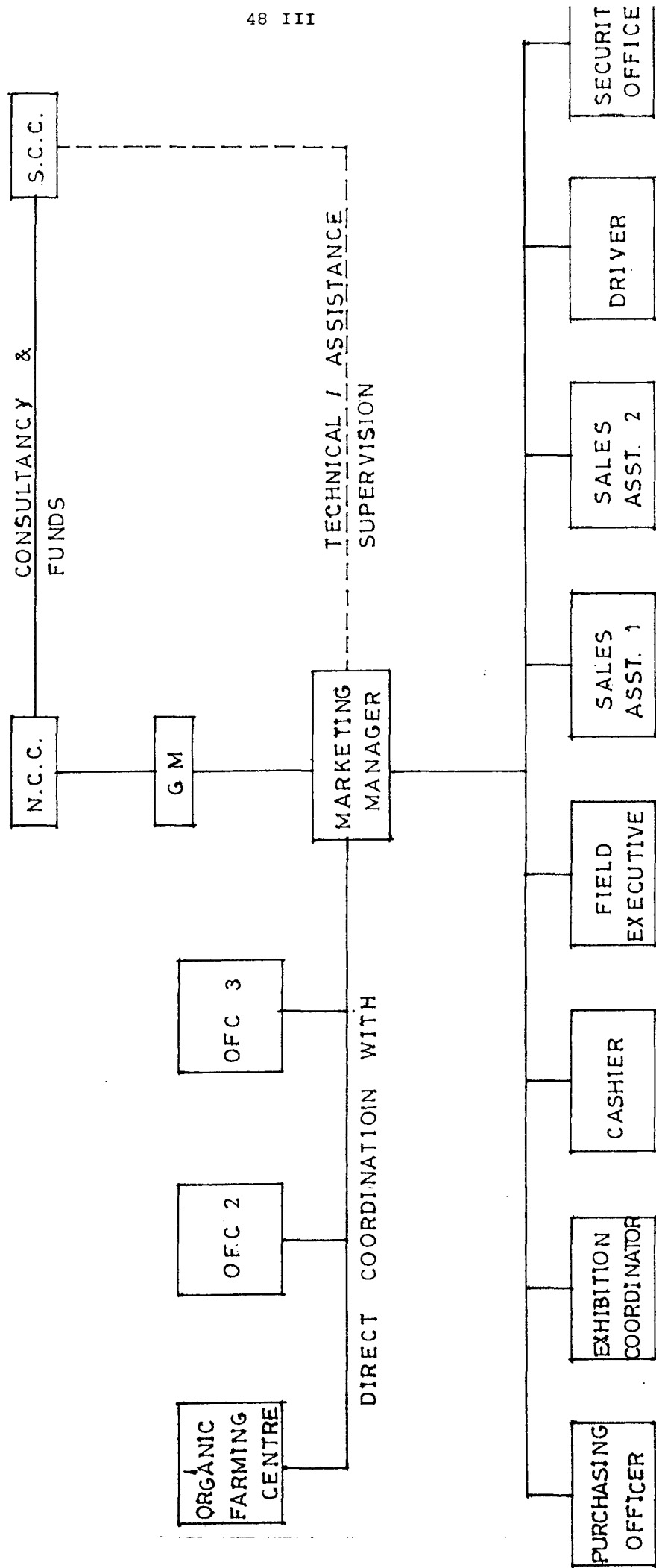
MARKETING CENTRE
FOR ORGANIC FARM
PRODUCTS IN COLOMBO



PLAN

MARKETING CENTRE
FOR ORGANIC FARM
PRODUCTS IN COLOMBO

ORGANIZATION CHART
(PROPOSED MARKETING CENTRE IN COLOMBO)



Job Description

JOB 1 Marketing Manager
 (Organic Farm Marketing Centre and the
 exhibition centre)

Title : Marketing Manager

Duty station : Colombo

Contract : 3 years
 period

Reporting to: General Manager (NCC)

Duties & : - To implement the marketing activities
 Responsi- regarding organic farm products in
 bilities accordance with the project

- To manage the staff, finance and the
 other resources at the centre

- To provide day-today information about
 the activities of the centre to General
 Manager NCC with a copy to the country
 Representative of Swedish Cooperative
 centre

- To maintain close links with the
 organic farming centre at Pannala and
 other Agricultural cooperatives to the
 supply and distribution of farm
 products.

- To motivate staff for maximum sale of
 farm products in the centre

- To take prompt actions to remove perishable items from racks and to replenish with new stocks.
- To ensure that entire premises of the sales centre is well cleaned and properly maintained
- To send monthly, quarterly, and halfyearly report to the management.
- To take every possible steps to attract and to retain customers in the habit of buying organic farm products
- To take every possible action to provide consumer with knowledge on organic farm products
- To organic Exhibitions with the concurrent approval of the management
- To advice and organise publicity work within or out of the sales centre in order to promote sales.

Salary : Rs. 10,000 /= (All inclusive)

Age Limit : 30 - 40 years

Qualification : - A Degree in Business Administration /
Economics/ Management

- A good command of English Language knowledge of Tamil and other foreign Languages would be an added advantage
- At least 3 years work experience in a marketing set-up
- ability to organize publicity work and organization of Exhibition and seminars would be an added Advantage.

Job Description

JOB 2

Title : Marketing Assistant

Duty station : Colombo Marketing Centre

Contract : 3 years.
period

Reporting to : Marketing Manager

Duties & Responsibilities : - To display organic farm products as instructed by Marketing Manager.

- To receive customers who visits the shop and to pay maximum attention
- To communicate customers effectively and to help them in the buying process.
- To have a knowledge on the buying behaviour of customers and to make any possible, but genuine attempt to increase sales.
- To motivate customers to become repeat customers
- To have a thorough knowledge on almost all the products marketed at the centre.
- To ensure that entire premises at the sales outlet is neat and cleaned properly.

- To report daily about customers complaints to the Marketing Manager and to take remedial actions after obtaining instructions from the Manager.
- To help the Exhibition coordinator when Exhibition are held inside the premises of the Marketing Centre.
- To make proposals on behalf of customers make suggestions to the Manager with a view to promote, sales and customer care.

Age : 25 - 35 years

Salary : 5000/= (All inclusive)

Qualification & Experience : G.C.E. (Advance Level) Examination preferably in Science or Commerce

AND

- At least 3 years Work-Experience in a Marketing Environment.
- (preference will be given to candidates who have taken Marketing as a subject for any professional Examination or who have experience in working in a Green shop.
- A sound knowledge of English essential. Knowledge of Tamil and other foreign languages would be an added Advantage.

Job Description

JOB 3

Title : Cashier

Duty station : Colombo Marketing Centre

Contract period : 3 years

Reporting to : Marketing Manager

Duties & Response-
bilitiles : - To hold the full responsibility of cash and monies belong to the marketing centre.

- To hold the full- responsibility for banking of cash and other monies on time

- To have a sufficient stock of changed money everyday

- To operate the cash registers efficiently

- To ensure that customers are provided with balance money

- To prepare daily return and obtain certifications from Manager

- To hold the monitory responsibility at the safe jointly with the Marketing Manager

Salary : Rs.4000 per month (All inclusive)

Age limit : 30 - 45 years

Qualification : G.C.E. (Advance Level) Examination in
& Experience Commerce subjects

- At least 3 years work Experience

in a commercial organization.

Job Description

Job 4

Title : Exhibition Coordinator

Duty Station : Colombo Marketing Centre and other venues
where Exhibitions and seminars are held.

Contract : 3 Years
Period

Reporting to : Marketing Manager

Duties and Responsibilities : - To organize Exhibitions, as instructed by the management.

- To organize seminars and other publicity campaigns as instructed by the management to coordinate the above activities with Sec. Ncc organic farm Centres and other relevant Ministries and Institutions.

- To collect and preserve books magazines and other any literature pertaining to organic farm products.

- To write and publish leaflets , Pamphlets, brochures on organic farm products.

- To assist Marketing Manager for day -
today secretarial work.

- To prepare any Audio Visual materials for consumer education.

- To have a special attention to foreigners who visit the centre and educate with them about the activities of the centre.

Age : 30 - 40 Years

Salary : Rs. 6000 (All inclusive)

Qualification and Experience : Diploma in Agriculture together with three (3) years experience in Agriculture Extension work.

- Should have a sound command of English Knowledge of Tamil and other Foreign languages are added advantage.

- Candidates who have experiences in organising seminars , Exhibitions and publicity campaigns will be given preference.

Job Description

Job 5 Security Officer

Title : Security Officer

Duty Station : Colombo, Organic Farm Sales Centre

Contract Period: 3 Years

Reporting to : Marketing Manager

duties and responsibilities : 1. To welcome customers and others who visit the shop.

2. To provide directions to new courses

3. To hold responsibility for safely of people customers , and others building , equipment , furniture and all other resources.

4. To have a list of all assets of the premises are safe.

5. To ensure that all the vehicle parked inside the premises are safe.

6. To have constant vigiliance.

7. To assist customers further in whatever possible manner .

Age : 25 - 40 years

Salary : Rs. 3500 (All inclusive)

Qualification & Experience: G.C.E. (Ordinary Level) Examination
with 2 years experience.

- Knowledge of English will be an added
Advantage.

_ Physical requirements

Hight - minimum 5' 4"

Weight- minimum 52 Kg

- Should have a good personality.

Job Description

Job 6 :

Title : Driver Cum Messenger

Duty Station : Colombo

Contract Period: 3 Years

Reporting to : Marketing Manager

Duties & Responsibilities : 1. To drive safely in accordance with the prevalent Traffic regulations and other institutions.

2. To have a good knowledge on Road Net work of Sri Lanka.

3. To pay maximum courtesy to officers and guests who travell in the vehicle.

4. To ensure that vehicle is properly maintained and srivices are done on time.

5. To have a preliminary knowledge on basic motor mechanism.

6. To attend minor repairs and way - side minor break-downs.

Age : 25 to 35

Salary : Rs. 3500.00 (All inclusive)

Qualification & Experience : G.C.E. (O.L) with 3 years driving experience.

- Should have a heavy vehicle driving licence for at least 2 years.

- Should be in good health.

The selected candidate will be subjected to a medical test before appointing to the post of driver.

JOB DISCRIPTIONJob 7

Title : Field Executive

Duty Station : Mostly in Field

Contract Period: 3 Years

Duties & Responsibilities :

1. To establish close links with agriculture cooperatives to obtain information on organic farm products.
2. To implement and monitor the distribution system.
3. To organic discussions with organic farmers and Agriculture Cooperatives for collecting products.
4. To advice marketing Manager and the steering Committee of the SCC regarding pricing and other marketing factors.
5. To organise Organic Farm Products collection centres on provincial basis and to supply them to Colombo sales centre or to super markets.

6. To provide information on sales weekly basis to the management.
7. To advice and to provide further extension services to organic farmers when field visits are made to farms.
8. To participate as a member of a steering committee.
9. To organize publicity work on provincial basis with the help of super markets.
10. To advice management regarding sales promotions.
11. To assist exhibition coordinator to organize such events.

Qualification
& Experience

- : Diploma in Agriculture from a recognized Institution and
- At least three (3) years experience in training and extention works.
 - should be and physically fit to travel extensively.

- should be prepared to work long-hours in the field.

- should be able to work with different communities and different cultural backgrounds.

- Ability to ride a motor cycle.

Salary : Rs. 6,000.00 (All inclusive)

Age Limit : 28 - 35 Years.

Job Description

JOB 8

Title : Purchasing Officer

Duty station : Colombo (but mostly in the field)

Contract : 3 years.
period

Reporting to : Marketing Manager

Duties & Responsibilities : - To have through Knowledge on Organic Farm products.

- To have a thorough knowledge about the production of organic farm products at at different collecting centre

- To plan the purchasing of organic farm products to participant at the purchase committee as a member

- To provide sufficient information on organic farm products through Marketing Manager

- To have a thorough knowledge about the quality of products and to check the Quality not only at the purchase but also at the receiving point.

- To ensure that the producer/farmer is paid for their products within 7 working days.

- To organise auction to sell perishable items

Salary : Rs.4000 per month (All included)

Age limit : 25 - 45 years

Qualification & Experience : G.C.E. (Advance Level) with two years working experience in purchasing in a merchantile establishment.

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : **HIGH YIELD SEEDS**

Country : **THAILAND**

Project Prepared by : **SUNEE KARNDEE**

**Funded by the Government of Japan
(Ministry of Agriculture, Forestry & Fisheries)
and
Executed by the ICA in collaboration with its Member Organisations
in India, Malaysia and Japan**



ICA Management Training Project for Agricultural Cooperatives in Asia

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ACKNOWLEDGEMENT

The High Yield Seeds project is a part of the Tenth ICA - Japan Training Course for Strengthening Managment of Agricultural Cooperative in Asia which is organized from October 19, 1995 to April 20, 1996 in India, Malaysia and Japan.

I would like to express my gratitude to ICA ROAP and Japanese Government which provide me this very good opportunity to learn about the agricultural cooperative movement in Asian region.

And I would like to thank Dr. Daman Prakash, Project Director of this program, Mr. A.H.Ganesan and other staffs of ICA ROAP, Professor G. Krishnamurthi and his faculty of IRMA for so much trouble in helping and sincere teaching for the successful gaining of training objects.

I also would like to thank the Cooperative Promotion Department and the Cooperative League of Thailand for nominating me to the trainingcourse and extending me all the support.

Sunee Karndee
February, 1996
CPD., Bangkok,
Thailand.

Chapter I

Summary

1.1 The project focuses on the farmers in Buo Yai District. The project will be implemented and operated by Buo Yai Agricultural Cooperative Limited which is located in Nakorn Ratchasrima Province in the North-east of Thailand which is about 397 kilometres far from Bangkok.

1.2 The direct objects of this project are to increase the income of farmer members by value addition products with dilicate method which they will get better products both quality and quantity. The indirect objects of this project are to increase the yield per rai of the farmers who grow with High Yield Seeds of rice which produce from this project thus they will get better income.

1.3 The target group of this project are farmer members of Bua yai Agricultural cooperative Limited who have their own field and grow rice as usual.

1.4 The government give subsidy through Cooperative Promotion Department (CPD) for provide sufficient fund to the cooperative in order to provide loan (3% of interest) to the farmers and collect products to distribute. Moreover, remunerative price is about 20 % higher than general paddy in order to encourage the farmers produce High Yield Seeds of rice for propagation and encorage the farmers to use High Yield Seeds of rice for growing rice.

Rai is Thai measurement: 2.5 rai = 1 acre

1.5 Total investment of the project is 2,468,500 baht which for providing loan to the farmers 935,000 baht, collecting products 1,530,000 baht and grant aid for transportation 3,500 baht.

1.6 The sources of fund are subsidy by government for 4 years.

1.7 The Cooperative Promotion Department (CPD) coordinate with the Department of Agricultural Extension (DAE) for provide High Yield Seeds of Rice (Khao Mali 105) for produce High Yield Seeds.

1.8 CPD coordinate with Department of Agricultural (DA) in order to train the farmers for this project.

1.9 The cooperative collect the products which DAE will purchase products for High Yield Seeds processing.

Baht is Thai currency :

25 baht = 1 \$us

Chapter II

BACK GROUND

2.1 OVERALL SITUATION

Thailand is agricultural country with majority of population engaged in agricultural sector, 50% of agricultural land is paddy land. Moreover the main of primary agricultural exports is rice (see appendix 1,2) thus the government subsidize Funds in Warehouses, Drying Fields, Paddy Collecting Facility, District Central Market for Agricultural Products and Fund for Paddy Linked Market through cooperative throughout country.

The farmers use usually use their own seeds which they kept from the last harvest for growing rice which cause decline not only in yield but also quality. In currently situation the farmers face the problem of paddy price according to their cost which depend on the yield and the quality of their products. The good quality products always get a better price. The government give Paddy Linked Market through the cooperative for get rid off the middlemen problem in order to the farmers could get better income. The government realize that to help the farmers get better income they could get better yield of rice and get good quality rice.

So government give project for produce High Yield Seeds of rice for propagation through the cooperative. Bua yai Agricultural Cooperative Limited is a potential

cooperative which select by Cooperative Promotion Department (CPD), Department of Agricultural (DA) and Department of Agricultural Extension (DAE). Bua Yai Agricultural Cooperative Limited got subsidy funds from government in Warehouse, Drying Field, Paddy Collecting Facility, District Central Agricultural Products and Paddy Linked market. This cooperative is located in Nakorn Ratchasima province in the North-east of Thailand which have the soil quallity in the medium level for planting but it is suitiable for growing High Yield Seeds of rice especially Khao Mali 105 which always have stable price and get a large demand. Bua Yai district area is about 532,312 rai, agricultural land is about 360,064 rai and there are 307,757 rai are paddy land. 55 of farmer members' land whom participate this project is irrigated area under the plan of electric pump irrigation system for agricultural purpose which benefit from Shee River.

2.2 AREA OF PROJECT

The High Yield Seeds Project will be given to Bua Yai Agricultural Cooperative limited which located about 397 kilometres from Bangkok. The vileges that will be covered by this project are as follow :-

- | | |
|--------------------|------------------|
| 1. Buo Yai | 2. Buo Lai |
| 3. Sam Muang | 4. Nongchang Yai |
| 5. Nong Buo Sa-ard | 6. Khuntong |
| 7. Huay Yang | 8. Nongwa |
| 9. Nongkard Yai | 10. Nonsamrarn |
| 11. Seesuk | 12. Boungpalai |

This project area have good infrastructure ei. irrigation and transportation to facilitate the outflow of the products.

2.3 PROBLEM FACED BY THE FARMERS.

2.3.1 The limited Money of Farmers.

The farmers have limited fund and some of them have a lot of debts to the local merchant. The farmers sell their products as fast as possible after harvesting because they need money to repay to the merchant and that is a cause of products' low price.

2.3.2 Farmers have Low Yield Seeds of rice.

The farmers accustom to use seeds which they collected from their early harvesting for growing new crops thus farmers' production is low so they have low income.

2.3.3 Due to low quality of rice, the farmers are unable to compete in the market.

2.4 NEED AND JUSTIFICATION FOR THE PROJECT.

Rice is a main crop of Thailand, 50% of agricultural land is paddy land. The government want to strengthen and improve agricultural sector through cooperative in order to bring about a quanlitative and quantitative improvement in products and cooperative services to the farmers at the grass-root level.

High Yield Seeds of rice produced by government sector which get high cost. The government sector can produce about 3% of demand for propagation seeds of rice. (see appendix 4) Currently the farmers need efficiency in growing good quality rice, High Yield Seeds is necessary in producing.

CHAPTER III

PROJECT

3.1 OBJECTIVES

3.1.1 To increase farmers' income.

The farmers in this project grow rice as usual but they can increase their income by value addition products with dilicate method and change the products for consumer to products for propagatoin which get higher price.

3.1.2 To increase yield of rice.

The efficiency in growing rice of the farmers decline according to the quality of seeds which they kept from their early harvesting it is a cause of low yield. The government want to encoprage farmers to improve their producing by use high yield seeds.

3.1.3 To introduce/encorage modern technology in farming to farmers.

CPD coordinate with DA and DAE for training and guidance 55 farmers whom participate this project in technique of producing High Yield Seeds.

3.1.4 To provide the quality seeds to the farmers.

The High Yield Seeds of rice produce by the the government sector only is not sufficient for demand.

3.1.5 To encourage the farmers to produce the good quality rice.

Growing rice with seeds which produce for propagation is a quality control method especially High Yield Seeds it is a function to increase efficiency of producing rice.

3.1.6 TO ensure the farmers to have better income. Producing better quality and quantity products cause the farmers have better income.

3.2 AREA OF OPERATION

The location of High Yield Seeds producing will be operated in Bua Yai district in Nakorn Ratchasrma Province which 55 farmers who participate this project are members of Bua Yai Agricultural Cooperative limited. The cooperative got subsidy from government in Warehouse, Drying Field, Paddy Collecting facilities, District Central Agricultural Product Market and Fund of Paddy Linked Market so the project area has complete facilities. The cooperative is about 250 kilometres far from Khonkaen Plant Propagation Centre which coordinate in this project for purchasing products in order to processing High Yield Seeds then distribute to the farmers. Moreover, 55 farmers' field is in irrigation area and soil quality is suitable for growing High Yield Seeds of rice (Khao Mali 105).

3.3 PROJECT COMPONENT

3.3.1 Input Supply

The cooperative provide High Yield Seeds from DAE, fertilizer, pesticides etc. to the members in reasonable price as loan.

3.3.2 Farm Guidance

The cooperative coordinate with DA and DAE for technical transferring to the cooperative staff for guidance the farmers (May 1996) and train the farmers about technique in producing High Yield Seeds of rice for propagation before beginning of crop (June 1996). During crop (July - October) there are technicians from DAE and cooperative staff working in the field for advice the farmers.

3.3.3 Marketing

The project's products are High Yield Seeds of rice (Khao Mali 105) which purchase by Khonkaen Plant Propagation Centre 20 % higher than general paddy price. The Centre will process High Yield Seeds after processing there are 20 % by weight waste. The Centre will distribute products.

CHAPTER IV

DETAIL OF OPERATION

4.1 INPUT SUPPLY AND FARM GUIDANCE

The cooperative coordinate with DA and DAE provide High Yield Seeds, fertilizer, pesticide etc. and farm guidance to the farmers.

4.2 PROCUREMENT

The government subsidize fund through the Cooperative Promotion Department (CPD) in order to :

4.2.1 Provide High Yield Seeds of rice (Khao Mali 105) for propagation from Department of Agricultural Extension (DAE) to distribute to the farmers.

4.1.2 Provide sufficient funds to the cooperatives. Occasionally the cooperative will provide loans (3% of interest) to the farmers for producing High Yield Seeds.

4.1.3 Provide sufficient funds to the cooperative for collecting products which get 20% higher than general paddy's price then cooperative transport the products to Khonkaen Plant Propagation Centre for High Yield Seeds Processing then distribute.

4.1.4 Coordinate with Agriculture Department (AD) and Department of Agricultural Extension for technical transferring to the cooperative staff and training the farmers in agricultural technique and using farm mechanization.

4.3 MARKETING

4.3.1 POTENTIAL MARKETS

Currently the government provide the High Yield Seeds where by it is only 3 % . (see appendix--) The government will encouraged the cooperative to provide the High Yield Seeds to the farmers. The government is trying to increase the usage of these seeds from 3 % to 50 % , the demand for high quality rice is encourageing, thus it is the opportunity for farmers to produce high quality rice through High Yield Seeds. (see appendix---)

Varieties	Productions/rai
General Seeds	300 kgs
High Yield Seeds	550 kgs

4.3.2 Government Policy

The government want to improve rice quality which not only increase efficiency in area but also increase farmers' income. In open economy the high quality and low products can compete in the market, thus the government through CPD which will coordinate with DA and DAE will encourage the cooperative to participate in this project so as most farmers can benefit directly and indirectly will increase the demand for quantity rice in the market.

CHAPTER V

ORGANIZATION AND STRUCTURE

5.1 ORGANIZATION AND STRUCTURE

The project will be implement by Bua Yai Agricultural Cooperative Limited in Nakorn Ratchasrima province. The activities of the cooperative at the present are providing credit, procuring and marketing the members' produces, farm input and consumption goods supply. The organization structures are as follow :

5.1.1 Members

The organization is comprised of 960 members which 55 members participate in this project.

5.1.2 Board of Director

There are 15 members in board director whom are are elected from the members in General Meeting.

5.1.3 Management Staff

Management staff is boardly classified as follows :

- 1) Existing staff which is comprised of manager, accountant, cashier, creditor, procuring and marketing staff, clerk and workers.

2) Project staff is comprised of variose officers as below :

- Project Manager
- Accountance
- Procuring and marketing staff
- Farm guidance
- Driver

5.2 ROLE OF ORGANIZATION

5.2.1 Members

There are 55 members particitate in this project. They must get training course which provide by CPD collabarated with Da and DAE. 55 members grow 550 rai of High Yield Seeds of rice (10 rai per a member) and sell their products to the cooperative.

5.2.2 Board of Directors

They make the policies in accordance with the project operation and make decision on the operation policy.

5.2.3 Management Staff

- General Manager

He is responsible for the cooperative administration including the project too.

- Existing Staffs

They are charge of their former duties and support the project operation.

Procuring and Marketing Staff

They provide seeds, fertilizer, pesticide etc. for supply loan in this project. After harvesting in each crop (early November) they procure facilities for collecting product and transportation to Khonkaen Plant Propagation Centre.

Driver

He take charge of his former duty and support this project for transportation purpose.

Accountant

She take charge of her former duty and account for this project, and they will be assisted by cashier in arrangeing finance.

CHAPTER VI

FINANCIAL ANALYSIS

Financial analysis of the project has been keeping the following main assumption :

1. The project period is 4 years.
2. Government subsidize fund through CPD for:
 - 2.1 Supporting loan of free interest through cooperative for provide loan 3% of interest rate to the members.
 - 2.2 Supporting loan of free interest to cooperative for collecting products.
 - 2.3 Supporting grant aid for transportation products.

6.1 PROJECT COST

It is estimated that the cost of producing High Yield Seeds of rice as follow :

Variable Cost	1,508	baht/rai
Fixed Cost	<u>206</u>	baht/rai
Total Cost	1,768	baht/rai
Yield/rai	550	kgs
Revenue (5.04 baht/kg)	2,772	baht
Net Profit	1,004	baht
Agr.Land/member	10	rai
Net Prof./member	10,040	baht

(Detail see in appendix 9)

There are 55 members whom participated in this project so it covered area about 550 rai. The cooperative need ^{825,000}~~935,000~~ baht for provide loan to the members.

Yield per rai is about 550 kilograms, this project can produce 302,500 kilograms. The remunerative prices is 5.04 baht/kgs. The cooperative need about ~~1,530,000~~ baht for collecting products.

Income estimatation is about 27,720 baht per member, total cost per member is about ^{15,070}~~17,680~~ baht so net profit per member is ^{12,650}~~10,040~~ baht, in Thailand agricultural products are exemption, the net profit of this project is about ^{695,750}~~552,200~~ baht.

This project evaluate in term of economic efficiency which government collaborate with cooperative for improvment of efficiency in growing rice.

CHAPTER VII

BUDGET

The total project investment cost is about 2,468,500 baht which is subsidy fund from the government through CPD as medium term loan for cooperative. The cooperative provide short term loan with 3% of interest rate per year. The revenue of 3% of interest are project management expenditure of cooperative.

CPD provide sufficient fund of free interest^t to the cooperative in the first year (See appendix 10) as medium term loan which the cooperative will repay in the forth year (project's period is 4 years). The cooperative will provide loan in kind to the farmer members for each crop as short term loan.

CHAPTER VIII

RECOMMENDATION

This project is a government policy in developing efficiency in growing rice. The average yield of rice is about 300 kilograms per rai but in this project by using High Yield Seeds the productivity increase to 550 kilograms per rai. Benefit from this project are as follow :

	WITHOUT PROJECT	WITH PROJECT	UNIT
Land	550	550	rai
Yield	300	550	kgs/rai
Products	165,000	302,500	kgs
Price	4.2	5.04	baht/kg
Revenue	693,000	1,524,600	baht
Cost	1,013	1,768 1,507	baht/rai
Total Cost	557,150	828,850 -972,400	baht
Net Profit	135,850	695,750 552,200	baht
Net Profit/farmer	2,470	12,650 10,040	baht

The 55 farmer members whom participated in this project can get benefit from this project directly, they will get excess profit about 2,470 baht per member.

In this project the government want to improve the efficiency of growing rice both quality and quantity of products. The produces from this project are 302,500 kilograms after High Yield Seeds processing there will be 242,000 kilograms. Growing rice needs 10 kilograms per rai, from this project High yield Seeds of rice is sufficient for 24,200 rai thus indirectly benefit are as follow :

	WITHOUT PROJECT	WITH PROJECT	UNIT
Land	24,200	24,200 /	rai
Yield	300	550 /	kgs/rai
Products	7,260,000	13,310,000 /	kgs
Price	4.2	4.2 /	baht/kg
Revenue	30,492,000	55,902,000 /	baht
Cost	1,013	1,768 1507	baht/rai
Total Cost	24,514,600	42,785,600 36469400	baht
Net Profit	5,977,400	13,116,400 19432600	baht
Net Profit/rai	247	542 803	baht

Increasing of productivity from 7,260,000 kilograms to 13,310,000 kilograms which get excess 6,050,000 kilograms, the remunerate price estimated as general paddy. Growing rice with High Yield Seeds is a quality control method the produces will get good quality which should get better price. Moreover,

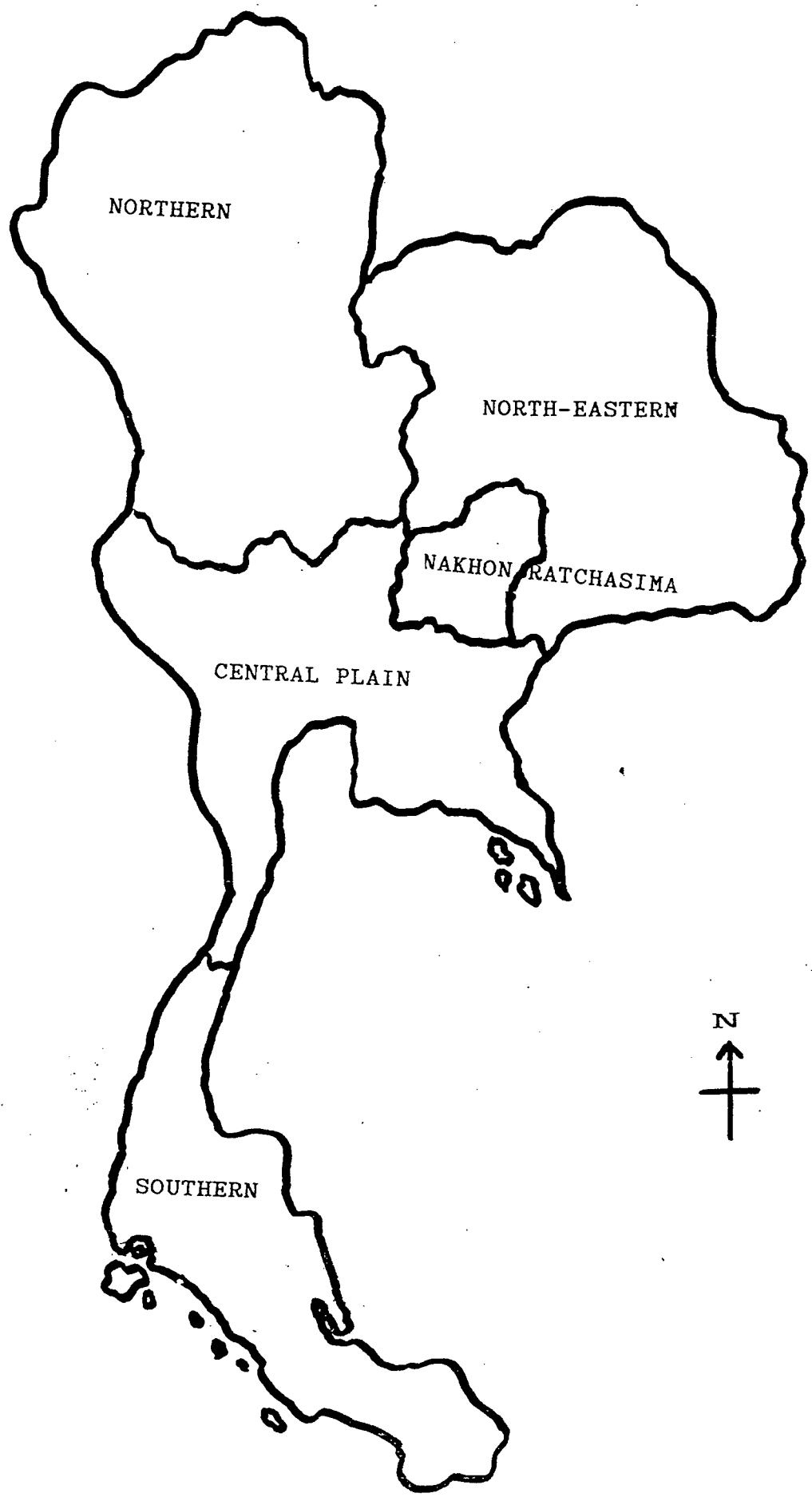
the cooperative carry out Paddy Linked Market business, to encourage the farmer members use High Yield Seeds for growing rice is a strategy for extension the business.

The cooperative will be collaborated with the other cooperatives for carry out business of High Yield Seeds of rice, which in 1999 the government will invest in Phimai Agricultural Cooperative Limited for High Yield Seeds Processing Plant it is about 68 kilometres far from Bua Yai.

This project is a pilot project; it can be operated anywhere High Yield Seeds of rice can be grown and location is suitable.

APPENDICES

MAP OF THAILAND



Appendix 1. Value of agricultural exports, 1989-1993

unit: million bahts

Products	1989	1990	1991	1992	1993
Rice	45,462.3	27,769.5	30,515.8	36,213.8	32,946.6
Rice products	926.5	1,037.6	1,237.6	1,521.8	1,749.7
Food crops	6,607.1	7,150.4	7,117.5	3,486.1	3,835.9
Cassava products	23,974.8	23,136.8	23,175.1	27,592.8	19,552.1
Sugar and products	20,204.8	19,119.1	16,669.7	20,675.5	13,388.5
Oil seeds	313.0	521.7	420.4	347.7	215.7
Vegetable oils	148.6	154.5	158.8	160.9	165.2
Fiber crops	7,897.6	8,438.2	8,669.9	8,953.6	8,967.5
Fruits and products	8,507.3	11,198.1	14,836.3	16,058.9	14,299.2
Other food products	1,898.8	2,408.6	3,279.9	4,363.2	5,080.2
Rubber and products	31,952.6	30,155.9	32,156.6	38,137.1	40,631.2
Milk products	231.3	295.8	307.2	357.6	527.5
Fertilizer and pesticides	125.6	253.6	380.8	291.6	315.2
Fishery products	50,002.6	57,802.2	73,958.1	78,190.4	86,191.6

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

Appendix 2. Utilization of farm holding land of Thailand by region, 1991

Unit: rai

Region	Farm holding land								
	Total holding	Housing area	Paddy land	Under field crop	Under fruit trees and tree crop	Under vegetable and flowers	Livestock farm area	Idle land	Other
North-Eastern	7,718,517	1,252,713	37,972,843	13,454,928	1,844,105	209,090	394,819	2,068,752	521,267
Northern	29,394,278	942,377	15,196,970	10,474,955	1,753,992	275,615	134,158	431,739	184,472
Central Plain	28,629,478	852,507	12,530,777	9,438,406	4,379,380	309,380	124,526	444,833	549,669
Southern	17,333,915	488,899	3,612,413	150,432	12,120,934	64,095	53,309	675,931	167,992
Whole Kingdom	133,076,188	3,536,496	69,313,003	33,518,631	20,098,411	858,180	706,812	3,621,255	1,423,400

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

Appendix 3. Rice; (Major and second rice) : Area, production, yield,
farm price and farm value, crop year 1984/85-1993/1994

Crop Year	Planted area	Harvested area	Production	Yield per rai	Farm price	Farm value
	1,000 rais	1,000 rais	1,000 tons	Kqs.	Bahts per ton	Million bahts
1984/85	62,329	60,186	19,905	331	2,325	46,278.7
1985/86	63,422	61,457	20,264	330	2,301	46,627.2
1986/87	61,571	57,463	18,868	328	2,994	56,491.3
1987/88	58,888	57,169	18,428	322	3,764	69,364.0
1988/89	64,677	61,912	21,263	343	4,030	85,689.8
1989/90	64,439	61,744	20,601	334	3,511	72,330.3
1990/91	61,910	54,949	17,193	313	3,743	64,354.2
1991/92	59,671	56,581	20,400	361	3,763	76,763.0
1992/93	60,453	57,248	19,917	348	3,268	65,089.7
1993/94	59,251	53,015	18,447	348	3,496	64,491.6

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

Appendix 4. High Yield Seeds Production

1990-1994

unit: tons

Year	Rice	Corn	Sorghum	Mungbean	Soybean	Peanut	Cotton	Total
1990	13,913.78	2,222.78	27.33	1,493.00	4,344.29	1,727.43	129.90	24,180.02
1991	21,224.07	2,650.59	14.58	1,856.06	4,628.13	2,035.47	194.63	33,037.23
1992	24,684.26	2,438.67	57.18	1,639.81	5,064.64	1,769.04	200.90	36,157.81
1993	25,152.02	286.56	5.01	2,636.54	6,823.28	2,050.27	204.60	37,578.87
1994	31,020.54	4.92	-	4,804.23	9,821.50	1,666.89	174.77	47,925.36

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

and fram value, crop year 1984/85-1993/1994

Crop Year	Planted area 1,000 rais	Harvested area 1,000 rais	Production 1,000 tons	Yield per rai Kqs.	Farm price Bahts per ton	Farm value Million bahts
1984/85	57,915	55,774	17,275	310	2,299	39,714.8
1985/86	59,437	57,476	17,930	312	2,320	41,597.0
1986/87	57,943	53,836	16,826	313	2,408	40,517.0
1987/88	54,324	52,664	15,658	297	3,790	59,342.9
1988/89	59,372	56,648	17,882	316	4,092	73,172.4
1989/90	59,195	57,177	18,477	323	3,610	66,700.8
1990/91	58,205	51,303	14,902	290	3,748	55,854.3
1991/92	55,177	52,202	17,518	336	3,892	68,179.6
1992/93	56,295	53,199	17,302	325	3,357	58,084.4
1993/94	56,153	50,002	16,483	330	3,749	61,793.5

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

Appendix 6. Major Rice; Area, Production and yield by region, crop year 1990/91-1993/94

Region	Planted area (rais)				Harvested area (rais)				Production (tons)				Yield per rai (kgs.)			
	1990/91	1991/92	1992/93	1993/94	1990/91	1991/92	1992/93	1993/94	1990/91	1991/92	1992/93	1993/94	1990/91	1991/92	1992/93	1993/94
North-	31,639,413	29,774,250	31,707,356	30,734,409	29,477,522	28,193,390	29,574,980	27,223,024	7,744,744	7,667,013	8,027,395	7,125,324	263	272	272	271
Eastern																
Northern	13,049,873	12,169,997	11,883,423	12,129,172	11,023,286	11,196,048	11,539,563	10,722,914	4,030,558	4,576,672	4,378,481	4,170,424	366	409	379	379
Central	10,536,161	10,221,946	9,822,009	10,221,356	8,047,418	9,911,286	9,290,697	9,431,000	2,400,613	4,331,920	4,009,598	4,244,548	298	437	432	432
Plain																
Southern	2,979,219	3,010,640	2,881,773	3,068,133	2,755,113	2,901,000	2,794,025	2,625,504	726,508	942,287	886,991	942,367	264	325	317	317
Whole Kingdom	58,204,666	55,176,833	56,294,561	56,153,070	51,303,339	52,201,724	53,199,265	50,002,442	14,902,423	17,517,892	17,302,465	16,482,663	290	336	325	325

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

Appendix 7. Major Rice; Area, production and yield by province, crop year 1990/91-1993/94

Province	Planted area (raisi)				Harvested area (raisi)				Production (tons)				Yield per rai (kqs.)			
	1990/91	1991/92	1992/93	1993/94	1990/91	1991/92	1992/93	1993/94	1990/91	1991/92	1992/93	1993/94	1990/91	1991/92	1992/93	1993/94
Nakhon Phanom	956,848	959,908	928,889	947,007	890,938	778,439	852,329	864,144	201,430	235,177	235,938	251,904	226	302	277	277
Sakon Nakhon	1,760,781	1,520,951	1,726,046	1,636,471	1,618,613	1,398,017	1,630,407	1,567,903	486,040	380,238	448,772	427,119	300	272	275	275
Nong Khai	1,175,152	980,986	1,179,053	1,086,234	1,116,107	813,344	952,323	970,659	279,989	222,684	266,466	253,093	251	274	280	280
Udon Thani	2,944,619	2,783,902	2,739,939	2,682,600	2,826,016	2,565,851	2,568,201	2,249,092	755,881	712,679	693,205	552,616	267	278	270	270
Loei	389,052	343,082	345,890	383,473	367,586	339,281	329,048	283,387	132,786	158,161	145,620	91,267	361	466	443	443
Mukdahan	327,882	312,796	281,447	379,462	325,830	308,843	266,048	371,721	99,810	99,469	76,554	102,834	306	322	288	288
Yasothon	1,059,708	1,062,518	1,119,338	1,032,059	1,045,185	980,250	1,116,733	932,672	256,449	252,879	301,102	254,919	245	258	270	270
Ubon Ratchathani	3,838,720	3,593,593	3,508,727	3,432,199	3,810,819	3,458,047	3,441,368	3,212,881	909,777	804,965	821,042	713,897	239	233	239	239
Kalasin	1,277,607	1,115,487	1,271,971	1,265,070	1,171,930	1,028,192	1,149,298	1,147,545	346,847	311,221	379,047	344,099	296	303	330	330
Khon Kaen	1,840,612	1,839,711	1,752,018	1,605,387	1,703,497	1,773,055	1,472,193	1,232,616	465,284	483,844	395,956	314,656	273	273	269	269
Maha Sarakham	1,721,062	1,462,919	1,638,702	1,582,340	1,650,706	1,413,932	1,546,008	1,344,989	435,678	361,341	416,230	346,532	264	256	269	269
Roi Et	2,656,605	2,417,435	2,679,183	2,604,064	2,471,581	2,207,657	2,547,673	2,378,292	649,359	565,680	747,492	661,432	263	256	293	293
Buri Ram	2,620,222	2,414,862	2,578,947	2,719,697	2,575,970	2,414,862	2,541,945	2,366,136	671,606	581,982	606,053	584,735	261	241	238	238
Si Sa Ket	2,301,736	2,140,923	2,797,115	2,240,200	2,298,405	2,120,686	2,785,274	2,084,506	701,129	618,727	688,090	508,525	305	292	247	247
Surin	2,541,686	2,429,161	2,816,326	2,783,007	2,516,155	2,401,128	2,720,183	2,588,753	676,088	580,569	704,082	726,365	269	242	259	259
Chaiyaphum	1,367,671	1,313,120	1,445,311	1,269,340	998,259	1,208,118	1,332,730	979,804	244,813	437,269	411,914	297,026	245	362	309	309
Nakhon Ratchasima	2,859,450	3,082,896	2,898,454	3,085,799	2,089,925	2,983,688	2,323,219	2,647,924	431,778	860,128	689,832	694,305	207	288	297	297

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

Appendix 8. Production cost by crop and region, crop year 1991/92-1993/94

Crops and Items	(1992/93)					(1993/94)				
	Northern	Central Plain	North-Eastern	Southern	Whole Kingdom	Northern	Central Plain	North-Eastern	Southern	Whole Kingdom
Second rice										
Variable cost (bahts/rai)	1,614.35	1,561.78	1,250.74	1,228.78	1,525.34	1,511.84	1,529.54	1,151.53	1,301.82	1,495.38
Fixed cost (bahts/rai)	158.77	171.61	141.04	141.54	170.93	158.77	173.50	141.04	141.54	170.93
Total cost (bahts/rai)	1,773.12	1,733.39	1,391.78	1,370.32	1,696.27	1,670.61	1,703.04	1,292.57	1,443.36	1,666.31
Average cost (bahts/ton)	2,646.44	2,587.14	3,394.56	3,460.39	2,693.59	2,558.36	2,592.15	3,746.58	3,818.41	2,628.25
Major rice										
Variable cost (bahts/rai)	872.91	1,060.36	730.30	943.49	825.03	891.48	1,046.79	757.93	918.14	836.81
Fixed cost (bahts/rai)	190.77	192.74	153.77	163.44	172.53	190.77	192.74	153.77	163.44	176.00
Total cost (bahts/rai)	1,063.68	1,253.10	884.07	1,106.93	997.56	1,082.25	1,239.53	911.70	1,081.58	1,012.81
Average cost (bahts/ton)	2,890.43	2,900.69	3,494.34	3,491.89	3,249.38	3,146.08	2,986.82	3,929.74	3,523.06	3,444.93

SOURCE : OFFICE OF AGRICULTURAL ECONOMICS

Appendix 9. Production Cost of High Yield Seeds of Rice

	Baht/rai
<u>Variable Cost</u>	1,580
1. <u>Labor Cost</u>	909
1.1 Tilling	164
1.2 Seedling	170
1.3 Cultivation Practice	114
1.4 Harvest	345
1.5 Seeds Conditioning	116
2. <u>Material</u>	540
2.1 Seeds	70
2.2 Fertilizer	233
2.3 Pest Control	72
2.4 Other	165
3. <u>Miscellaneous</u>	58
3.1 Repairing of Equipment	11
3.2 Interest & Opportunity Cost	47
<u>Fixed Cost</u>	260
1. Tax & Opportunity cost of Land	224
2. Depreciation of Equipment	36
Total Cost per Rai	1,768
Agricultural land/member	10 rai
Yield/rai	550 kgs.
Revenue (5.04 baht/kg.)	2,772 baht
Net Profit per Rai	1,004 baht
Net Profit per Mamber	100,040 baht
Cost/ton	3,215 baht
Revenue/ton	5,040 baht
Net Profit/ton	1,824 baht

Figures in are improved figure.

No.

Page 2.

1.5 Total investment of the project is 2,355,000 baht which for providing loan to the farmers 825,000 baht, collecting products 1,530,000 baht and grant aid for transportation 3,500 baht.

Page 17 Paragraph 3.

Income estimation is about 27,720 baht per member, total cost per member is about 15,070 baht so net profit per member is 12,650 baht,

Page 18 Paragraph 1.

The total project investment cost is about 2,355,000 baht which is subsidy fund from government

6.1 PROJECT COST

It is estimated that the cost of producing High Yield Seeds of Rice as follow :

Labor Cost	909	baht/rai
Materail	540	baht/rai
Miscellanous	58	baht/rai
TOTAL COST PER RAI	1,507	baht/rai
Yield/rai	550	kgs
Revenue (5.04 baht/kg)	2,772	baht/rai
Net Profit	1,265	baht/rai
Agr. Land / Member	10	rai
Net Profit / Member	12,650	baht

	WITHOUT PROJECT	WITH PROJECT	UNIT
Land	550	550	rai
Yield	<u>300</u> <u>260</u>	550	kgs/rai
Products	165,000	302,500	kgs
Price	4.2	<u>5.04</u>	baht/kg
Revenue	693,000	1,524,600	baht
Cost	1,013	<u>1,507</u>	baht/rai
Total Cost	557,150	828,850	baht
Net Profit	135,850	695,750	baht
Net Profit/Farmer	2,470	12,650	baht

27,720
/

	WITHOUT PROJECT	WITH PROJECT	UNIT
Land	24,200	24,200	rai
Yield	300	550	kgs/rai
Products	7,260,000	13,310,000 ✓	kgs
Price	4.2	<u>4.2</u> ✓	baht/kg —
Revenue	30,492,000	55,902,000 ✓	baht
Cost	1,013	1083 1,507 ✓	baht/rai
Total Cost	24,514,600	28,208,600 ✓ 36,469,400	baht
Net Profit	5,977,400	29,693,400 ✓ 19,432,600	baht
Net Profit/rai	247	1227 803 ✓	baht

Appendix 9 Production Cost of High Yield Seeds of Rice

	baht/rai
1. Labor Cost	909
1.1 Tilling	164
1.2 Cultivation Practice	114
1.3 Seedling	170
1.4 Harvest	345
1.5 Seeds Conditioning	116
2. Materail	540
2.1 Seeds	70 /
2.2 Fertilizer	233 /
2.3 Pest & Disease Control	165 /
2.4 Other	72 /
3. Miscellanous	58 /
3.1 Repairing of Equipment	11 /
3.2 Interest & Opportunity Cost	47 /
TOTAL COST	1,507 / per rai

Appendix 10 : Implementation Schedule of the High Yield Seeds

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 Internal Decision Making	*											
2 Selecting Potential Farmer Members		*	*									
3 Training Coop. Staff			*									
4 Training Farmers				*								
5 Getting the Govt. Subsidy Fund					*							
6 Provide Loan in Kind to the Farmers						#						
7 Crop Beginning							#					
8 Harvesting										#		
9 Collecting										#		

* The first year activities

The annual year activities

**TENTH ICA/JAPAN TRAINING COURSE FOR
STRENGTHENING MANAGEMENT OF
AGRICULTURAL COOPERATIVES IN ASIA
INDIA, MALAYSIA AND JAPAN
October 18, 1995 to April 20, 1996**

Title of Project : JUTE PRODUCTS FACTORY

Country : SOCIALIST REPUBLIC OF VIETNAM

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in India, Malaysia and Japan**



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PHAM MINH DUC

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INTRODUCTION

THAI BINH TOWN is a rural area of 23,600 hectares with an approximate population of more than 150,000. This town is basically an agricultural crop. Due to the inadequate irrigation facilities and antequated farm practices, the farmers have very low farm production. The average land holding of a household is only 0.7 hectares. This makes a household of very little income and most often not enough to provide a decent life to its family members.

Other sources of income of the household is raising livestock, like pigs, cattle, chicken and goats, but on a minimal basis only. The household, at times, engage in planting other crops, like vegetable and fruits, but just enough for household consumption. There is a need of a more productive farm activity to augment the income of the rural household.

The percentage of household below the poverty line goes as far as 40%, and some 30% may just have enough for a year subsistence. Around 30% are having an income slightly above the average standard of living in the area.

Jute plants are easy to produce in THAI BINH TOWN, because the banks of the Red River Traverse the town, and it is in this area where jute is planted. There are small producers of Jute products in the area consisting of rugs, carpets, door mats, household decors, center pieces and other items. But the demand of finished products made of Jute is unlimited, and there is an export possibility and market demand for the product, especially if quality is given prior consideration. There is a need to promote and develop the industry.

The rural household need to increase its income and improve its living condition. The opportunity for a better life is possible in this undeveloped industry, so the Thai Binh COoperative Federation is spearheading the establishment of a JUTE PRODUCTS FACTORY, with a total Capital of 1,586 million Dong. (\$150,000)

CHAPTER 1

SUMMARY

- 1.1 The Project is to encourage households of Thai Binh town to increase their income and uplift their living condition through increase production of Jute Products.
- 1.2 The Jute Products Factory project will train the household to plant Jute and process it for sale to the factory.
- 1.3 The Thai Binh Cooperative Federation will establish the factory and operate it for the production of Jute products produced by its primary society members.
- 1.4 The Jute factory will produce products for local, as well as, for export market.
- 1.5 The main object of this project is to improve the household income of the members of the primery societies under the Thai Binh Cooperative Federation

11.6 The target household of this project are those with an average landholding of 0.7 hectares and below the average income level.

1.7 The proponent of this project is the Thai Binh Cooperative Federation, which has 12 primary affiliates with 30,000 individual members.

1.8 The total investment of this project is 1,586 million Dong, (\$150,000) Distributed to:

land

building

Furniture & equipment

Training

1.9 The sources of Funds shall be from:

Members equity

Government subsidy

Loan

CHAPTER 2

JUSTIFICATION

The Vietnamese farmer has been burdened with low income, little landholding and lack of financial and technological assistance from concerned agencies of the Government. This is compounded with the absence of other than from agricultural activity, thus giving the farmer a very slow improvement in terms of income and progress.

The Vietnamese farmer is also at times a victim of informal money lenders when he needs support for his farm inputs like fertilizer, seeds and cash for labour. Due to his limited landholding and meager income, the Vietnamese farmer has never the opportunity to progress.

Due to the inadequate irrigation facilities, people of the area have only one or two planting seasons. There is therefore an urgent need to diversify the agricultural activity of the farmers and utilize their vacant periods to other agricultural crops, in order to be more productive.

The town of Thai Binh is an area which is conducive to the production of Jute, due to the presence of a long river bank from the Red River which crosses the area of the total 18,900 hectares of land producing jute in entire Vietnam Country, Thai Binh has a share of 1,246 hectares, which is approximately 7%. Out of this, around 1,400 metric ton of jute is produce in Thai Binh annually which is enough to maintain the capacity of the proposed JUTE PRODUCTS FACTORY.

There are 15,000 farmers who can be mobilized to produce more than 1,400 tons of jute every year, with an average production of 93 kg. per farmer with an income of approximately 1,300,000 Dong. This amount is very significant in uplifting his economic well-being added to the household average income of 5 million Dong, or around 24%increase annually.

There is therefore a justified reason to establish the THAI BINH COOPERATIVE FEDERATION JUTE PRODUCTS FACTORY.

CHAPTER 3

AREA OF THE PROJECT

The area of the project covers the whole town of Thai Binh. But the total area available for jute production is approximately 1246 hectares, consisting of the banks of the Red River which traverses the THAI BINH town. The bank area is conducive to the production of jute, because jute grows favourably on river banks and swamps. Jute is planted on swamps, marshy places or wet places and can be harvested in three months. Jute seeds can be provided by the Thai Binh Co-operative Federation, including methods and technique in planting jute. The jute is sundried by the members and cut to the required sizes and length before delivery to the factory. This jute supply is collected in collecting centers, before delivery to the Jute factory for classifying and processing. Processed and classified jute are dyed to any colour designed before it can be weaved and made to a jute finished product.

Red River is the major river that provide Thai Binh farmers the area for producing jute. 15,000 farmers who are members of the different cooperative societies

under the Federation, who are along the Red River banks are to be engaged in jute planting. The Red River crosses Thai Binh from Hanoi.

Thai Binh is bounded by Nam Dinh in the north, Cho Bo in the West, Dong Xuan in the east, and Kien Xuong in the south. These are towns which can also be sources of additional jute supply if needed, but most importantly is jute finished products can be marketed in these places very adequately, considering their proximity.

The climate of Thai Binh is relatively temperate, which is favourable to the growth of jute plants. Along the Red River banks, going down to the China sea, jute plants can be planted the whole year round. The 15,000 farmers who are to plant jute have an alternative activity when not tending their ricefields. After planting or harvesting rice, farmers can shift to planting or gathering jute plants.

Thai Binh is strategically situated in an area for jute for jute planting because Red River cuts inside the town. The possibility of export for jute products is promising with the assistance of the Central Council Of National Cooperative Union of Vietnam, and in coordination of the Vietnam Department of Trade and Industry.

CHAPTER 4

THE PROJECT

The Jute Factory Project of the Thai Binh Federation is considered as an added activity of 15,000 farmer members of the society, affiliates of the Federation. This project can generate an annual income to the farmers to an approximate amount of 16,850 million Dong. increasing the farm income of the farmers to 18%. The regular income of an individual farmer is 5,000,000 Dong. If a farmer engage in jute production, he can derived an additional income of 1,300,000 Dong, making his annual income to a total of 6,300,000 Dong.

The project will be established in the central town of Thai to guie accessability for farmers to deliver their Jute products. The Thai Binh Cooperative Federation will operate and manage the factory, which will classify, process, tan, weave and produce different jute products such as rags, carpets, center pieces, house decors and other items. 200 weavers, tanners and employees will be employed to work 300 days in a year. This factory will produce 466,000sq meters of Jute finished products, including decorative art products.

Employees weavers and other worker will be trained by experts or trainers to produce quality jute products.

Quality control will be strictly imposed to quality different items for export. A warehouse use factory building, and Administration office will be built and adequate facilities shall be installed.

The project has a backward and forward intergration, considering that society individual members produce the jute raw materials and supplied to the Federation to processing and marketing. Considerable benefits shall be provided to the members in terms of services net surplus, training and other servoces.

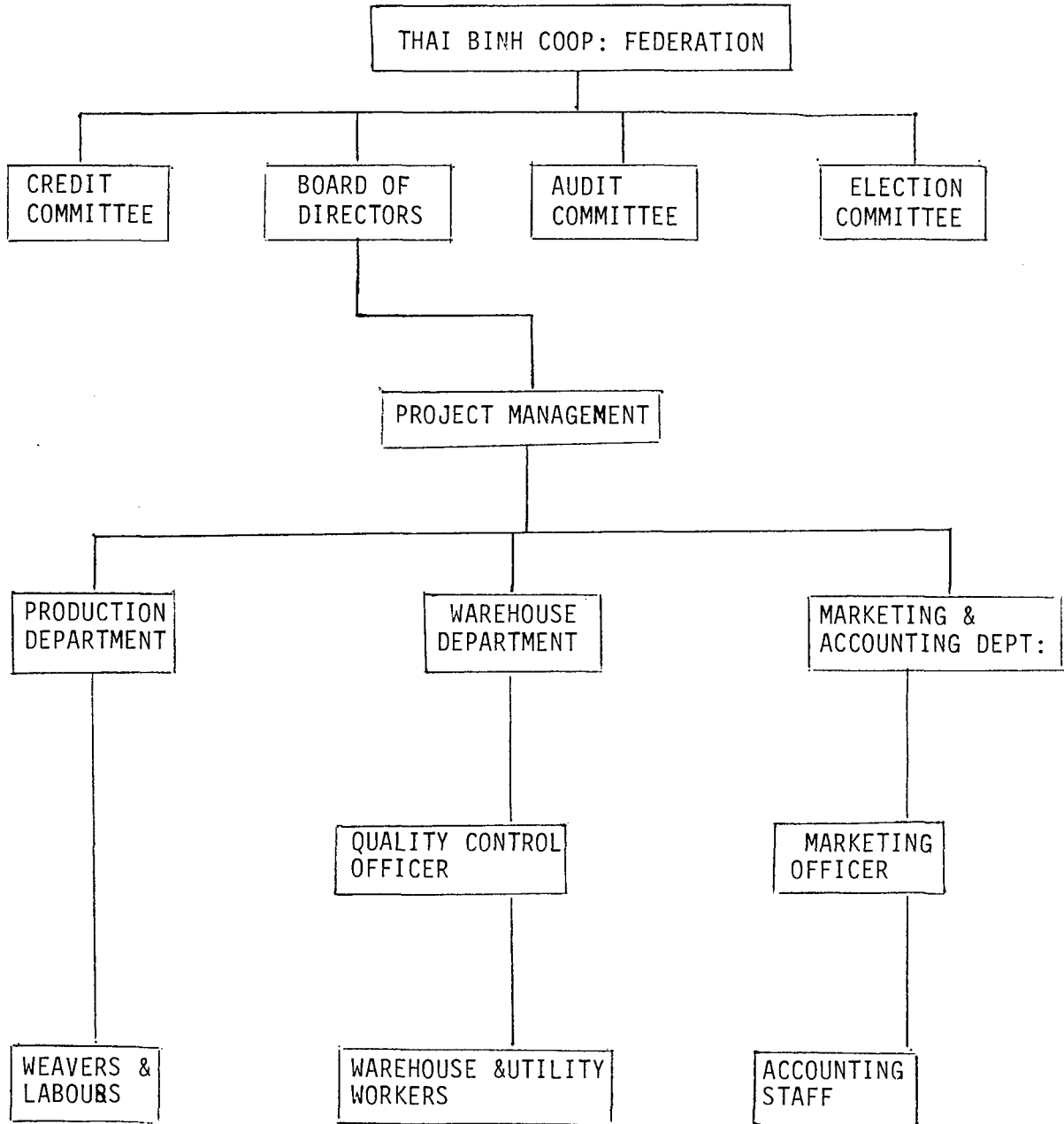
The project is assumed to operate for 10 years after construction. It is scheduled to be constructed Gn 1997, and to be fully operational on 1998.

CHAPTER 5

ORGANIZATION AND MANAGEMENT

The Jute Factory to be established by the Thai Binh Cooperative Federation is to be operated and managed by the Federation. The Thai Binh Cooperative Federation is composed of the Board of Directors, the Credit Committee, Audit Committee and the Election Committee. The Federation through a Board Resolution to be confirmed on a general meeting in an Assembly, create a PROJECT MANAGEMENT composed of the General Manager, the Production Department Officer and staff, the warehouse Department Officer and staff, the Marketing and the Accounting Officer and staff.

The jute factory is established to serve cooperative society farmers. The Thai Binh Cooperative Federation Board of directors formulate policies in the effective management of the Jute Factory. The day to-day operation and management of the factory is under the General manager and staff. The total number of management staff and employees is 200. Schedule of salaries and wages is provided in an annex page.



CHAPTER 6

FINANCIAL ANALYSIS

1 The project life is for 10 years, including construction period.

2 The capacity of the project is to process 1,400 tons of jute into different jute products, like rugs, carpets, door mats, household decorations and table center pieces.

3 The Initial investment of the project is 1,586 million Dong, distributed to

Land	420
Building	800
Furniture & Equipment	306
Training cost	60
Total	1586

4 Sources of funds:

Members Equity	576
Government Loan (No Inte;)	150
Loan from Bank(10%)	960
Total	1586

5 The depreciation calculate

Building	10%
Furniture and Equipment	20%

- 6 Selling Price is 45,000 Dong / sq.m.(approx 3kg)
- 7 Processing loss 3% of raw materials.
- 8 The factory is expected to achieve a capacity utilization of 60% in the first year, 80% in the second year and 100% on the third year, onward.
- 9 Procurement of raw materials will be provided by society-member farmer to a minimum supply of 840 metric tons per year, and to increase every year in accordance to the production capacity utilization of the factory.
- 10 The working capital of the Factory is 1,080,000, increasing by 24% every 3 year.

ANNEXURE V

STAFF POSITION WITH THEIR ESTIMATED SALARIES

In Thousand Dong

S. No.	POSITION	NUMBER	SALARY PER MOUNTH		
			YR1	YR2	YR3
1.	Manager	1	2,000	2,000	2,000
2.	Officers	5	1,600	1,600	1,600
3.	Staffs	68	1,000	1,000	1,000
4.	Worker& Weaves	186	650	650	760
Total		200	140,000	140,000	160,000

ANNEXURE I

Cost of Land

In Million Dong

S.No.	Item	Estimated Cost
1	Cost of Land 2,000 m ² x 160,000	320
2	Development Expenses	100
Total		420

ANNEXURE II

Cost of Building

In Million Dong

S.No	Particulars	Size/Area	Estimates Cost
1.	Office, Store, Groundroom, Toilet	500 m ²	300
2.	Tanning & Weaving House	1,200 m ²	500
Total		1,700 m²	800

ANNEXURE III

EQUIPMENT AND FURNITURE

In Million Dong

S.No.	Item	Quantity	Cost/unit	Total Cost
1.	Weaving Framers	190	1,000	190,000
2.	Chairs	200	100	20,000
3.	Office Tables	20	500	10,000
4.	Others			86,000
Total				306,000

ANNEXURE IV

WORKING CAPITAL

In Thousand Dong

S.No.	Quantity	Yr1	Yr2	Yr3
1.	Raw Materail 10 Days	360,000	480,000	600,000
2.	Work in Progress 5 Days	210,000	262,000	327,000
3.	Finished Goods 5 Days	210,000	262,000	327,000
4.	Book Debts 10 Days	420,000	524,000	654,000
		1,200,000	1,528,000	1,908,000
5.	Trade Creditors 50%	180,000	240,000	300,000
	Working Capital	1,020,000	1,288,000	1,608,000
	Interest in WC 16%	163,000	206,000	257,000

CHAPTER 7

RECOMMENDATIONS

- 1 Vietnamese farmers are limited to agricultural activities, giving them no alternative for additional source of income, so the cooperative section should create other measures of income to improve the living conditions of the farmers.
- 2 The Vietnamese farmers should be trained and encouraged to develop other agricultural activities to augment their existing income.
- 3 The Vietnamese Central Council of Cooperatives should assist the Federations in establishing alternative agricultural income-generating projects through technological and financial assistance.
- 4 Export of Vietnamese local products should be promoted to spur the development of economic status of the country side.

