AGRIBUSINESS COOPERATIVES

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FOREWORD

The International Cooperative Alliance (ICA) is one of the oldest non-governmental international organisations. It is a worldwide confederation of cooperative organisations of all types. Founded by the International Cooperative Congress held in London in 1895, it now has 191 affiliates in 79 countries, serving over 670 million members at the primary level. It is the only international organisation entirely and exclusively dedicated to the promotion of cooperation in all parts of the world.

The Regional Office for Asia and the Pacific (ICA ROAP) in New Delhi was opened in 1960. The main tasks of the ROAP are to develop the general activities of the Alliance in the Region, to act as a link between the ICA and its affiliated national movements, to organise and conduct technical assistance programmes, to conduct training courses, seminars and conferences, undertake surveys and research, to bring out publications on cooperative and allied subjects and to support and supplement the educational activities of national cooperative movements. The ROAP activities in the Region cover 55 affiliates in 19 countries, i.e. Afghanistan, Australia, Bangladesh, China, Fiji, India, Indonesia, Iran, Japan, Republic of Korea, Democratic Republic of Korea, Malaysia, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Russia and Vietnam.

This book is a part of the continuing efforts of ICA to bring out publications which would be useful in strengthening management of cooperatives in the Asia Pacific Region. Mr M.V. Madane, Project Director of the ICA/Japan Management Training Project, has been making continuous efforts to improve the quality of training material and to provide analytical papers on various managerial issues at the cooperative level. Profs. S.P. Seetharaman and P.M. Shingi have painstakingly collected the data from cooperative organisations from four different countries and presented them in a conceptual framework.

I am sure this book on Agribusiness Cooperatives would be a valuable addition to the existing cooperative literature.

ICA Regional Office for Asia and the Pacific,
New Delhi

G.K. SHARMA
Regional Director

PREFACE

The International Cooperative Alliance (ICA) initiated a major management development programme when in July 1986 it launched the ICA/Japan Management Training Project for Agricultural Cooperatives for the Asian Region. This project was made possible as a result of very active policy support extended to the ICA by the Central Union of Agricultural Cooperatives in Japan and the financial support provided by the Ministry of Agriculture, Forestry and Fisheries of the Government of Japan. The management training programmes being conducted under the Project have provided to the cooperative movements in the Region an opportunity to upgrade their management development efforts in order to bring to their members increased benefits of cooperative activity.

The present publication is a result of efforts made by the ICA to build up documentation and training materials based on experiences and management situations at the grass-root level. The ICA sponsored case studies included in the book were made possible because of the very willing cooperation extended by Prof. S.P. Seetharaman and Prof. P.M. Shingi of the Indian Institute of Management, Ahmedabad.

The eight case studies conducted in India, Bangladesh, Thailand and Indonesia cover not only the traditional crops like paddy but also commodities such as mushroom, asparagus, shrimps, prawn, ice-cream and eucalyptus. This effort gives an insight to the marketing and processing aspects of these commodities and opens up new avenues for cooperative enterprise in different directions.

These cases have been prepared essentially for the purpose of classroom teaching and should not be treated as research studies. Going beyond the basic production aspects, they underline the importance of marketing. They bring together relevant data for analysis and decision-making purposes and can be useful for formulating cooperative strategies.

Using the case study material as a base, a conceptual model on agribusiness has been prepared. Though not by design, but by accident, the selected cooperatives provided opportunities to study and compare different leadership and management styles. The trend arising out of these studies indicates that the managerial patterns emerging out of administratively run, management-oriented and leadership-motivated agribusiness cooperatives were qualitatively different in character.

All these cases are currently being used in the management training programmes organised by the ICA. These cases have not only generated enough enthusiasm among the participants but have also provided opportunities for discussing grass-root level situations. I am sure, these cases can be used with advantage in teaching cooperative marketing in institutes imparting managerial training to cooperative functionaries.

These case studies would not have been possible but for the willing cooperation and assistance of ICA member organisations in providing valuable data and opportunity for the authors to conduct the studies in particular countries.

I am grateful to these organisations and their staff for facilitating our efforts. My special thanks to Prof. S.P. Seetharaman and Prof. P.M. Shingi for conducting these studies and for presenting them in a book form by adding the conceptual model. The addition of a case for project appraisal exercise makes the book doubly useful. My special thanks to the authorities of the Indian Institute of Management, Ahmedabad, for sparing the services of the two professors for conducting the case studies.

At the end I would like to place on record our thanks to M/s Oxford & IBH Publishing Co. Pvt. Ltd. for bringing out this publication in the form of a book.

I am confident this book will further enrich the material already available for management training.

ICA Japan Management Training Project
ICA ROAP, New Delhi

M.V. MADANE
Project Director

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FRAMEWORK FOR CASES

Professor V.K. Gupta (VKG) and Professor V.R. Gaikwad (VRG) of the Indian Institute of Management, Ahmedabad have conceptualized and given shape to what is widely known as the AMSAC model (Appropriate Management Systems for Agricultural Cooperatives). The focus of the cases presented in this book is on some of the processes and project components of the AMSAC model.

Case 1: Farmer, Cooperatives, and Government

Not as a rhetoric, but as a serious concern; the AMSAC addresses itself to two basic questions as to "How to increase the income of small farmers" and "whether cooperatives as a form of organization can help small farmers to increase their income". VKG-VRG indicate that there are three ways by which the income of farmers can be increased: (1) increase land/water productivity or yield per acre, (2) reduce the cost of production, and (3) ensure remunerative prices of output. But they also ask a question as to what role the existing cooperatives are playing with respect to these three routes.

On the first route they feel that optimum yields can be obtained by:

a) Sequential application of scientific methods and improved inputs based on an ideal set of combinations but applied under a given set of conditions.

b) Strengthening yield saving strategies. Everywhere figures indicate that the gap between yield levels at research stations and a farmer's field is large and at the same time a good portion of the losses in the produce of small farmers is avoidable through strengthening of yield-saving strategies. They feel that the existing cooperatives are not playing an important role on increasing productivity. The general feeling is that it is the role of the government, or it is up to the people to worry about it, or for other supply systems to work on it. Increasing productivity requires managerial responsibility in terms of

planning, organizing and controlling the production activities of the members. How can these responsibilities and skills be developed among the agricultural cooperatives? The first case in this volume brings out this issue clearly.

On the second route of increasing income of small farmers, VKG-VRG feel that the cooperatives have been involved in the supply of inputs, but by and large, they have been ineffective. The cooperatives mostly acted as commission agents and were interested in "10 per cent" business. They did not cover farmer's risks nor stocked yield saving inputs. While they worried about their own balance sheets, they were not bothered about the profit and loss accounts of farmers. The focus of their business was not on saving the cost of farmers. Mounting overdues was a result of this. But the total system was concerned about their margins.

On the third route of increasing income through providing remunerative prices for agricultural produce, VKG-VRG feel that the role of cooperatives has been at best marginal. They have become merely sales and purchase centres working on fixed margins. According to its philosophy, the cooperatives were to act on behalf of the farmers but they did not stop to ask a question to themselves whether their selling and purchasing activity helped the farmers to improve their income. They worked on the same principles as did the private traders. Prices were not offered on the basis of quality (like moisture content or fat content) but on the basis of regulated prices. They preferred to act as development agents of government machinery, than as representatives of farmer members.

The role of existing cooperatives on all the routes of increasing the income of farmers has not been that praiseworthy, but certainly the potential did exist.

Case 2: Marketing of Mushrooms

Farmers cannot stop innovating themselves. They will not wait forever for the cooperatives to come out with the right ideas. This goal is achievable for cooperatives by undertaking storage, processing, or marketing activities. By nature, most of the agricultural commodities have a seasonal character. Sheer volume of produce available simultaneously creates problems for some commodities, while in others it may be a short, perishable life. Tomato or fish, for example, come in bulk in the market and cannot sustain the falling prices for lack of storage, transport, or processing facility. Considerable losses

take place by being kept in the open. Lack of market information increases dependence on traders and commission agents. If farmers produce more, they may not get more prices. Higher production in the country has a dampening effect on production. Storage, processing, or marketing, though capital intensive, can help increase the production as well as offer better prices. Through this route, one not only increases the shelf-life of the perishable commodity, but also begins to control both production fluctuations and marketing fluctuations along with price fluctuations.

Though some cooperatives have undertaken storage and processing functions, they are limited only to a small number of commodities and also as a residual activity. Marketing specific functions are covered inadequately by the cooperatives. Many important commodities are also left out. In short, efforts to strengthen processing, storage, transport or market control are on a limited scale and in many cases unsuccessful. May be we are not sure of the size of operations needed for each commodity. And also the kind of cooperative structure could be most functioinal for such a purpose. Case 2 in our volume brings out these issues vividly and highlights the problems of a village level cooperative.

Case 3: Unfrozen Shrimp

The existing cooperative structure is a three-tier structure: apex, secondary or middle, and primary level. VKG-VRG observe that these structures compete and fight among themselves for their own share of margins instead of supplementing or complementing activities of each other. Most of the apex level and secondary level bodies are weakest of the organizations; consisting of deputed managers and a large number of clerical cadre. The whole cooperative structure runs on normative decisions rather than negotiative or creative decisions. Everything is prescribed from government or apex body. Lower people tend to only operate those prescriptions. Thus, the system generally works on operating rules.

To arrive at newer or alternative solutions to the member problems, negotiative or creative decisions are needed to be taken. VKG-VRG are of the opinion that we have less of the cooperatives working on negotiative or creative decisions and more of those working on normative decisions. Even what may seem to be a fairly good technology in the cooperative structure, may be a result of normative decisions; and may continue to work on similar decision-making

patterns. The third case in this volume refers to this phenomena and underlines the importance of professional management. A structure based on normative decision making can only engage in fire-fighting exercise as long-term planning to assess and strengthen the activity with an explicit purpose of creating an impact on the producer itself is lacking.

Case 4: Satan's Eucalyptus: A Case Study of Vinayak Rao Patil

Structure should be determined by the activity and associated functions. The only link the farmers at present have is with their primaries. Can primary societies be effective in stimulating three of the routes of increasing income? Most of them are not even economically viable. VKG-VRG feel that the member participation in such cooperatives, therefore, is weak. None of these primaries would be able to tell what is happening to their members: what are their resources, land quality, irrigation, technical stagnation, systems of farming, transport, markets, losses, etc? Only a genuinely interested leader of a cooperative can keep track of these as part of his planning to work on the three routes of income generation for members.

Improper activity-mix is another major problem facing the cooperatives. They will sell fertilizers, pesticides, and suddenly get into groundnut business becasue they were told to do so. Basically, what is needed is building strong and endurable connections among activities aimed at a goal. "I should first worry about my farmers. My activity-mix is not proper as long as it is not proper for my producers. I have limited capital and therefore whose point of view should I honour," are some of the important considerations. Only that activity-mix can be considered as proper which helps to increase the income of a farmer.

One needs to redefine a problem and search for a solution—a solution which can sustain itself economically, and which can also stand the test of time. Redefinition and search needs a visionary and a leader of outstanding qualities. It is a leadership function. Because redefinition of problem leads to redefinition of norms; redefinition of existing structures and culture; redefinition of policies; and so on. New ideas have to be legitimized. Legitimization requires struggle and conflict resolution. But it is necessary to create this kind of favourable environment to reorient cooperative structure to get away from basic deficiencies and march towards new horizons. Shri Vinayak Rao Patil of the Fourth case shows what difficulties one is

likely to encounter in redefining the goals; in evolving a proper mix of activities; in changing the structure and values, and in influencing the government policies.

Case 5; Two Sides of a Project

What is the solution to the existing situation? VKG-VRG believe that AMSAC (Appropriate Management Systems for Agricultural Cooperatives) is probably the answer. They feel that only the broad indicators can be given, which the project authorities have to translate into an appropriate environment. Models are only skeletons; somebody has to put the right kind of life in them, but the skeletons should be known, or their requirements should at least be known. And working on only a part of a skeleton should be avoided unless the situation so demands. One should look at the problem not in piecemeal, but from a management point of view and from the system as a whole. Farmer interests can be served only if cooperatives think and operate as an agribusiness system. Designing of the activities, the structures, and the projects has to be from this angle. One does not look at production or finance alone; but also looks at members, personnel, marketing, products, and consumer subsystems. In that sense, the activities, the structures and the projects become integrated.

There are various aspects and levels of integration, but integrating activities which have a bearing on the immediate constraints of the small farmers is the simplest. All activities which can help increase the income perceptibly provide the ideal conditions for cooperatives to enter and integrate with. Tendency is to concentrate only on production support. How to turn an unfavourable market situation to a favourable one through a collective action is practiced only on a limited scale. That small farmers are ridden with constraints, have limited capital, outdated attitudes, high servicing cost and inadequate skills are not negative factors. On the contrary, they provide justification for the cooperative action, but lack of appropriate integration of activities could be a serious problem. VKG-VRG propose that the most desirable type of integrations could be: (a) backward integration to strengthen production support; (b) forward integration to provide processing and marketing support; and (c) horizontal integration to encourage member participation in collective action. Case 5 shows that one sided projects have their own limitations.

Case 6: Milk-Vita Ice-Cream

What is an integrated management system? According to the AMSAC model, anything that effectively and purposefully links a farmer to a consumer is an integrated management system. For analytical purpose it can be broken down into forward, backward and horizontal integration subsystems as they refer to, and deal with a distinct set of complementary activities. Forward integration is with the markets because only markets bring farmers closer to consumers. However, value addition is the soul of forward integration. Forward integration for the sake of forward integration because available technology makes it possible to produce something, irrespective of the fact whether it can really add value to the produce of the farmers, is of cosmetic value only. Value-addition is where the cream lies. Forward integration, therefore, also requires constant evaluation of the product mix, product behaviour, and value additioin in terms of increased returns. Obviously, an integrated system should be able to share the value added returns with the producers. Value addition generally takes place through processing; but it can also be through innovative storage and handling. VKG-VRG point out that a utility to a farmers production can be added by changing: (a) the form of the produce (processing); (b) the place of the produce (marketing it in different places); and/or (c) the time of sale (storage). They suggest that integration should be in a particular order. First, one must decide the basis on which, or the product with which, to establish a link with the consumers with the express purpose of value addition, and then decide on the course of backward linkage. Our case 6 indicates that backward intergration has been successfully achieved keepingn in view the requirements of a forward linkage. But, product identification process to know which side of the bread has butter requires professional competence and strong market information system.

Case 7: Tanayamma Cold Storage for Asparagus

Backward linkage helps to increase production at a lower cost, whereas, horizontal integration is critical to increase member participation. The objective is to get as many people involved in production as is necessary to reduce the cost and create opportunities to actualize value addition. Both forward and backward integration cannot work without horizontal integration. Backward integration involves all efforts needed to strengthen the production-supply base. It involves planning, supply of all critical inputs, well-directed extension activity,

and so on. A particular activity may be a loser from the cooperative viewpoint but it might be a critical one from the production point of view. Backward integration encourages control over supplies, quality and planned production. Such a system does not emerge automatically. It needs to be designed. Forward linkage becomes a stimulus for designing such a system. The seventh case in the volume points out to the importance of designing such a system. The system should result in the desired production. Otherwise, opportunities presented by forward linkages are lost. Reduction of risk should be a goal, and it should not be adding more value to the existing risks.

It is generally commented that only big farmers have been benefited by the production support generally extended by the cooperatives. VKG-VRG argue that one should not blame the big farmers. Nobody prevented cooperatives from helping the small farmers. It was their objective of earning more profits and more margins for themselves (cooperatives), which was self-defeating. There is no problem if the objective is to increase the income of small farmers. In processing and marketing, the participation of big farmers on the contrary does help in realizing the advantages of the scale of operation.

Case 8: To Fund or Not to Fund

Horizontal integration is necessary for the control of raw material flow. There is nothing sacrosanct about two--tier or a three-tier structure. Commodity, activity and other related functions can decide the structural arrangements. Farmer groups are necessary to ensure participation and member control. This component, therefore, also has to be planned. VKG-VRG observe that increasing the income of small farmers means exploiting everything except the consumers. It can be done with the use of modern technology, and with the modern management systems. One cannot think of having the latest technology and no professional management; or having a professional management but outdated technology. Modern is what is cost effective, efficient and quality conscious. Modern technology and modern management give cooperatives a strength to influence the market forces, and not get influenced by it.

Therefore, according to VKG-VRG, projects based on AMSAC principles, that is, those which have been conceived by paying careful attention to the forward, backward, and the horizontal linkages, and those which enlist professional competence would have a strength of a sound diagnosis, as long as the immediate aim is to increase the

income of small producers through value addition. Our eighth case in this volume on Fund or Not to Fund presents one such example of project formulation.

FARMER, COOPERATIVES AND GOVERNMENT

A Dairy Farmer

Suhiar, a 45 year old dairy farmer of Sukalarange village had no previous experience with milch animals when he received his first two cows imported from Australia in 1983 under the government programme to promote dairy activity. Two hundred farmers from his village had applied for the cattle loan, but only 10 farmers got selected by the department of cooperatives on the basis of certain criteria. Members of a cooperative society having a piece of land not very close to their houses and a reliable source of water were considered as eligible. Suhiar had one hectare under paddy and 0.5 hectare of dry land in which he grew banana, corn, and cassava. He used the dry patch of land for his dairy cattle.

The farmers selected for the programme were given a month long training at a centralized place on aspects related to conception, birth, hygiene, diseases, artificial insemination, shed construction and milking. Though residential in nature, Suhiar attended the programme stay ing at his home as the place of training was very close to his village.

He was sanctioned a loan of Rp 1,100,000 which included the cost of two cows (Rp 1,040,000) and the construction of shed (Rp 60,000). In addition, the transport cost of Rp 10,000 to bring the animals from the harbour to his village was incurred by him. The selection procedure for milch animals was simple. A society representative went to the harbour and picked up the number of animals allotted to the society from the lot which had arrived.

Similarly, when the cattle arrived in the village, the farmers went and selected whatever animals they wanted from the lot on the "first come first serve basis".

Realizing the importance of milch animals, Suhiar once again applied for a second lot in 1984. He was fortunate enough to get eight

more (out of the 10 he had applied) animals imported from New Zealand at the cost of Rp 1,340,000 for each pair and Rp 60,000 for the shed. All the animals were pregnant at the time of arrival, and started giving milk within a period of five months.

Though Rp 60,000 were sanctioned for the construction of a shed, Suhiar found that the amount was inadequate for the purpose. His actual expenses came to Rp 2,10,000 as follows:

	Rp
i) Cement 15 bags @ Rp 2000 per bag	30,000
ii) Wood 1 cm @ Rp 85,000 per cm	85,000
iii) Tiles 500 @ Rp 30 per tile	15,000
iv) Bamboo 50 pieces @ Rp 200 a piece	10,000
v) Labour	70,000
Total Rp	2,10,000

The cost of construction was higher partly because he had also constructed a water storage tank along with the shed and used high quality wood to increase the life of the shed. He used his own sources of funding.

The veterinary department had trained two of the KUD employees in artificial insemination. With their help, Suhiar was able to maintain the intercalving period as short as 11 months. He generally requisitioned the services for the artificial insemination two months after the calving. The inseminator, after insemination visited the farmer a month later to inspect whether the artificial insemination was successful or not. Suhiar got milk for the first seven months of lactation. Dry period lasted for about four months. The average production of milk per cow per day was as follows:

Month	Morning (Ltrs)	Evening (Ltrs)	Monthly (Ltrs)
First	10	5	450
Second	12	8	600
Third	10	9	570
Fourth	8	6	420
Fifth	8	4	360
Sixth	6	2	240
Seventh	2	0	60
	Total		2,700

Suhiar initially purchased his cattlefeed from the private dealers, but then switched over to the concentrates supplied by the federation. His animals weighed around 400 to 450 Kg. Suhiar also spent about Rp 25,000 on medicines per year per animal. The KUD had trained a person in the first aid and to attend to minor ailments. Suhiar fed his animals as shown below.

Feed	Kg. per animal per day		Price per kg (Rp)
	in Milk	Dry	
Green Grass	35	35	10
Concentrates	2.5	1	245
Bran	2.0	1	150

Suhiar already had four successful lactations per animal by 1987, and expected two more. Out of four lactations, he had obtained 40 calves - 34 males and six females. He sold three month old males of first lactation at Rp 1,50,000 each; the second lactation ones at Rp 2,00,000, the third at Rp 2,50,000, and the fourth at Rp 3,00,000. The six female calves he gave to his relatives and in return obtained paddy for home consumption.

Suhiar had four daughters and a son. He was earlier a small trader. He used to purchase broilers from Bandung and sell them in his area. He then joined the KUD as an employee. He was in service when the dairy scheme was introduced. As he was in service, he had employed a full time labourer on Rp 95,000 per month to look after cattle. A small wooden house was provided for the labourer's family on the same plot where the animals were kept. While the labourer attended most of the functions, including cutting the grass; his wife helped him to milk the animals. The labourer carried milk to the milk collection centre every day and made entries in the passbook given by the KUD. They also disposed of the dung by spreading it in the field. The dung production was about 30 kg a day per animal and a large portion of it remained unutilized. The market price was about Rp 5 per kg, but Suhiar never sold it.

Suhiar said that the KUD gave the milk producers Rp 300 per litre. Prices were not given on the basis of fat content. Lactometer testing was done only to determine the reject quality of milk, if necessary. Spoiled milk was rejected. The prices offered by the private traders were Rp 700 per litre. The open market prices were very

tempting, but the KUD restricted the sale of milk by farmer members to the private traders. Though no sanctions were specified, the farmers perceived that if found guilty, the KUD would take away the cattle given to them on loan. It was reported that the managing committee of a nearby KUD was considering to sell its milk to private traders by passing a resolution. They were also expecting a strong reaction from the department.

The KUD (Village Level Primary Cooperative Society)

The Gemah Ripah KUD covered six villages. The farmers generally grew paddy, vegetables and corn, and raised either poultry or milch animals. The society mostly supplied the inputs like fertilizers and pesticides but not the seeds. No marketing services were provided except in the case of milk which was sold to the Milk Federation. The farmers sold their ripe corn in Sukabumi, and sent fresh corn to Jakarta as fresh vegetables. Tomatoes were also grown in the area and were sold in the departmental stores. The KUD had a small consumer store. Agricultural credit was one of the regular activities of the KUD. The KUD had participated in the poultry development programme till 1985, but since then the programme has been inactive. During the last two years, however, the KUD had established its new business connected with the supply of electricity.

The poultry programme in the KUD was initiated in 1981 as part of the government scheme. Earlier the government had extended credit to the farmers to raise poultry. But private companies also raised large scale poultry farms and the small farmers could not stand in competition. The government therefore took a decision to restrict poultry business in the hands of small farmers. The big units were advised to reduce their size of operation to 500 layers. To strengthen the decision, the government improved its credit flow to the small farmers through the cooperatives. This credit was to be given in the form of poultry feed and day-old chicks. The KUD had concentrated on these two items as important components of the scheme. Traditionally, some farmers were involved in this business. But the society had no knowledge about the number of persons raising poultry. A member selected for this programme could get from the KUD 500 birds every two months or 250 layers.

In 1982, 28 farmers from six villages started raising broilers and 20 members started raising the layers. The beneficiaries were selected by the department of cooperatives on the criteria, that: (a) the benefi-

ciary should be a member of the KUD; (b) he should have a small piece of land to construct a shed; (c) he should have some experience in poultry raising; and (d) he must have been trained by the agricultural extension machinery. Since the selection was done by the department, the KUD assumed that all these criteria must have been met to their satisfaction. In 1983, the number of persons in poultry business decreased to 21 raising broilers and 13 raising layers. Some of them were continuing, though the KUD had suspended the programme.

The farmers used to deliver the eggs to the KUD and receive their money immediately after deducting the dues. For the sale of broilers, the KUD had identified the private buyers to cooperate with the KUD by informing them about the sales and by deducting the dues. The buyer to that extent was treated as a representative of the KUD. Whenever the sale was executed, the buyer was expected to make the payment to the farmer in the KUD premises. Without the permission of the KUD, the buyers were not allowed to buy the broilers from the members. To legitimize the permission, the buyer had to give Rp 5 per kg by way of commission to the society. A society person would be present at the time of weighing. After 1983, the prices of feed and the day-old chicks increased substantially. But the output prices by and large started sliding down as they could not be controlled by the government. As a result the poultry business became unprofitable both to the KUD as well as to the farmers. Some of the farmers who continued with the business purchased the broilers/layers and poultry feed from the private dealers and also sold their produce to them.

Supply of electricity was considered to be one of the important and profitable activities by the society. It was actually not supplying the electricity, but undertaking associated functions like collection of electricity charges and small repairs. A society employee recorded the meter readings in each house. For this the society got Rp 8 per house per record from the electricity company. After receiving the monthly bills, the consumers paid their bills in the society office. The amount then was deposited by the society in the company's account. The first 15 days of the month were treated as a payment period. Rp 1000 was charged as penalty for the late settlement of bills. The supply was cut if the bills were not settled within a period of two months. The society informed the supplier about the defaulters. For the collection of dues, the society received a commission of Rp 12,000 per 100 houses. The KUD in all serviced 1,367 houses. Whenever the members failed to pay the bills, the society paid on their behalf, if it had money. If not,

then only it gave the names of the defaulting members to the company. However, only about 40 per cent of the users were the members of the society.

Though the working area of the Gemah Ripah KUD was only six villages, the bill collection function was carried out in 10 villages as not all the KUDs in the region were selected by the electricity company for this work. This function was being carried out for the last two years. Prior to that there was no electric supply to these villages.

According to the working norms, the responsibility rested with the KUD in relation with the discrepancies in meter readings. It was also the responsibility of the KUD to repair faulty meters and charge for it. Repairs in relation to the fittings inside the house were paid by the consumers, and outside the house by the company. Three persons, one cashier and two meter readers/repairers were employed by the KUD on a monthly salary of Rp 35,000 each. The repair charges were given to the repairers. A small work space (8m x 3m) and small equipments and material was provided by the KUD to these persons at the head quarters. The meter readers were supposed to meet their own transport expenses.

The society in 1986 had an annual income of Rp. 1,17,000 and an expenses of Rp. 8,77,150. Thus its net profit from this activitity was Rp. 5,39,850. It did not have to use any working capital for this purpose.

INKUD

The INKUD mainly concentrated on two broad activities: member development as a non-business activity and business related operations. It was structured on federal system. The farmer groups formed a KUD; a group of KUDs (at least 25 in number) formed a PUSKUD; and PUSKUDs formed the INKUD. Each organization had its own by-laws. It allowed them to do their business activity alone or together with each other. Basic intention of INKUD was to make available to farmers and their organizations the financial resources, marketing outlets, and access to high technology. INKUD believed that higher the level of technology, higher was the requirement for the efficient and complex organizations. It was realized that each KUD cannot own such a technology or even manage it. Some technology can at best be managed at the level of PUSKUD. The cooperative banks which advanced loans for such a purpose would not be able to deal with KUDs individually. That was how the INKUD came in the picture.

The INKUD positioned itself as a marketing organization and/or as a producer of the finished or semi-finished goods of agro-based industries. Poultry feed or cattle feed manufacturing were some of the examples of its activities. The INKUD also had a slaughter house, and a canning project under active consideration. Feasibuility studies were also prepared for various products having a potential like corn-beef. The INKUD also planned to supply different production inputs to its members at cheaper prices. But it had certain problems. The government policy stressed the development of primaries. The government was of the opinion that unless the primaries felt a need for it, one should not push secondary cooperatives on them from above. Fertilizers were manufactured in the government sector, and it had to face a stiff competition from the private sector, having its own distribution network. The government sector therefore had to depend on the cooperative network. The INKUD tried to make bulk purchases to reduce the cost of the farmers on inputs, but the private industry people were considered to be too strong to allow the INKUD to be successful.

ILO/Swiss Project

A multi-bilateral ILO/Swiss Project on Cooperative Training, Management and Member Participation for KUDs was jointly sponsored by the International Labour Organization, the Government of Indonesia, and the Government of Switzerland. The immediate objectives of the project were to (a) provide regular management consultancy to KUDs; (b) organize member education training programmes for extension field staff; (c) improve institutional capability of cooperative training centres to strengthen in-service training programmes for the Movement personnel; and (d) strengthen training material resources and documentation.

The main target groups of the project activities included: (1) cooperative management officers of the department and the Cooperative Movement; (2) cooperative extension officers from the department and extension workers from the Movement, (3) cooperative trainers working at the national and provincial centres; (4) cooperative librarians and documentation officers working within the Movement; and (5) cooperative leaders and selected members of village level cooperatives (KUDs) in the country.

The project covered 14 provinces and had several technically competent national and international staff. The project became fully operational in April 1985 and had a time frame of 39 months.

Views of Professor Soedarsono Hadisapoetro, President of DEKOPIN

It is true that the average landholding size in case of a large number of farmers is less than 0.5 hectares. Therefore they try to get more income by diversifying their activities. They are not only farmers; but are also labourers or small traders. This is one of the reasons why the Indonesian government has given high priority to increase the income of the farmers through agricultural cooperatives. The first priority of course had been to increase the production of rice. The second priority was to increase the production of other crops like maize, soybean and cassava. In addition, poultry and dairy activities were also promoted in certain regions.

So one looks at the activities of the cooperatives in terms of the extent to which they support the government programmes. And at the same time what kind of support do they provide to the farmers to improve their production. Their activities are looked at from the national priorities angle. As a result, not only Indonesia became self-sufficient in rice production in 1984, but today it is also in a position to export rice.

Crops like maize and soybean now need to be concentrated. These crops are important not only as human food, but also as cattle feed. We stopped importing rice, but started importing soybean. Increasing the production of these crops is essential from the national perspective.

The government is also simultaneously trying to increase the income of the farmers. It has realised that increasing the production is not enough. Therefore, the floor prices were introduced.

The meat consumption in our country is fairly high. It is one of the essential food items. Poultry has been found to be comparatively cheap and can be produced in a short time. It also provided the farmers the means for diversification. Family labour could be used profitably and it created additional employment as landholding size was small. That is why the government introduced the poultry production programme.

Similar was the case with dairy development. We had to depend on imports. Local productivity was low. The market prices were low. Therefore, the dairy farmers were not able to give better feed to the cattle, which in turn, reduced their productivity further. By increasing the milk price and by introducing the better breed, the government felt that the farmers would be able feed their cattle properly and increase

milk production. Dairy development is one of the important national programmes.

To implement all these programmes, the cooperative societies were set up. They therefore must undertake activities which increased the agricultural production. Market mechanisms have their own push and pulls. Egg production for example, does not fluctuate as much as the demand for eggs. We thought of introducing the processing units to take care of extra egg production. This certainly is a suitable way for sustaining higher production as perishable commodities really cannot have floor prices.

Though development planning revolves around the above activities, the farmers engage in their own activity mix. Growing mushrooms, or constructing fish ponds are some examples. All such activities in all regions are not supported by the government as these are not planned programmes. Cooperatives, however, try to support these activities as 'non-programme' activities. They can identify new projects and make them available to their members. How to strengthen these capabilities is an important issue. Government programmes do attract financial and administrative support predominantly. In this context, one needs to understand and strengthen the roles of organizations such as National Federation of Village Unit Societies (INKUD) or Cooperative Banks like BUKOPIN to extend support to 'non-programme' component of the agricultural development.

The linkage and the relationship between the primary cooperatives (KUDs) and the secondary cooperatives (PUSKUDs) is still problematic. The government is generally of the view that the promotion of the village level societies can be done by the department itself. We agree that the primary societies can be improved to provide efficient services to their members. But it cannot be done effectively and alone by the department. The secondary cooperatives can play a significant role. They can enhance member participation by introducing different activity mix based on an enterprise focus. For government machinery, the cooperatives play an important role as an instrument to implement its programme, but because of pre-planned, externally directed nature of programme, the members loose their flexibility to make changes in those programmes. Besides, their participation in decision-making, in capital accumulation or having access to new business opportunities is restricted. They cannot exercise social control on mismanagement if any takes place. With their own secondary cooperatives, they can exercise these controls. We have been pleading

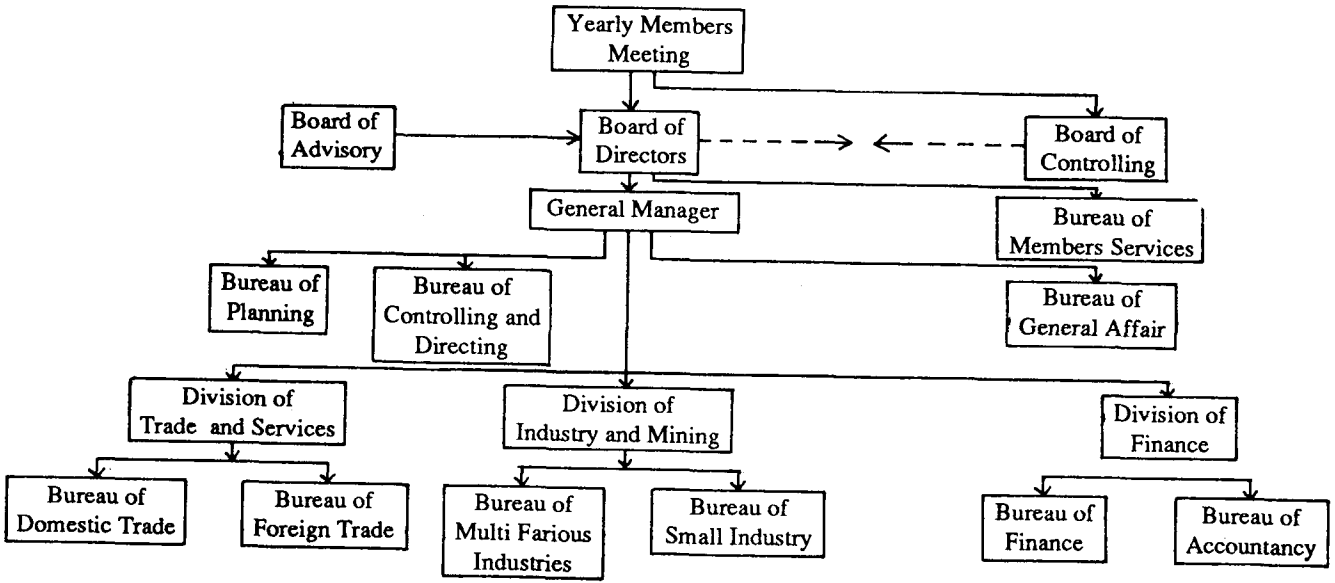
with the government to strengthen the relationship between secondary and primary cooperatives by encouraging a 'non-programme' component which is decided by the people and societies together themselves. So, besides the government efforts, the societies themselves should also be able to decide the direction in which they want to move to improve the income of their members. At the primary level we have multipurpose societies because the farmers have multiple activities. They grow rice, catch fish, cultivate soybean, and raise milch animals. Processing activities can be undertaken successfully by the secondary cooperatives. Issue is still open. The government recently issued an order to close down a secondary cooperative dealing with fish marketing.

The secondary cooperatives earlier used to purchase fertilizers in bulk for distribution to their members to achieve the economies of scale, but poor recovery of dues from the members forced them to withdraw from this activity. So just having secondary cooperatives is also not an answer. Their establishment must follow the improvement in management. Professional management, separated from the board of directors, needs to be introduced. Besides the overall change in the management styles, the composition of capital also needs to be changed. Activities which can attract member participation by way of financial contribution and which can lead to stable capital formation will have to be identified. Both professional management and capital formation are critical for secondary cooperatives to gain acceptance and grow. How to strengthen this connection between secondary and the primary cooperatives is a live question before us.

Questions

1) Is there a conflict between the role of the cooperatives as an instrument of national development and as an organization to promote economic interests of members?
2) What should be the role of cooperatives in national development? and, in member development?
3) What kind of support is given by the government to the cooperatives? What kind of support needs to be given?
4) Should a linkage between primary and secondary societies be strengthened? Why? and if yes, how?
5) What should be the role of the apex bodies like INKUD in the development of cooperatives?

Organization Structure of Induk Koperasi Unit Desa (National Federation of Village Unit Cooperative).



MARKETING OF MUSHROOMS

PART 1: THE VILLAGE COOPERATIVE

1) The Jatisari KUD

Though 62 years of age, Kusnandar, dressed invariably in a national costume of batik shirt and black cap, is the most dynamic and spirited chairman of the Jatisari KUD (pronounced as Kaudey), a village unit cooperative society. Riding on his Honda motorbike, he regularly attends his office and knows about all office papers and other information. He keeps track of almost all the members and their economic activities. During his leadership in the last 10 years, the membership of KUD had increased 13 times from a mere 200 members in 1976 to 2,633 members in 1986. He also encouraged women to become members. Against 15 women members in 1976, the KUD had 700 women members in 1986 (see Exhibit 1).

Located about 100 km east of Jakarta in Western Java district of Krawang, the KUD covers six villages having a total population of 20,030 from 3,668 households. The chairman during his tenure brought more than 50 per cent of the households under the cooperative fold (see Exhibits 2 and 3). The KUD had a board of directors which consists of the chairman, the secretary and the treasurer who were paid honorarium on a monthly basis. The KUD had on its payroll one Manager, 24 staff members, and 31 labourers to carry out its operations (see Exhibit 4).

2) The Approach

The KUD Jatisari was set up as an agricultural cooperative in 1971 when the present chairman was also its founder chairman. However, in 1973, it became the village unit cooperative society (KUD) and another person took over as the chairman. The performance of the KUD in its initial years was not good. In 1977, the present chair man was elected again. His taking over synchoronized well with the intro-

Exhibit 1

Membership of the KUD 1976 to 1986

Year	Men		Women		Total
	No	%	No.	%	No.
1976	186	92.5	15	7.5	200
1977	260	78.1	73	21.9	333
1978	283	78.1	94	24.9	377
1979	586	77.5	170	22.5	756
1980	884	79.9	222	20.1	1106
1986	1933	73.4	700	26.6	2633

Source: Office Records.

Exhibit 2
Village-Wise Distribution of Population, 1985

Village	Men	Women	Total	Number of households
Jatisari	1671	1710	3381	498
Chirejog	1491	1430	2921	595
Makarsari	1800	1790	3590	677
Telersari	1600	1701	3301	565
Pacing	2144	2184	4328	704
Sukamakar	1188	1321	2509	820
Total	9894	10136	20030	3859

Source: Office Records.

Exhibit 3
Ratio of Members to the Households

Year	Number of households	Number of members	% of Members to households
1977	3668	333	9
1978	3668	377	10
1979	3668	756	21
1980	3668	1106	30
1981	3668	1260	34
1982	3668	1611	44
1983	3668	1657	45
1984	3668	1694	46
1985	3668	1803	49

Source: Office Records.

duction of government assisted programmes for agricultural development through the cooperatives. The KUD since then has been making appreciable profits though these profits showed sometimes a fluctuating trend (see Exhibit 5).

The KUD Jatisari's overall approach had been: (a) start with a small simple business; (b) prepare a good operational plan; and (c) expand the business gradually. The three main sources of its working capital had been the member savings, the reserve funds, and the borrowings. The ratio of owned funds to other funds had been becoming increasingly favourable from 1:99 in 1977 to 33:67 in 1985. The

Exhibit 4
Number of Employees of KUD 1976 to 1986

Year	Number of Employees		
	Manager	Staff	Labours
1976	1	6	5
1977	1	6	5
1978	1	9	5
1979	1	12	13
1980	1	16	31
1986	1	24	31

Source: Office Records.

Exhibit 5

Income, Expenses, and Profits During 1977 to 1985
(Rp in million)

Year	Income Rp	Expenses		Profits	
		Rp	%of income	Rp	% of income
1977	1181	981	83	200	17
1978	4141	3665	89	476	11
1979	7225	4681	65	2544	35
1980	16650	6369	38	10281	62
1981	11295	7284	64	4011	36
1982	15357	8769	57	6588	43
1983	43371	40386	93	2985	7
1984	86505	78019	90	8486	10
1985	68389	48946	75	16443	25

Source: Office Records.

working capital over the years had increased substantially from Rp 42 million in 1977 to Rp 142 million in 1985. The savings included initial savings, compulsory savings, and voluntary deposits. The compulsory deposits showed rapid increase reflecting impressive business turnover and dominated the other savings (see Exhibits 6 to 9). The borrowings from the bank were mostly used for the procurement of paddy/rice.

Exhibit 6
Working Capital of KUD 1977 to 1985

(Rp in million)

Year	Savings Rp	Reserves Rp	Borrowings Rp	Others Rp	Total Rp
1977	0.20	0.00	42.03	0.20	42.43
1978	0.27	0.00	59.58	0.68	60.53
1979	0.42	0.00	72.13	3.32	75.87
1980	1.74	0.00	75.33	12.70	89.77
1981	4.65	0.00	92.15	14.13	110.93
1982	6.32	0.00	84.13	20.72	111.17
1983	8.80	0.00	94.27	19.80	122.87
1984	9.85	16.05	92.25	10.65	128.80
1985	10.91	23.45	96.02	12.03	142.41

(US $ 1 = Rp 16.40)
Source: Office Records.

Exhibit 7
Average Working Capital Per Member 1977 to 1985

Year	Number of members	Per Member				
		Savings Rp	Reserves Rp	Borrowings Rp	Others Rp	Total Rp
1977	333	612	0	126221	600	127433
1978	377	723	0	158040	1792	160555
1979	756	555	0	95415	4391	100361
1980	1106	1572	0	68113	11479	81164
1981	1260	3687	0	73138	11214	88039
1982	1611	3926	0	52224	12860	69010
1983	1657	5312	0	56889	11952	74153
1984	1694	5816	9475	54458	6287	76036
1985	1803	6052	13006	53253	6670	78981

(US $ = Rp 16.40)
Source: Office Records.

Exhibit 8
Ratio of Own Funds to Borrowed Funds

(Rp in million)

Year	Own Funds		Funds from others		Total
	Rp	%	Rp	%	Rp
1977	0.40	0.94	42.03	99.06	42.43
1978	0.95	1.57	59.58	98.43	60.53
1979	3.74	4.93	72.13	95.07	75.87
1980	14.43	16.08	75.33	83.92	89.76
1981	18.78	16.93	92.15	83.07	110.93
1982	27.04	24.32	84.13	75.68	111.17
1983	28.61	23.28	94.27	76.72	122.88
1984	36.55	28.38	92.25	71.62	128.80
1985	46.39	32.57	96.02	67.43	142.41

(US $ 1 =Rp 16.40)
Source: Office Records.

Exhibit 9
Savings by Members, 1977 to 1985

(Rp in million)

Year	Initial	Compulsory	Voluntary	Total
	Rp	Rp	Rp	RP
1977	0.17	0.07	0.04	0.28
1978	0.19	0.07	0.05	0.31
1979	0.38	0.13	0.06	0.57
1980	0.55	1.07	0.12	1.74
1981	0.64	3.85	0.27	4.64
1982	0.81	5.25	0.27	6.33
1983	0.86	6.95	0.11	7.92
1984	0.90	7.75	0.10	8.75
1985	1.02	9.90	0.08	11.00

(US $ = Rp 16.40)
Source: Office Records.

3) Business Operations

The business operations of the KUD included giving agricultural credit, input supplies, rice marketing, rice milling, selling consumer goods and transportation.

Extending credit under the government credit scheme (KCK) had been one of the traditional business activities of the KUD. The rate of recovery from the borrowers had always been more than 95 per cent.

Supplying inputs such as fertilizers, insecticides and seeds on BIMAS (credit) and INMAS (cash basis) was another important activity of the KUD. Not only the absolute number of members purchasing inputs from the KUD had been going up, but the percentage of members depending on their cooperative for input supplies had also been steadily increasing (see Exhibit 10).

Year	Loan amount (Rp)	Recovery rate
1976-78	15,734,000	96.8
1979	5,437,500	96.8
1980	4,376,000	98.4

The turnover of input supplies increased 33 times from Rp 4 million in 1977 to Rp 133 million in 1985 (see Exhibit 11). As the KUD was located in the rice belt of the Java, rice marketing had been one of the prominent activities of KUD and had accounted for almost 80 per cent of its business volume. However, this activity increased substantially during the eighties. Rice marketing involved purchasing paddy at regulated prices from the farmers, milling it, and selling it to BULOG (a centralized government body to purchase paddy/rice) or in the open market. Though rice processing was undertaken, the rice milling unit was old and less efficient. BULOG accepted only standard quality of rice. And therefore, the rejected rice had to be sold in the open market. Since 1981, the KUD started purchasing paddy from

Exhibit 10
Percentage of Members Buying Inputs From KUD

Year	Number of members	Number of members buying inputs	Per cent
1977	333	219	66
1978	377	238	63
1979	756	430	57
1980	1106	609	55
1981	1260	946	75
1982	1611	966	60
1983	1657	1093	66
1984	1694	1201	71
1985	1803	1334	74

(Us $ 1 = Rp 16.40)
Source: Office Records.

the non-members. This significantly contributed to its turnover (see Exhibit 12). The KUD had 12 rice collecting centres, two rice milling units, eight input supply units, three drying spaces, and three transport vehicles. The KUD also operated a consumer store and since 1981 its volume of business had been increasing appreciably to the extent of surpassing even the input supplies (see Exhibit 11).

Exhibit 11
Volume of Business of KUD, 1977 to 1985

(Rp in million)

Year	Credit	Input supplies	Rice marketing	Proce-ssing	Consumer shops	Others	Total
1977	9.14	3.70	10.33	0.95	0.00	0.00	24.12
1978	6.60	10.09	41.89	1.01	3.19	1.14	63.92
1979	5.44	25.50	90.90	4.47	2.25	3.98	132.54
1980	4.38	56.94	257.39	3.34	3.51	6.34	331.90
1981	3.85	43.88	420.75	6.27	57.27	7.24	539.26
1982	8.51	35.17	356.99	3.22	65.50	6.66	476.05
1983	7.65	58.84	192.26	8.67	58.57	6.65	332.64
1984	7.06	77.76	1109.83	12.53	133.54	10.94	1351.66
1985	3.92	133.42	1124.12	6.98	135.52	10.66	1414.62

(US $ 1 = Rp 16.40)
Source: Office Records.

Exhibit 12
Number and Percentage of Members and Non-members Selling Paddy to KUD

Year	No. of Members	Sellers			
		Members	Total Sales (kg)	Non-members	Total Sales (kg)
1977	333			--	--
1978	377	325	342382	--	--
1979	756	271	318800	--	--
1980	1106	836	1892336	--	--
1981	1260	908	1364499	1230	2295910
1982	1611	1123	1316957	1113	1516566
1983	1657	906	809340	465	684904
1984	1694	1475	3576768	1238	4103266
1985	1803	1547	3661575	1146	2544370

Source: Office Records.

On the whole, the substantial expansion in the volume of business from Rp 24 million in 1977 to Rp 1414 million in 1985 indicated its level of performance, growth and organizational stability. Number of members depositing money with the KUD also reflected this trend (see Exhibit 13). Not only the KUD felt confident of initiating new activities, but also had its own financial back-up. It also had enough vacant land for additional construction.

Exhibit 13
Total and Percentage of Members Taking KCK Loan and Depositing Money with KUD

Year	Number of members	Members taking loan	Members depositing money
1977	333	234	145
1978	377	330	175
1979	756	426	206
1980	1106	496	256
1981	1260	490	267
1982	1611	635	197
1983	1657	600	318
1984	1694	599	346

Source: Office Records.

4) Priority Programme

The chairman said that to help farmers increase their productivity the government has initiated many schemes and it depended on the network of village level cooperatives to implement them. Though not compulsory, the government schemes received priority because member's interests were also served. As a result, the credit activity, and the existing manpower were tied up with these programmes. It was not easy for the KUD to invest funds and recruit new personnel for the KUD initiated development projects. This was a major problem which needed appreciation. For example, the government targeted this year to increase paddy production from the present five to six tonnes to nine tonnes per hectare. Obviously, the KUD had to give priority to this work keeping everything aside.

PART II: MUSHROOM CULTIVATION

5) Background

Mushroom cultivation in Jatisari village cooperative area started somewhere in 1970. The name of the innovative farmer who first started growing mushrooms has been forgotten. In 1982, 210 units were engaged in mushroom cultivation. Chirejog, a village falling within KUD's area of operation, had 300 mushroom producing units in 1987 among 525 families. Most of the families owned one *kubung* (shed used for cultivating mushrooms) and very few had owned more than one *kubung*.

The reason for the popularity of mushroom cultivation is not far to seek. Most of the inputs required for *kubung* construction and mushroom cultivation were easily available locally or from the nearby towns. The requirements were as follows:

Materials required for a *kubung*		Materials required for mushroom cultivation	
Items	Local/nearby towns	Items	Local/nearby towns
Bamboo	Local	Paddy straw	Local
Rope	Local	Paddy bran	Local
Plastic sheets	N. town	Cotton lint	N. town
Nails and wires	Local	Lime	N. town
Banana leaves	Local	kerosene	N. town
Bamboo mats	Local	Seed	N. town
		Water	Local

6) The Kubung Preparation

The most popular size of *kubung* at Chirejog village was 7 × 4 × 10 m. The *kubung* structure was made of bamboo with mat cover and plastic enclosures on all sides. To protect the plastic from weathering, dried banana leaf curtain was hung all around the shed. Inside the shed two rows of seven-layer-shelf like structures were constructed with a distance of 1 m between the rows to facilitate easy movement. The distance between one shelf and the other was generally about a meter to facilitate cultivation of mushroom and harvesting it. The two rows with seven shelves, provided 84 m length (2 × 7 × 6) of bed with

1 m width for mushroom cultivation.

These shelves were filled with decomposed material made out of paddy straw, lime, bran and cotton. Layers of paddy drenched in water were spread with layers of lime and rice bran and allowed to rot for 10 days in open places close to the *kubung* and near a source of water. Similarly, layers of cotton drenched in water and mixed with lime were allowed to rot for 10 days. At the end of 10 days these two were mixed and spread on the shelves about one feet in thickness. Before sowing the seed, steam was blown into the *kubung* and the *kubung* was kept air tight for a day. From the next day onwards, after sowing the seeds, the water was sprayed by the sprayer both in the morning and evening for 10 days for mushrooms to sprout. From the tenth day onwards mushrooms were ready for picking for a period of 10 days. By the end of the 10 days of harvesting the vigour of the seed-bed got exhausted, and the spent decomposed mixture was used as organic manure.

In brief, one production cycle was composed of 34 days for different activities as follows:

a) Decomposition of straw and cotton	10 days
b) Removing spent decomposed material and loading fresh material	3 days
c) Filling *kubung* with water vapour	1 day
d) Sowing and rearing	10 days
e) Picking/harvesting	10 days
Total	34 days

Since decomposing of straw and cotton were carried out in the open yard, it was possible to manage 14 cycles in a year without much difficulty. Generally farmers planned for 12 cycles in a year. Like in industry, it was possible to supply mushrooms in equal quantity every day by scheduling the time among the farmers. It was also possible to increase or decrease the supply of mushrooms at a short notice of one month.

7) Cost of Cultivation

To understand the cost of cultivation of Chirejog village, information from three farmers was collected. The estimated cost of production in May 1987 was as given in Statement I.

Statement I: Cost of Construction of One Kubung

Based on the field enquiry in May 1987		Based on data prepared by* agricultural extension in 1982	
Items	Rp	Items	Rp
Strong big bamboo 12 Nos. @ Rp 2000	24000	Bamboo 250 Nos. medium sized @ Rp 250	62500
Bamboo mat 10 Nos. @ Rp 1000 per mat	10000	Steelwire 10 kg @ Rp 700 per kg	7000
Medium sized bamboo 250 Nos. @ Rp 300 per piece	75000	Nails	8000
Plastic sheet 20 kg @ Rp 2000 per kg	40000	Bamboo mat 12 Nos. @ Rp 1300 per mat	15600
Wire, nail, rope	15000	Plastic	20000
Labour charge	100000	Labour expenses	26250
Total	264000	Total	139350
Depreciation per cycle $= \frac{264000}{24} = 11000$		Depreciation per cycle $= \frac{139350}{25} =$ Rp 6000 (Say)	

**Note*: In 1982 Agricultural Extension Service prepared a proposal for the mushroom farmers of Krawang, the district where Jatesari village is located. Data from that report is used for comparison. During the past five years the prices of several materials have changed.

The life span of a *Kubung* is two years and assuming that 12 cycles of mushrooms are reared in an year, the depreciation per cycle would work out to Rp. 11,000. The available expenses for mushroom cultivation per cycle are given in Statement II.

8) Production and Returns

The average production per *kubung* in Chirejog village was around 200 kg per cycle. The spent composed material commanded a market price of Rp 4000. The average price received by a farmer for one kg of mushroom was Rp 1000. Statement III gives the returns to the farmers.

The economics of cultivation shows that though the cost of production had increased along with the market price, the net revenue for the farmers had declined. The family labour cost for harvesting, watering, preparation of decomposed material, sowing, maintenance have not been incorporated. If the revenue is treated as return for the family labour, it could be stated that the return has

Statement II: Variable Expenses Incurred in Cultivation of Mushroom

Item	Based on our field enquiry in May 1987 Rp	Based on data prepared by agricultural extension, June 1982 Rp
Straw (transportation cost)	25000	10000
Lime	6000	3100
Rice bran	16000	10000
Cotton	12000	18000
Kerosene	20000	7500
Seed	15000	12500
Labour cost	20000	12500
Sterilization	10000	7500
	Total 124000	81100

Statement III: Per kg Production and Returns from Mushroom Cultivation

Revenue per kg	Based on our field enquiry in May 1987	Based on data by agricultural extension, June 1982
Average production per cycle	200 kg	200 kg
Average price received	Rp 1000	Rp 800
Income by sale	Rp 200000	Rp 160000
Income by sale of material spent	Rp 4000	
Variable cost per cycle	Rp 124000	Rp 81100
Depreciation per cycle	Rp 11000	Rp 6000
Total expenses per cycle	135000	87100
Cost of production per kg	$\frac{135000}{200} = 675$	$\frac{87100}{200} = 435$
	$\frac{204000}{200} = 1020$	$\frac{160000}{200}$
Net contribution per kg	345	365

declined. If one were to consider the inflation factor one can conclude that over the years the net returns of the mushroom farmers have eroded.

9) Alternatives for Increasing Farmers Income

A) *Reduction in the Cost of Inputs Used*

Straw, the base material used for mushroom cultivation is burnt in the field and the mushroom farmers have to incur transportation cost to carry it from the farm to the homes. There also seems to be scope to reduce the cost of construction of *kubung*. Bulk buying of lime and cotton can be another source of cost reduction . Mushroom seed is an important cost item. More importantly, the quality of seed can be a significant factor determining the yield, (farmers did not complain about the quality of seed.) Statement IV gives the production cost of seed as worked out by the extension department in 1982.

Statement IV: Cost of Production of Mushroom Seed per Bottle

A. *Fixed Investment*	
Plant for rearing 1000 tubes	Rp 5,000,000
Building	Rp 2,500,000
Total	Rp 7,500,000
B. *Variable Cost for Producing 100,000* bottles a month	
Material used for culturing seed	Rp 7,500,000
Labour expenses	Rp 1,350,000
Total	Rp 8,850,000
C. *Cost of Production for bottle of seed*:	
Variable cost per month	Rp 8,850,000
Depreciation cost (5 years life is assumed)	Rp 125,000
Cost of 1,00,000 bottles	Rp 8,975,000
Per bottle cost	Rp 89.75

One *Kubung* with 84 m bed needs 50 bottles, the cost of which would be 90 X 50 = Rp 4500.

Assuming that the cost of production has doubled between 1982 and 1987, the seed cost would be Rp 9000 (Rp 4500 x 2) which would still be lower than the farmer's reported expenses of Rp 15,000. More than the cost, the quality of seed is critical and this activity managed by the cooperative can contribute significantly to this aspect. Three hundred units at Chirejog village can alone consume 15,000 bottles a month, that is 15 per cent of the capacity. Another cost reduction

could be in the technology adopted for filling the *Kubung* with water vapour.

B) *Yield Increasing Efforts*

It was reported that the yield per *Kubung* (84 m) varied between 200 to 300 kg. Yield levels of the research centres were not available for comparison. There could be scope for not only increasing the yield, but also the quality of mushrooms.

C) *Marketing and Processing*

The shelf-life of fresh mushrooms is 24 hours. After this the mushroom would flower and the fibrous and spongy character of the mushroom would deteriorate. Picking of mushroom starts early in the morning around 6 A M and is completed within an hour. At Chirejog village the agents of the primary traders visit *Kubungs* in the morning and collect mushrooms. The price paid, it was reported, was uniform across the traders. Some interlocking between traders and farmers was reported but there was no complaint that interlocking worked against the interest of the farmers. On an average the farmers received Rp 1000 per Kg at the farm gate. Fluctuations in price during the year were not high. Whatever the quantity that was available in the village was purchased by the traders.

10) Marketing

Four traders at Krawang handled all the mushrooms produced in the district. Before despatching them to the major consuming/terminal markets, they cleared and graded the mushrooms. Small sized mushrooms commanded a good price. Those with dark top layers were considered overmatured and did not get a good price. The three destinations to which the mushrooms were transported were Jakarta, Bogor and Bandung. At these markets, the mushrooms were not auctioned but directly sent to the wholesalers.

The fresh mushroom finds its way to consumers through the following channels.

Wholesaler	A Large fresh vegetable retailers B Institutional suppliers C Exporters D Processors

A. Large fresh vegetable retailers: Mushroom is one of the products handled by large vegetable retailers in fresh areas. The price is quoted high in the morning and by afternoon it starts declining. Generally, the price ranges between Rp 1400 and 1800.

B. Institutional suppliers: Mushroom is popular in pizza huts, mushroom soup sellers and hotels. Most of the institutional buyers (pizza huts, hotel, small restaurants) have one or two regular suppliers for vegetables, eggs, meat and other products. Mushroom is also supplied by them. Generally the prices are negotiated for the whole year with some scope for adjustments. Two top hotels in Jakarta paid Rp 1500 per kilo of fresh mushrooms. The most popular variety was straw mushroom. In hotels which offered Chinese or Japanese cuisines, other good varieties of mushrooms were also purchased. The demand in the hotels fluctuated depending on the tourist traffic. All the institutions reported that they placed orders with their suppliers of mushrooms once in three days. Most hotels reported that they also kept in stock tinned mushrooms to cope with a sudden increase in the demand.

C. Export of Mushroom: Straw mushroom, it was reported, was mostly exported to Hong Kong and Singapore in fresh form. Sometime they were treated with chemicals to appear bright white. All

Statement V: Particulars about Canned Mushrooms Sold at Super Markets

Brand name	Type of mushroom	Package size		Price	
		Gross weight gm	Net weight gm	Rp dept. store 1	Rp dept. store2
1. PORNAS P.T. DIENG, DJAYA Central Java	Straw	425	230	960	--
2. PRIME PJ MARGO	Straw	425	230	1385	1200
		655	550	2960	--
		390	230	1300	--
3. NARCHSUS (Made in China)		425	227	1820	1720
4. MALING (Made in China)		425	227	1820	--

exports were by air cargo to ensure that they reached destination without loss of time. Midday flights to these destinations were not available on all the days in a week and naturally the quantities purchased by the exporters changed frequently. Quantity exported to different destinations and the prices realized were not available. The government had no special export promotion scheme for mushrooms.

D. Processors: Canned and straw mushrooms were available in the departmental stores. The different brands, packaging sizes and retail prices were as shown in statement V:

It could be observed that the price between one departmental store and another varied. On an average about two dozen tins of each brand and size were found in the shelves. Sales particulars per month were not readily available.

Exhibit 14
Canning Unit Investment Cost

A. *Capital Investment*		
Investment on machinery to can	Rp	Rp
300 kg mushroom/hour/2000 kg a day	15,000,000	
building and others	10,000,000	
Total cost A		25,000,000
B. *Working Capital*		
i) For 30 days @ 2000 kg mushroom @ Rp 800 per kg	48,000,000	
ii) Cost of preservatives @ Rp 150 for 60,000 kg	9,000,000	
iii) Cost of cans, labels, package and other material for packing 60,000 kg @ 450 per kg	27,000,000	
iv) Labour expenses for 30 days for 20 persons @ Rp 1500 per person	900,000	
v) Administrative and Misc expenses	600,000	
Total Cost B		85,500,000
C. *Production and Income*		
Production per month 30 x 2000	60,000 kg net wt	
packaging size planned 350 gm net weight		
Expected gms Rp 500		

Source: Taken from the Proposal for Guidance of Mushroom Farmer of Krawang, Agricultural Extension Service, 21 June 1982.

E. Processing: Canned straw mushrooms were sold within the country as well as exported. To increase the income of the farmers, it was possible to enter in the canning industry. A proposal for canning of straw mushrooms was prepared by the extension department in 1962 (see Exhibit 14). The investment costs as well as the material and labour costs must have increased over years. The cheapest price of mushroom was sold at Rp 4000 per kg (net).

To get a better price, the Jatisari KUD had three options: First, reach consumers within Indonesia with fresh mushrooms, second, process and sell mushrooms as canned products, and third, to concentrate on sale of fresh mushrooms to institutional and export markets. The chairman was wondering, what should be the choice of markets for society and what additional information should be collected to prepare a detailed project report?

Annexure I

MUSHROOMS OF INDONESIA

Four varieties of mushrooms are grown in Indonesia. They are: rice mushrooms, Japanese mushrooms, ear mushrooms and oyster mushrooms.

Rice Mushroom: This is the most important variety grown in Indonesia. It is grown on a bed prepared from paddy straw as its base. That is how it gets its name. In regions where alkali content of paddy straw is less, paddy straw is drenched in water and treated with lime and paddy bran. In about 10 days it gets decomposed. To this, cotton lint is mixed with lime and decomposed for a period of 10 days, and added. The mushrooms are then sown on this bed. In regions where paddy straw with high alkali content is available, the straw is soaked with water and allowed to rot along with charcoal made of husk. Rice mushroom is grown in most parts where paddy is cultivated. Of the four varieties, the rice mushroom is easy to grow and can be reared in the least possible time. It is round in shape, and opens up when kept for more than 24 hours. Once opened, it commands very little price because its spongy and fibrous character changes. Since it is not as expensive as the other three varieties, it commands a large market share within and outside Indonesia. The important and nearest foreign markets are Singapore and Hong Kong. The major competitor for Indonesia is Thailand. Most of the exports are in the fresh form, while some are bleached and exported. Canned rice mushroom export is negligible. Since the fresh ones command an export market, soon after the harvest the product should reach the airport, say, within three to four hours, and immediately displayed in the shelves of the retail shops of the importing countries. Generally, the small ones are considered to be of the best quality, and as such suitable for export.

Japanese and Oyster Mushroom: These two are reared on an organic matter put in plastic bags. In recent years, soybean shell and plants were used as organic matter. The seed is sown in the bag and water is sprayed three to four times a day to keep it wet. It needs a dark room to grow well. One cycle of cultivation takes three months. Among the four varieties, the cultivation of these two varieties is complex and requires a lot more care and attention. They also command an export market. Generally, the price of these two varieties is twice as much as that of rice mushroom.

Ear Mushroom: As the name indicates, the shape of this mushroom is just like an ear. It is grown on wood. In a specific variety of wood, holes are made and are filled up with seed and some organic material. The mushroom is ready in about one and a half months. This variety is generally grown in the hilly regions, and can be dried and stored. It provides flexibility in coping with variations in the consumer demand and is mostly consumed within Indonesia.

General Information

Mushroom is considered as an exotic variety of vegetable. As a vegetable its price of Rp 1400 to 1600 is much above all other vegetables. One kg of potato, for example, costs Rp 600 to 900, beans Rp 800 and carrot Rp 700. Its price, however, is much below that of an egg (per kg Rp 1600), chicken (per kg Rp 2500), beef (per kg Rp 5,345 to 6000), and fish (Rp 12,000). In terms of nutritive value, it is better than vegetables but poorer than meat, fish and eggs. Mushroom is used mostly in pizza huts and big restaurants. In urban areas, a relatively richer class of people consume mushroom at home. In Indonesia, with the increase in the income of the people, mushroom eating at home is gaining popularity. On the export front, Indonesia has a scope to expand its market in Singapore and Hong Kong. Government of Indonesia has several incentive schemes for export of other crops like coffee, tea and rubber; but no such scheme is available for mushroom export.

UNFROZEN SHRIMP

The Bangladesh Jatiya Matsyajibi Samabaya Samity (BJMSS) came into existence in 1960 with 88 Central Fisheries Cooperative Societies (CFCS) as its members. These central societies had membership of 4,297 Primary Fisheries Cooperative Societies (PFCS). This three-tier cooperative structure was meant to support 5,42,499 fishermen of Bangaldesh. The objectives of BJMSS were as follows:

a) To improve socio-economic conditions of fishermen and encourage in them thrift, self-help and cooperation.
b) To arrange finance for the affiliated societies on easy terms.
c) To arrange marketing of fish and fish products of members.
d) To improve fishing techniques by modernizing boats and gears,
e) To disseminate knowledge about the latest development in the fishing industry.

With a view to support the members in their fishing as an activity, BJMSS took several measures. It imported nylon twines, marine diesel engines, nylon ropes, tyre cords and other fishing accessories and distributed them to the fishermen. A fish net manufacturing unit was established to supply nets to the members. In 1972-73, in collaboration with the Canadian Hunger Foundation it established a unit to manufacture a ferro-cement boat. Up to 1987, 60 boats were sold. Ice, an important input to preserve the quality of harvested fish, was produced at 17 ice plants set up by BJMSS in important fish landing spots in the country. BJMSS's total ice production capacity was 15,000 metric tonnes. One engineering work-shop with qualified and well-trained workers was set up to repair and maintain boats of members at a reasonable cost. BJMSS organized training camps to impress on its members the need for mechanized boats and improved equipment to increase the catch.

BJMSS also acted as a credit disbursing agency. Out of its own funds and the amount borrowed from either the national government

or international organization, the BJMSS provided loans to fishermen through CFCS and PFCS. Most of these loans were given during 1975-80 and whenever the fishermen were affected by the storms and cyclones.

While all these activities aimed at either increasing the productivity or reducing the costs of fishermen, the BJMSS also initiated steps to ensure remunerative prices for their catch. Two processing and freezing plants with an average freezing capacity of 250 tonnes were set up at Chittagong and Khulna, two major port cities of the country. Chittagong unit had a blast freezer, while the Khulna unit had a plate freezer. These units facilitated freezing and packing of export fish and shrimps, which were sold under the brand names of 'coopfish' and 'samabaya'

To understand the functioning of the fisheries cooperatives, Khulna district--an important region for fisheries, was selected. Financial performance of one of the best primary fishereis cooperative and that of the central fisheries cooperative was studied with the help of the District Cooperative Department (see Exhibit 1 for the role of the District Cooperative Department.)

Information provided in the 1986-87 audit reports was used to gain understanding of their functioning. To understand the production-specific and processing-marketing specific support extended by the BJMSS, the data collected from the BJMSS owned freezing plant located at Khulna were used. Three sections that follow present the performance profile of CFCS, PFCS and the freezing plant.

SECTION I : KHULNA CFCS

The Khulna Central Fisheries Cooperative Society (CFCS) was registered on April 22, 1961 with the greater Khulna district as its area of operation. As on June 1986, 141 PFCS's were its members. (Data on total membership were not readily available). During 1985-86, three new primary cooperatives had become its members during this year; however, the primary societies did not deposit any savings with the society. Two trawlers which were in possession with the society were out of order and needed repairs. Since the BJMSS, the owner of the trawlers, had not provided any advance for repairs they could not be made operational. Against the loan amount of TK 23,74,998 to be recovered from the PFCS's, only TK 840 could be recovered during this year. Similarly, a small amount of TK 3,650

Exhibit 1
Khulna District Cooperative Department, Its Role and Number of Different Types of Societies

The functions of the district cooperative officer are as follows:

a) Registration of cooperative societies,
b) Supervise the work of cooperative societies,
c) Supervise the audit of cooperative societies,
d) Supervise the work of upa-zilla cooperative office,
e) Supervise the work of cooperative extension service,
f) All other work as provided in the cooperative act and rules.

The district cooperative officer is assisted by one assistant registrar of cooperative societies, seven inspectors, one field investigator, one instructor, six administrative staff and a driver. The district has 10 upa-zilla units and each of them is provided with one upa-zilla cooperative officer, two assistant inspectors and one clerk-cum-typist. The main function of the upa-zilla officer is to organize, inspect and audit cooperative societies, in addition to carrying out cooperative extension work.

Statistics relating to cooperative societies in Khulna district:

Central Cooperative Societies (Deptts.)		
1.	Central Cooperative Bank Ltd (Agri.)	2
2.	Central M.P. Society (Marketing)	1
3.	Central Industrial Union Ltd (Weaver)	1
4.	Central Fishermen Cooperative (Fisheries)	1
5.	Central Mohila S.S. Ltd (Only for Women's upliftment)	1
6.	District Cooperative Union (Extension Service)	1
	Total	7
Central Societies (Under B.R.D.B.)		
7.	*Upa-zilla* Central Cooperative Association Ltd.	9
	Total	9
Primary Cooperative Societies (Dept.)		
1.	Union M.:. Ltd.	64
2.	Krishi S.S. Ltd.	251
3.	Fishermen Cooperatives	104
4.	Weavers Cooperatives	27
5.	Mohila S.S. Lid	40
6.	Coop. Land Mortage Bank.	1
7.	Auto-Rickshaw.	6
8.	Landless Cooperatives	24
9.	Housing Cooperatives	2
10.	Bus Drivers.	3
11.	Krishi and Matsha Chash S.S.	306
	Total	830

Contd.

Primary Societies under B.R.D.B.	
1. Krishi S.S. Ltd.	410
2. Mohila S.S.	150
3. Bittahin S.S.	200
Total	760

Source: Based on the note supplied by the Khulna District Cooperative Officer, Khulna.

was recovered from the loan advanced against another head to the primaries. The amounts recovered were not deposited into the accounts of the institutions from whom these amounts were borrowed. The society also could not collect the amount of interest due from its members. Only one person was in its employment. The audit report showed that the society had earned a profit of TK 13,591 during the year (for financial statements see Exhibits 2 and 3). The society did not have any transactions with the primaries on the one hand and the BJMSS on the other.

Exhibit 2
Khulna Kendriya Matsya Jibi Samabaya Samity

PROFIT AND LOSS A/C 1985-86

Loss	Tk	Profit	Tk
Salary	30,654	Interest earned	2,68,735
Launch repair	2,080	Rent	1,807
Conveyance	79	Admission	30
Postage	132	Sale of forms	20
Stationary	122	Interest on savings deposit	4,810
Cost of general	779	Closing stock	1,616
Body meeting refreshment	51		
Interest payable	2,25,445		
Depreciation on furniture etc.	2,268		
Miscelleneous	177		
Stock in hand	1,640		
Profit	13,591		
Total	2,77,018	Total	2,77,018

Sourc: Office of the Registrar, Khulna District.

Exhibit 3
Khulna Kendriya Matsya Jibi Samabaya Samity
Balance Sheet 1985-86

Liabilities			Assets	
Particulars		*TK*	*Particulars*	*TK*
1. Paid up share capital		215775	1. Cash in Hand	1694
Deposits		122306	2. Bank Balance	909
a) Current deposits	36503		3. Investment	138416
b) Savings deposits	85316		a) Share 58100	
c) Suspense deposits	187		b) Savings deposit 80316	
d) Security deposits	300		4. Loan due	2180522
2. Amount of loan		230074	a) Dev.	
3. Loan from BJMSS owned funds		840	b) Loan 1809610	
4. Building fund		39499	b) Short term loan 3250	
5. Loan for BJMSS from borrowed amount		2374918	c) Rehabilitation loan 337983	
a) Development loan	1918500		d) Medium term loan 28390	
b) Medium term loan	37370		e) Fisheries loan 1289	
c) Govt. loan	71000		5. Deposit	25276
d) Rehabiliation loan	348048		6. Interest on loan	2486996
6. Advanced received		101905	7. Advance to be collected	107715
7. Interest due		2362100	8. Interest on savings deposit	36289
8. Reserve fund		5000	9. Other assets	291169
9. Other liabilities		107037	a) Value of launch 277232	
a) Pilots fee	300		b) Furniture 1914	
b) Toll tax	4600		c) Dead-stock 7833	
c) Tender fee	200		d) Type-writer4000	
d) Salary due to Ice factory	8727		e) Cycle 190	
e) Salary due to general staff	19060		10. Stock in hand	1616
f) Office rent	7700		11. Other assets	101670
g) Overtime due to Ice factory staff	3988			
h) Electricity				

Contd.

Liabilities			Assets		
due to Ice Factory	43080		12. Loss		187182
			Previous	200774	
			Current profit	13591	
i) General Sec. electricity due	1772			187183	
j) Audit fee	2000				
k) Other dues	15550				
		5559454			5559454

Source: Office of the Registrar.

SECTION II: KASIM NAGAR PFCS

The Kasim Nagar Primary Fisheries Cooperative Society (PFCS) was registered in April, 1972 and was a member of the Khulna CFCS. Its area of operation covered two villages and it had 93 members in 1985-86. It had seven *Jalmahals* (inland water fish ponds) belonging to the government, but given on lease through the department of cooperatives to carry out fishing activity. The lease cost was TK 43,347 against which it had realized TK 42,408 from its members by way of lease fee. Of the seven ponds, two were suitable for shrimp culture and the society had invested TK 2,18,300 to strengthen it. The break-up of expenses was as follows:

Purchase of shrimp fries	75000
Boundary repairs	12000
Watch and ward	75000
Accessories	48000
Feed cost	5300
Additional watch and ward	3000
Total TK	218300

The society's revenue was TK 2,40,000 by sale of shrimp and it earned a net profit of TK 21,700. The secretary of the society was fully empowered to carry out all functions of fishing in these two ponds, which in the opinion of auditors was not a healthy practice. Member-wise passbooks were not maintained. The society also had not made efforts to recover the loans from the members. Even some of

the members of the managing committee were defaulters and had not even paid the interest on loans. It was reported that share certificates were not issued and efforts to mobilize saving deposits from the members were not adequate. Financial performance of the society is given in Exhibits 4 and 5.

Exhibit 4
Kashim Nagar Matsya Jibi Samabaya Samity
TRADING ACCOUNT

Debit		Credit	
Particulars	Talika	Particulars	Talika
Opening stock	29008	Sale of fish	240000
Repairing of embankment	12000	Realization of lease	42407
Fisheries accessories	23000	Stock of fish	25000
Shrimp fries	75000		
Other expenses	2449		
Watch and ward	75000		
Cost of bait	8000		
Cost of feed	5000		
Leasing charge	43347		
Wages for catching fish	3100		
Gross profit	31503		
Total	307407	Total	307407

PROFIT AND LOSS ACCOUNT

Loss		Profit	
Particulars	TK	Particulars	TK
Interest paid	3163	Gross profit	31503
Conveyance	470	Entrance fee	10
Entrance fee	125	Interest earned	3662
Net profit	31417		
Total	35175	Total	35175

Source: Office of the Registrar.

SECTION III: KHULNA FREEZING PLANT

Khulna region is well-known for its shrimps. When BJMSS set up its freezing plant at Khulna in the early seventees, there were only

four units in operation. The number of freezing plants which exported the shrimp increased to 16 by 1984, and to 31 by 1987.

Exhibit 5
Kashim Nagar Matsya Jibi Samabaya Samity
BALANCE SHEET

Liabilities		Assets	
Particulars	TK	Particulars	TK
Paid up share capital	540	Cash in hand	2758
Savings deposit	1996	Share investment	1275
Reserve fund	2100	Savings deposit in central society	1437
Excess savings to be refunded	207	Deposits in commercial banks	94
Rehabilitation loan from cent. soc.	15845	Rehabilitation loan due	16645
Interest on loan	12425	Interest	14822
Advance due	20000	Other assets	277
Undistributed profits	845	Excess amount to be realized	67
Net profit	31417	Value of net	10000
		Value of boat	10000
		Value of cottage	3000
		Value of fish	25000
Total	85375	Total	85375

Source: Office of the Registrar.

Shrimp Production

In Khulna district, the shrimp is reared in man-made as well as natural ponds. It was possible for a paddy farmer to convert its paddy fields into shrimp ponds by deepening the plots. Both brackish water from the sea or fresh water from the river could be used by the same pond to rear either salt-water or fresh water shrimp. Most of the natural ponds belonged to the government and were given on lease to the cooperatives. The periods of seeding and harvesting of saltwater and fresh water shrimp in Khulna region were as follows:

	Seeding Period	Harvesting Period
a) Salt Water	Jan -- Feb	April -- June
b) Fresh Water	July -- Aug	Oct -- March

Except for three months, the shrimps were available for processing throughout the year.

Shrimp Production

There were two varieties of shrimps: tiger and ordinary. Within the tiger variety, black tiger was more popular. Length and weight of shrimp commanded better price. Immediately after harvesting, the shrimp needed to be kept in ice to prevent spoilage. Fishermen generally kept adequate quantity of ice ready before harvesting.

Processing

At the processing units, shrimps were cleaned and graded before deciding about their conversion into different products. Shrimps could be offered as full or peeled shrimps. The peeled ones could be undeveined (PUD) or preserved as peeled shrimps and deveined (PD). The full or peeled shrimps were put in metal containers, placed in a metal plate and kept inside a special freezer till the shrimps got frozen. The frozen shrimps were packed in cardboard boxes and stored in a deep freezer ready for marketing. The box indicated particulars about the frozen shrimps like salt or fresh water shrimps, tiger black or ordinary, peeled and deveined or peeled and undeveined along with the size. The BJMSS unit packed eight different sizes of shrimps.

Capacity of the Plant

The Khulna unit had a plate freezer with a capacity to freeze 3.5 metric tonnes per day. Assuming that the plate freezer was used for 240 days, the freezing capacity of the unit worked out to (3.5 × 240) 840 metric tonnes. Soon after freezing, the shrimp needed to be stored in deep freeze. The deep freezing capacity of the Khulna unit was 250 metric tonnes. This capacity would get fully used in three months, if the shrimps stored were not sold. In other words, the capacity of a shrimp processing unit could be determined in combination with the deep freeze capacity, the plate freezing capacity and the marketing arrangements. The Khulna unit, since its inception, never produced more than 250 metric tonnes of shrimp in a year. The total cost of the plant was TK 70 lakhs, including land, building and machinery. A similar unit in 1987 costs approximately TK 700 lakhs.

Raw Material Procurement

The plant had appointed three agents at Khulna to procure raw

material on its behalf. Fishermen delivered their catch to any one of the agents, who purchased the shrimps according to the standards fixed by the freezing plant and made payments on the spot as per the procurement price stipulated by the agents but its copy was not sent to the primary fishermen's cooperatives. The Khulna unit manager was entrusted with powers to fix the procurement price taking into consideration the price prevalent in the market (see Exhibits 6 to 8 for the prices fixed by the Khulna unit). Though a cooperative, the shrimp processor's association, it was reported, would not allow the unit to offer higher price to its members.

Exhibit 6
BJMSS Khulna Freezing Plant Sea Water Black Tiger Procurement Price (1985-1986)

			TK Price	per metric tonne (1 = 275 maund)				
Variety/ Date	8-12	13-15	16-20	21-25	26-35	36-50	51-60	P & D
01.07.85	--	14400	13100	10900	7800	5500	3500	800
17.08.85	--	14700	13600	11400	8000	5500	3500	800
27.07.85	--	14800	13700	11600	8300	5500	3500	800
16.08.85	--	14000	12400	10300	7100	4900	8900	800
31.08.85	--	14400	12800	10800	7100	5100	3200	800
01.09.85	--	10100	12200	10200	6450	4400	2600	800
27.09.85	14500	13700	12350	10200	6900	4500	3100	800
12.10.85	--	14100	12500	10300	7300	4500	3100	800
27.10.85	--	14300	12900	10700	7500	5100	3400	800
27.02.86	--	14600	13200	11100	7750	5400	3500	1000
07.04.86	--	15200	13600	11600	8400	5600	4000	1000
07.05.86	--	14500	12400	10800	8000	5500	3800	1000
01.06.86	--	13500	10500	92000	7300	5200	3200	1000
04.06.86	--	14200	11800	10200	8200	5400	3600	1000

Source: Supplied by BJMSS, Khulna Branch.
Note: 8-12 means 8 to 12 pieces per kg.

The transportation cost from ponds to the agent's place was met by the fisherman. The agent met the cost of transportation to the processing plant. The agents, it was stated, were useful to the unit for the following four reasons:

i) Agents accepted delivery of shrimps during any part of the day which was difficult for the plant to do.

ii) Fishermen were allowed to deliver any quantity of shrimps. It

was reported that quite often the quantity brought by them was a few kilograms.

iii) Agents accepted payment from the factory once in two or three weeks depending on the cash position, but they made payment to the fishermen on the spot.

iv) Whereas the agents had to handle a large number of fishermen, the factory had to transact with a few persons only. This reduced the administrative burden on the part of the factory.

Exhibit 7
BJMSS Khulna Freezing Plant Sea Water Procurement Price (1985-86)

(TK Price Per Maund)

Variety/ Date	4-5	6-8	8-12	13-20	21-30	31-50	51-60	P & D
01.07.85	10000	9000	7200	5800	3200	1500	800	600
10.08.85	10700	9700	8900	6600	3700	2100	1600	600
19.08.85	11000	10400	9000	6600	3700	2200	1700	800
31.08.85	11400	10500	9400	6900	4900	2900	2100	800
07.09.85	11700	10700	9500	7600	5500	3600	2700	800
11.09.85	12000	11000	9500	8000	6000	4000	2800	800
18.09.85	12200	11200	10100	8200	6100	4100	2900	800
31.10.85	13000	12000	10900	8600	6500	4500	3100	800
22.10.85	13100	12150	11100	8800	6800	4800	3500	800
04.11.85	13300	12300	11300	8900	6900	4800	3500	800
16.11.85	13500	12500	11500	9000	7000	4800	3300	800
21.11.85	14100	13150	12100	9400	7400	5700	3500	800
28.11.85	14500	13400	12400	9700	7600	5300	3700	800
16.02.86	15100	14100	13000	10400	8100	5300	4100	1000

Source: Supplied by BJMSS, Khulna Branch.

Exhibit 8
BJMSS Khulna Freezing Plant Harina Variety Pud Procurement Price (1985-86)

(TK Per Maund)

Date	1/70	71/100	101/150	151/250
01.07.85	2700	2200	1800	1300
28.07.85	2500	2100	1700	1200
23.06.86	3100	2700	2300	1900

Source: Supplied by BJMSS, Khulna Branch.

BJMSS or its plant did not have any information about the quantity of shrimps delivered by different primary cooperatives. They had no idea whether or not non-members also delivered shrimps. The unit did not have any systematic way of knowing whether or not the agents diverted part of their procurement to the private units. Information was not available to reconcile whether the grading done by the agents while procuring from the fishermen matched with the grading done at the factory. TK 200 per maund or TK 5,500 per metric tonnes was paid as commission to the agents (see Exhibit 9 for agent-wise procurement).

Exhibit 9
BJMSS Khulna Freezing Plant Month-Wise, Agent-Wise Supply of Shrimps (1985-86)

(Qty. in lbs)

Month	Agent I	Agent II	Agent III	Total
July	20929	12188	7920	41037
August	4225	6901	2958	14084
September	13100	7205	4887	25192
October	7155	4167	2708	14030
November	7200	4147	3053	14400
December	6650	4072	2850	13572
January	1132	622	422	2176
February	1782	1207	701	3690
March	2241	3660	1569	7470
April	5547	2352	3195	11094
May	1522	887	576	2985
June	7455	4072	2810	14337
				164067

Source: Supplied by BJMSS Khulna Branch

Marketing

The entire production of BJMSS was exported to foreign countries. Importers generally visited the factories, examined the quality of frozen shrimp, and negotiated the price before placing orders. The manager of the BJMSS owning a freezing plant was given authority to negotiate the price without awaiting clearance as the distance between headquarters at Chittagong, and the plant at Khulna was great and the communication systems not well developed. When the contract was agreed upon, the quantity, the product mix and the period of export

were finalized. The banks paid the amount on presentation of documents after shipment. Since negotiations were done in person, up-to-date information on the ruling market situation was critical. The marketing assistant of the plant occasionally visited banks, office of the Export Promotion Bureau and other private commission agents to get some idea about the range of ruling prices. The Export Promotion Bureau was submitted with a copy of each export transaction which also contained price related information. But this information was generally not shared with others. There was no formal channel of knowing the market situation and ruling prices. The BJMSS or its plant did not have information on country-wise, variety-wise, destination-wise, importer-wise, month-wise, or year-wise export of shrimps. Prices of salt water shrimps fluctuated whereas the prices of fresh water shrimp did not fluctuate (see Exhibit 10).

Exhibit 10
BJMSS Khulna Freezing Plant Export Price Realized for Different Varieties

Fresh water shrimp			Sea water shrimp			Pud shrimps	
Grade	Highest price lbs/US $	Lowest price lbs/US $	Grade	Highest price lbs/US $	Lowest price lbs/US $	Grade	Price per kg US $
0-5	5.30	5.20	8-12	13.10	11.00	71-80	4.50
6-8	5.10	4.95	13-15	13.00	10.90	81-100	4.20
9-12	4.15	4.10	16-20	11.95	10.25	101-200	3.50
13-15	3.50	3.50	21-25	10.25	9.45	201-300	3.00
16-20	3.10	3.10	26-30	8.70	8.10	301-500	2.30
21-25	2.60	2.60	31-35	7.05	6.95	Broken	1.50
26-30	2.00	2.00	36-40	6.00	6.00		
31-35	1.70	1.65	41-50	5.35	5.25		
36-40	1.60	1.55	51-60	4.85	4.50		
41-50	1.50	1.45	61-70	4.30	4.00		
51-60	1.40	1.35					

Source: Supplied by BJMSS, Khulna Branch.

Particulars about party-wise, country-wise transactions of the plant as compiled from the office records are given in Exhibit 11. The plan unfortunately was running at losses.

The manager of Khulna Plant reported that the competition in the Khulna region had become so stiff with commissioning of new units in the private sector that it was becoming difficult for the plant to procure shrimp for processing. It was reported that private units, to

Exhibit 11
BJMSS Khulna Freezing Plant
PARTICULARS OF FOREIGN BUYERS

1982 - 83

1. M/s Affish B.V.--Netherlands.
2. M/s Nissho--Iwai Corporation--Japan.
3. M/s Palimex Balzano--Italy.
4. M/s Nissho Iwai Corporation--Japan.
5. M/s Rud Kenzow--West Germany.
6. M/s Affish B.V.--Netherlands.
7. M/s Comtrade Ltd.--Switzerland.
8. M/s Creestimex Ltd.--West Germany.
9. M/s Creestimex Ltd.--West Germany.
10. M/s Affish B.V.--Netherlands.
11. M/s Affish B.V.--Netherlands.
12. M/s Creestimex Ltd.--West Germany.
13. M/s Affish B.V--Netherlands.
14. M/s Pieree Hottlet Co.--Belgium.
15. M/s Affish B.V.--Netherlands
16. M/s Affish B.V.--Netherlands.
17. M/s Nikko foods--Japan.
18. M/s Yuasa Trading Co.--Japan.

1983 - 84

1. M/s Nikko Foods--Japan.
2. M/s Toyo Kusuisan Ltd.--Japan.
3. M/s Affish B.V.--Netherlands.
4. M/s Tuasa Trading Corp.--Japan.
5. M/s Toyo Kusuisan--Japan.
6. M/s Affish B.V--Netherlands.
7. M/s Shinyei Kaisha--Japan.
8. M/s Affish B.V.--Netherlands.
9. M/s Affish B.V--Netherlands.
10. M/s Affish B.V.--Netherlands.
11. M/s Tuasa Trading--Japan.
12. M/s Shinyei Kaisha--Japan.
13. M/s Shinyei Kaisha--Japan.
14. M/s Comtrade Ltd.--Switzerland.
15. M/s Comtrade Ltd.--Switzerland.
16. M/s Comtrade Ltd.--Switzerland.
17. M/s Toyo Kusuisan--Japan.

1984 - 85

1. M/s Tuassa Trading--Japan.
2. M/s Mitsubishi Corporate--Japan.

3. M/s Comtrade Ltd.–Switzerland.
4. M/s Mitsubishi Corporate–Japan.
5. M/s Mitsubishi Corporate–Japan.
6. M/s Comtrade Ltd.–Switzerland.
7. M/s Toyo Kusuisan–Japan.
8. M/s Affish B.V–Netherlands.
9. M/s Arnold Otto Meyer–West Germany.
10. M/s Toyo Kusuison–Japan.
11. M/s Affish B.V.–Netherlands.
12. M/s Toyo Kusuisan–Japan.
13. M/s Mitsui & Co.–Japan.
14. M/s Mitsui & Co.–Japan.

1985 - 86

1. M/s Mitsui & Co.–Japan.
2. M/s Mitsui & Co.–Japan.
3. M/s Landeumen Ltd.–Scotland.
4. M/s Mitsui & Co.–Japan.
5. M/s Mitsui & Co.–Japan.
6. M/s Mitsui & Co.–Japan.
7. M/s Creestimex–West Germany.
8. M/s Comtrade–Switzerland.
9. M/s Comtrade–Switzerland.
10. M/s C. Itoh–Japan.
11. M/s Sealect C.V.–Netherlands.
12. M/s Mitsui & Co.–Japan.
13. M/s Select & Co.–Japan.
14. M/s Mitsui & Co.–Japan.
15. M/s Comtrade–Switzerland.
16. M/s Comtrade–Switzerland.
17. M/s Comtrade–Switzerland.

ensure adequate availability of shrimp, advanced loans to fishermen which the cooperative processing plant was unable to do.

Secondly, he said that the plant faced severe financial problems. It could not stock the adequate quantity of shrimp when the purchase prices were low. More funds are needed to operate the plant profitably.

Thirdly, he felt that the cost of processing was more since he had to strictly follow all the rules and regulations and prompt payment of government taxes. It was reported that electricity charges, which constitute a major expense in freezing plants, were manipulated by the private traders, which the cooperative unit cannot think of even doing.

Fourthly, though the head office had given full authority to nego-

Exhibit 12
BJMSS Trading Account

Particulars	1985-86	1984-85	1983-84
Opening Stock			
Shrimps	1675	4408	2341
Packing materials	188	318	421
Printing and stationary	3	4	4
Purchases			
Shrimps	18076	13032	16833
Ice	109	108	97
Processing Cost			
Electrical diesel–2	624	563	421
Wages	42	53	29
Marketing			
Packing materials	330	345	502
Carrying charge	1	–	10
Freight	556	634	539
Export expenses	243	126	136
Gross profit	68	344	1824
	21915	19935	23157
Quantity of Shrimps Raw	156648 lbs	192961 lbs	162370 lbs
Sale of shrimps	17208	15791	16160
Sale of IEC	1494	2278	2268
Closing Stock			
Shrimps	2949	1675	4408
Packing material	263	188	318
Printing & stationary	2	3	4
	21916	19935	23158
Finished products	147368 lbs	152507 lbs	163071 lbs

Source: Supplied by BJMSS, Khulna Branch.

tiate the price, he was not given freedom or flexibility to entertain the foreign buyers which is an essential trade expense as most negotiations were made across the table.

The manager felt that: (a) there exists a network of cooperatives which can supply the shrimp; (b) the plants technology and machinery is in excellent condition; (c) loading and unloading facilities and location of the plant on a river bank is not problematic; (d) organization-

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Exhibit 13
BJMSS Khulna Freezing Plant
PROFIT AND LOSS A/C

(Amt. in 000 Taka)

LOSS				PROFIT			
Particulars	1985-1986	1984-1985	1983-1984	Particulars	1985-1986	1984-1985	1983-1984
Administrative Cost	1283	1929	865	Gross profit	67	–	1824
Operational Cost	771	919	580	Rent	2	1	1
				Notice pay realeased	9	1	1
Marketing Cost	4	4	3				
Business Cost	49	37	51	Int. received	4	–	20
Net Profit	–	–	348	Loss	2025	2887	1
Total	2107	2831	1847		2107	2889	1847

Source: Supplied by BJMSS, Khulna Branch.

Exhibit 14
BJMSS Khulna Freezing Plant
BALANCE SHEET

(Amt. in 000 Taka)

Liabilities				Assets			
Particulars	1985-1986	1984-1985	1983-1984	Particulars	1985-1986	1984-1985	1983-1984
Head office Investment	7676	7457	7402	Land, building plant& machinery	6509	6675	6718
Int. on capital	750	450	150	Furnitures & Fixures	23	25	24
Current Liabilities	266	274	227	Tools & equipments	200	112	100
Loans & advances	1910	22	1892	Bicycle	2	2	2
Profit & loss	300	2325	5212	Loans & advances	463	920	1956
				Closing balances	491	222	1353
				Bank	–	706	–
				Closing Stock	3214	1866	4730
	10902	10528	14883		10902	10528	14883

Source: Supplied by BJMSS, Khulna Branch.

ally, the head office is not that bureacratic; (e) shrimp market internally and for export is growing and has a great deal of potential; (f) supply of electricity is reasonably satisfactory, but the plant also has a emergency generator; and (g) there is no political interference. In spite of all these favourable factors, the plant was running into losses. He felt that may be his analysis was wrong and something else needed to be done. He was interested in identifying the problem that his unit was facing, and what probable strategies he should adopt to make the plant profitable.

SATAN'S EUCALYPTUS

A Case Study of Vinayak Rao Patil

I firmly believe that after successful examples of milk and sugar cane cooperatives, eucalyptus cooperative would be a third major step in the history of agro-processing through large-scale cooperatives. A sugar cooperative requires an investment of around Rs. 10 crores. If cooperative sugar factories were not there in Maharashtra, I could not have conceptualized in terms of crores. A eucalyptus paper and pulp unit costs Rs 15 crores. Farmers coming from Maharashtra and Gujarat have much faith in cooperatives, because of people like Vaikunth Lal Mehta, Dhananjay Rao Gadgil, and Vikhe Patil who have given brilliant examples of their selfless service and rational approach. It is basically the groundwork done by them which helps people like me. Heights that we have obtained are due to them, and because of which we can see wider horizons. The eucalyptus project which I have conceptualized for my district has been supported by the wisdom of these forefathers.

I am in politics and election business for the last 27 years though I am only 44 years old today. I was the director of the Niphad Cooperative Sugar Factory; was on the board of the Karmaveer Kakasaheb Vagh Sugar Factory; chairman of an oil mill and a ginning factory; a chief promoter of a cooperative lift irrigation society; a main organizer of the nation's first ever cooperative drip irrigation society under establishment; an elected member of the Maharashtra Legislative Assembly (MLA); a member of the Legislative Council (MLC); and even a minister of industries for the state for sometime. People from my district have seen me from close ranks for the past many years. They may have doubts about my decisions, but not about my intensions. One can go wrong on decisions and I have a string of failures to

my credit, as also successes, but my intentions have never been in doubt.

Oil mill and ginning factory operations, for example, were my major failures. There was no monopoly purchase for oil. Price fluctuations in the market were very high. By the time, I called the board meeting for a major decision, the market situation changed. Sometimes I had to obtain prices on the telephone and written records of such transactions could not be maintained. My directors and member shareholders supported me as they understood the situation, but the auditors would not spare me as they wanted written proofs. Price fluctuations were a major blow to our oil mill. Ginning factory suffered because the area under cotton itself went down dramatically due to cotton's susceptability to pest attack. However, in both these cases, people did not doubt my intentions.

I grew up with the cooperatives. Like Rajnish who thinks of *Sambhog-se Samadhi-tak* (from sex to salvation); I, because of my past experience, can think of *Sahkar-se Samadhi-tak* (salvation through cooperatives). The formula is simple. It is basically changing the raw material through a specified form of organization. In my present project, instead of sugar cane, I am thinking of processing eucalyptus. Eucalyptus cooperative for a paper mill is a new concept. All that people had heard was a eucalyptus tree or a bottle of eucalyptus oil. Our concept of farm forestry does not stop at growing eucalyptus trees on farms, but extends it to using it as a raw material for paper making.

Choice of eucalyptus came out of my personal need. My father died in 1980 and I had to look after our farm. The government in which I was working was dissolved and I was what you may call jobless. We had a small lift irrigation scheme on the river close to my farm, but the government built a dam upstream and our lift irrigation dried up. No water and no one to look after the farm prompted me to go for eucalyptus cultivation. Besides, after 27 years of active political life, I suddenly found plenty of time to try new things. I was therefore in search of new opportunities. I thought and ruled out many other crops like custard-apple, *ber* and drumsticks as alternatives, but none of them had the strengh of eucalyptus. Somebody suggested me to visit Kalidasbhai Patel at Vatva in Ahmedabad. Kalidasbhai was a veteran of eucalyptus. It was difficult to say who had made popular whom. Surprisingly he spent a whole day with me. I was convinced that eucalyptus was the answer for me. Features like limited use of

fertilizers, limited labour input, marketing according to your convenience, and more returns than even sugar cane were quite attractive. The only drawback was the waiting period of five years. Better returns with less investment and low risk, however, outweighed this drawback. Besides, the feeling that tree cultivation serves the national cause was also comforting.

I did some homework and when I was convinced that eucalyptus was the best alternative, I talked to the farmers from my village. It is a small village having a population of 1,200 to 1,500. We met, discussed and decided to try eucalyptus and 175 acres were committed then and there. This response gave me the feeling that others in the *taluka* and in the district may also be looking for such opportunities. I thought of contacting the farmers from my own constituency. It occurred to me that while there is a great deal of potential in eucalyptus, a large number of people opting for it may create a marketing problem for ourselves, should it happen the eucalyptus may turn out to be a burden than a solution. So I went to Gujarat again with the explicit purpose of understanding the marketing problems and prospects. After understanding the situation there, I contacted the Tata Consultancy Services, one of the best in the country, to identify and assess product alternatives. They gave me excellent insights. I also sought advice of my political friends and senior colleagues who encouraged me to go for paper. This also was one of the alternatives suggested by the experts. I visited a paper unit to find out their requirements and also their interest in our raw material. I realized that raw material was going to be my strength. I discovered that a factory with 30 tonnes capacity was not likely to cost more than 15 crores, and said to myself why not we dream of having it ourselves. My friends again told me that if I was thinking of a processing unit, then I must get farm forestry on a firm footing, and plan for a small, compact project like what Vikhe Patil, M.P. did in his area. I decided to go for eucalyptus processing and prepared myself to sell our eucalyptus to other units if the processing unit was delayed for some reason. That is how the Nasik Zilla Eucalyptus Producers Cooperative Society was set up in June 1983.

I had visited Kalidasbhai in 1982. He paid a visit to us with his wife in 1985 and stayed with us. He was as happy as a father would be to see his child growing. It was a day of pride for both of us. He was in a real sense a pioneer of farm forestry in the country. Other eucalyptus growers had other sources of income; he was solely dependent on eucalyptus cultivation. The father of eucalyptus said that he could

go only up to planting and farming, I went much beyond to processing and extension.

Following on our initiative, 22 district level eucalyptus growers societies have now been registered in Maharashtra. The registrar of cooperatives at one time had hesitation in registering these societies as eucalyptus societies, and had suggested to make them broad-based by calling them "tree-growers societies". It was a good suggestion. Because in future we may find trees like teak or sandalwood as better trees, and can go for them. We are farmers and wedded to farming, and not to eucalyptus.

Whenever farmers from other districts wanted to grow eucalyptus, and form their cooperatives, I went there. The first meeting of all the interested farmers in all districts was invariably held under my chairmanship. Some of the political stalwarts and ex-ministers like Yashwantrao Mohite at Satara, Mohan Dharia at Pune, Vartak at Thane, Prabhakar Rao Kunte at Raigarh and so on, have now formed eucalyptus growers cooperatives in their home districts. We soon plan to have a state level federation of the district level societies. Vasantrao Dada Patil, the ex-Chief Minister of Maharashtra, has promised us an office space for this federation in Bombay. To have a state level federation is not what our immediate mission is. Solving farmer's immediate problems, or better yet, serving their economic interest through promoting eucalyptus cultivation is what we are aiming at.

Normally it takes a lot of time, energy, travel and money to convince farmers to do something collectively. Our forefathers in cooperatives had to do it. But in my case, the efforts needed to motivate farmers to grow eucalyptus were the least. People with wastelands were attracted; farmers with shortage of labour and shortage of water were attracted; persons who could not attend to their agriculture for some reason were attracted. Out of 10,000 acres which have been planted so far, more than 50 per cent of the area is a wasteland. A cooperative was not a new form of organisation for them. They had seen benefits of it and had faith in it. They knew it was going to be a producers society as they were treated as 'A' class members. All other institutions willing to grow eucalyptus and supply it to the society were treated as 'B' class members. Surprisingly, a sugar cane factory having its own plot of land meant for sugar cane is our 'B' class member. It started cultivating eucalyptus in place of sugar cane due to shortage of water as it did not want its land to remain fallow. It is the self-need that makes people come together quickly. I have noticed

that if you offer the best price to a farmer, you do not need to teach him anything. He is quick in learning all the technicalities.

To make it further attractive, I made arrangements to supply seedlings to them; wrote a small booklet in local language on how to cultivate eucalyptus; had employed a retired extension officer to provide guidance when needed; and had an M.Sc. agriculture person specialized in pest control whose services the farmers could avail of by paying nominal fees and his transport cost.

We had our own share of problems with the supply of seedlings to our members (see Exhibit 1). The forest department is known to have supplied millions of seedlings to the people not having land. When we approached them with a request to supply a crore of eucalyptus seedlings they said we must be crazy. They were worried as to what would happen to the small, marginal, scheduled caste, and tribal farmers who needed these saplings. I told them even if a thief wanted to plant a tree there was nothing wrong. As a forester he should encourage everyone. Foresters always tell us to "plant trees and attain *moksha* (salvation)", and when we approach them they start shrinking. They are not professional promoters. Only a few top officers are cooperative.

It is funny how decision making in bureaucracy gets influenced by what appears in the newspapers. If some newspaper article says that eucalyptus is harmful to the environment, everybody believes and starts deciding on that basis. Our officers do not have any faith in, or regard for, the work done by the researchers. Though research reports are available, nobody has time to read them. It is easy to rely on opiniated publicity. A lot of research on eucalyptus has been carried out in Australia, Israel, and even at Dehradun. If a professional farmer wants to grow eucalyptus one should not feel, unless convinced, that something scandalous is going on.

We had applied for 75 lakh saplings this year, well in advance, and were willing to make advance payment to ensure supply. But what we were promised were a meagre 8.5 lakh saplings. That too by charging: (a) the price of the seedlings which were free so far; (b) 2 per cent additional sales tax; and (c) 5 per cent additional forest development tax on the total sales. It is strange that a person interested in growing trees now should also pay a tax for doing so. I do not understand why departments cannot have a stable policy on any subject for at least three to five years. If you feel that eucalyptus is bad, then conduct research on all facets of it, arrive at scientifically deduced

Exhibit 1
Supply of Seedlings to the Society

In January 1987, the society wrote to the (a) divisional forest officer (east division); divisional forest officer (west division); and (c) deputy director, social forestry, Nasik division that its members would require a total of 75,00,000 seedlings (25 lakhs from each of them) of eucalyptus during June-July 1987. The DFO (east division) immediately replied that since the seedlings to the society would be supplied by the social forestry division, the society should get in touch with them. The social forestry division wrote that they have received the request for 25 lakh seedlings, but the government has yet not taken a decision on its pricing. Last year the prices were Rs.0.75 per plant and whether the society would purchase the seedlings at the rate fixed by the government. The society agreed to purchase the seedlings at whatever rate the social forestry division finally decided, but requested to keep the seedlings ready. Till June there was no correspondence on this subject. On June 4, the society requested the project authorities to indicate which nursery would supply how many seedlinds during what period, so as to inform its members. On June 9, the social forestry division informed the names of nurseries which would supply the seedlings but indicated that only 8.5 lakh seedlings against the total demand of 75 lakh seedlings would be supplied. The society was also asked to deposit money (amount not indicated) as advance payment if the society wanted the seedlings in time. Realizing that the sanctioned number of seedlings were far short of its requirement, the society immediately wrote a letter to a private party from a neighbouring state to quote their rates for supply of seedlings including the cost of transport.

In the meantime, the state department of forest issued a circular on June 5, 1987 stating that to encourage people and particularly the farmers to plant trees, the forest department was implementing a scheme of distribution of seedlings, and people interested in planting trees could collect their requirements from departmental nurseries at the following rates: eucalyptus in plastic bags (20 paise per plant), and without bags (10 paise per plant). This rate would be in force from June 5 (World Environment Day) to August 15 (Independence Day). Under this rate, a farmer can purchase up to 500 plants. For additional plants, the rate would be 45 paise for plants with bags and 25 paise for plants without bags. Educational institutions, cooperative societies or voluntary organizations could purchase as many seedlings as they desire. There would not be any ceiling for them.

The chairman of the society personally met the officers of social forestry who as a result issued three challans of Rs. 6.60 lakhs for the society to deposit the amount in the treasury. After receiving the payment, the deputy director informed the society to lift the sanctioned seedlings during June itself as a large number of people were demanding the seedlings.

In the meantime, the private supplier wrote that he could supply the naked plants at the rate of Rs. 90 for 1000 plants. On June 23, 1987, the deputy director of social forestry informed the society that the government has decided to charge 2 per cent sales tax and 5 per cent forest development tax on the seedlings to be supplied during this year. Therefore, the society should pay the balance amount of remaining seedlings along with the tax due on the entire amount within eight days to ensure the supply of seedlings.

conclusions, and decide once and for all for banning it. First saying that it is good, then proceeding to say it is bad then alright , and then again problematic, has no value for a grower because once he takes a decision to plant a tree, his decision is valid for at least seven years. Another old behaviour of the bureaucracy is that all the departments ask questions that do not pertain to their departments. Department of cooperatives started asking questions as to what would happen to the supply of foodgrains if they registered eucalyptus societies. Banks wanted to know what would happen to the environmental degradation and pollution. I advised them to let the pollution department worry about it. I was recently asked by a person associated with the Friends of the Bird Association to stop planting eucalyptus because it did not attract birds. My reply was that first of all for planting eucalyptus I did not cut any standing tree on which birds were sitting. As it is, on barren land there are no branches of trees where birds can sit. Besides, if birds came and sat on my eucalyptus. I was not going to charge them a fee. But if you wanted me to grow only those trees on which the birds can sit, sorry, as a farmer I cannot do it. Surprisingly, I came across an Australian weekly in which photographs showed that eucalyptus was the best habitat for a wide range of birds ranging from a cuckoo to eagles. When I showed him the photograph, he was convinced that eucalyptus can also attract birds, but felt that as he has already taken a stand on this subject it suits him to believe otherwise.

All kinds of people make all kinds of statements on eucalyptus without any homework or concrete proof. I feel that all these friends of animals, friends of birds, friends of trees, friends of forests, and so on, should have an open mind and a friendly attitude. I am a farmer and they should not expect me to grow trees to suit their purposes. We are struggling hard to set up a paper unit by mobilizing members active participation. They should understand that for little publicity, or for provocative material useful for workshops and conference, they should not hamper a movement of farmers.

Environmentalists are telling us not to grow eucalyptus as it is damaging the environment. I feel that while remaining in India, we should not crave for the standards set in the U.S.A. or in Europe. If we want to follow their standards, why not follow scrupulously the standards of birth control instead of only soil pollution standards. Environmentalists should, in that case, concentrate more on family planning, as population explosion is the greatest threat to the environment than eucalyptus.

We wanted to link up plantation of eucalyptus with the employment guarantee scheme. We approached the authorities for assistance. We were told that we should have a village level eucalyptus growers society to get such an assistance. We told them that we had a district level cooperative society because for eucalyptus enterprise, the village level societies were not viable and had no useful function to perform. Requirements of commodity should determine the organizational structure and not the requirements of a scheme. But it is very difficult to convince these departments.

Credit encourages farmers to grow trees as they are unlikely to get income from their fields for some time to come. The National Bank for Agriculture and Rural Development (NABARD), without whose authorization no credit can flow for any agricultural of rural development activity, has kept us waiting now for more than three years to get credit. In 1982, the NABARD came up with a scheme to support farm forestry as one of the important national programmes and instructed all nationalized banks to finance a large number of tree species. Eucalyptus was of course on top of the list. On the basis of this scheme, we promised our members and many more potential farmers that we would make arrangements for their credit. It was a tripartite agreement between a bank, society and a farmer. NABARD was to refinance the banks. The Nasik District Cooperative Bank even started financing the applicants. At that time not many proposals were forthcoming and funds generally remained unutilized. When we submitted the tripartite proposal, we were told to bring a no objection certificate from the government indicating that the government had no objection if farmers planted eucalyptus trees. It was odd that such a demand was made considering the scheme was announced by the government itself. Besides, which department in government should we approach for such a certificate--department of cooperatives, revenue, agriculture, forestry or somebody else. The argument was that plantation of eucalyptus would affect food production. Decision makers in government first think of negative things. Everybody said that they had their instructions from the top. When probed, nobody was able to say who actually gave the instructions to get a no objection certificate but we were struck because credit flow had been completely stopped before it actually started.

I went to my village level revenue officer who said he did not have any objection if we grew eucalyptus, but his no objection had no value. So I approached the Director of Agriculture of the state. He

was convinced with my arguments, but said that he would send his recommendations to the Secretary (agriculture) as it might be appropriate for him to decide and issue a no objection certificate on an important matter like this. The Secretary (agriculture) after getting convinced told me to let the matter be discussed with the Minister of Agriculture. The minister in turn felt that since eucalyptus has created a lot of controversy, let the Chief Minister be briefed and asked to give proper guidance. The Chief Minister promised that he would assess the views of the Prime Minister, but finally the state cabinet will have to discuss the issue and make recommendations. The Chief Minister has formally referred the matter to the newly constituted Maharashtra State Wasteland Development Board, of which I am also now a member.

We do not know whose brain child it was to ask for a no objection certificate, but the NABARD refused to refinance the nationalized banks without having that certificate. If that certificate was that critical, then they should not have issued the circular to begin with. I have had detailed discussions with the officers of NABARD on more than one occasion. The Managing Director of the NABARD told me, "look, Mr. Vinayak Rao Patil, you are doing a fantastic job. Only let that certificate come and we will extend all possible help."

How this food problem is likely to be aggravated because of eucalyptus that I do not understand. As it is we are importing pulp and other forest-based products. On the other hand, we now have a surplus of food. Planting eucalyptus is really an important import-substitution project. In my district itself 36,000 acres of forest land has been regularized as agricultural land after people encroached upon it and started cultivation. There is a lot more forest land which has not been regularized, but which is under regular cultivation. Against this only 10,000 acres of agricultural land has been brought back under eucalyptus by way of farm forestry, that too, 50 per cent of the land under eucalyptus is marginally productive land. Then how can it upset the food balance. On the other hand, what type of forests do we have in our country. More than 50 per cent of the forest area is denuded. A major portion of the green cover in the remaining area is of poor quality. The productivity of our forests is reported to be hardly 3 per cent of that of the forests in the USA or Europe. Effectively only 10 to 11 per cent of forests can be called as forests. We obviously need to grow more trees. Is not everybody saying that? Whether you grow trees for beauty, or for shade, timber, fuel or fodder is immaterial as

long as you grow it. But when I want to grow it for money, I become a culprit. Once I was told by a nursery-incharge to bring a certificate that my land is a marginal land to get the specified number of saplings. My ego tells me that I am planting a tree which the nation values, and therefore I should be given a red carpet treatment, but instead I am given a red tape treatment.

The credit matter is on for last three years without any solution. I could not keep the promise I made to my farmers. I have developed a credibility problem. My stakes are higher than the officers of the NABARD or any other department. I have started behaving like an industrialist doing *salams* (saluting) to everybody. As a leader, or as a farmer, I would not have compromised on certain things. I do not behave like a farmer now.

The financial bodies have financed popular plantations for WIMCO, a private match box manufacturer. I can also grow poplar, but then I will also think of manufacturing match boxes. The thinking process would not change. But then their doubting my intentions would also not change. For me, eucalyptus is better than poplar. May be in a cooperative language you can say that I was not able to successfully handle the bureaucracy.

I am convinced that officers and others should appreciate that ecology or food problem is not a bureaucrat's privilage. We, as farmers are also equally concerned about it. But I am not here to sell ecology to my member farmers. They are not likely to grow trees for national benefits. I told them it is their *roji-roti* (bread and butter), which only brought seriousness in them. I did not tell them that cultivation of trees would stop soil erosion, or produce more oxygen, or bring more rains. I told them it would bring them more money. There was a long queue of 200 farmers when we annòunced distribution of eucalyptus seedlings on the first day. Police were called to ensure smooth distribution. Departments run after farmers even after elaborate extension work; farmers were running after me.

As I mentioned earlier, I will have to worry about marketing. Setting up a paper unit is one of the alternatives we have opted for. Yashwant Rao Mohite who had been a minister in the government of Maharashtra for almost 20 years, once visited me and argued that farmers in his area had plenty of water, had one of the best cooperative sugar factory, got the highest price in the country for their sugar cane, had a small landholding size and fertile land. He said that my problems were different. Uncertainty of labour and water, poor quality

of soil and unmanageable size of landholding prompted me to go for eucalyptus. But why should he do it in his region? He stayed here for four to five days, visited my farmers, looked at the economics and went convinced that eucalyptus could in fact bring more returns with less investment and less efforts. He decided to go for a panel board (hardboard) manufacturing unit as we are thinking of a paper unit to avoid duplication.

Our consultants say that technology is not a problem. They know at least four units in the world, including one in Brazil, that uses 100 per cent eucalyptus as raw material. Such technology has not been tried in India and we may have to go for a mixture of raw material. I have already started prompting agave cultivation in our region to ensure that supportive raw material would also be available. We need a letter of intent from the ministry to set up a paper unit. They only need a certificate clarifying that we had the requisite area under standing eucalyptus. Again the problem would be who would assess the area to give that certificate. Revenue, forestry, and agriculture are the only departments who should be able to do it, but we do not have a precedence of this kind. I do not visualize much problem on this score.

A paper mill means a sizeable investment, Our farmers would not be able to mobilize that much of money at one go. Therefore, we have requested the government of Maharashtra to participate in our share capital in 1:5 ratio. We are pursuing the matter for the last two years, but it is still fluid (see Exhibit 2). We are keeping a low profile on paper project as everything depends on the government's participation. But should something go wrong, we will continue to work as the eucalyptus grower's society and forget about the paper project. We have thought of alternative marketing arrangements and we will be able to sell our eucalyptus without any problems.

Thinking about eucalyptus-based paper unit made us aware of many inadequacies that exist in our technical knowledge on eucalyptus. I wanted to know which varieties of eucalyptus were good for pulp. for rayon fibre, for speciality paper, for oxalic acid, or even for construction material. Very little research output is available. I have written to an Australian Research Institute to give us a computer programme which can provide us information on 100 and odd varieties of eucalyptus on items such as productivity, characteristics, types of soils needed, temperatures, altitudes, end uses and so on. We should be able to select the right variety by feeding all the background

Exhibit 2

In July 1985, the society applied to the government of Maharashtra for its participation in the share capital in the ratio of 1:5 (for each share of the society five shares of the government). In its application, the society furnished information on its objectives, total area of the district area under crop cultivation, irrigation and eucalyptus; suitability of land and climate for eucalyptus cultivation; plantation techniques; per hectare cost of cultivation; facilities to provide technical knowledge to the farmers, marketing arrangements; details on the proposed paper project; and society's financial position. The project report prepared by a consultancy firm was also submitted. The government in October 1985 asked the state industrial and investment corporation to scrutinize the technical feasibility and economic viability of the project and to submit its recommendations to the government to take a decision on the request.

In December 1985, the Deputy Registrar of cooperatives asked the society to supply: (a) a balance sheet for the year ending 1985; (b) a copy of the resolution of the society to set up a processing plant; and (c) details on how the proposed project would be beneficial financially to the members as well as to the society. Similarly, in the follow-up letter in January, additional information was sought on: (a) the number of existing members and their area under eucalyptus, including the expected production; and (b) whether or not sufficient raw material would be available for the proposed paper unit. The society supplied all the information on January 6, 1986.

In the meantime, the government had reminded the state industrial and investment corporation to expedite its recommendations. It was also pointed out that the corporation, while scrutinizing the proposal, should also take into account an article published in Maharashtra Times on the dangers of eucalyptus plantation which stated that the large scale plantation of eucalyptus affected the soil fertility, and was harmful to agriculture, other plant life and the environment. The corporation then submitted its recommendations in January 1986. In February, the government wrote to the society seeking information on: (a) the kind of land on which eucalyptus is likely to be planted and whether or not the land under food crops is being planted, or, is likely to be planted with eucalyptus; (b) whether or not eucalyptus plantations are likely to be irrigated from the government implemented irrigation systems; and (c) details on the sources of funding for the project.

The society immediately replied giving all the details. It was pointed out that: (a) eucalyptus is being planted on all types of lands such as saline land, waterlogged areas, wastelands, unproductive agricultural land, and *murram* land; (b) eucalyptus plantations so far have not received water from government implemented irrigation systems; (c) possible sources of funding included members share capital, governments participation in share capital and loans from the financial institutions. In response to a query, it was also pointed out that the society had sent a rejoinder to the Maharashtra Times under the title "Eucalyptus plantation: fears and realities" which disputed the dangers indicated in the previous article published by the newspaper.

In March 1987, the registrar's office wanted to know whether the society has been registered as a "producers' society" and which institution has promised to

extend financial assistance to the project on a long-term basis. The society responded by stating that it was registered as a 'general' society but wanted its classification to be changed as an agro-processing society. Its application for this change has yet not been approved. Similarly, the society has submitted its project report to ICICI for possible funding. ICICI has agreed to give financial assistance if the government of Maharashtra agreed to participate in the share capital on 1:5 basis.

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information to the computer. Our foresters know about trees, but they do not know about finer technical details needed by a processor. Again they probably know about trees, but they do not know much about farming. If you ask them about fertilizers, pests and crop behaviour in different seasons or growth stages of eucalyptus, one gets the feeling that their knowledge is superfluous. They have not studied eucalyptus from the farmer's angle. That prompted me to organize a meeting of all the Vice Chancellors of agricultural universities in our state. After exposing them to various aspects which needed research inputs, I requested them to march with the farmers and not remain behind. All of them understood the merit of the argument and have agreed to encourage further research and organize appropriate training programmes on eucalyptus farming.

It is unfortunate that we are not doing enough research on eucalyptus, but what is more unfortunate is that we do not even accept the researches done by the others. Whenever I had shown a piece of research findings of some institute to my forester friends, they invariably aruged that they knew what kind of research goes on in that institute. There is no sense in such arguments because they can be used against almost everything. You can, for example, say that you knew what kind of judgments were given by the High Courts and Supreme Court. We cannot sit on judgments everywhere.

Supply of seedlings is the only role in my opinion the forest department can work for us. But after thinking about the paper project, I have realized that we cannot depend on them too much. Most importantly, the forest department is not quality conscious. We do not know what kind of seeds they use for growing seedlings; whether or not they use fertilizers, or water the seedlings properly, or use the right kind of soil mixtures. We want to be commercial farmers. We are going to be in the business of paper making. The forest department can afford to make compromises in raising seedlings; we cannot. Therefore I am thinking of having our own nurseries and also setting up a small research station owned by the farmers. When we are plan-

ning to make an investment of more than Rs. 15 crores, we cannot afford to take chances. Our decisions must be based on proven knowledge and correct information. We hope to be professionals.

I have already promised an advance payment of Rs. 800 per ton to the growers. By selling *ballies* (poles for construction of houses, shops) they may get more. Our consultants also feel the same way. But processing gives a great support. If we decide to make oxalic acid out of the bark of eucalyptus, the farmer would get the entire tree free. In any case, we have decided to allow our members to sell 15 per cent of his produce as *ballies* in the open market, if he chooses to do so.

It took me two to three years to conceive the idea of processing and of working out the details. When I submitted the proposal to the office of the Registrar of Cooperatives, he had hesitation in registering the society. He said it is all Greek and Latin to him. I also did not expect him to understand the document. Because it took me three years to understand the eucalyptus business. I told him not to assume that I am interested in registering the society because I want to become a chairman of it. I have had my share of chairmanships for long and it is no more a great attraction for me, but they always have this nagging feeling. I did not want registration to be delayed because someone does not understand the subject and technicalities. Therefore, I preferred to use my political connections for registration. I went to the Chief Minister who was aware of my homework and plans. He rang up the department and asked him to register the society. The Secretary of Cooperation was also known to me. We had worked together when I was the chairman of the *panchayat samiti*. I felt bad that I had to use my connections to get my society registered, but that was the only quickest way available to me. The issue in relation to food problem would have been another bottleneck in registration. The stereo-type image is that agriculture is for food and a farmer would serve the national interest, as if the farmers and the nation are two different identities, and farmers interests are not in nation's interest. But a lot of time could be wasted in these arguments. Therefore, it was better to get things moving because of my connections than arguments.

When I realized that a no objection certificate was likely to create problems and I alone could not take up the matter forcefully, I did see merit in making the eucalyptus grower's movement bigger. Now I am not alone. We have a team of colleagues working on similar objectives in many districts. We do not have as many problems with either

people, or eucalyptus as a commodity, as we have with the critics of eucalyptus as well as our friends in government departments. Once a senior cooperative officer told me that all kinds of people are coming with agro-processing related proposals, and asked me whether there was any way of objecting to them. I informed him that he should raise an objection if the major portion of their costs did not relate to the raw material they produced. He was very happy as he now had a handle and a formula to raise objections.

The Nation's Wasteland Development Board also comes out with so many schemes, circulars, and directives that officers scrutinizing proposals take advantage of the variations. They always say that they are under instructions from Delhi, so you are stuck. The NWDB probably has a preference to say what we should not do. They should also now say what should we do. All species cannot be grown everywhere. They should indicate regionwise profitability and narrow down the choice of species, if needed, but take a positive stand. We do not know who to believe for what. Researchers, administrators, newspapers, foresters and bankers do not talk the same language on eucalyptus. Therefore, I trust Kalidasbhai, a 100 per cent farmer and treat him as my guide.

We rely on records. In case of eucalyptus cultivation, even a village level revenue officer cannot give a wrong certificate about its cropping pattern because eucalyptus would have been standing for 25 years. We send pre-paid, pre-addressed postcards periodically to all members and ask for certain information including the number of standing trees. As we are likely to follow the same technique as adopted by the sugar factories in harvesting and transporting sugar cane, the data on the date of plantation are important to us. There is no political involvement in the selection of the site for the factory, because transportation cost to the farmer residing anywhere in the district would be the same as determined by the total cost divided by the total acreage.

We did not have any problem with people's participation. When I declared that I am looking for a 100 acre plot for our paper factory, I received eight proposals from my district offering this land free of charge. I finally selected a plot near a source of water and persuaded 17 farmers owning those 100 acres to at least charge Re 1 as rent to make it official. Once we get clearance from the government for its participation in share capital, the erection of plant will not take more than 30 months. The machinery is available in India. By that time, our

eucalyptus would also be ready for harvesting. Of course, according to schedule, I am delayed by two to three years, but I have some customers already lined up who will purchase our eucalyptus till our plant gets ready. Some of our farmers are taking other crops like wheat, sunflower and vegetables along with eucalyptus. At least for two years they do not have any problems.

The cost of cultivation of eucalyptus depends on location and the person who is managing it. It can be reasonably low with a person taking intercrops and using furrows for planting. It can be high for those who dig pits. We recommend digging pits. The cost varies from one situation to another. According to the NABARD norm it would be Rs 22,000 per acre. We are requesting only Rs 6,500 per acre as that is the minimum that we anticipate, but we are not getting even that. Paying taxes is another punishment for growing trees, and it would increase the cost further. For tree cultivation, a general classification like small farmer, marginal farmer and tribal and untouchable farmer, is not needed. I can understand if there is a ceiling on the landholding size, but I do not understand why should there be a ceiling on what crops to grow. I am a thick-skinned politician, but it hurts me when the country says that I should plant trees; and when I decide to plant trees I do not get credit or saplings. In fact what I get is discredit and sapping of my energies. May be I have a sinister motive. May be I am a satan. But then people at least are planting trees. For that cause I would prefer to be a satan.

TWO SIDES OF A PROJECT

SIDE ONE

Aquaculture Development Project

The EEC-ADB initiated the aquaculture development project in Thailand which had both economic and social objectives and aimed at increasing the fish and shrimp production to: (a) meet the growing local demand; (b) improve income and employment opportunities of small fish farmers; and (c) increase foreign exchange earnings through exports. Given the inland and aquaculture resource potential of the country, several sub-projects were selected on the basis of some criteria, such as, availability of: (i) resources; (ii) suitable fish and shrimp species; (iii) suitable sites; (iv) project manpower and implementing capacity; (v) appropriate technology; and (vi) domestic consumption and export potential. The selected sub-projects were as follows:

SUB-PROJECTS

Sub-project 1: Upgrading of existing shrimp/fish ponds
Sub-project 2: Brackish water shrimp/fish pond estate settlement
Sub-project 3: Bracksih water shrimp hatchery pilot project
Sub-project 4: Fresh water prawn hatchery
Sub-project 5: Pangasius cage culture
Sub-project 6: Integrated pond culture

The analysis led to the identification of these sub-projects and their locations are given in Exhibits 1 and 2. The total investment cost of the project was estimated at US $ 41.8 million of which US $ 10 million was the foreign exchange component.

Sub-project 6

Sub-project 6 related to the development of integrated pond culture. It was observed that agriculture, which not only supported 78 per cent of the total population, but also met national as well as export

demands, contributed significantly to the growth of the national economy. Of the 15 million metric tonnes of rice produced in the country, about 3 million tonnes was exported to Indonesia, Malaysia, Singapore, Hong Kong, and Saudi Arabia. Further increase in rice production was expected only from the irrigated areas while 80 per cent of the total cropped area under paddy was rainfed and was influenced by uncertain agro-climatic conditions. Population growth was 1.8 per cent per annum. Intensification of the integrated farming system was considered to be one of the possible ways of increasing agricultural production in a limited land base by recycling the waste of one product as an input for another within a single farm unit. Integration of

Exhibit 1
Description of the Project

The EEC-ADB funded project was designed to increase fish and shrimp production in Thailand through aquaculture development and consisted of the following parts:
Part A. Aquaculture Development

a) *Sub-Project 1: Upgrading of Existing Shrimp/Fish Ponds* Upgrading and rehabilitation of about 9,000 hectares of brackish water shrimp ponds in the coastal provinces of Samut Sakhon, Samut Songkram, Chachengsau, Chunburi, Rayong and Trat including installation of water pumps.
b) *Sub-project 2: Brackish Water Shrimp/Fish Pond Estate Settlement*
Development of about 2,000 hectares of swamp land into small shrimp/fish pond holdings included in estate settlements in the provinces of Nakhon Sri Thammarat and Surat Thani, construction of shrimp/fish ponds; installation of water pumps; and, provision of infrastructure facilities, including a feed processing plant, ice storage facilities and transport equipment.
c) *Sub-Project 3: Brackish Water Shrimp Hatchery Pilot Project*
Construction of two shrimp hatcheries, based upon the Galveston system, together with maturation pens and field spawning laboratories at two sites; one along the coast of Central Thailand and the other along the coast of Southern Thailand.
d) *Sub-Project 4: Fresh Water Prawn Hatchery*
Construction of a fresh water prawn hatchery and a broodstock pond near Songkhla Lake.
e) *Sub-Project 5: Pangasius Cage Culture*
Construction of about 3,000 fish cages to be located in rivers in the central region of Thailand, and construction of a supporting hatchery.
f) *Sub-Project 6: Integrated Pond Culture*
Development of about 1,000 hectares of land into small integrated farms at selected sites in the provinces of Central Thailand; construction of fishponds; and, provision of a feed processing plant, ice plant, ice storage facilities and transport equipment

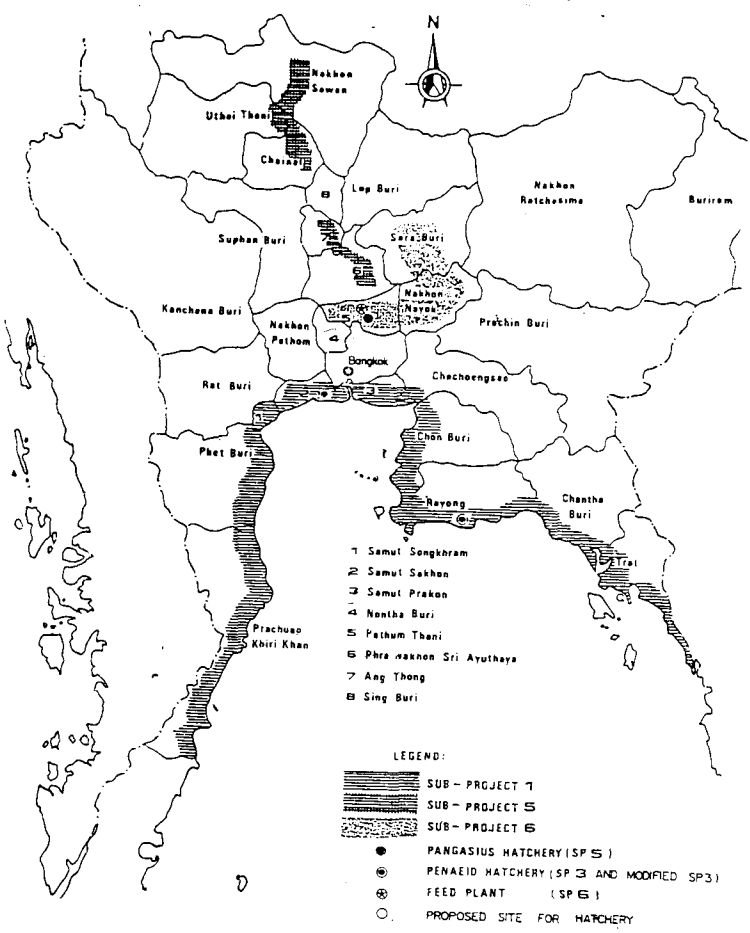


Exhibit 2: Location of Project Sites (1).

crop-livestock-fish culture was expected to maximize production, improve land fertility, earn additional income and provide better nutrition. The project targeted to introduce mixed farming system among 250 farmers in selected cooperatives covering a project area of 1000 hectares (6,250 rai).

Each selected farm in the sub-project was to have: (i) a small size (.16 hectare or 1 rai) pond for intensive culture of giant fresh water prawn; (ii) a big-sized pond (0.64 hectares of 4 rai) for fish culture; (iii) a duck/pig house to be constructed on the big dike between the two ponds; (iv) a water supply channel; and (v) a paddy field of 20 rai (See Exhibit 3 for layout).

The water was first to be pumped into the small pond meant for prawns and led to the big sized pond by a water channel. In between, the fish pond was planned to receive natural fertilizer from two sources, that is, animal manure (pig or duck) and the water-born organic wastes from the prawn pond. From the fish pond, the water containing some manure would be drained into the paddy fields.

Project beneficiaries were expected to select one of the following four types of culture systems offered by the project:

Type 1: Prawn + Pig.

Type 2: Prawn + Fish + Domestic duck for meat.

Type 3: Prawn + Fish + Domestic duck for egg.

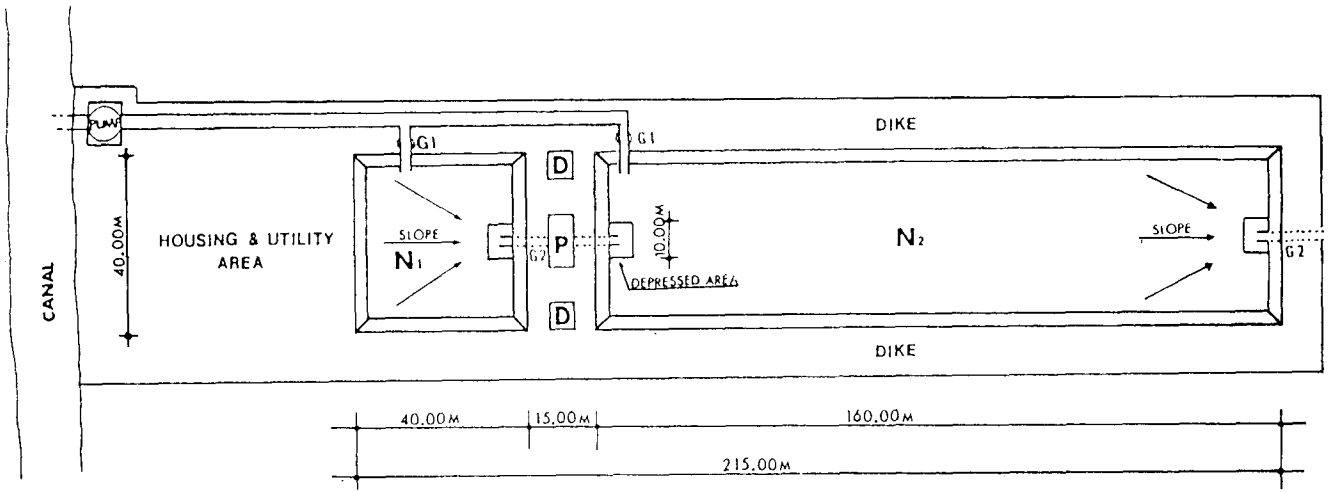
Type 4: Prawn + Fish + Peking duck.

Since marketing conditions were not favourable for domestic duck, the farmers preferred mostly the alternatives 1 and 4. The cost-benefit figures for each type of system as expected by the project are given in Exhibit 4.

Inclusion of Chachengsau Province in Sub-Project 6

Earlier the EEC and the ADB had approved an extension of sub-project 6 to include additional 81 members from Ayuthya (45 members) and Patumthanee (36 members) provinces. However, because of problems associated with landholding, the Patumthanee province stated that they were not yet ready to implement the project. Subsequently, the Muang Pad Rew (MPR) Agricultural Cooperative Society from Chachengsau province submitted in 1986 a proposal to promote prawn culture to increase the income of its members by changing some parts of their paddy fields into prawn ponds. Both the departments of cooperatives and the fisheries made their preliminary

Exhibit 3: Layout of Integrated Fish Farm (Overall Layout of Farm).



N1 : FRESH WATER PRAWN POND
N2 : FISH POND
P : PIGGERY
D : DUCKLING
G1 : WATER INLET GATE
G2 : WATER OUTLET GATE

Exhibit 4
Summary of Project Expected Cost-Benefits for Each Type of Culture in Subject-Project-6

1. Prawn culture	
1) Pond size	: 0.16 hectares (1 rai)
2) Stocking density	: 16,000 animals (8,000 x 2 cycles or 5 animals/ m^2 cycle)
3) Rearing period	: 6 months/cycle
4) Survival rate	: 40%
5) Weight of prawn at harvest	: 40 gm
6) Number of rearing cycles/year	: 2 cycles
7) Production (kg/0.16 hectares/year)	: 256 kg
8) Feed (kg/year)	: 640 kg
9) Feed (conversion rate)	: 3:1
10) Cost of seed	: Bahts 250/1,000 animals
11) Cost of feed	: Bahts 12/kg
12) Annual revenue	: Bahts 30,720 (256 kg x B 120)
2. Fish culture	
1) Pond size	: 0.64 hectares (4 rai)
2) Stocking density	: *Tilapia*: 3,000 *Pungius*: 3,000
3) Rearing period	: 1 year/cycle
4) Survival rate	: 90%
5) Weight of fish at harvest	: 300 g/fish
6) Production (kg/0.64 hectare/year)	: 1,620 kg
7) Cost of fingerlings	: Bahts 700/1,000 fingerlings
8) Selling price Tilapia	: Bahts 8 kg
Puntius	: Bahts 12/kg
9) Annual revenue	: Bahts 16,200
3.Piggery	
1) Number of young pigs/household	: 32 head
2) Number of rearing cycles	: 1 cycle
3) Weight /pig at harvest	: 110 kg
4) Production/household/year	: 3,520 kg
5) Feed/household	: 10,080 kg
6) Feed conversion rate	: 3.5:1
7) Cost of young pig	: Bahts 600/head (20 kg in body weight)
8) Cost of feed	: Bahts 3.75 kg
9) Selling price	: Bahts 22/kg
10) Annual revenue	: Bahts 77,440
4. Duckling	
a. Meat type duck (khaki)	
1) Number of ducks/household	: 4,000 ducks (800 ducks x 5 cycles)
2) Number of rearing cycles/year	: 5 cycles
3) Survival rate	: 95%

4) Weight/duck and harvest : 1.5 kg
5) Production/household/year : 5,700 kg
6) Feed/household/year : 17,100 kg
7) Feed Conversion rate : 3:1
8) Cost of young duck : Bahts 0.25/duck
9) Cost of feed : Bahts 5/kg
10) Selling price : Bahts 26/kg
11) Annual revenue : Bahts 148,200

b. Egg type duck (khaki)
1) Number of ducks/household : 800 ducks
2) Number of rearing cycles : 1 cycle/2 years
3) Survival rate : 90%
4) Production of eggs/ducks/year : 200 eggs
5) Weight/egg : 70 gm
6) Production (household/year) : 10,080 kg (or 144,000 eggs)
7) Feed/duck/year : 30 kg
8) Feed/household/year : 21,600 kg
9) Cost of young duck : Bahts 10/duck
10) Cost of feed : Bahts 5/kg
11) Selling price : Bahts 17.1/kg (B 1.20/egg)
12) Annual revenue : Bahts 172,800

c. Peking duck
1) Number of ducks/household : 2,000 ducks (400 ducks x 5 cycles)
2) Number of rearing cycles : 5 cycles
3) Survival rate : 95%
4) Weight/duck at harvest : 2.5 kg
5) Production (household/year) : 4,750 kg
6) Feed/household/year : 14,250 kg
7) Feed conversion rate : 3:1
8) Cost of young duck : Bahts 15/head
9) Cost of feed : Bahts 5/kg
10) Selling price : Bahts 28.5/ kg
11) Annual revenue : Bahts 135,375

5.Summary for household

a. Prawn + Fish + Pig culture
1) Seed required
Prawn 16,000 animals/year
Tilapia 3,000 juvenilli/year
Puntius 3,000 juvenilli/year
Pig 32 young pigs/year
2) Buying price of seed : Bahts 27,400
Prawn Bahts 4,000
Fish (Tilapia and Puntius) Bahts 4,200
Pig Bahts 19,200
3) Feed required : ~~Bahts~~ 47,016
Formulated feed for prawn 768 kg/year
Feed for pig 10,080 kg/year

4) Buying price of feed : Bahts 47,016

Prawn feed	Bahts 9,216
Pig feed	Bahts 37,800

5) Annual production

Prawn	Bahts 256 kg
Fish	Bahts 1620 kg
Pig	Bahts 3,520 kg

6) Annual revenue : Bahts 124,360

Prawn	Bahts 30,720
Fish	Bahts 16,200
Pig	Bahts 77,440

7) Number of farms : 100 farms

b. Prawn + Fish + Meat type duck (khaki) culture

1) Seed required

Prawn	16,000 animals/year
Fish	6,000 juvenilli/year (Tilapia : 3,000) (Puntius : 3,000)
Young duck	4,000 ducks/year

2) Buying price of seed : Bahts 9,200

Prawn	Bahts 4,000
Fish	Bahts 4,200
Duck	Bahts 1,000

3) Feed required

Prawn	768 kg/year
Duck feed	17,100 kg/year

4) Buying price of feed : Bahts 94,716

Prawn	Bahts 9,216
Duck feed	Bahts 85,500

5) Annual production

Prawn	256 kg
Fish	1,620 kg
Duck	5,700 kg

6) Annual revenue : Bahts 195,120

Prawn	Bahts 30,720
Fish	Bahts 16,200
Duck	Bahts 148,200

7) Number of farms : 25 farms

c. Prawn + Fish + Egg type duck (khaki) culture

1 Seed required

Prawn	16,000 animals/year
Fish	6,000 juvenilli/year
Duck	800 ducks/year

2) Buying price of seed : Bahts 16,200

Prawn	Bahts 4,000
Fish	Bahts 4,200
Duck	Bahts 8,000

3) Feed required

Prawn feed 768 kg/year
Duck feed 21,600 kg/year

4) Buying price of feed : Bahts 117,216
   Prawn feed — Bahts 9,216
   Duck feed — Bahts 108,000
5) Annual production
   Prawn — 256 kg
   Fish — 1,620 kg
   Egg — 10,080 kg (or 144,000 eggs)
6) Annual revenue : Bahts 277,720
   Prawn — Bahts 30,720
   Fish — Bahts 16,200
   Egg — Bahts 280,800
7) Number of farms : 100 farms

d. Prawn + Fish + Peking duck culture
1) Seed required
   Prawn — 16,000 animals/year
   Fish — 6,000 juvenilli/year
   Young peking duck — 2,000 ducks
2) Buying price of seed : Bahts 38,200
   Prawn — Bahts 4,000
   Fish — Bahts 4,200
   Duck — Bahts 30,000
3) Feed required
   Prawn — 768 kg/year
   Duck feed — 14,250 kg/year
4) Buying price of feed : Bahts 80,466
   Prawn — Bahts 9,216
   Duck feed — Bahts 71,250
5) Annual production
   Prawn — 256 kg
   Fish — 1,620 kg
   Duck — 4,750 kg
6) Annual revenue : Bahts 182,295
   Prawn — Bahts 30,720
   Fish — Bahts 16,200
   Duck — Bahts 135,375
7) Number of farms : 25 farms

6. Summary for project
1) Number of farms : 250 farms
2) Seed required
   a. Prawn seed : 4,000,000 animals (16,000 animals x 250)
   b. Tilapia seed : 750,000 juvenilli (3000 juvenilli x 250)
   c. Puntius seed : 750,000 juvenilli

(3,000 juvenilli x 250)

d. Young pig : 2,240 pigs
e. Young duck (khaki) : 300,000 ducks
f. Egg type duck (khaki) : 60,000 ducks
g. Peking duck : 60,000 ducks

3) Feed required
a. Formulated feed for prawn : 192 tonnes (768 kg x 250 farms)
b. Pig feed : 705.6 tonnes (10,000 kg x 10 farms)
c. Duck feed : 3,300 tonnes (17,100 kg x 75 farms + 21,600 kg x 75 farms + 14,250 kg x 30 farms)

4) Annual production
a. Prawn production : 64 tonnes
b. Fish production : 405 tonnes
c. Pig production : 246.4 tonnes
d. Duck (khaki) production : 427.5 tonnes
e. Egg (duck) production : 1,008 tonnes (14.4 million eggs)
f. Peking duck production : 142.5 tonnes--

F. Chachengsau

	No. of replies	range	average
1) No. of farmers surveyed	5		
2) No. of family members	5	2-4	2.8
3) Extensive	5	3.2.8	4.3
4) Financial assistance (Bahts))			
a. For facilities by loan	5	20,000	20,000
by own funds	5	9,000-40,000	20,200
b. For operation cost of loan	5	15,000-20,000	19,000
by own funds	5	5,000-37,250	26,550
5) Shrimp seeds introduced for extensive pond			
a. No. of cycles (time/year)	5	1	1
b. No. of seeds (pcs/time)	5	70,000-185,00	107,000
c. Stocking density (pcs/m2)	5	0.8-3.3	2.2
d. Price (Bahts/100 pcs)			
P. monodon	4	35	35
P. merguiensis	4	5-10	7.5
6) Feeds			
For extensive pond			
a. Amount (kg/day)	4	5-12	6.8
b. Total amount (tonne/day)	4	1.5-3.6	2.0
7) Pump			
a. Capacity (hp)	5	130	130

	b. Operation hour/day	5	2	2
8)	Harvesting			
	a. Production (kg/crop			
	p. monodon	4	22.5-1,140	307.1
	p. merguiensis	4	27-1,680	450.8
	b. Total production (Tonne/year)			
	p. mondon	4	1.1-1.8	1.5
	p. merguiensis	4	1.4-2.8	2.0
	c. Unit production (kg/ha/year)	3	352.89-1,313	726.8
9)	Sales (Baht/kg)			
	p. monodon			
	large	5	170-190	176
	medium	3	160	160
	small	2	150	150
	p. merguiensis			
	large	5	60-120	88
	medium	5	50-80	63
	small	3	40-45	43
10)	Gross income (Baht/year)	4	229,250-498,000	417,679

11) Regarding the marketing channels of the products, all farmers sold them to middlemen.

12) Regarding living conditions, all farmers replied that their living standards have improved.

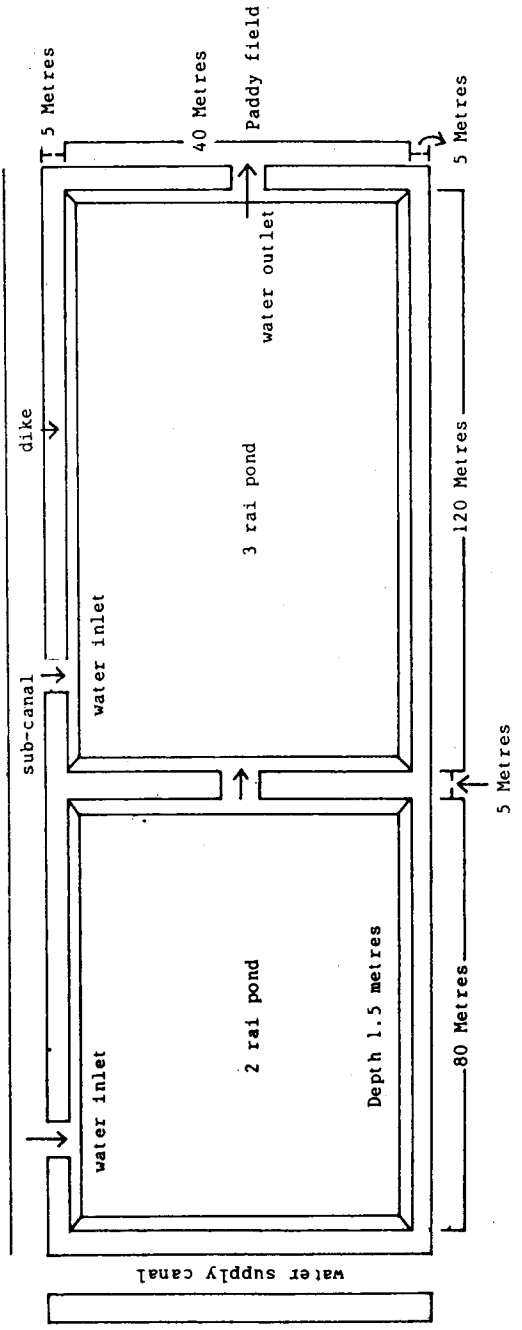
13) Regarding problem areas, all farmers replied that they were not affected by any particular problem.

14) Regarding feeds, two farmers used formula feeds and two farmers used minced fish.

baseline surveys in January 1987 on aspects like location, water supply position and communication facilities. The survey also indicated that unlike in other provinces the members preferred to integrate prawn with paddy or other crops as livestock production was increasingly getting risky because of price fluctuations. The project aimed at dividing a farm area of about 15 rai into 5 rai of prawn pond and 10 rai of paddy as well as other crops (for layout see Exhibit 5). It was envisaged that on an average 130 kg of prawn would be produced per rai per year to make an annual production of 27 tonnes for the 42 project beneficiaries in Chachengsau.

Only 5 Tumbols (sub-districts) were selected for the project implementation as these sub-districts had sufficient water supply throughout the year except in March and April. It was also possible to obtain additional water supply from the Royal Irrigation System, if needed. It was decided that pond size smaller than 3 rai would not be

Exhibit 5: Prawn Pond Layout.



viable. The project planned to acquire prawn fries from the Chachengsau fishery station as well as from private prawn hatcheries in the province.

A standard prawn pond was estimated to cost Bahts 75,000 to each project member. The fixed costs included construction of prawn pond and water control and other structures. The operation costs covered the cost for prawn fries, lime, nylon net, chemicals for killing fish, prawn feed, transportation, fuel and lubricant oil.

The most suitable time for pond construction was March to first week of May, as the construction was needed to be completed before the rains. The cooperative society was allowed to negotiate with the private constructors, provided the cost of construction was not higher than the cost at which the engineering centre of the department would have constructed it. The evaluation committee of the cooperative was to evaluate the quality of construction before final payment to the contractors.

The project had worked out the economics of prawn cultivation. It was stated that the cost of rice production from 5 rai was about Bahts 3,900 against a revenue of Bahts 6000. However, a project beneficiary would produce 650 kg of prawn from the same piece of land and earn Bahts 65,000 per year at the prevailing selling price of Bahts 100 per kg. The details on estimated costs and revenue per farm and the loan repayment schedule as prepared by the project for Chachengsau is given in Exhibits 6 and 7.

As soon as it was decided that 42 farmers from Chachengsau province would participate in the acquaculture development project, the project officer started the process of identifiction of beneficiaries. First of all, a meeting of all the chairmen and secretaries of the cooperative groups in the project area was organized on October 2, 1986. It was explained to them that the objective of the project was to increase the income of farmers through mixed farming and it would mean converting 5 rai of paddy land into prawn culture pond. Eligibility required that the members must have (i) their own piece of land not less than 5 rai; (ii) paid their loan dues regularly for the previous three years to the cooperatives; (iii) their houses located near the pond; (iv) access to a motorable road; and (v) keen interest in the project. Officials from the department of fisheries attended this meeting and gave technical information on the prawn culture and answered their questions.

The office bearers were told that a survey team may approach the

Exhibit 6
Estimated Cost and Revenue Per Farmer

Expenses		Baht
1. Long-term		
1.1 Pond Construction Baht 7,000/rai x 5 rai	=	35,000
1.2 Water control structure	=	5,000
Total long-term	=	40,000
2. Short-term		
2.1 Prawn fries 40,000 @ Bahts 0.15	=	6,000
2.2 Lime	=	1,300
2.3 Nylon to prevent predator	=	3,000
2.4 Chemical for killing fishes	=	500
2.5 Prawn feed	=	17,200
2.6 Fuel oil + lubricant	=	3,000
2.7 Transportation	=	2,000
2.8 Miscellaneous	=	2,000
Total short term	=	35,000
Grand Total	=	75,000
Revenue (8 to 10 months period) 130 kg/rai x 5 rai = 650 kg selling		
Price of Baht 100/kg		65,000

farmers in their area for additional information. Soon after, a survey team collected from each member the background information on items such as age, marital status, size of family, annual family expenditure, landholding size, cropping pattern, economics of crop cultivation, use of fertilizers, and mechanization. The results of the technical survey were analysed to narrow down the potential beneficiaries. A second round of a survey was carried out to gather additional information on the selected members and also to prepare rough sketches of location maps and layouts for further deciding the possibility of implementing the project. These two exercises identified 102 farmers who had some potential to participate in the project. A second meeting was organised on January 15, 1987 to discuss the project details only with these 102 farmers. After verification of the rough sketches, they were informed that further scrutiny would be on the basis of the loan repayment record of each individual. The society office maintained a file on each person taking loans from the cooperative. Each file was assigned a color code to immediately identify the recovery position. A black label meant the person had died. Other codes and the number of farmers falling into that category were as follows:

Exhibit 7
Loan Repayment Schedule Plan for Project Member

Item	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	Remarks
Revenue									
Selling prawn	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	1. Interest rate 12% per annum.
Short--term loan	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	
Long-term loan	40,000	-	-	-	-	-	-	-	2. Every two years the pond should b improved with the estimated expense of about Bahts 5,000/time
Total revenue	140,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	
Expenses									
Investment cost	40,000								
Operation cost	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	
Total expenses	75,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	

(Contd.)

Exhibit 7 Contd.

Item	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	Remarks
Loan repayment									
Principal of short-term loan	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	
Interest of short-term loan	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	
Principal of long-term loan	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	
Interest of long term loan	4,800	4,200	3,600	3,000	2,400	1,800	1,200	600	
Total loan repayment	47,300	46,700	46,100	45,500	44,900	44,300	43,700	43,100	
Balance	17,700	18,300	18,900	19,500	20,100	20,700	21,300	21,900	

Colour code	Meaning	Number
Red	Matter in Court	14
Blue	dues 5 year old	39
Yellow	dues 3-5 year old	42
Green	dues 1-2 year old	121
White	Normal dues	204
		420

This analysis resulted in identifying 42 members who were offered the project benefits. A third meeting was called on March 2, 1987 to discuss the implementation of the project with these 42 selected members. They were also told that in the next meeting issues in relation to pond construction would be undertaken. The landholding size of the selected beneficiaries was as given in the Table below.

Table 1
Landholding Size of the Project Beneficiaries

Landholding size	All members	Only selected members	Final Beneficiaries
1) Up to 5 rai	34	16	16
2) 6 to 10 rai	80	32	13
3) 11 to 15 rai	47	19	7
4) 15 rai and above	259	35	6
Total	420	102	42

A senior project official reported that the department of fisheries had prepared the terms of reference of the project and had initiated the idea of increasing the production of fish and shrimp in 1979. A study group on fisheries had also recommended to initiate the project. The ADB mission visited Thailand and studied the matter. It was realized that the farmers individually would not be able to support the production activity and it could be done only through the cooperatives. That is how it became a cooperative project. The project was divided into sub-projects. Each sub-project had a different purpose. Sub-project 1, for example, was to encourage rehabilitation of agricultural cooperatives. Sub-project 2 was for new land never developed before on the sea coast. Sub-project 3 belonged to the department of fisheries for the construction of hatcheries. Sub-project 4 aimed at promoting fresh water prawn culture in rivers and lakes near the sea. Sub-project 5 was

to promote production of fish and shrimp. Sub-project 6 was meant for inland on farm integrated fisheries.

ADB has been requested to increase the scope of the Sub-project 6. A survey for location specific environment was done in association with the cooperative department to determine the suitability. On the basis of four land settlement cooperative societies working at different places under this project, a model was prepared for integrated farming system. This model included not only rice cultivation, but also swine, duck, shrimp, fish and chicken farming systems. A general guide-line was to select the type of livestock which was most suitable for production as well as marketing and also to look at the life cycle and recycling of waste material. In fact four models had been practiced in four sub-projects. But in Chachengsau, the same model was not promoted as the cost-benefit of some of the livestock in this environment was not favourable. Changes in the existing models meant provisions to be made for the supply of feed for the shrimp. Though not favoured by the ADB, it was felt that the cost of construction of a pond, cost of feed, short-term loan for lime, nylons to prevent predators, and other investments were equally important for shrimp production.

In short, the sub-project 6 in Chachengsau needed flexibility. Instead of 1 rai of shrimp and 4 rai of fish, 5 rai of prawn and 10 rai of paddy were suggested. Animal feed was planned to be supplied through a plant owned by a cooperative federation in the neighbouring province. A federation owned plant was in operation, but it had yet not commenced the supply. The other projects differed significantly from the Chachengsau component because the other projects were land settlement projects in which farmers did not own their land. But in Chachengsau, farmers owned their own land. Though the cooperative Promotion Department (CPD) got a free loan and could charge 9 per cent interest on it, it was actually charging 6 per cent to promote the project. CPD wished to use this interest money to strengthen marketing aspects. A consultant was recently hired to submit a marketing plan for piggery as farmers were facing problems in selling their pigs.

SIDE TWO

I. Ooy Somchitra Takes to Prawn Rearing

Ooy Somchitra in his late forties, lived in Bangpara village, in Chachengsau district, 50 km from Bangkok. He owned in all 36 rai of

land. Only three years ago in 1984, he cultivated paddy in 16 rai, had 5 rai under coconut and the rest under mango. This district was well-known for its mangoes. In some years he used to cultivate banana in his paddy fields. His income from coconut was Bahts 80,000 (16,000 per rai) and in the mango field his income was Bahts 9000 (1800 per rai) per year. The yield per rai in the paddy field was 800 kg. When his neighbours switched over to prawn rearing, he removed the mango and coconut trees and converted that land into ponds for rearing prawns.

Pond Preparation: For rearing prawns, a depth of 5 feet digging was required. This meant that the rice fields to convert into the prawn ponds, had to be deepened. Ooy approached a private Caterpillar owner to get earth removed from his rice field and to make it into three ponds of 5 rai each. The remaining rai was used to construct channels for letting in and letting out the water. He had to provide space for a punp house and a shallow well for collecting water. He spent Bahts 1500 per rai for deepening the rice fields. The soil removed from the field was used for strengthening the embankment and water channels.

Prawn Rearing: The Bangpara village area being close to the sea, nad canals connected to back waters and fresh water rivers. From February onwards when the fresh water availability declined, the brackish water prawns were cultured. Thus, farmers at Bangpara village raised two crops of prawns in a year. In June-July, they used to fill the ponds with fresh water and rear fresh water prawns, and from February they used to rear brackish water prawns.

Before letting in the fresh water in mid-June, the pond would be allowed to dry off for a month from May; and lime would be spread on the soil to remove any acidity in the soil and also to disinfect the land. After filling the pond with fresh water, Ooy would get 15 to 20 day-old prawn fries from the department for rearing. The department generally recommended 8000 fries per rai, but Ooy always used to seed 10000 fries. His neighbours in fact used more fries than him. He felt that he should allow for some mortality. For a fresh water pond, his pumping expenses were relatively low, because in June-July due to the rains, the water was always to the level of the pond and there was no need to pump in fresh water. From the third month onwards, he used to pump in fresh water once in 15 days and drain out old water to ensure adequate availability of oxygen. He used to feed the prawns twice daily, once in the morning and once in the evening. He learnt

about the feeding schedule from his neighbours. The department's recommendation was to feed the prawns according to their body weight, but Ooy followed a monthly time table as follows.

Daily Feed

Age in month	Department's recommendation	Ooy's feeding chart for 3 rai
1	10% of body weight	1/2 kg in morning and 1/2 kg in evening
2	10% of body weight	1 kg morning, 1 kg evening
3	10% of body weight	2 kg morning, 2 kg evening
4	7% of body weight	4 kg morning, 4 kg evening
5	5% of body weight	8 kg morning, 8 kg evening
6	5% of body weight	10 kg morning, 10 kg evening

In the first two months, Ooy purchased feed from the private traders, because he felt that the marketed feed, though costly, was good. From the third month onwards he prepared feed at his home using his grinding machine. He learnt from his neighbours about the proportions of ingredients to be used in the feed. He harvested his fresh water prawns at the end of the sixth month. Once the fresh water harvesting was over, and when the pH value of brackish water available in the canal was declared adequate, he drained the pond and filled it with sea water. In the next four months, he reared salt water prawns. Since the availability of oxygen was a problem in the case of sea water, he was aware that if the salt prawn rearing was extended beyond four months, it would cut into the days needed for the pond to dry up.

Consumers liked large sized prawns. In the case of fresh water, harvesting was possible only after the fourth month because only by that period the prawn could attain a reasonable length and weight. Ooy was aware that if he wished to put too many fries, he would need an air pump to ensure that sufficient oxygen was available for healthy growth of the prawns. There were several trade-offs between the number of prawns, duration, oxygen availability and harvesting time.

Marketing: Ooy used to generally harvest once in a season, and in some cases twice or thrice. The prawn needed to be kept in ice immediately after harvesting to preserve its quality. Therefore, just before harvesting, he used to first arrange transport on hire and bring ice from the nearby town. Harvesting was generally done at night and transported in the morning. As large sized prawns attracted better

Cost of Production and Returns

Per Rai Cost of Production for Fresh Water Prawn

I Cost of fries — Bahts

10000 fries per rai @ 20 cents per fry — 2000

II Cost of feed

Month	Morning Qty (kg)	Evening Qty (kg)	Per month kg	Rate per kg	Amount Bahts	
1	0.5	0.5	30	14	420	
2	1.0	1.0	60	14	840	
3	2.0	2.0	120	8	960	
4	4.0	4.0	240	8	1920	
5	8.0	8.0	480	8	3840	
6	10.0	10.0	600	8	4800	
			For 3 Rai		12780	
			For 1 Rai		4260	4260

III Cost of pumping water — 834

IV Cost of lime application — 120

V Maintenance of pond and water ways — 140

VI Depreciation

Investment in motor	23000
Investment in pipes and shed	27000
Total	50000

Assuming a life of 10 years and total area of 15 rai the depreciation per rai is 334 — 334

VII Interest on expenses of pond preparation @ 16 per cent on Bahts 1500 — 240

VIII Interest on expenses on channel construction, water storage tank, @ 16 per cent on Bahts 1400 — 224

IX Marketing Expenses

a) Commission expenses @ Bahts 10 per kg for 132 kg — 1320

b) Transport expenses @ Bahts 200 per 1.5 metric tonnes for 132 kg — 18

c) Ice @ Bahts 640 for 1.5 metric tonnes for 132 kg — 57

X Miscellaneous expenses — 100

Total — 7647

The income of Ooy from 6 rai of prawn was as follows:

1st Harvest	160 kg	Bahts 15000
2nd Harvest	470 kg	Bahts 30900
3rd Harvest	160 kg	Bahts 10800
Total 6 rai	790 kg	Bahts 56700
Per rai	131.7 kg	Bahts 9450

price, the prawns were also graded before sending them to the market. Ice cost him Bahts 640 per trip.

The choice of place to sell prawn was always a problem. There were three markets—Bangpakong, Sambtpahen and Bangkok. The transport charges for these markets were Bahts 200, 300, and 400 respectively per 1.5 metric tonnes. Commission agents in the market charged Bahts 5 to 10 per kg for their services.

The net return per rai was negative (Bahts 9647-9450 = 197). Ooy maintained that his returns per rai were about Bahts 7000. He mentioned that the Bangkok Television staff who interviewed him recently estimated his returns as Bahts 7000 per rai. Questions still remained unanswered as to (a) Was he overfeeding his prawns? (b) Was his yield commensurate with the feeding practice? (c) Were feeding schedules and the quantity fed scientifically determined? (d) Was the price realized in the market reasonally good? The department office at the provincial level did not have data on profitability of prawn rearing.

Ooy and his wife looked after all the activities relating to prawn rearing. In the nights, he was busy with watch and ward, and during the day his wife used to prepare and feed the prawns and also look after tasks like pumping the water. Ooy did not have the data on salt water prawns because he had not kept the records. He also had five pigs, about 20 chickens, 15 ducks, 10 mango trees and a few coconut trees. He had a well furnished, traditional house with a fridge, television and a music sytem. He also used a motor cycle to visit nearby places. His two sons were studying in school. He was of the opinion that prawn culture had substantially increased his income. He claimed that he had repaid the entire loan of Bahts 20,000, he received from the cooperative, within one year.

II. Efforts by a Group of Farmers

Five km away from Ooy's village, at Bankood, 15 farmers had joined together to practice prawn culture. Each one of them got a loan of Bahts 6000 from the society. From the total loan of Bahts 90,000 they purchased machines worth Bahts 30,000. The machines mostly consisted of a mixing plant to prepare prawn feed and a freezer to keep fish as raw material in the preparation of prawn feed. The balance amount was invested on deepening of land, preparation of water channels, installation of motors and purchase of nylon nets. They used the following formula for preparing the prawn feed:

Proportion

Dry fish	8 kg	Seashell	2.5 kg
Bran	10 kg	Fish	2.5 kg
Soybean	2.5 kg	Medicines	2.5 kg

A blackboard was maintained near the mixing plant which showed the requirement of feed of each member. Different farmers had different requirements and the mixing plant was operated accordingly. On the day of visit, for example, the requirements of each member were as follows:

Name of farmer	Requirement	Name of farmer	Requirement
1	600 kg	9	60 kg
2	--	10	--
3	--	11	140 kg
4	150 kg	12	190 kg
5	25 kg	13	--
6	15 kg	14	10 kg
7	--	15	--
8	15 kg		

Every month the group members used to meet and share the expenses. The responsibilities of doing various things like operating the plant were also shared equally. They collectively purchased their fries and other inputs and there was a great deal of trust among themselves.

Coming together they thought was necessary to reduce feed cost and negotiate a better price. The group was too small to own their own cold storage. The chairman had given a small piece of land near his house for the installation of a mixing plant and other equipment. He used to contact different cold storage owners and negotiate a price for the prawns before harvesting on behalf of all the group members. Once the price was fixed, the cold storage owners indicated a schedule for prawn harvesting. The members graded the prawns before taking them to the cold storage.

III. Issues

In Chachengsau province a large number of farmers had already taken to prawn cultivation. Some of them like Ooy had sorted out problems from digging of ponds to feeding and marketing at their own level. Smaller farmers, as in the case of Bankood village. had sponta-

neously formed groups to collectively solve problems of providing feed and marketing. Ooy and his neighbours were not aware of scientific methods of prawn rearing.

Though the fisheries department introduced to promote prawn cultivation, most of the farmers in this area had mobilized their own resources or used the credit facilities to start production. They were convinced of the profitability of prawn rearing; but their expenses in marketing, and more importantly getting the right price were felt as major problems. At this time, the district was launching a programme of providing loans for prawn cultivatioin as part of the ADB funded project. Every effort was made to ensure that the project was implemented and the beneficiaries obtained the benefit from the new activity. The prawn research station had reported that the prawn cultivation in recent years had achieved tremendous success. It was estimated that during the last two years itself the area under prawn culture had gone up from 30,000 to 50,000 rai. Since the station which was the main centre to supply seed fries, could not cope up with the demand, many private hatcheries had mushroomed in the area. Most of the adoption of prawn culture among the farmers took place on their individual initiative. Marketing was mostly in private hands. Given the magnitude of the production activity in the area, the farmers probably needed highly specialized support services.

Questions

1. How do you assess the investment objectives of the ADB funded project?
2. What do you think are the needs of the farmers engaged in prawn culture.
3. If ADB had requested you to recast the project for Chachengsau, what would have been the content and activity components of the project proposed by you?

MILK VITA ICE CREAM

The Registrar of Cooperatives was happy that the Bangladesh Milk Producers' Cooperative Union Ltd (BMPCUL) had an integrated system of collecting milk from its members and marketing the processed milk and milk products in urban areas. He was aware that BMPCUL had been providing an efficient production support to the milk producers. Though one of the largest and successful cooperative efforts in the country, the BMPCUL had however been facing some problems. The registrar was concerned as to how the profitability of the dairy cooperative could be improved.

The government of Bangladesh had decided in its First Five Year Plan (1973-1978) to strengthen its dairy industry through cooperatives by collecting milk from 500 and odd village level milk producers' primary societies located in Pabna, Manikganj, Tangrail and Faridpur. To achieve this objective a project was formulated. The project envisaged: (a) purchase of milk from individual farmer members twice a day against cash payment; (b) transporting it to chilling centres at Faridpur, Manikganj, and Tangrail, and (c) transporting the chilled milk by insulated road tankers to the dairy plants for processing, packaging and marketing. Besides the sale of liquid milk, the milk was also to be converted into various products like full cream milk powder, skimmed milk powder, butter, ghee and ice cream, and marketed under the brand name of Milk Vita. (see Exhibit 1 for historical details).

The General Manager of BMPCUL was also proud that his organisation was like a mini Amul and had successfully encouraged milk producers to produce and supply more quantity of milk to their village cooperatives. The support services extended by the BMPCUL to its member producers included animal breeding, mobile veterinary facilities, feed and fodder development programmes, extension activities for better animal husbandry, regular collection of milk and remunerative prices. The BMPCUL had registered an impressive growth in

Exhibit 1
History of Milk Vita

Before the partition of India, one Indian firm had brought in 1945 dairy machinery from Australia to set up a dairy industry. The machinery, however, could not be installed as the owners had left the country during partition. The locked factory remained under the custody of the district authority till 1952 when late Rahman exchanged his property in Calcutta with this factory. Rahman installed the machinery and started production under the name of M/s Eastern Milk Products Limited.

Roller dried baby food and butter were the first products marketed by the company in 1954 under the brand name of Milk Vita. Condensed milk was introduced in 1958. Spray Drying Plant was commissioned in 1963 and production of spray powder started in the same year. Rahman also brought from Denmark new machinery on loan from the banks, but could not instal it till 1967. In the meantime, at his own initiative, he organized the first milk producers cooperative in 1965 and registered it as Eastern Milk Producers Cooperative Union Ltd (EMPCUL). He handed over the entire factory to the EMPCUL. The then East Pakistan Government planned to modernize the factory by investing TK 48 lakhs, but could not implement its plans successfully because of shortage of funds. After liberation, the Government of Bangladesh approached UNDP and the Danish Government to strengthen the dairy industry on a cooperative basis. A survey on milk potential was carried out in 1972 in the milkshed area and a project on" Cooperative Dairy Complex" was prepared and approved by the government in 1974 to: (a) ensure fair prices to milk producers; and (b) supply wholesome milk to urban consumers at reasonable prices. The EMPCUL was renamed as Bangladesh Milk Producer's Cooperative Union Ltd (BMPCUL) and five dairy plants costing TK 1,135 lakhs were installed during 1975 to 1977. These plants included : (i) pasteurization and packing of liquid milk, ice cream at Dhaka (capacity : 60,000 ltrs/day); (ii) chilling centre at Manikganj (capacity : 10,000 ltrs/day); (iii) chilling centre at Tangrail (capacity : 10,000 ltrs/day; (iv) pasteurization at Faridpur (capacity : 10,000 ltrs/day); and (v) powder and butter plant at Bajhaborighat (capacity : 50,000 ltrs/day). (Source: Handbook on Milk Production, Compiled by A.Z.M.Sayem, BMPCUL, 1986).

terms of membership and milk collection (see Table 1). In addition, it had established a functional network of retailers to distribute its milk and milk products. Liquid milk was distributed by the rikshaw-van cooperative society. The General Manager constantly kept watch on the cost figures. He was painfully aware that not all the products made profits. His analysis reflected that while products such as icecream, butter, and flavoured milk contributed to the profit; liquid milk, full cream milk powder, and skim milk powder were losing items (see Exhibits 2 and 3). He felt that the government policy was responsibile to some extent for the losses. In India, for example, the urban con-

sumer is subsidized, but the producer is paid the adequate price. The BMPCUL does not receive any subsidy. Furthermore, free imports of milk products are allowed and the BMPCUL cannot compete with the importers. The yield levels of milk producers are very low and one has to invest sizeable resources to increase their production. On an average TK 8 are paid per litre to the producers. Additional TK 5 are required for transportation, processing and packaging. The selling price cannot be more than TK 11. Therefore, on an average the BMPCUL has to loose TK 2 per litre. He was happy to learn that the government was planning to introduce a comprehensive dairy development policy to boost the local production with a view to make the country self-sufficient in milk production.

Table 1
Growth in Membership and Milk Collection

Year	Number of societies	Number of members	Milk collection (ltrs)
1974-75	132	4984	3630990
1975-76	139	6829	5032146
1976-77	162	9887	8483094
1977-78	187	14989	8121384
1978-79	195	17725	8228237
1979-80	200	21401	9823814

In the meantime, he thought the BMPCUL has to concentrate and study carefully the profit-making items. Butter, for example, had become a profitable item when the government had banned the imports of butter. Butter consumption had peculiar characteristics and had close association with the increase in the living standards. Therefore, it posed difficulties to plan its growth or profitability. Icecream, on the other hand, provided factors which could be controlled and manipulated for profit earning. Compared to any other item the profitability of icecream was quite high. He was wondering whether icecream provided scope for further expansion and increase profitability. The product-wise sales pattern for the last 12 years is given in Exhibits 4 and 5.

Exhibit 2
Bangladesh Milk Producers Union Ltd.
Cost of Marketed Products and Comparison with Sales Price

(Period: 1985-86)

	Past. Liquid Milk						Ice-Cream					
	5703655				Ltrs		50814				Ltrs	
	Pkt 1 ltr	% Rt prc	Pkt 1/2 ltr	%Rt prc	Bulk ltrs	% Rt prc	Pkt ltr	% Rt prc	Pkt 1/2 (ltr)	%Rt prc	Cup	% Rt prc
- Raw milk cost	3.0954	28	1.5477	26	3.0954	31	5.4062	11	2.7031	11	0.5406	8
- Recomb. milk cost	4.3778	40	2.1889	36	4.3778	44	1.9948	4	0.9974	4	0.1994	3
- Ingredients cost	-	-	-	-	-	-	1.5192	3	0.7596	3	0.1519	2
Packing cost	0.4047	4	0.2790	5	-	-	2.2000	5	1.5500	6	1.000	14
Variable cost	7.8779	72	4.0156	67	7.4732	75	11.1202	23	6.0101	24	1.8919	27
- Soc.Div. cost	0.1440	1	0.0720	1	0.1440	1	0.2509	1	0.1254	1	0.0250	1

- Milk transport cost	0.4704	4	0.2352	4	0.4704	5	0.7978	2	0.3989	2	0.0797	1
- Fact. Div. cost	1.0082	9	0.5041	8	1.0082	10	1.5960	3	0.7980	3	0.1596	2
- Market. Div. cost	0.2163	2	0.1081	2	0.2163	2	0.3281	1	0.1640	1	0.0328	1
- Admn.Div. cost	0.5479	5	0.2739	5	0.5409	5	0.8312	2	0.4156	2	0.0831	1
- Depreciation	0.3958	4	0.1979	3	0.3958	4	6.6436	14	3.3218	13	0.6643	9
- Interest	1.1258	10	0.5629	10	1.1258	11	1.7079	4	0.8539	3	0.1707	2
Fixed & semi Fixed cost	3.9084	36	1.9541	33	3.9084	39	12.1555	25	6.0776	24	1.2152	17
Total cost	11.7863	107	5.9697	99	11.3816	114	23.2757	49	12.0877	48	3.1071	44
- Sales commission	0.6250	6	0.3125	5	0.3000	3	7.0000	15	4.0000	16	1.0000	14
- Cost at Retail level	12.4113	113	6.2822	105	11.6816	117	30.2757	63	16.0877	64	4.1071	59
- Retail sales price	11.0000	100	6.0000	100	10.0000	100	48.0000	100	25.0000	100	7.0000	100
Profit/(loss)	(1.4113)		(0.2822)		(1.6816)		17.7243		8.9123		2.8929	

(Contd.)

Exhibit 2 Contd.

	Flv. Milk		Chocobar		Ice Lolly		Ghee		Cream	(Sale)
	583287	pkt	138860	Pc	1000	Pc		kg	3459	kg
	Pkt 1/2 ltrs	%Rt prc	Pc	% Rt prc	PCs	% Rt prc	Kg	% Rt prc	Kg	% Rt prc
- Raw milk cost	0.3994	8	0.6147	9	-	-	-		52.9829	44
- Recomb. milk cost	0.5645	11	0.3848	5	-	-	-	-	-	-
- Ingredients cost	0.4141	8	2.1474	31	0.3053	15	-	-	-	-
Packing cost variable cost	0.1994	4	0.5978	9	0.6128	31	-	-	-	-
- Soc. Div. cost	1.5774	32	3.7447	53	0.9181	46	-	-	52.9829	44
- Milk transport cost	0.0185	1	0.0287	1	-	-	-	-	2.4579	2

- Fact. Div. cost	0.0766	2	0.1168	2	0.0060	1	-	-	7.0598	6
- Market. Div. cost	0.2474	5	0.3701	5	0.0430	2	-	-	10.0855	8
- Admn.Div. cost	0.0634	1	0.0943	1	0.0130	1	-	-	1.5322	1
- Depreciation	0.1608	3	0.2390	3	0.0330	2	-	-	3.8814	1
- Interest	0.0952	2	1.8742	27	0.1750	9	-	-	4.0867	3
Fixed semi Fixed cost	0.3304	7	0.4912	7	0.0680	3	-	-	7.9751	7
Total cost	0.9923	20	3.2143	46	0.3380	17	-	-	37.0786	31
Sales commission	2.5697	51	6.9590	99	1.2561	63	-	-	90.0615	74
- Cost at retail level	0.9750	20	1.0000	14	0.5000	25	-	-	-	-
- Retail sales price	3.5447	71	7.9590	114	1.7561	88	-	-	90.0615	74
Profit/ loss	5.0000	100	7.0000	100	2.0000	100			121.2541	100
	1.4453		(0.9590)		0.2439				31.1926	

RT. mean Retail

Source: Data Provided by BMPCUL

Cream = Product Cost = 40.8512 lakhs
Sale = 55.0000 lakhs
Profit Total = 14.1487 lakhs

Exhibit 3
Bangladesh Milk Producers Union Ltd.
Cost of Marketed Products and Comparison with Sales Price

Period: July 84-June 85

	Past. liquid milk						Ice-cream					
	6167477			(Ltr)			44255			(Ltrs)		
	Pkt 1	% Rt prc	Pkt 1/2 ltr	%Rt prc	Bulk ltrs	% Rt prc	Pkt ltr	% Rt prc	Pkt 1/2 (ltr)	%Rt prc	Cup	% Rt prc
- Raw milk cost	2.546	28	1.273	25	2.546	32	3.538	9	1.769	9	0.353	6
- Recomb milk cost	3.664	41	1.832	37	3.664	46	1.432	4	0.716	4	0.143	2
- Ingredients cost		-	-	-	-	-	4.154	11	2.077	10	0.415	7
- Packing cost	0.390	4	0.275	6	-	-	1.560	4	0.910	5	0.86	4
Variable cost	6.600	73	3.380	68	6.210	78	10.684	27	5.472	27	1.771	9
- Soc. Div. cost	0.222	2	0.111	2	0.222	3	0.178	1	0.089	1	0.017	1
- Milk transport cost	0.310	3	0.155	3	0.310	4	0.248	1	0.124	1	0.024	1

- Fact. Div. cost	0.966	11	0.483	10	0.966	12	0.077	1	0.038	1	0.007	1
Market Div. cost	0.199	2	0.099	2	0.199	2	0.016	-	0.080	1	0.001	1
- Admn. Div. cost	0.524	6	0.262	5	0.524	7	0.420	1	0.210	1	0.042	1
- Depreciation	0.570	6	0.285	6	0.570	7	0.457	1	0.228	1	0.045	1
- Interest	1.135	13	0.567	11	1.135	14	0.910	2	0.455	2	0.091	2
Fixed & semi Fixed cost	3.926	44	1.962	39	3.926	49	2.306	6	1.224	6	0.227	4
Total cost	10.526	117	5.342	112	10.136	127	12.990	33	6.696	33	1.998	33
- Sales commission	0.525	6	0.262	5	0.300	4	7.000	18	3.500	18	1.000	17
Cost at retail level	11.051	123	5.604	117	10.436	130	19.990	51	10.196	51	2.998	50
Retail sales price	9.000	100	5.000	100	8.000	100	39.000	100	20.000	100	6.000	100
Profit/ (Loss)	(2.051)		(0.604)		(2.436)		19.010		9.804		3.002	

(Contd.)

Admn. Div. cost	0.122	3	0.025	1	0.012	1	7.664	6	4.370	5
- Depreciation	0.132	3	0.027	1	0.055	3	8.332	6	4.582	5
- Interest	0.264	6	0.054	1	0.027	1	16.599	12	9.461	11
Fixed & semi Fixed cost	0.912	21	0.185	3	0.133	7	57.427	43	32.611	37
Total cost	4.706	111	2.377	40	0.644	32	148.244	110	84.341	96
Sales commission	0.630	15	0.800	13	0.500	25	10.000	7	-	-
Cost at Retail level	5.336	126	3.177	53	1.144	57	158.244	117	84.341	96
Retail sales price	4.250	100	6.000	100	2.000	100	135.000	100	88.184	100
Profit/ (Loss)	(1.086)		2.823		0.856		(23.244)		3.843	

Source: Data Provided by BMPCUL

Exhibit 3 continued

	Flv.Milk	Chocobar		Ice Lolly		Ghee		Cream		(Sale)
	215590	Pkt	63860 Pc.	5230	Pc	1044	1/2 kg	1297	kg.	
	Pkt 1/2 ltr	% Rt prc	Pc	% Rt prc	PCs	% Rt prc	kg.	% Rt prc	kg	% Rt prc
- Raw milk cost	0.591	14	0.213	4	-	-	90.817	67	51.730	59
- Recomb milk cost	0.851	20	0.085	1	-	-	-	-	-	-
Ingredients cost	2.009	47	1.564	26	0.181	9	-	-	-	-
Packing cost	0.343	8	0.330	6	0.330	17	-	-	-	-
Variablecost	3.794	89	2.192	37	0.511	26	90.817	67	51.730	59
Soc.div.cost	0.051	1	0.010	1	0.005	1	3.251	2	1.852	2
Milk tran.cost	0.072	2	0.014	1	0.007	1	4.532	3	2.583	3
- Fact. div. cost	0.225	5	0.046	1	0.023	1	14.128	10	8.099	9
- Market. Div. cost	0.046	1	0.009	1	0.004	1	2.921	2	1.664	2

Exhibit 4
Bangladesh Milk Producer's Cooperative Union Ltd
Product-Wise Sales Statement (in Quantity)

Year	Liquid Milk (lakhs ltrs)	Butter (Thousand lbs)	Ghee (Thousand Kg)	Ice Cream (Thousand ltrs)	FCMP (Thousand lbs)	Flavoured Milk (Thousand packets)	Cream (Thousand lbs)
1974-75	19.9	37.9	--	--	236.1	--	--
	(100	(100)			(100)		
1975-76	47.2	28.7	--	--	84.1	--	--
	(237)	(76)			(36)		
1976-77	59.2	74.9	--	--	158.0	--	--
	(297)	(198)			(67)		
1977-78	78.6	131.1	--	30.1	379.9	--	0.9
	(395)	(346)		(100)	(161)		(100)
1978-79	70.0	136.1	--	61.4	482.6	--	0.4
	(352)	(359)		(204)	(204)		(44)
1979-80	77.7	148.7	--	63.4	362.7	--	1.2
	(390)	(392)		(211)	(159)		(133)
1980-81	102.0	170.1	--	72.6	374.7	10.0	4.0
	(513)	(449)		(241)	(159)	(100)	(444)
1981-82	79.3	76.0	--	78.8	362.9	189.2	0.4
	(398)	201		(262)	(154)	(1892)	(44)
1982-83	78.8	153.2	--	79.5	407.4	254.0	3.0
	(396)	(404)		(264)	(173)	(2540)	(33)
1983-84	72.5	236.4	19.9	70.9	160.0	350.8	6.3
	(364)	(624)		(236)	(68)	(3508)	(700)
1984-85	61.1	157.0	3.4	55.2	10.0	375.5	5.7
	(307)	(414)		(183)	(4)	(3755)	(633)
1985-86	56.3	294.1	2.9	63.1	17.3	530.4	9.6
	(283)	(776)		(210)	(7)	(5304)	(1067)

Source: Data provided by the BMPCUL
Figures in parentheses indicate an index.

The icecream offered some unique advantages and potentials. In terms of profitability, against a retail price of TK 48 per litre, its cost of production was only TK 30. Its cost structure was as follows:

Cost of milk	7.40 TK
Sugar and other ingredients	1.52 TK
Cost of packing	2.20 TK
Fixed and semi fixed cost	12.16 TK
Sellers commission	7.00 TK
Total Cost	30.28 TK

Exhibit 5
Bangladesh Milk Producers Cooperative Union Ltd
Year with Selling Price and Sale Value

(Sales Value in lakhs TK)

Year	Liquid Milk Per ltr	Butter Per lb	Ghee per kg	Ice Cream Per ltr	FCMP Per lb	Flavoured Milk per packet	Cream Per lb	Total Sales lakhs TK
PF	4.00	20.00						
1974-75			–	–	N.A.	–	N.A.	
V	79.6	7.6						87.2
P	4.50	20.00						
1975-76			–	–	N.A.	–	N.A.	
V	212.4	6.9						219.3
P	5.00	24.00						
1976-77			–	–	N.A.	–	N.A.	
V	296.00	18.0						314.0
P	5.50	24.00		12.00	16.00		12.00	
1977-78			–			–		
V	432.3	31.5		3.6	60.8		0.1	528.3
P	6.00	26.00		12.00	19.00		12.00	
1978-79	–		–					
V	420.0	35.4		7.4	91.7		0.05	554.5
P	6.50	27.00		12.00	19.00		20.00	
1979-80	–		–					
V	466.2	40.1		7.6	69.0		0.2	583.1
P	6.75	30.50		17.00	18.00	3.05	20.00	
1980-81	–							
V	688.5	51.9		12.3	67.4	0.3	0.8	821.2
P	7.00	35.00		19.50	20.0	3.05	32.00	
1981-82	–							
V	555.1	26.6		15.4	72.6	5.8	0.1	175.6
P	7.50	40.00		24.00	24.00	3.05	32.00	
1982-83		–						
V	591.0	61.2		19.0	97.8	7.7	1.0	777.7
P	9.00	45.00	125.00	32.00	27.00	3.05	40.00	
1983-84								
V	625.5	106.4	24.9	22.7	43.2	10.7	2.5	835.9
P	10.00	55.00	135.00	41.00	27.00	3.80	45.00	
1984-85								
V	611.00	86.4	4.6	22.6	2.7	14.3	2.6	744.2

	P	11.00	64.00	140.00	41.00	25.00	4.05	55.00	
1985-86									
	V	619.3	188.3	4.1	25.9	4.3	21.5	5.3	868.7

P = Price. V = Value in lakhs TK. NA = Not available

The hot and humid climate provided an ideal environment for a natural liking for icecream. Low level of consumption of icecream was not as much a function of low purchasing power as the lack of easily accessible selling points. Drinking of fresh milk for nutritional intake of food was not greatly valued as a majority of the population consumed animal source-based proteins and diets. The BMPCUL on the other hand sold a major portion of its production as liquid milk and converted only about 1 per cent of its milk into icrcream. To increase the demand for milk, it had, in fact to undertake special promotion programmes (see Exhibit 6).

Exhibit 6
Promotional Efforts to Popularize Consumption of Liquid Milk

The deputy manager for public relations and planning indicates that though a losing proposition, it must be recognized that 70 per cent of our revenue comes from liquid milk and promotional programme planning has to be on that basis. Our basic selling points are on freshness and nutrition.

As part of milk promotion, the marketing division also undertakes activities to emphasize the importance of fresh milk. One of the approaches had been to work on school going children as a potential target. School visits are organized to show video programmes on how milk is collected, processed and marketed. Samples sales are carried out. Special time tables for the use of school children are prepared and distributed widely with a message describing milk as the ideal food. A sample message normally propagated is given below.

"For sound health a human body needs food which contains calcium, vitamins, iron, fats, protein etc. Any nutritional deficiency can lead to weakness and sickness. If deficient in protein, your muscles become weak. Vitamin A deficiency can lead to blindness. Babies suffer from rickets if deficient in Vitamin D or calcium. Vitamins and proteins play a vital role in human body. Only milk contains all kinds of vitamins, minerals and protein. Milk has 85 different types of nutrients. Therefore, milk is regarded as the ideal food. Lactose which helps sharpen your intelligence is available only in milk. Therefore, if you don't drink milk, you may not do well in studies. Ultimately the nation will suffer."

The icecream also offered compatibility with the highly popular soft drinks. The 100 cc icecream cup of Milk Vita cost only TK 7 which was very close to the price of a bottle of Pepsi Cola. Soft drinks had a very dense network of distribution.

Another advantage with the icecream was the relative lack of strong competition. While imported milk powder and other products staged a severe competition with the BMPCUL's products, there was no possibility of importing icecream. Igloo, a local brand of icecream, offered some competition, but its plant was located in Chittagong and it had transport problem. Dhaka, on the other hand, with its more than four million growing population, offered a greater potential.

BMPCUL marketed only three varieties of icecreams: vanilla, chocolate and strawberry. It had production technology and know-how available to introduce many more varieties.

Production of icecream was not a part of the original project plan of the BMPCUL. Some of the officers including the additional general manager had insisted on making a provision for icecream production as it was a profitable line of business and had an excellent future. Though the project was initiated in 1974, the actual production of icecream began only in 1977-78. Neither a market survey was carried out nor any feasibility report was prepared. The organization did not have any experience or idea of icecream marketing. The executives learnt about icecream marketing the hard way only over a period of time. None had any technical training in the business. The existing product range was introduced right from the beginning.

The story on the development of the distribution channel was not available. A person involved in the initial years had left the organization. A need was however felt to get deep freezers either on rental or on hire purchase basis to develop the channel. The experience with the rental basis was not very satisfactory as the retailers did not pay as much attention to maintenance and care of the machinery as the retailers who thought of it through hire purchase. Retailers having their own freezers were also given the retailership. These retailers, however, also stocked the product of competitors. The performance of retailers can be seen from various angles. Some of the performance specific parameters on a sizeable sample of retailers are given in Exhibit 7. Both profitability as well as the adequacy of margins can be worked out by basic information given in Exhibit 8. The selected retailers were mostly in the business of confectionary and general stores and had their outlets in residential localities.

Production capacity reportedly was not much of a problem. The plant had a capacity to produce 300 litres of icecream per hour. It all depended on how many hours the plant was to run. It was possible to operate the plant in three shifts. When not used for icecream making,

Exhibit 7
Profile of the Retailers having their own Deep Freezers

Retailer number	Locality code	Type of locality	Type of business	Type of business surrounding	Annual Sale of icecream (TK) in	
					1985-86	1986-87
1	4	R	C	M	10422	22297
2	4	R	C	A	--	--
3	14	R	CG	H	17447	20592
4	4	R	C	A	--	--
5	3	R	C	H	--	--
6	5	R	C	LC	520	--
7	5	S	C	S	--	--
8	11	S	C	M	21603	33640
9	12	I	D	C	564	--
10	12	RI	C	I	--	--
11	5	S	S	C	--	--
12	5	R	C	R	--	--
13	11	S	C	M	--	--
14	11	S	C	M	--	--
15	11	S	C	M	--	--
16	7	SC	G	M	--	--
17	1	RC	G	S	14890	21411
18	1	RC	C	S	32450	26940
19	1	RC	D	S	53730	49138
20	1	RC	G	S	6090	16139
21	1	RC	G	S	--	--
22	1	RC	G	S	15561	26684
23	1	RC	G	S	3746	--
24	1	RC	G	S	18006	29936
25	1	RC	G	S	1712	--
26	1	RC	G	S	17259	35031
27	1	RC	G	S	--	--
28	3	R	C	S	11011	11094
29	4	R	C	B	--	--
30	14	R	C	B	30937	27968
31	14	R	G	B	5100	--
32	1	RC	C	S	23058	20090
33	14	S	G	C	--	--
34	7	S	G	M	--	--
35	3	R	G	S	--	--
36	3	RS	G	S	46464	35533
37	3	RS	G	M	--	--
38	7	S	H	M	--	--
39	1	RC	G	M	43121	43322
40	14	RS	C	S	--	--
41	14	RS	G	M	--	--
42	6	R	C	M	--	--

Retailer number	Locality code	Type of locality	Type of business	Type of business surrounding	Annual Sale of icecream (TK) in	
					1985-86	1986-87
43	1	RC	G	S	43644	45074
44	14	R	C	M	23253	25777
45	9	R	C	MB	--	--
46	5	R	G	R	--	--
47	1	RC	G	S	29818	23393
48	14	SI	C	1	--	--
49	14	SI	C	1	90058	62482
50	8	R	G	H	--	--
51	14	R	C	C	--	--
52	11	R	C	M	--	--
53	1	RC	N	S	--	--
54	9	R	G	B	9889	2325
55	3	R	G	B	2409	900
56	4	R	G	M	--	--
57	3	R	D	M	4440	31167
58	4	R	G	M	1320	3876
59	3	R	G	B	8811	13045
60	8	R	G	H	2001	4910
61	3	R	G	M	--	14594
62	3	R	G	L	--	4508
63	3	R	G	M	--	9615
64	3	R	G	M	--	21362
65	5	RS	C	CS	--	876
66	3	R	G	M	--	10951
67	14	R	C	S	--	3112

Note:-

Locality Code

1 = Gulshan
2 = Posta
3 = Dhanmondi
4 = Mirpur
5 = Motijheel
6 = Gandaria
7 = Nilkhet
8 = Azimpur
9 = Khilkhet
10 = Jurain
11 = Maghbazar
12 = Hatkhola
13 = Nayapaltan
14 = Others

Type of Locality

R = Residential
S = Shopping/Commercial
O = Office
C = Campus, Educational Diplomatic
I = Industrial

Business Code

G = General Store
C = Confectionery
H = Hotels/Clubs
S = Stationery
B = Snack bar
I = Institutional
D = Departmental store
N = Newspaper shops
W = Wholesalers

Surrounding Code

M = Main Street/Market	L = In the lane	C = Shopping Complex
A = Near Theatre	R = Near Railway	E = Near Bus stop
S = Near School, School Embassy etc.	H = Near Houses	P = Near Parks

Profile of the Retailers having BMPCUL Deep freezers

Retailer number	Locality code	Type of locality	Type of business	Type of business surrounding	Annual Sale of Icecream (TK) in	
					1985-86	1986-87
1	4	R	G	B	31022	13286
2	4	R	C	M	5295	576
3	14	R	G	AM	48319	50996
4	14	R	G	AM	16388	21975
5	3	R	G	L	--	--
6	--	CLOSED		--	--	--
7	3	R	G	L	16313	2211
8	3	R	G	M	6278	--
9	3	R	G	M	56466	45577
10	14	S	CS	S	20002	15126
11	14	C	H	P	11009	17725
12	14	C	B	P	33498	15244
13	7	S	G	C	60364	48646
14	3	S	C	M	24126	28086
15	3	R	C	M	2165	--
16	14	R	G	M	23068	26317
17	14	C	C	HS	5413	--
18	1	RC	G	SC	105858	124184
19	1	RC	G	SC	29739	32783
20	1	RC	G	SC	31566	40857
21	--	CLOSED		--	--	--
22	11	R	G	M	47554	31472
23	11	R	C	M	13590,	15905
24	11	R	C	C	43477	51498
25	11	R	G	S	32353	33668
26	11	R	C	M	--	--
27	5	R	C	CS	11913	--
28	5	R	C	CS	5618	--
29	5	R	C	CS	39216	20844
30	--	CLOSED		--	--	--
31	3	R	G	AC	60189	38920
32	1	CS	G	S	108162	135664
33	3	R	C	M	13871	20819
34	14	R	G	C	29205	17234
35	14	R	C	M	2451	--

Retailer number	Locality code	Type of locality	Type of business	Type of business surrounding	Annual Sale of icecream (TK) in	
					1985-86	1986-87
36	3	R	G	M	27220	29931
37	14	R	C	L	37692	37636
38	12	R	C	A	16777	19732
39	12	R	C	M	40051	49253
40	14	R	CS	S	20768	--
41	14	R	C	M	19441	12269
42	3	R	C	L	9405	10776
43	14	R	C	C	60861	25984
44	11	R	C	M	--	--
45	3	R	C	L	26244	23942
46	13	R	G	A	33104	26882
47	3	R	C	L	15390	3943
48	11	R	G	L	--	--
49	1	RC	G	C	41260	35054
50	3	R	G	M	22984	12853
51	5	R	W	MC	32509	14292
52	11	R	G	L	--	--
53	--	CLOSED		--	--	--
54	3	R	C	M	--	--
55	--	CLOSED		--	--	--
56	--	CLOSED		--	--	--
57	1	RC	G	C	21976	65545
58	--	CLOSED		--	--	--
59	11	R	G	L	--	--
60	14	R	G	M	34842	35269
61	1	RC	G	C	46492	87077
62	3	R	C	M	4055	--
63	--	CLOSED		--	--	576
64	4	R	C	L	--	--
65	4	R	G	L	5220	876
66	--	CLOSED		--	--	--
67	--	CLOSED		--	--	--
68	1	RC	G	C	36255	37822
69	8	R	G	L	--	--
70	3	R	C	L	12130	6290
71	--	CLOSED		--	--	--
72	3	R	G	M	56466	45578
73	7	S	B	C	1025	--
74	5	R	G	L	--	--
75	3	R	G	L	987	--
76	--	CLOSED		--	--	--
77	--	CLOSED		--	--	--
78	12	R	C	L	13590	15905

Retailer number	Locality code	Type of locality	Type of business	Type of business surrounding	Annual Sale of icecream (TK) in	
					1985-86	1986-87
79	12	R	C	M	--	--
80	4	R	G	M	24960	21910
81	1	RC	D	M	45904	55338
82	14	C	G	HS	744	--
83	1	RC	D	C	19643	12273

Retail no 46 onwards freezers on instalment basis; previous ones on rental basis.

Exhibit 8
Bangladesh Milk Producers Union Ltd.
Particulars about Deep Freezers of 11.5 CFT

Cost of a 11.5 CFT Deep Freezer	: TK 22000
Average Monthly Electricity Expenses	: TK 100
Maintenance cost per annum @ 5%	: TK 1100
CAPACITY	
a. If used only for 1 ltr pack	: 110 packs
b. If used only for 1/2 ltr pack	: 220 packs
c. If used only for cups	: 1000
d. If used only for chocobars	: 1500

Terms and conditions: initial down payment TK 5500 plus TK 200 per month till total amount of TK 22000 is recovered.

the plant was used for its regular function of processing liquid milk. Therefore, there was no possibility that manpower remained idle when icecream was not manufactured. The plant also had a large deep freeze storage capacity. Icecream in fact was not produced every day. The liquid milk was the main product and not the icecream. Icecream filling and packing was mostly done manually, which sometimes resulted in production variation. The plant offered flexibility not only to produce the existing range, but widen the range, with the addition of some equipment.

Production constraints mainly included occasional shortage of some of the ingredients and raw materials except milk. Vanilla, chocolate, and strawberry ingredients were imported. Production was sometimes hampered because of import problems. Sorting the problems involved handling a chain of bureaucratic requirements which took time. Plastic cups or spoons were produced in the country, but the plastic cup manufacturers did not supply the cups according to the

approved samples and it had affected production. Sometimes, the price of sugar fluctuated widely making it difficult to produce ice-cream within the normal cost range, but all these problems were temporary in nature and could be handled with proper planning. While icecream could technically be stored for four to five months if one had storage capacity, the plant normally did not store it for more than one month. The BMPCUL preferred to keep a stock for 10 to 15 days all packed and ready to sell.

Transport of icecream was also not a problem. The plant had three distribution vans which could carry 1000 ltr of icecream each to any part of the country. Each van cost around TK 6 lakh and were imported. Salesmen collected the orders from the retailers and delivered them their requirements by following a pre-fixed route.

The prices of icecream per ltr for the retailers have been changing over time as follows:

	TK
1979-80	12
1980-81	17
1981-82	19.50
1982-83	24
1983-84	32
1984-85	41
1985-86	41

The prices were determined by looking at the prices of the competitors. It was difficult to say to what extent the changes in the prices influenced sales. Product-wise, year-wise and month-wise sales of icecream are given in Exhibits 9 to 13.

Since liquid milk accounted for a larger share of revenue a larger portion of promotional budget was spent on it. There was no specific budget allocated for icecream promotion as such. The total budget for 1986-87 was TK 10 lakhs Because of a limited budget for individual products, the variety-wise promotion in icecream was not carried out. Only two to three years ago the budget for promotion was doubled from TK 5 lakhs to TK 10 lakhs. The promotional strategy was designed in consultation with the marketing department and the advertising committee consisting of additional General Manager, FAO project representative, Deputy General Manager and managers of finance, marketing, and public relations (See Exhibit 14 for details on promotion).

Exhibit 9
Bangladesh Milk Producers Union Ltd.
Monthly Sales Statement of Vanilla

(Sales in Unit)

Month	1986-87			1985-86		
	1 ltr	1/2 ltr	Cups.	1 ltr	1/2 ltr	Cups
July	1563	979	7150	1178	848	7259
August	1888	1085	8582	1395	1043	9319
Sep.	1768	1116	7318	1729	1432	10226
Oct.	1180	792	4059	2267	1401	10745
Nov.	1081	641	5955	1072	495	4013
Dec.	1123	435	2917	390	231	2387
Jan.	825	252	1453	698	359	2083
Feb.	1038	577	3779	593	292	3828
March	1495	1030	6019	1609	1218	7958
April	1405	1027	7411	1926	1061	7803
May	933	726	1988	1601	1041	5414
June	not computed			1760	1128	8392
Total	14299	8660	56631	16218	10549	79427
	1984-85			1983-84		
July	1381	1018	1937	3182	1229	15499
August	1611	878	11737	2151	1240	13598
Sep.	1285	835	9045	2068	1192	14170
Oct.	1712	1174	11199	1989	1374	11862
Nov.	949	786	8032	1112	616	5960
Dec.	745	278	1756	1120	606	5099
Jan.	726	425	3275	990	489	3289
Feb.	993	561	4389	1372	858	5057
March	1351	989	8000	1763	1206	10688
April	1689	999	7829	1896	1408	11817
May	1258	804	6775	1404	766	2795
June	1255	988	11227	1422	1085	1986
Total	14955	9735	85201	19469	12069	101820
	1982-83			1981-82		
July	2202	1484	12037	2472	2806	17951
August	1933	1395	13779	2400	1391	12284
Sep.	2440	1448	13524	1920	1468	14028
Oct.	1961	1322	13179	2335	1087	1338
Nov.	1148	778	5226	1318	913	7128
Dec.	947	580	3177	1248	690	3079
Jan.	905	5741	4064	1468	428	4516
Feb.	1046	642	6223	2071	1190	8469
March	2363	1581	12865	1504	953	7677

April	1999	1431	16239	3072	1957	12800
May	2052	1520	12724	2667	1517	13154
June	1863	1480	11768	2034	1319	9672
Total	20854	14325	124895	24509	14999	124139

Exhibit 10
Bangladesh Milk Producers Cooperative Union Ltd.
Monthly Sales Statement of Strawberry

(Sales in units)

	1986-87			1985-86		
	1 ltr	1/2 ltr	Cups	1 ltr	½ ltr	Cups
July	245	220	432	510	395	2640
Aug.	410	320	1920	285	350	1338
Sept.	245	185	672	510	500	2016
Oct.	290	140	336	565	465	1536
Nov.	165	161	1008	145	100	672
Dec.	145	70	144	55	66	192
Jan.	120	40	--	--	87	460
Feb.	210	100	336	80	40	864
March	270	290	1248	200	300	2016
April	190	245	1248	--	290	1248
May	175	180	--	--	495	1152
June	------ Not Sold------			--	380	2528
Total	2465	1951	7344	2350	3486	16662
	1984-85			1983-84		
July	560	411	--	523	556	7086
Aug.	495	210	672	680	411	2976
Sep.	405	346	3024	857	538	4320
Oct.	455	408	2832	618	348	3496
Nov.	400	368	2176	397	150	1028
Dec.	80	30	624	241	115	833
Jan.	105	40	384	280	95	1056
Feb.	225	130	1152	520	263	1264
March	300	250	1344	570	470	3488
April	481	360	1208	630	496	3330
May	280	230	1344	270	180	4706
June	375	305	2016	445	316	--
Total	4080	3093	16816	6031	3938	33583

	1982-83			1981-82		
July	830	496	5544	470	396	4368
Aug.	735	442	3948	750	726	6079
Sep.	815	417	3948	590	862	6048
Oct.	605	389	4536	780	504	6804
Nov.	500	216	1932	335	318	1680
Dec.	245	101	1122	340	131	722
Jan.	260	75	1916	346	142	1649
Feb.	395	181	2051	820	340	2940
March	863	414	4028	400	341	3024
April	785	594	4492	895	563	4032
May	775	597	4552	780	514	3780
June	696	519	4704	575	387	3360
Total	7504	4441	42173	7081	5224	44486

Source: Data provided by BMPCUL.

Exhibit 11
Bangladesh Milk Producers Cooperative Union Ltd.
Monthly Sales Statement of Chocolate

(Sales in units)

Month	1986-87			1985-86		
	1 ltr	1/2ltr	Cups	1 ltr	1/2ltr	Cups
July	615	465	2928	690	588	3888
Aug.	865	545	2688	725	621	3936
Sept.	675	395	2352	930	835	4800
Oct.	550	330	1164	1270	870	3264
Nov.	590	421	1868	320	200	1248
Dec.	468	285	624	240	196	672
Jan.	415	200	496	451	275	946
Feb.	595	210	1008	345	245	1728
March	890	770	2976	790	670	2880
April	700	630	2064	880	795	3168
May	660	484	--	740	555	2112
June	----- NOT SOLD ----			830	605	4064
Total	7023	4735	18268	8211	6455	32706

	1984-85			1983-84		
July	600	552	2320	1088	987	6389
Aug.	675	410	3652	1075	506	5280
Sep.	630	497	2195	962	643	4170
Oct.	925	526	3760	1074	684	4694
Nov.	725	593	4144	682	342	1704

Dec.	305	85	912	498	197	1808
Jan.	170	80	480	470	186	1552
Feb.	350	200	2448	930	300	1984
March	775	490	3840	905	633	4592
April	655	597	3744	945	690	4716
May	625	385	2400	390	301	--
June	575	620	3648	775	600	--
Total	6910	5035	33543	9794	6069	36889
	1982-83			1981-82		
July	1257	688	5712	1050	760	4750
Aug.	1165	625	3864	670	635	3780
Sep.	1014	482	4788	680	684	6720
Oct.	925	645	4704	890	508	4048
Nov.	740	404	2436	615	498	2016
Dec.	515	171	1354	630	248	1058
Jan.	515	253	1847	540	213	1634
Feb.	705	453	2558	1155	550	3696
March	1178	664	6298	645	334	2545
April	1268	695	5474	1410	778	4116
May	1055	666	4942	1585	954	4200
June	1071	641	5144	915	602	3192
Total	11408	6387	49121	10785	6764	41755

Source: Data provided by BMPCUL

Exhibit 12
Bangaldesh Milk Producers Cooperative Union Ltd.
Monthly Statement of Sale of Lollies and Chocolate Bars

(Sales in units)

	1986-87				1985-86			
	Ora-nge	Le-mon	Pine apple	chaco bar	Ora-nge	Le-mon	Pine apple	choco bar
July	--	--	--	12646	--	--	--	8983
August	--	--	--	19541	--	--	--	13449
Sep.	--	--	--	12700	--	--	--	13654
Oct.	--	--	--	6963	200	--	--	15291
Nov.	--	--	--	3157	--	--	--	6743
Dec.	--	--	--	4091	--	--	--	4323
Jan.	--	--	--	4145	50	--	--	5125
Feb.	--	--	--	8527	--	--	--	4534
March	--	--	--	5342	600	--	--	13578

Contd.

Exhibit 12 Contd.

April	--	--	--	7640	240	--	--	15037
May	--	--	--	13314	--	--	--	13173
June	--	--	--	--	--	--	--	18398
Total	--	--	--	98066	1090	--	--	32292

	1984-85				1983-84			
	Ora-nge	Le-mon	Pine-apple	choco-bar	Ora-nge	Le-mon	Pine-apple	choco-bar
July	700	--	--	7262	460	--	--	6885
August	800	--	--	7267	2025	--	500	6641
Sep.	900	--	--	7754	1690	--	300	8029
Oct.	1000	--	--	2437	1815	50	50	7626
Nov.	1400	--	--	560	520	--	--	418
Dec.	400	--	--	22	670	--	--	14
Jan.	400	--	--	4	300	--	--	2746
Feb.	200	--	--	2780	100	--	--	4325
March	--	--	--	998	1350	--	--	7134
April	--	--	--	8114	1970	--	--	8348
May	--	--	--	6678	1050	--	--	3697
June	--	--	--	11685	1050	--	--	8647
Total	5800	--	--	64481	13000	50	850	64511

	1982-83				1981-82			
	Ore-nge	Le-mon	Pine-apple	choco-bar	Ora-nge	Le-mon	Pine-apple	choco-bar
July	1570	--	--	3050	--	300	--	--
August	300	120	--	2979	--	600	--	1035
Sep.	420	450	--	3818	300	--	--	2491
Oct.	500	250	300	3948	550	--	--	1160
Nov.	--	210	25	1799	300	100	--	350
Dec.	--	130	--	1406	--	--	--	1210
Jan.	--	40	--	1962	--	--	--	615
Feb.	--	140	70	3086	--	--	--	1087
March	445	--	--	6631	400	--	--	915
April	580	--	--	8494	200	--	--	2600
May	1240	--	--	6975	1320	280	350	2030
June	1110	--	--	6026	490	100	300	2347
Total	6165	1340	2055	50176	3560	1380	650	15840

Exhibit 13
Bangladesh Milk Producers Cooperative Union Ltd.
Annual Variety-Wise Package-Wise Sales

(Figs. in Units)

Particular	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Vanilla						
1 ltr packs	24509	20854	19469	14955	16218	14299
1/2 ltr packs	14999	14235	12069	9735	10549	8660
Cups	124139	124895	101820	85201	79427	56631
Strawberry						
1 ltr packs	7081	7504	6031	4080	2350	2465
1/2 ltr packs	5224	4441	3938	3093	3468	1951
Cups	44486	42173	33583	16816	16662	7344
Chocolate						
1 ltr packs	10785	11408	9794	6910	8211	7023
1/2 ltr packs	6764	6387	6069	5035	6455	4735
Cups	41755	49121	36889	33543	32706	18268
Lollies						
Orange	10785	6165	13000	5800	1090	No
Lemon	6764	1340	50	--	--	Produc
Pineapple	41755	2055	850	--	--	tion
Chocobar	15840	50176	64511	64481	132292	98066

Exhibit 14
A Summary of the Promotional Compaign Plan for 1985-86 of BMPCUL

It was felt that from the promotion point of view, the performance of BMPCUL during 1984-85 was not as expected. The targets in most cases could not be achieved because of shortage of raw milk collection as well as marketing bottle-necks. The achievements with respect to raw milk collection were 40.29 per cent of the targets. Similarly, not a single Milk Vita product could reach the marketing projections for 1984-85. Keeping this in mind, promotion and other efforts were needed to be mounted to achieve the targets set for 1985-86. The promotional strategy proposed was as follows :

Advertising budget 1985-86 : TK 8,00,000

Promotional proposal :

Reviewing the performance of 1984-85 and the projections of 1985-86, the advertising and promotional strategy takes into account two basic aspects :

1) Society level extention activities.

2) Marketing development and promotion.

Keeping this in mind, the promotional plan of 1985-86 concentrates on :

a) Institutional campaign

b) Promotional campaign

a) *Institutional Campaign*

The Institutional campaign includes development extention activities at the society level as well as at the public relations, through :

1) Educational materials supply.
2) A-V show/film show arrangement.
3) Orientation/visit to plants/society.
4) Radio/television, advertisement, newspaper/journal write-ups etc.
5) Regular monitoring of the performances.

b) *Promotional Campaign*

No.	Item	Purchasers	Season
1.	Liquid milk	Low income to higher income group	All season.
2.	Icecream (Chocobar/lollies)	Children Higher income group	Specially Summer
3.	Flavoured milk	Middle to higher income group.	Round the year
4.	F.C.M.P.	Middle to higher income group.	Round the year
5.	S.M.P.	Low to higher income group.	Round the year
6.	Butter	Middle to higher/ income group institutions.	40 per cent round the year
7.	Ghee	Middle to higher income group	(Peak in festivals)

Reviewing the revenue income, purchaser group, season-wise sale tendency and costing etc. promotional activities for marketing were as follows :

1) Advertising
2) Publications
3) Promotional programme in television, radio, A-V shows etc.
4) Exhibition/mela etc.
5) Orientation/visits etc.
6) Gift/item productions, calender etc.

Media: In Bangaldesh, the following media are popularly used for advertising

a) Newspapers/periodicals/journals.
b) Television.
c) Radio.
d) Outdoor hoardings, traffic canopies etc.
e) Cinema slides.
f) Souvenier, calender, leaflet, poster, gift items etc.

Evaluating purchaser's attitude, media preference, effectiveness of media performance and suitability of Milk Vita products, the following media were chosen for advertising campaign:

(1) Television (2) Radio (3) Newspapers
(4) Hoardings, bellsigns, canopies (5) Cinema slides.

Advertising theme : From the initial stage of planning the advertising theme depicted in the slogans was as follows:

1977-78	: Milk Vita	--	For vitality.
1979-80	: Milk Vita	--	House of quality dairy products.
1981-82	: Milk Vita	--	National product of International Standard.
1983-84	: Milk Vita	--	Quality dairy products from the farmers cooperative.
1984-85	: Milk Vita	--	Quality dairy products from rural farmers cooperative.

In tune with the above, the theme of 1985-86 was proposed to highlight the following :

i) Laboratory tested quality dairy products.
ii) A national product on which people can rely on.
iii) Quality is maintained in a-z of Milk Vita operations.
iv) It's farmers as well as the largest dairy enterprise in the country devoted to the rural social-economic progress.

Milk Vita - Products :

Advertising campaign was scheduled on the basis of product-sale revenue. The priority/preferences were :

	In per cent
1. Liquid milk	65.20
2. Butter	17.66
3. Ghee	4.11
4. F.C.M.P.	4.10
5. Flavoured milk	3.83
6. Ice-cream	3.75
7. Chocobar	0.82
8. S.D.P.	0.45
9. Ice lollies	0.08

But analysing cost/profit situation, media policies, product behaviour etc. this strategy could not be accepted. As per standing media rule, television did not accept more than one product in one advertisement, whereas no such limitation was placed for newspapers/radio and outdoor display advertisements.

Therefore, the product-wise strategies were:

a) Liquid Milk : Being the highest revenue income product, priority, and preferences in all aspect have been shown to this product. Moreover, in the current year the price of the product has been increased. Therefore, all the media should be used for liquid milk advertisement and it should be at regular frequency.
b) Full Cream Milk Powder : The product has been a loss-recurring one. Promotion will have to be done to avoid deterioration of quality due to piling up of stocks. The media to be used are television and newspaper.
c) Butter : Milk Vita butter has a demand in the market and to keep this

demand steady, publicity through television, radio, hoarding/bellsigns, and canopies has been proposed.

d) Ghee : It's a loss product and in fact it is primiarily a product from the balance cream and to avoid it piling up newspaper advertisements should be taken up specially in the festival season.

e) Icecream/Ice lollies and Chocobar: These have been profit earning product and as such the media should be involved in their advertising campaign.

f) Flavoured Milk : It has a blend of a new product and also a profitable one. Moreover vanilla flavours in new packets are going to be launched (fully) this year. Therefore, a vigorous campaign in all the media is needed along with gift items.

A. *General Advertisement* :

1. Liquid milk	1,00,000	-	Television/radio/newspaper, hoar dings/bellsigns/canopies.
2. F.C.M.P. (S.M.P)	40,000/	-	Television radio/newspaper, hoar dings; bellsigns, canopies.
3. Butter	50,000/	-	Television radio/newspaper, hoar dings, bellsigns, canopies.
4. Icecream, ice lollies	80,000/	-	Television,radio, hoardings.
5. Flavoured milk	1,00,000/	-	Television, radio, hoardings etc.
6. Ghee	30,000/	-	Newspaper, hoardings
	4,00,000/	-	

B.	*Hoardings*:	
	6 - Dhaka, 2 - Chittagong	1,00,000.00
C.	*Canopies/Bellsigns* :	
	(4 Dhaka, 2/2 Chittagong)	60,000.00
D.	Calender	1,00,000.00
E.	Publications	30,000.00
F.	Gift items	10,000.00
G.	Society extension materials	50,000.00
H.	Miscellenous marketing items	50,000.00
	Total TK	8,00,000.00

Schedule :

The proposed advertising schedule for different products was as follows :

A. *Television, Newspaper, Radio* :

1. Liquid milk	Sept-Nov 85	:	Jan-April 86
2. FCMP (SMP)	Dec 84-Mar 85		
3. Butter	Sept-Dec 85	:	Feb-Mar 86
4. Icecream	Oct-Nov 85	:	Apr-Jan 86
5. Flavoured milk	Oct 85-June 86 (with scant frequency).		
6. Ghee	Festival times		
B. Publications	Sept-Oct 85		
C. Calender	Sept 85-Dec 85		
D. Hoardings, canopies bellsigns.	Sept 85-Dec 85		
E. Gift items	Oct 85		
F. A-V films	Nov-Dec 85		

Consumers were familiar with Milk Vita icecream and the various varieties introduced by it. Though they were aware about Igloo icecream, they felt that Milk Vita was better. They did not express or comment about the high price or non-availability of Milk Vita icecream. Often they purchased 1 ltr packets so that it could be stored at home and served whenever required. No one could state about any advertisement they had seen recently.

Icecream was sold along with several breakfast, snack and other items like cold drinks. In some shops ice cream was sold where fish and other meat items were sold with deep freeze facilities. In the posh area the outlets of icecream were more from shops who preferred to keep both brands of icecream. Shopkeepers generally kept the refrigerator inside so that the brand display on it was not visible to consumers. The shops did not display that icecream was available with them. The retailers felt that for increasing sales of icecream the price should be reduced by half and their margin increased.

At present only Igloo brand of icecream offered some competition to BMPCUL's icecream. BMPCUL's all products were named as Milk Vita products and there was no brand specification for ice cream. Igloo was also not a big competitor though it offered to the consumers some range of products at the same range of prices and package sizes except that they had introduced an icecream cake for which they were known. Following Igloo, the Milk Vita was also thinking of introducing a similar product. Bar varieties have been showing a great market appeal. In the case of Igloo the main disadvantage had been its location in Chittagong which involved more than 200 km of road transport. Igloo's product image was not that strong. Margins given to the retailers were by and large the same. The distribution policy did not differ. In fact, Milk Vita had not captured the opportunity presented by the favourable market potential and weak competition.

Realizing that both Milk Vita and Igloo were not sensitive enough to the growing icecream consumers, a private company has recently taken a decision to enter the market aggressively. The man behind the enterprise was regarded as an extremely dynamic marketeer. He had very successfully established a soft drink market in Bangaladesh. All famous, popular and fast moving brands like Pepsi-cola, and Seven-up were marketed by him and he had developed a good network for distribution and retailing. His promotional displays have been very effective. This person has already imported the machinery from

Europe and set up a most modern plant for the manufacture of ice-cream at Dhaka. He was planning to offer eight to ten different varieties, concentrate on developing bar ice cream market, expand retail network by providing deep freezer capacities, capture markets in other important towns, and engage a competent technician form the parent company to train his staff in maintaining production schedules and product quality. The production had yet not started. His only problem was likely to be that he had no control over the milk as was the case with BMPCUL. He was therefore planning to use imported icecream mix as the base. In addition, since milk fat was expensive, he was planning to use vegetable fats to reduce the production cost. The BMPCUL used pure milk fat manufactured in its own unit. Ice cream quality using milk fat was much superior, but customers were quite ignorant of this difference.

Igloo was also planning an expansion of its market in Dhaka by introducing more deep freezers as it had already expanded its production capacity in Chittagong by modernizing its plant.

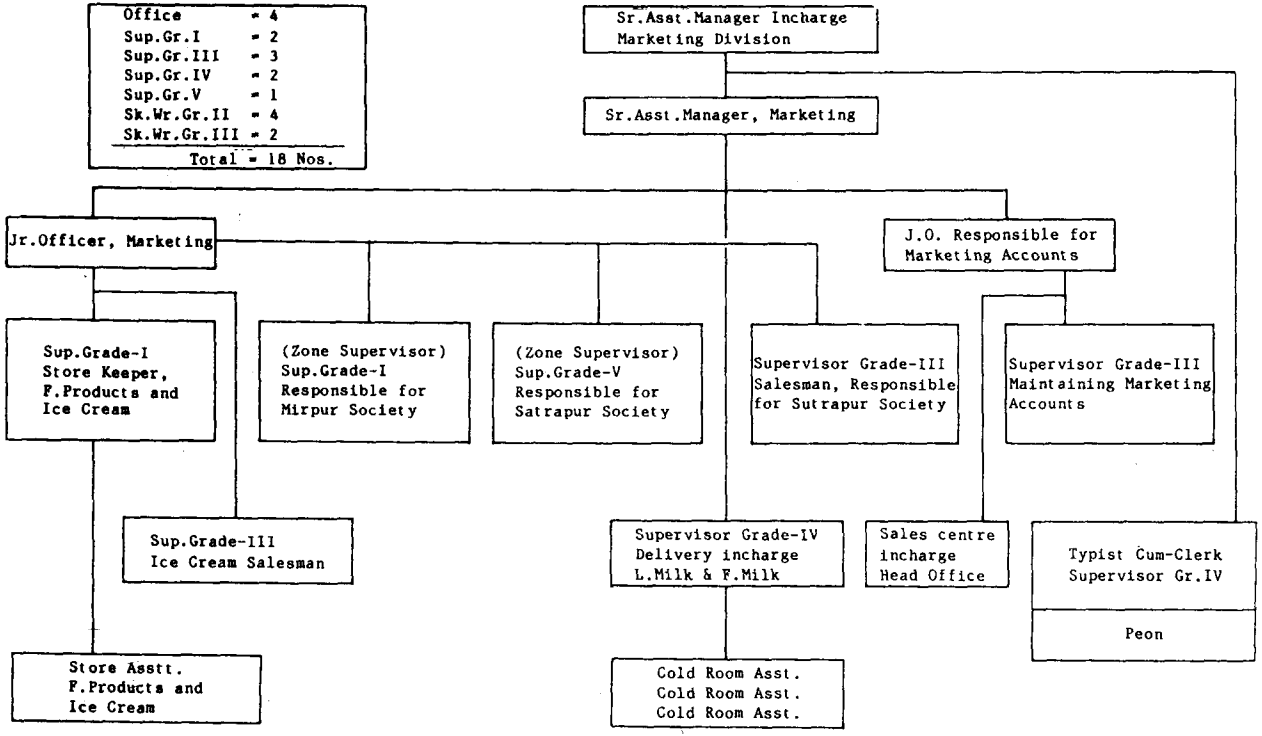
In view of such impending competition, the middle level executives felt that Milk Vita will have to gear up soon. Otherwise, instead of expanding the market for icecream, it may have to lose its most profitable business line. They felt that while cooperatives had certain advantages, they also had major disadvantages of executive decision making as cooperative government interaction systems were based on different lines and complications. Even to introduce 25 additional deep freezers in the market took long decision-making processes. They did not have trained manpower both for product and market identification. It was pointed out that more than 200 officers had left the organization during the last 13 years. And during the same period 11 officers belonging to the prestigious administrative services occupied the position of chief executive at Milk Vita. Organizational stability was considered to be important for new market development.

Marketing is an important wing of the enterprise. A small number of middle and low level executives handled all the product ranges. They had little time for exposing themselves to the changing market conditions. However, the organization at all levels maintained an excellent information system and cost data were compiled very meticulously. The general feeling was that the budget given to the marketing division was not adequate and at the same time, since the milk business itself was losing money, marketing was considered as an area where some saving in the expenditure could be contained. The organ-

Exhibit 15

Bangladesh Milk Producer's Cooperative Union Ltd.

Organizational Chart and Job Description of Officers and Staff of Market Division



izational chart of the marketing division and their annual budget for various heads are given in Exhibits 15 and 16.

Exhibit 16
Bangladesh Milk Producers' Union Ltd.
Marketing Division Budget for 1986-87

Items	Actual for 1984-85	Estimated for 1985-86	Actual up to Dec. 1985	Revised for 1985-86	Estimated for 1986-87
1. Pay and allowances	4,94,722	5,90,540	2,19,632	6,11,150	6,62,525
2. Ex-Gratia	60,270	40,000	12,945	68,770	63,730
3. Recreation allowance	-	5,000	470	5,000	10,000
4. Overtime and holidays	37,469	90,000	41,275	80,000	80,000
5. Wages casual labour	18,410	20,000	10,849	25,000	20,000
6. Uniform and liveries	5,049	45,000	2,165	24,698	2,000
7. Travelling expenses	35,060	32,000	8,779	10,000	10,000
8. Fuel oil delivery vehicles	2,39,439	2,50,000	77,258	1,75,000	1,75,000
9. Rep.maint. and deli. veh.	1,35,141	50,000	32,154	60,000	60,000
10. Insurance, road taxes deli. veh.	18,656	20,000	6,996	15,000	15,000
11 Hire charge carring products	31,790	30,000	2,926	10,000	10,000
12. Carrying outwards	48,870	50,000	97,069	1,50,000	2,00,000
13. Rep. Maint. deep freeze	39,595	40,000	1,295	25,000	25,000
14. Marketing learning and research	4,032	5,000	--	5,000	5,000
15. Exhibition expenses	--	20,000	--	10,000	10,000
16. Product advertising	3,11,744	8,00,000	4,49,685	8,00,000	10,00,000
17. Free sample and complementaries	7,958	10,000	--	10,000	10,000
18. Training expenses	9,970	15,000	--	10,000	10,000
19. Complementaries to staff	3,224	7,000	--	37,500	37,500
20. Printing and stationeries	60,440	50,000	16,426	30,000	30,000
21. Miscellaneous exp.	1,325	5,000	372	1,000	1,000
Total	16,13,164	21,74,540	9,80,316	21,63,118	24,36,755

Source : Data Provided by BMPCUL

Though production capacity was not considered to be a constraint, the production scheduling was perceived to be problematic. The production personnel on the other hand felt that production was

carried out on the basis of indents placed by the marketing division. They felt that the indents were sent as a routine matter and may not have any relevance to the actual demand during that period. Therefore, the supply figures may not match the indent figures and may not reflect production constraints. In any case, the figures on projected sales, indents, production and actual sales showed variations almost in all years. Data for at least one year to appreciate the production planning process are given in Exhibits 17 and 18.

Exhibit 17
Bangladesh Milk Marketing Cooperative Union Ltd
Projection and Actual Sales

(Year 1984-85)

	Projection				Actual sale			
	1 ltr	1/2 ltr	Cup	Total	1 ltr	1/2 ltr	Cup	Total
July	6941	3465	36217	11295	2541	1986	4257	3959.70
Aug.	6882	2696	27317	10161	2701	1498	16061	5056.10
Sept.	6058	2960	28325	10373	2320	1678	14264	4585.40
Oct.	5801	3007	25065	9811	3092	2108	17791	5925.10
Nov.	3938	1305	10865	5717	2074	1747	14352	4382.70
Dec.	3523	1147	10322	5128	1030	393	3292	1555.70
Jan.	3375	1012	7371	4618	1001	545	4139	1687.40
Feb.	4727	1776	10381	6653	1568	891	7989	2812.40
March	5242	2886	23460	9036	2426	1729	13184	4608.90
April	5963	3242	26565	10240	2824	1956	12821	5084.10
May	6525	3727	29381	10326	2163	1419	10519	3924.40
June	6791	3913	30850	11832	2205	1913	16891	4850.60

Exhibit 18
Bangladesh Milk Marketing Cooperative Union Ltd
Monthwise Indent and Production for 1985-86

Month	Vanilla						Strawberry					
	Indent			Production			Indent			Production		
	1 ltr	1/2 ltr	cups	1 ltr	1/2 ltr	cups	1 ltr	1/2 ltr	cups	1 ltr	1/2 ltr	cups
July	2000	1500	10000	1282	1039	8670	500	250	2000	500	415	1856
Aug.	2000	1500	10000	1236	947	7490	500	250	2000	Nil	Nil	Nil
Sept.	2000	1500	10000	2081	1554	12031	350	500	2000	511	500	2050
Oct.	2000	1500	12000	2079	1517	12011	500	500	2500	567	503	2840
Nov.	2000	1000	7000	1063	577	5040	500	400	500	200	200	2200
Dec.	1500	500	-	408	200	-	100	-	-	Nil	Nil	Nil
Jan.	1000	500	1000	587	212	1170	200	100	--	Nil	Nil	Nil
Feb.	1080	750	2500	898	426	4954	100	200	--	111	200	Nil
March	1500	1000	5000	1686	1011	8010	700	200	1000	172	410	2070
April	7500	2500	12000	2027	836	7230	400	500	3000	Nil	640	1990
May	1500	1000	8000	1891	904	7616	500	--	--	Nil	Nil	Nil
June	2000	2000	5000	1168	1136	8180	700	700	2000	Nil	750	1840
Total	21000	15250	82500	16406	10359	82402	4550	3600	15000	1950	3618	14846

	Chocolate						Chochetry	
	Indent			Production			Indent	
	1 ltr	1/2 ltr	cups	1 ltr	1/2 ltr	cups	1 ltr	1/2 ltr
July	750	500	2000	962	939	5690	12000	9200
Aug.	750	500	2000	460	441	2060	12000	13200
Sept.	1000	750	4500	1405	1128	7626	14000	30060
Oct.	1000	1000	5000	1041	612	2020	13000	18170
Nov.	1000	600	1500	360	200	1070	9000	2090
Dec.	300	200	--	Nil	Nil	Nil	8000	7936
Jan.	300	300	--	759	562	1989	8000	4130
Feb.	750	500	--	Nil	Nil	Nil	10000	6980
March	1000	1000	2500	994	800	4996	10000	12100
April	1300	1200	3500	1662	1196	3880	16000	15650
May	500	500	500	605	513	2100	12000	17340
June	1300	300	3000	520	202	3360	15000	12010
Total	9950	8350	24500	8708	6593	34791	139000	138866

Exhibit 19
Percentage Distribution of Respondents Aware of Milk Vita Product Line

Sl. No.	Name of Area	Did you know Milk Vita produced the following											
		FCMP				SMP				Ice cream			
		Yes	No	Others	Eligible cases	Yes	No	Others	Eligible cases	Yes	No	Others	Eligible cases
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.	GULSHAN	86.7	13.3	–	100.0	30.0	70.0	–	100.0	100.0	–	–	100.0
2.	POSTA	66.7	33.3	–	100.0	40.0	60.0	–	100.0	68.9	31.1	–	100.0
3.	DHANMONDI	48.9	50.0	1.1	100.0	21.1	77.8	1.1	100.0	92.2	6.7	1.1	100.0
4.	MIRPUR	26.7	73.3	–	100.0	4.6	95.6	–	100.0	94.3	5.7	–	100.0
5.	MOTIJHEEL	73.9	26.1	–	100.0	63.6	36.4	–	100.0	78.9	20.0	1.1	100.0
6.	GANDARIA	50.0	48.9	1.1	100.0	5.6	93.3	1.1	100.0	100.0	–	–	100.0
7.	NILKHET	97.9	2.1	–	100.0	89.4	10.6	–	100.0	78.9	21.1	–	100.0
8.	AZIMPUR	75.6	24.4	–	100.0	37.8	62.2	–	100.0	51.1	48.9	–	100.0
9.	KHILKHET	33.3	66.7	–	100.0	7.8	92.2	–	100.0	56.7	43.3	–	100.0
10.	JURAIN	30.0	70.0	–	100.0	10.0	90.0	–	100.0	56.7	43.3	–	100.0
11.	MOGHBAZAR	75.6	24.4	–	100.0	45.6	51.0	3.3	100.0	82.2	14.4	3.3	99.9
12.	HATKHOLA	72.2	27.8	–	100.0	17.8	82.2	–	100.0	95.6	4.4	–	100.0
13.	NAYAPALTAN	73.3	22.2	4.4	99.9	55.6	38.9	5.5	99.9	84.4	12.2	3.3	99.9
	TOTAL AVG.	79.0	20.0	1.0	100.0	33.1	66.0	0.8	99.9	81.5	17.8	0.7	100.0

Source: Rapport Bangladesh Limited, Milk Marketing Survey for BMPCUL, 1985-86

		Butter				Ghee				Chocolate milk			
		Yes	No	Others	Eligible Cases	Yes	No	Others Cases	Eligible	Yes	No	Others	Eligible Cases
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.	GULSHAN	100.0	-	-	100.0	95.6	4.4	-	100.0	93.3	6.7	-	100.0
2.	POSTA	70.0	30.0	-	100.0	70.0	30.0	-	100.0	66.7	33.3	-	100.0
3.	DHANMONDI	86.7	12.2	1.1	100.0	87.8	11.1	1.1	100.0	81.1	17.8	1.1	100.0
4.	MIRPUR	64.4	35.6	-	100.0	66.7	33.3	-	100.0	42.2	57.8	-	100.0
5.	MOTIJHEEL	92.0	8.0	-	100.0	71.5	28.4	-	99.9	85.2	14.8	-	100.0
6.	GANDARIA	77.8	21.1	1.1	100.0	73.3	25.6	1.1	100.0	46.7	52.2	1.1	100.0
7.	NILKHET	93.6	6.4	-	100.0	93.6	6.4	-	100.0	94.7	5.3	-	100.0
8.	AZIMPUR	81.1	18.9	-	100.0	77.8	22.2	-	100.0	71.1	28.9	-	100.0
9.	KHILKHET	45.6	54.4	-	100.0	30.0	70.0	-	100.0	21.1	78.9	-	100.0
10.	JURAIN	48.9	51.1	-	100.0	41.1	58.9	-	100.0	16.7	83.3	-	100.0
11.	MOGHBAZAR	87.8	8.9	3.3	100.0	74.4	18.9	6.7	100.0	71.1	25.6	3.3	100.0
12.	HATKHOLA	94.4	5.6	-	100.0	91.1	8.9	-	100.0	77.8	22.2	-	100.0
13.	NAYAPALTAN	84.4	12.2	3.3	99.9	84.4	11.1	4.4	100.0	83.3	12.2	4.4	99.9
	TOTAL AVG.	79.0	20.3	0.7	100.0	73.7	25.3	1.0	100.0	65.5	33.7	0.8	100.0

Source: Milk Market Survey by Rapport Bangladesh Ltd., 1985-86

Exhibit 20

Percentage Distribution of Respondents by Whether or Anyone in the Family Consume Milk Products

Sl. No.	Name of areas	LIQUID MILK				BUTTER				ICE CREAM				CHOCOLATE MILK			
		Yes	No	Others	Total	Yes	No	Others	Total	Yes	No	Others	Total	Yes	No	Others	Total
1.	GULSHAN	94.4	5.6	-	100	90.0	10.0	-	100	86.7	13.3	-	100	60.0	40.0	-	100
2.	POSTA	77.8	22.2	-	100	54.4	45.6	-	100	56.7	43.3	-	100	50.0	50.0	-	100
3.	DHANMONDI	55.6	41.1	3.3	100	62.2	34.4	3.3	100	60.0	36.7	3.3	100	24.4	72.2	3.3	99.9
4.	MIRPUR	51.1	45.6	3.3	100	25.6	71.1	3.3	100	44.4	52.2	3.3	99.9	13.3	83.3	3.3	99.9
5.	MOTIJHEEL	82.9	17.0	-	99.9	64.8	35.2	-	100	31.8	68.2	-	100	10.2	89.8	-	100
6.	GANDARIA	80.0	18.9	1.1	100	24.4	74.4	1.1	99.9	31.1	67.8	1.1	100	4.4	94.4	1.1	99.9
7.	NILKHET	70.2	29.8	-	100	78.7	21.3	-	100	44.7	55.3	-	100	14.9	85.1	-	100
8.	AZIMPUR	85.6	14.4	-	100	78.9	21.1	-	100	74.4	25.6	-	100	57.8	44.4	-	100
9.	KHILKHET	91.1	8.9	-	100	4.4	95.6	-	100	7.8	92.2	-	100	-	100.0	-	100
10.	JURAIN	73.3	26.7	-	100	11.1	88.9	-	100	23.3	76.7	-	100	1.1	98.9	-	100
11.	MAGHBAZAR	66.7	32.2	1.1	100	77.8	16.7	5.5	100	78.9	16.7	4.4	100	48.9	44.4	6.7	100
12.	HATKHOLA	83.3	16.7	-	100	66.7	33.3	-	100	54.4	45.6	-	100	32.2	67.8	-	100
13.	NAYAPALTAN	74.4	22.2	3.3	100	55.6	36.6	7.8	100	66.7	27.8	5.6	100	27.8	64.4	7.8	100
	TOTAL AVG.	76.1	23.0	1.0	100	53.4	44.9	1.6	99.9	50.8	47.8	1.4	100	27.3	71.8	1.7	100

Source: Milk Market Survey by Rapport Bangladesh Ltd., 1985-86

Exhibit 21
Percentage Distribution of Respondents by ownership of Refrigerator Education and Income

Name of area	Refrigerator ownership		No. of years of schooling per person	Average annual income of family (TK)
	Owns	Does not own		
(1) (2)	(3)	(4)	(5)	(6)
1. GULSHAN	95.6	4.4	12.63	278135
2. POSTA	25.6	74.4	9.71	119622
3. DHANMONDI	47.8	52.2	8.80	55343
4. MIRPUR	10.0	90.0	6.77	26434
5. MOTIJHEEL	64.8	35.2	8.54	112898
6. GANDARIA	15.6	84.4	7.37	88569
7. NILKHET	76.6	23.4	10.90	53461
8. AZIMPUR	60.0	40.0	9.97	63748
9. KHILKHET	1.1	98.9	4.82	46280
10. JURAIN	5.5	94.4	4.64	74176
11. MEGHBAZAR	61.1	38.9	8.69	70449
12. HATKHOLA	46.7	53.3	9.46	115200
13. NAYAPALTAN	52.2	47.8	8.71	73734
TOTAL	43.3	56.7	8.59	90386

Source: Rapport Bangladesh Limited, Milk Marketing Survey for BMPCUL, 1985-86.

The BMPCUL had recently hired a private consultancy firm to undertake a milk marketing survey in Dhaka. The study pointed out that a significant portion of Dhaka's population was aware of Milk Vita products (see Exhibits 19). The consumption practices, however varied depending on the product and the residential area (see Exhibit 20). Location-wise profile based on the sample survey is shown in Exhibit 21 to predict demand patterns. A sizeable number of consumers also pointed out deficiencies in the Milk Vita ice cream (see Exhibit 22).

In spite of a growing market for ice cream and favourable awareness and image of the Milk Vita products, the sales of Milk Vita ice cream have been going down in the recent years after they had reached a peak of about 80,000 ltr in 1982-83 (see Table).

Exhibit 22
Percentage Distribution of Respondents by their Reasons of not Buying Milk Vita Ice Cream

Sl. No.	Name of area	Why you did not choose Milk Vita ice cream?									
		Deficient quality	Deficient flavour	Packing problems	High price	Less attractive	Unaware of product	Un-healthy	Others	N/R	Eligible cases
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	GULSHAN	7.3	30.9	10.9	12.7	3.6	5.4	10.2	18.2	-	99.6
2.	POSTA	20.0	-	-	15.0	5.0	30.0	30.0	-	-	100.0
3.	DHANMONDI	18.7	16.7	10.4	25.0	4.2	6.3	4.2	14.5	-	100.0
4.	MIRPUR	3.6	10.7	10.7	60.7	-	7.1	-	7.1	-	99.9
5.	MOTIJHEEL	5.1	15.2	10.2	1.7	-	3.4	64.4	-	-	100.0
6.	GANDARIA	5.8	7.2	5.8	8.7	-	15.9	13.0	43.5	-	99.9
7.	NILKHET	34.4	-	3.1	28.1	9.4	21.9	3.1	-	-	100.0
8.	AZIMPUR	1.3	2.6	-	9.1	-	-	81.8	5.2	-	100.0
9.	KHILKHET	34.4	-	3.1	28.1	9.4	21.9	3.1	-	-	100.0
10.	JURAIN	4.1	4.1	4.1	16.3	-	30.6	26.5	14.2	-	99.9
11.	MOGHBAZAR	29.0	20.9	14.5	12.9	4.8	4.8	9.7	3.2	-	99.8
12.	HATKHOLA	17.7	22.5	17.7	11.2	-	1.6	12.9	14.5	1.6	99.7
13.	NAYAPALTAN	3.4	32.2	28.6	30.5	-	-	-	-	5.1	99.8
	TOTAL AVG.	10.8	14.0	9.5	16.2	1.6	9.7	22.4	15.3	0.6	100.0

Note : a) Not applicable cased (663 out 1350) are not taken account while calculating the proportions.
b) The word 'unhealthy' needs to be defined. In the days immediately preceding the survey, there were newsitems in Dhaka dailies about the ice creams made by most of the city's small-scale ice cream makers being health hazards. The survey questionnaire had included an entry titled 'unhealthy' relating to the above question. It appears that a number of respondents were influenced by such publicity.

Source : Raport Bangladesh Limited, Milk Marketing Survey for BMPCUL 1985-86.

Table 2
Sale of Ice cream

Year	Sales ltrs
1977-78	30,000
1978-79	61,000
1979-80	63,000
1980-81	73,000
1981-82	79,000
1982-83	80,000
1983-84	71,000
1984-85	55,000
1985-86	63,000

Nobody was sure whether the reduction in sales was because of the increased prices, lower production, unknown increase in the competitive sales, or consumer rejection of the products. The General Manager and his executives had reason to be concerned. The Registar of Cooperatives was eager to know what strategy should be adopted by Milk Vita immediately.

TANAYAMMA COLD STORAGE

Tanayamma, a Japanese company, engaged in export of asparagus from Thailand to Japan constructed a cold storage at the premises given to it by the Hubkapong Agricultural Cooperative Society (HACS). It invested Baht 200,000 on cold storage, Baht 100,000 on a generator to ensure continuous power supply, and trained women workers in grading and packing asparagus for export. The capacity of the cold storage was two metric tonnes per day.

Tanayamma was a different type of a buyer from the several others with whom the HACS had entered into contract earlier for buying asparagus (see Exhibit 1 for details about the agreements made with others.) Since Tanayamma had invested in a cold storage, it wanted a long-term agreement and insisted on the supply of only the best quality of asparagus. Consumers of Japan preferred only those asparagus shoots that were not opened up. To preserve the quality and the taste, the harvested asparagus needed to be placed in cold storage within about four to five hours of its harvesting. The cold stored asparagus once it reached 14° to 15°C temperature was taken out for cleaning, sorting, cutting and packing. The packed asparagus was stored again in cold storage and later transported at the same

	Size	Diameter	No. of pieces per kg	Weight in gm of each
I.	*18 cm Long Asparagus*			
	Large	>8 cm	5-8	15-24
	Medium	6-8 cm	9-11	11-14
	Small	>6 cm	19-20	6.5-10
II.	*23.5 cm Long Asparagus*			
	Large	>8 cm	4-7	18-27
	Medium	6-8 cm	8-10	13-17
	Small	>6 cm	11-17	7-12

Exhibit - 1

Selling Agreements

Though the society was registered in 1971, the asparagus cultivation in the society area staretd only in 1975. For the first time, asparagus was introduced on an experimental basis on the plots of two farmers each allocating 10 rai. Their daily production averaged 30 kg and 50 kg respestively. The members harvested the produce and brought it to the society everyday. The society paid them Bahts 18 per kg without grading and sold the same to the private traders at Bahts 20 a kg. Some of the other farmers who observed this experiment showed interest and started growing asparagus. Fertility of the virgin land was still good. But the demand for the asparagus was not increasing at the same rate. Therefore in 1979, the traders suggested to grow white variety of asparagus which fetched a market price of Bahts 30 to 40 a kg as compared to Bahts 20 realized by the green variety. The society resold the asparagus at that time by adding Bahts 5 per kg for its expenses. So the members started supplying the white variety which was considered good for canning purposes. As the supply of white variety increased, the supply of green variety decreased resulting in the increase of its prices to Bahts 25 a kg. The produce was still not graded. Unfortunately, the privately owned canning factory in the neighbouring province stopped operating and the traders in 1981 advised the farmers again to grow the green variety. The Bangkok market was picking up and the traders also introduced grading practices. Only in 1984, the society came to know that the private traders were selling the asparagus to the Thai International Airways and it was the airliner which wanted only the graded quality of asparagus.

Right from the late seventies, the society had adopted a practice of signing agreements with individual traders for a specified period of transaction. The content of the agreement and trading party, however, kept on changing from one year to another for various reasons, but mostly emanating from the trading partners. One of the early agreements in 1977, for example, defined A grade asparagus as 7mm in diameter and B grade as ranging between 5 and 7mm in diameter, but preferred to purchase a mixed grade as long as the length of the asparagus did not exceed 11 inches. The price from August 1977 to May 1978 was fixed at Bahts 21 a kg. It was agreed that the quantity supplied for each delivery would not be more than 250 kg per day. The buyer will purchase the excess quantity only at the guaranteed price of Bahts 18 a kg. The seller (that is the society) would sell its produce to the buyer only except the quantity in excess of 250 kg, which the seller was free to sell the way he wanted.The seller would deliver the produce to the buyer every other day at the office of the society. The payment to the seller would be made before Friday every week. Should the buyer fail to make the payment as agreed, it would be considered as a violation of the agreement. At the time of signing of the agreement the buyer would pay to the seller an amount of Bahts 20,000 in cash and Bahts 50,000 by undated cheque as guarantee money. The period of agreement would begin from the day of signing of the agreement. If the seller wished to continue the purchase after the completion of the agreement, he should inform the seller at least one month in advance of the agreement end. If the seller violated the agreement the buyer would be free to take the guarantee money immediately.

Because of one reason or the other, the private traders were not able to maintain stable relationships. According to the society, some of them faced market-

ing problems and did not renew the contract. Other traders came to know about it and new contracts were signed. The terms and conditions also kept on changing. The next contract lasted till June 1979. While a large number of conditions remained unchanged, the prices were offered according to the grade of produce. It was agreed that the buyer would pay Bahts 23 for A grade asparagus (8mm), Bahts 18 for B grade (5 to 8mm), and Bahts 7 per kg for C grade (less than 5mm). No limit was fixed on the quantity to be bought. The delivery was to be ensured every day. Guarantee money was increased to Bahts 40,000 in cash and Bahts 50,000 by cheque.

Many such agreements followed with some variations. One of the contracts signed in 1982 changed the grading definitions again, and the buyer agreed to buy a mixed grade of A and B grades asparagus with a diameter of 6 to 7 mm at a price of Bahts 19 a kilo. The buyer would not buy more than 625 kg at this price. The excess quantity could be purchased only at Bahts 15 a kg. In any case, the buyer would be consulted before the seller invited other traders. The buyer also for the first time agreed to use only the society-owned transport on hire for his purpose. The guarantee money was increased further to Bahts 50,000 in cash and Bahts 1,00,000 by cheque.It was also agreed that in case the society violated the agreement, the seller would cancel it after giving at least three notices to the society.

The most frequent reason for violation of the contract was the inability of the traders to make agreed upon payment every week to the society, and their dues in such cases went on accumulating. The society , therefore, had to make payment to the farmers out of its accumulated profits. More often than not some of the traders were suffering the losses.

The most significant agreement between the society and the Japanese Company, Tanayamma (Thailand) Ltd., was signed on December 22, 1986. The company started in January 1987 and the cold storage was ready in a month's time The society's land adjacent to the society office was given on lease to the company free of charge fot the first three years and the charges were to be decided soon for the remaining years. The society wanted the cold storage to be handed over to the society after 15 years, but the company wanted that the transfer should be after 20 years. The negotiations were still on, but trade specific agreement had been finalized. According to this agreement,the buyer would buy from the seller the asparagus for a period of three years beginning December 22, 1986. The asparagus would be delivered by the seller at its office every day. The quantity of asparagus to be delivered during the first six months would be as agreed at the time of signing this agreement. But after six months, the seller must deliver not less than 500 kg per day unless under unforeseen circumstances as described in the agreement later on. The buyer would not open a new purchase centre for asparagus within 75 km radius unless the seller gave his consent to do so. The buyer would buy the green asparagus at a price and at a time as follows:

	Large Size (Bahts)	*Medium Size* (Bahts)
April to September	30	20
October to March	32	22

The seller would maintain the quality as stated in the agreement and by using

standard measurements acceptable to the buyer. On the date of the signing of this agreement, the buyer would give a letter of bank guarantee for an amount of Bahts 5,00,000 and start a cold storage. A representative of the buyer and a representative of the seller would witness the measurements. When the buyer had inspected and received the asparagus, he would issue a receipt to the seller immediately as document for getting money. The buyer would send the seller a signature of the person authorized to receive the goods. Changes in signature would be notified by the buyer to the seller in advance. The buyer would make the payment within seven days of receipt of the invoice but not later than 10 days. In case of any disagreement over the quality of goods, the representative of the Cooperative Promotion Department (CPD) would inspect the quality of goods and his decision would be binding on both the parties.

If for unforeseen reasons, the seller could not supply the goods to the buyer or if the buyer could not buy from the seller, both of them would confine themselves to the agreement by making the transaction good. In such a case, the seller would notify the buyer the delivery schedule in advance. Similarly, if the buyer refuses to accept the goods of acceptable quality, the contract would be cancelled immediately and the buyer would compensate the actual amount within 15 days. If the seller refused to sell to the buyer, the buyer would be free to cancel the agreement and seek compensation within 15 days.

The agreement also specified the acceptable quality of asparagus. It was stated that the cutting of the stem would be done at the purchasing point of the buyer. After cutting the stem into 24.5 cm or 18 cm, whatever appropriate, the stem should have a white portion at the bottom. The stem should be straight and top flowering portion should be tight and unopened. The delivery must be made at 10 A.M. After cutting,the grade-wise weight of the asparagus stem should be as follows:

Length/Grade	*A-Grade*	*B-Grade*
24.5 cm	14 to 29 gm	8 to 13 gm
18.0 cm	11 to 20 gm	6.5 to 10 gm

temperature. So Tanayamma's major interest in setting up a cold storage was to procure the best quality asparagus for export. The quality specifications were as follows:

The quality of asparagus depended on agro-climatic conditions and management practices followed by the farmers. Asparagus plants started giving shoots nine to twelve months after sowing. Once in one to three days one harvestable shoot sprouted. Its thickness, length and state of leaves (opened or tight) depended on the soil, irrigation, fertilizer used, seed and the management of the field (see for details Exhibit 2).

Exhibit 2

Asparagus Cultivation

Among vegetables the asparagus is considered to be a delicacy. It is a young shoot of the plant that finds its way to the dining table. If the shoot is not harvested for three days it becomes a plant with branches and leaves. It grows well in sandy soils in tropical climate. The first step in its cultivation is the preparation of seedling bed. It takes three months for the seedlings to be ready for the transplanting. While transplanting, the space between rows is 1 m and the distance between two plants is about 70 cm. Deep furrows are made and the seedlings are planted on the slopes of the furrows. Before transplanting, the farmers are recommended to use a good quantity of farmyard manure. It takes about four and a half to five months for harvestable sproutings to appear. Once the yield starts,depending on the vigour of the plant, one sprout can be obtained every one to three days. Overnight the length of sprout increases by 5 to 8 cm.

Asparagus needs irrigation on every alternate day. Once in a month chemical fertilizers, mostly mixed (NPK), are applied. Two popular mixtures are 15:15:15 and 20:20:20. In the area visited, farmers did not use any pesticides. Weeding is done frequently to ensure better yield. The land being sandy, most of the operations are carried out by spade.

Generally one crop cycle is continued up to three to five years. As stated earlier, three months at seedling state, four and a half to six months for rearing, and 28 to 40 months yielding sprouts. In the crop rotation, after a crop of asparagus nitrogen fixing crops like soybean are cultivated. Factors like length, diameter and state of the leaves in the sprout determine the quality. Long thick and unopened leaves fetch the best price. The asparagus sprout exposed to sun is green and is not suitable for canning purposes. To make the asparagus suitable for canning, earth is heaped around the plant so that the sprout is not exposed to sun and its colour is white. Since additional labour is involved, farmers cultivate it only when higher prices are offered. Since the same variety is used for fresh as well as processing use, the supply can be varied at short notice. Like other vegetables, the shelf-life of asparagus in the open is not more than two days. But if kept at 18° to 22° C it can be preserved for three months.

To have a better understanding of the cost of production and returns, data from one farmer were collected. Paichin Klongklaw, in his late thirties, was given five rai of unirrigated land, as a second generation allottee. In 200 sq m area he had built a house (mostly made of bamboo structure with tin roof and with a partition inside seperating drawing-cum-bedroom from kitchen and store), a pen house for pigs, a small pond to store water, and some open space to relax. He had cultivated asparagus in three rai and he was having a seedling bed ready for transplantation in the remaining 1.75 rai. His wife helped him in farm operations in addition to looking after their two children. They used a motor cycle to deliver the produce to the cooperative society. They owned a refrigerator, television and a music system operated on storage battery.

Paichin used to cultivate asparagus in his father's field, and so when he was given this land he decided to cultivate asparagus. He spent two days of labour to prepare the seed bed. One improved variety and another local variety of seed were generally available in the market. The improved variety was supposed to give

more yield of A quality (above 50 per cent), whereas the traditional variety gave only 30 per cent A quality. The new variety seed cost Bahts 350 per lb and the traditional Bahts 250. He used 1.5 lbs of traditional seed for planting 3 rai. He also used 2 kg of chemical fertilizers and plenty of manure in the seed-bed.

Once the seedlings were ready, he spent three days of his labour in preparing the land for sowing. He used farmyard manure in most parts of his sandy soil, leaving a little patch without it to understand the impact of farmyard manure on yield. Transplantation was completed within two days. He had planted 200 plants in 48 rows, aggregating a total of 9,600 plants. The growth in the three rai looked more or less uniform except in the patch not treated with farmyard manure and in the other patch where the soil was not good.

His cost of cultivation for the period up to May for the three rai under asparagus was as follows:

I.	*Seed-Bed*		
	Labour	2 days (family)	
	Seed 1 1/2 lb B 375	(@250 Bahts per lb)	
	Fertilizer 2g B 9.60	(@ 4.8 Bahts per kg)	
II.	*Cultivation Cost*		
	Land Preparation	3 days (family labour)	
	Transplanting	2 days (family labour)	
	Fertilizer Application :		
	January 200 g (N:P:K 20:20:20)	Bahts 920	(@ 4.6 Bahts per kg)
	March 200 g (NPK 15:15:15)	Bahts 920	(@ 4.6 Bahts per kg)
	May 200 g (NPK 15:15:15)	Bahts 920	(@ 4.6 Bahts per kg)
	Irrigation expenses	Bahts 300	
III.	*Marketing Cost*		
	i) Harvesting	2 hours daily	(family)
	ii) Preparation for delivery	1.5 hours daily	(family)
	iii) Delivering at society	1 hour daily	(family)
	iv) Transport	Bahts 2 per day	(Distance to society farm 2 km. Uses motor cycle that gives per ltr. 20 km. Per ltr. cost of petrol is Bahts 10)

According to Paichin, irrigation was his major problem. As stated earlier, the project assigned him 5 rai of irrigated and 15 rai of unirrigated land. In the unirrigated land he had planted eucalyptus. The source of water for his irrigated land was the second reservoir. For most part of the year water was available in the reservoir. Farmers had to incur no expenditure in using this water. Whenever there was no water in the reservoir the farmers attatched to this

reservoir contributed Bahts 300 per member for lifting and supplying water from the main canal to the storage on the hilltop from where the water flowed through gravity to their reservoir. The chairman of the group looked after all tasks related to water distribution. In summer months water shortage was reported to be acute.

Paichin received Bahts 2000 loan from the cooperative society when he first started cultivation of asparagus. Subsequently he received another Bahts 7,400 from the society as a loan which he used for application of fertilizers and household expenses. The society charged him 16 per cent interest on the loan. Payment for the asparagus was done on each Friday. He did not face any problem in marketing his asparagus. He was under contract to deliver his entire production to the society at the prices offered by it. On several occasions the society had allowed him to sell C grade asparagus to local traders who offerred one Baht more than what the society paid. The daily grade-wise quality delivered to the society from January 20, 1987 to the end of May along with the price paid by the society, are shown in the table 1.

The Japanese company offered a good price to get the best quality of asparagus. The HACS never had such an attractive agreement which was valid for three years, but at the same time the contract specified that six months after the setting up of the cold storage, that is from June 22, 1987 the society would be obliged to supply a minimum of 500 kg of A and B asparagus per day. On May 4, 1978 the total quantity of asparagus received by the society was 205.7 kg comprising 78.2 kg of A grade, 58 kg of B grade and 69.5 kg of C grade. The society's performance over the years in asparagus is shown in Exhibit 3. The responsibility to supply asparagus according to the contract rested with the HACS but its working was guided by the Cooperative Promotion Department (see Exhibit 4), and more importantly, by the Hubkapong Project (see Exhibit 5). To bring additional area under the harvestable crop needed nine to twelve months. One wondered as to what were the alternatives that were available to augment supply? What kind of information one should collect to prepare an action plan to meet the commitment? What should be the organizational linkages to achieve the immediate objectives?

Table 1
Grade-wise Daily Sales of Asparagus by Paichin

Date	January - 1987				February - 1987				March - 1987			
	A	B (in kg)	C	Total Price	A	B (in kg)	C	Total Price	A	B (in kg)	C	Total price
1.					1.2	1.3	2.7	80.70	4.0	2.5	2.5	197.50
2.					1.2	1.2	2.4	76.80	2.4	1.2	2.2	112.80
3.					1.5	0.9	1.9	76.80	3.4	1.8	3.5	164.20
4.					1.3	1.0	1.5	70.30	4.7	3.4	6.3	254.90
5.					1.4	1.3	3.4	91.10	3.4	3.0	5.3	200.20
6.					1.5	1.0	3.2	86.70	4.2	2.8	5.9	224.40
7.					1.4	1.0	0.9	69.80	4.1	2.7	5.0	216.90
8.					1.4	1.5	3.0	92.90	3.8	3.0	5.8	214.60
9.					2.1	1.8	4.4	138.60	3.4	2.4	5.7	190.00
10.					2.3	2.4	4.5	148.70	3.3	2.5	5.0	184.80
11.					3.5	1.7	3.7	166.40	3.4	2.3	5.8	188.50
12.					2.0	2.0	3.8	126.80	2.9	2.0	5.4	164.30
13.					1.0	1.0	4.0	76.00	3.0	2.8	4.3	177.60
14.					2.2	2.3	4.0	140.50	2.7	2.0	5.5	158.70
15.					3.8	2.2	4.2	189.20	3.7	2.0	2.8	179.50
16.					3.3	2.0	4.0	168.30	3.5	2.3	4.5*	156.80

(Contd.)

Table 1 Contd.

Date	January-1987				February-1987				March-1987			
	A	B (in kg)	C	Total Price	A	B (in kg)	C	Total Price	A	B (in kg)	C	Total price
17.					3.7	2.2	3.5	181.90	3.8	1.8	3.4 *	155.60
18.					3.4	2.2	4.5	178.60	3.2	2.0	4.2 *	141.20
19.					5.2	2.2	3.4	227.80	2.7	2.0	3.8 *	125.70
20.	.2	.3	1.8	26.00	3.5	2.3	4.0	180.80	4.2	2.7	4.5 *	186.90
21.	.2	.4	.8	20.20	4.2	2.8	4.4	215.40	3.8	2.7	4.2 *	174.50
22.	.3	.3	.7	21.30	2.5	2.8	5.0	228.50	4.0	2.5	4.9 *	176.50
23.	-	.5	.8	14.80	4.5	2.0	4.5	208.50	4.0	2.5	2.9 *	176.50
24.	.5	.4	.9	31.90	4.8	2.5	5.4	233.70	3.5	2.5	4.5 *	158.90
25.	.3	.5	.1	27.10	3.2	2.0	4.2	166.40	4.4	2.9	4.5 *	196.30
26.	.9	.5	1.3	51.10	4.2	3.2	5.0	227.50	3.3	2.0	4.5 *	144.30
27.	.7	.8	1.3	49.70	4.0	3.7	4.0	204.70	3.8	2.4	2.9 *	168.40
28.	-	-	-	-	4.0	2.2	4.2	199.60	3.2	0.5	-	109.70
29.	1.3	1.4	3.0	94.10					2.9	2.3	2.4 *	138.20
30.	.9	.9	1.7	61.50					3.7	3	3.4 *	114.70
31.	1.2	1.3	2.4	84.80					3.5	2.0	4.4 *	150.50

Date	April - 1987				May - 1987			
	A	B	C	Total price	A	B	C	Total price
1.	3.5	2.2	3.7*	154.70	3.9	2.8	-	198.10
2.	3.4	2.0	2.9*	147.40	2.9	2.7	6.0 *	160.90
3.	3.3	1.9	2.8*	142.20	2.5	1.8	4.0 *	127.80
4.	2.5	1.7	2.7*	113.20	3.5	2.3	4.5 *	173.10
5.	2.3	1.5	2.7*	102.80	2.4	1.7	4.8 *	121.40
6.	1.8	1.2	2.0*	81.00	1.5	1.8	5.0 *	74.50
7.	1.8	1.5	2.4*	87.30	3.0	2.5	6.8 *	160.00
8.	2.3	1.5	2.0*	102.80	3.0	2.0	4.5 *	171.00
9.	2.5	1.4	2.0*	106.90	2.4	2.0	6.5 *	128.00
10.	2.3	1.5	2.4*	102.80	-	-	-	-
11.	2.4	1.5	2.3*	105.90	2.2	1.7	5.0 *	114.40
12.	2.3	1.5	2.8*	102.80	1.8	1.4	4.0 *	93.80
13.	3.0	2.0	3.0*	135.00	1.7	1.0	3.9 *	71.00
14.	2.7	1.8	2.8*	121.50	1.5	1.5	3.7 *	75.00
15.	2.0	2.0	3.2*	104.00	0.7	0.7	3.0 *	35.00
16.	2.9	1.8	2.3*	127.70	0.5	0.7	2.4 *	29.00
17.	2.7	2.5	-	136.20	1.2	0.9	3.0 *	54.00
18.	3.0	2.7	3.8*	149.70	0.8	0.7	3.0 *	38.00
19.	-	-	3.8*	-	0.9	1.0	3.0 *	38.00
20.	3.0	-	4.0*	144.60	1.0	0.5	3.8 *	40.00
21.	2.7	2.3	4.0*	145.10	1.0	0.8	3.0 *	46.00
22.	3.0	1.9	3.5*	146.80	0.8	0.5	3.0 *	34.00

(Contd.)

Date	April - 1987				May - 1987			
	A	B	C	Total price	A	B	C	Total price
23.	2.4	2.3	3.8*	134.60	0.7	0.7	2.0 *	35.00
24.	2.7	2.3	3.5*	145.10	-	-	-	-
25.	2.7	2.2	2.9*	142.90	0.5	0.7	3.0*	31.90
26.	1.7	1.5	4.7*	92.50	-	-	-	-
27.	1.9	1.9	3.7*	108.30	-	-	-	-
28.	2.0	1.7	4.5*	107.70	0.2	0.5	1.5 *	17.60
29.	2.2	2.0	4.8*	121.00	-	-	-	-
30.	2.7	2.8	5.5*	156.10	-	-	-	-

Notes for Table 1:

1. Dates on which prices were changed

	Asparagus grade-wise prices in Bahts per kg		
	A	B	C
a) January 20	37	20	7
b) January 21	37	20	6
c) February 1	31	21	6
d) March 10	35	22	6
e) May 12	30	20	4
f) May 24	33	22	4

2. White variety supplied on March 2, 1987 realized prices as follows:-
   A grade - 1.5 kg @ Bahts 44 a kg
   B grade - 0.5 kg @ Bahts 30 a kg.
3. * Indicates sold to private traders and price realized not included in the amount.

Source: From the record maintained by the farmer.

Exhibit 3
Hubkapong Agricultural Cooperative Society

Hubkapong Agricultural Cooperative Society was registered on August 12, 1971 with 82 families of farmers growing vegetables and 46 families of farmers from Prachuab Kirichan Province assigned land to settle down at Hubkapong village. The society's growth between 1972 and 1985 was as follows:

	1972	1985
Membership (families)	135	324
Operating fund (Bahts)	253647	6061998
Share capital (Bahts)	17500	546450
Reserve fund (Bahts)	60662	850022
Net surplus (Bahts)	3376	464740

The society was engaged in several activities like, provision of short and medium term loan to members; supply of inputs like seeds, fertilizers, pesticides and consumer goods; marketing of asparagus, sugar cane, rosellin and handicraft products; processing of products like rosellin; and provision of customer services like tractor hire and water supply.

The annual meeting of the society for the year 1986 was attended by 223 members in addition to several officials from the development departments. In other words, the society could generate sufficient interest among departments to help the society. The annual balance sheet, the plan of action for 1986-87 along with previous years plan and achievements are shown in the tables below. Particulars relating to asparagus are given in greater detail for years from 1979 to 1986. The performance analysis relating to per kg price paid to farmers, price realized by society, gross profit, etc. are also provided. Grade-wise month-wise asparagus purchases by the society in 1986 are given for October, 1986. The detail grade-wise purchase of asparagus is also shown. The area under asparagus was not readily available with the society.

Asparagus marketing was an important activity of the society. With the signing of contract with the Japanese firm, this activity has gained importance in the activity-mix of the society. Further growth and expansion of asparagus business would largely depend on how this activity is managed by the society.

Annual Balance Sheet of Hubkapong Agricultural Cooperative Society

ASSETS

	June 30, 1986		June 30, 1986	
I.CURRENT ASSETS				
A. Cash deposits		2500598		142486
B. Receivables		4446200		4526611
A/c receivable	600888		601544	
Receivable for fertilizer	1149602		1291508	

Balance Sheet Contd.

	Loan with members	3109523		2986525	
	Others	83849		110586	
	Sub total	8943862		4990163	
	Less bad debt	497662		463552	
C.	Net interest receivable		997977		950768
	Interest Receivable	1116597		1051310	
	Less bad debt	118620		100542	
D.	Inventory		264327		200397
	Total inventory	336743		210107	
	Less losses	72416		9710	
E.	Raw material		52599		40489
F.	Other current assets		149591		2876
	Total current assets I (A to F)		8411292		5863630
II	FIXED ASSETS				
	Building	70821		26935	
	Machine	6		6	
	Transportation	159865		103576	
	Office equipment	58417		51351	
	Total current assets II		289109		181868
III	OTHER ASSETS		16500		16500
	GRAND TOTAL ASSETS		8716901		6061998

LIABILITIES

			30 June 1986	30 June 1985
I.	CURRENT LIABILITIES			
	A. Bank overt draft loan		5922239	2945395
	B. A/c payable		408691	325612
	C. A/c payable suppliers		67784	98229
	D. Current deposits		107005	95808
	E. Contributions for membership		5000	8462
	F. Other liabilities		157398	160774
	G. Mis. liabilities		89303	60795
	Total current liabilities		6757420	3695075
II	NON-CURRENT LIABILITIES			
	A. Share @ 50 B for 11173 Share		558650	546450
	B. Reserve fund		856426	850022
	Accumulated	1058736		
	Less loss	202310		

C. Other funds	544405	505711
D. Profit		464740
Total non-current liabilities	1959481	2366923
Total liabilities	8716901	6061998

Plan of Activities of Hubkapong Agricultural Cooperative Society for 1987-88 with Performance of Previous Year

Items of Plan	Plan for 1987	Plan and Achievement	
		Plan 1986-87	Achievement 1986-87
Membership enrolment	10	10	33
Conducting group meetings	24	50	9
Credit disposal (in Bahts)	2273	51600	682674
Deposit mobilization:			
Membership savings (Bahts)	274000	307000	678770
Share capital (Bahts)	114000	28000	36150
Recovery of loan (Bahts)	165400	1500000	962376
Supply of inputs and consumer goods (Bahts)	800000	649000	412556
Collecting member produce (Bahts)	10000000	12000000	9975476
Processing business (Bahts)	2000000	2000000	1582766
Custom service (Bahts)	500000	500000	349131
Promote member	2000	2000	1297

Performance of Hubkapong Agricultural Cooperative Society in Asparagus Business 1979 to 1986

Year	No. of members supplying asparagus	Quantity supplied in kg	Purchase value in Bahts	Selling value Bahts
1979-80	87	96079	2690239	2822312
1980-81	90	89724	2422572	2690914
1981-82	70	60128	1563346	1705047
1982-83	96	98350	2753818	3099304
1983-84	114	152445	4268762	5548040
1984-85	95	104965	2939043	3689636
1985-86	57	57195	1601460	1910072

Performance Analysis of Asparagus Business of Hubkapong Cooperative Society

Year	Gross profit in Trade (Bahts)	Per kg average profit (Bahts)	Per kg price paid to farmers (Bahts)	Per kg price realized (Bahts)	Per member annual supply (Bahts)	Per member quantity supplied kg.	Average supplied by member per day
1979-80	132073	1.37	28	29.37	30922	1104	3.43
1980-81	268343	2.99	27	29.99	26917	996	2.76
1981-82	141702	2.35	26	28.35	22333	858	2.35
1982-83	345485	3.51	28	31.51	28685	1024	2.80
1983-84	1279278	8.39	28	36.39	37445	1337	3.66
1984-85	750594	7.15	28	35.15	30937	1104	3.02
1985-86	308612	5.39	28	33.39	28095	1103	2.75

Month-wise Quantity of Asparagus Purchased by Society in 1986

(in kg)

Month	Quality of Asparagus			
	A Grade	B Grade	C Grade	Total
January	2046	577	403	3026
February	2004	795	700	3499
March	1860	1023	1085	3968
April	1500	1050	1350	3900
May	2015	1023	1333	4371
June	1764	1050	900	3714
July	2241	1302	1538	5081
August	3339	1280	1048	5667
September	3901	2259	2389	8549
October	2878	1600	1841	6319
November	1132 *	161	99	1392
December	1170**	480	319	1969
Total	25850	12600	13005	51445
			Total for 1986	57195

Source: Compiled from office records

* Figures refer to November 1 to 17 only as other figures were not readily available.

** Figures refer to December 15 to 31 only as other figures were not readily available.

Datewise and Grade-wise Purchase of Asparagus in October, 1986

Date	Grade A	Grade B	Grade C	Total
1.	128	84	106	318
2.	149	95	126	370
3.	126	95	113	334
4.	140	98	115	353
5.	148	101	126	375
6.	137	89	119	345
7.	127	84	118	329
8.	116	86	103	305
9.	109	85	112	306
10.	110	77	97	284
11.	82	61	66	209
12.	90	63	82	235
13.	86	51	63	200
14.	93	57	73	223
15.	79	42	55	176
16.	77	31	31	139
17.	81	41	46	168
18.	71	41	44	156
19.	78	33	42	153
20.	85	37	30	152
21.	72	30	24	126
22.	70	36	26	132
23.	88	36	26	150
24.	64	23	15	102
25.	97	24	16	137
26.	67	21	17	105
27.	36	26	18	80
28.	94	15	9	118
29.	107	23	13	143
30.	71	15	10	96
Total	2878	1600	1841	6319

Exhibit 4
Phetchaburi Provincial Cooperative Office

The cooperative Promotion Department (CPD) was established in 1972 under the ministry of agriculture and cooperative for central and provincial administration. The provincial cooperative office is responsible for the organization, supervision and promotion of all cooperatives within a province. It also undertakes other works as ordered by the cooperative promotion department. At the district level, a district cooperative office performs functions similar to the provincial office but the area of operation is limited to a district.

Phetchaburi provincial cooperative office consisted of seven district cooperative offices having 43 officers employed in the province.

Cooperative works in Phetchaburi

The first cooperative in Phetchaburi, the Na-Koh Credit Cooperative, was registered in 1934. Since then many credit societies were organized at the village level. Besides these credit cooperatives, which mainly extended loans to the members and mobilized their savings other types of cooperatives such as land improvement cooperative, multi-purpose cooperative, thrift and credit cooperative, were also introduced.

After the promulgation of the Cooperative Society Act B.E. 2511 in 1968, the small credit cooperatives at the village level were amalgamated into one cooperative at the district level. This new type of cooperative performed multi-purpose functions like giving loans, selling agricultural inputs and collecting agricultural produce. These cooperatives were called agricultural cooperatives.

At present there were 26 primary cooperatives and one secondary cooperative scattered in different districts of the province having a total membership of more than 17,000 house-holds. The details of financial condition and their business activities are given in Exhibit 4.1 as the auditing of all cooperatives is done by the inspectors from the regional cooperative auditing office every month, every six months, and once a year. According to the Cooperative Society Act B.E. 2511, all cooperatives after auditing have to call a general body meeting within 150 days after the end of their financial year to report the result of business management and financial condition.

Besides the provincial cooperative office, there were four other offices in Phetchaburi province to assist and supervise cooperative works in different tasks. These were:

1) Land settlement cooperative units (two units).
2) Cooperative demonstration centres (four centres).
3) Engineering centre (one centre).
4) Regional training centre (one centre).

The area of operation of the last two centres covered eight provinces in the central and the southern regions.

The Phetchaburi Cooperative Demonstration Centre had functional sections like administration, budget, accounting, cooperative promotion, field demonstration, irrigation, land improvement, social welfare, electricity and water supply, purchase and maintenance of equipment and public relations. These functions and the centre's links with the ministry are shown in Chart 1. Three graduates were working in the cooperative promotion section as new land was likely to come under the extension project. At the time of this case writing, no one was working in the irrigation section, but the field demonstration section which had two demonstrators and 25 casual labourers were looking after the irrigation function. Other functions like social welfare, security, electricity and water supply were under the chief officer of the centre. The organizational structure of the asparagus society is shown in Chart 2.

Chart 1 : Organizational Set-up of the Phetchaburi Coop Demonstration Centre

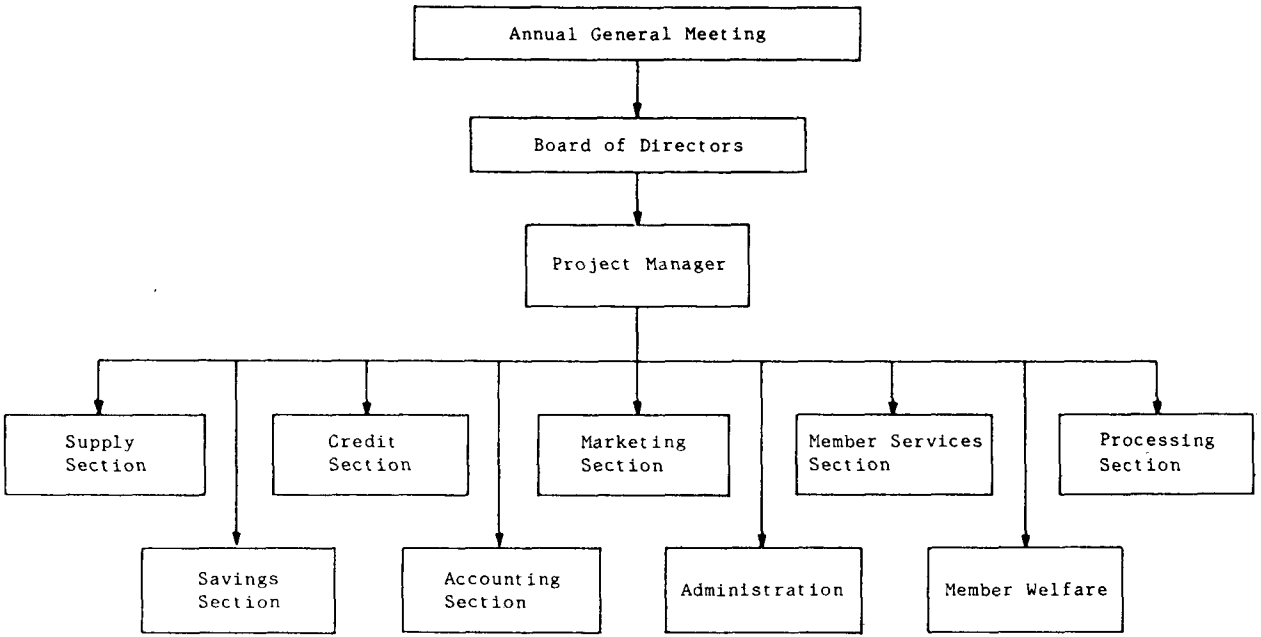


Chart 2 : Organizational Structure of the Asparagus Society.

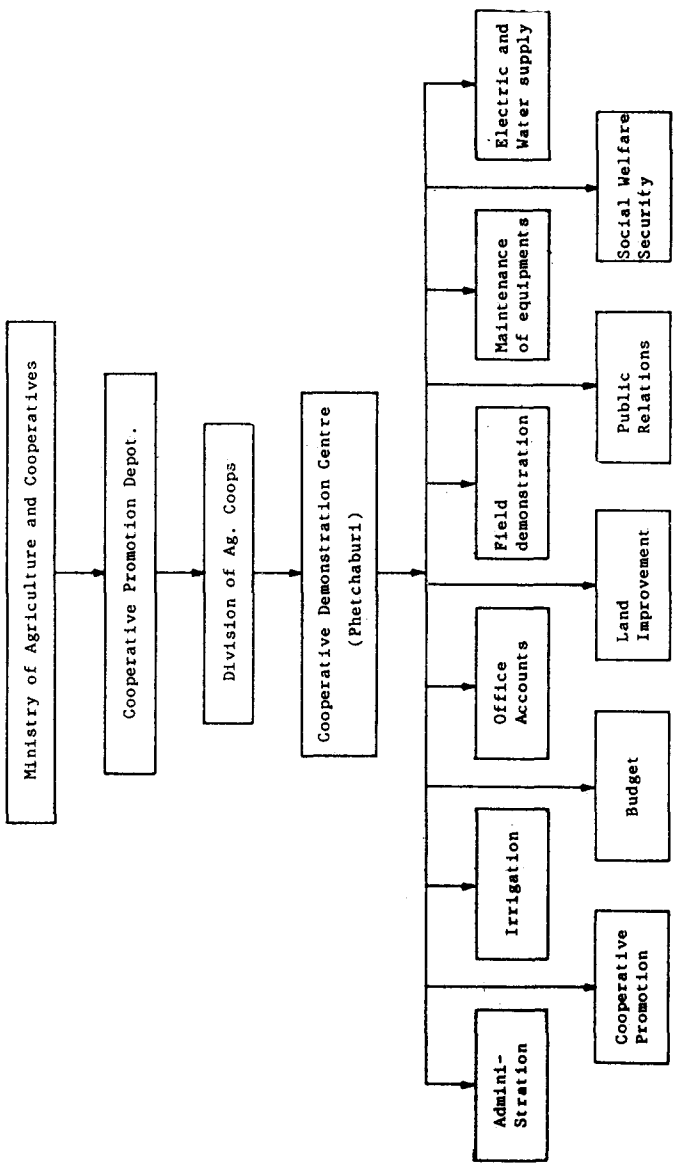


Exhibit 4.1

1. *General Agricultural Cooperatives*

	Households
Number of cooperatives	11
Members	10,730
Member groups	228
	Bahts in millions
Share capital	19.16
Reserve funds	15.17
Other funds	4.71
Gross profit	1.70
Operating fund	129.58
Member's deposits	18.86
Business activities during the year	
-- lending loans to members	33.28
-- loan repayment from members	40.74
-- selling agricultural inputs and consumer good	11.69
-- collecting agricultural produce for sale	31.62

2. *Special type of Agricultural Cooperatives*
(Swine - raisers and Dairy cooperatives)

	Households
Number of cooperative	2
Members	480
	Bahts in millions
Share capital	.14
Reserve funds	.56
Other funds	.17
Gross profits	.34
Operating funds	1.66
Selling business	
-- selling swine meat	49.36
-- selling dairy feed and powdered whole milk	3.12

3. *Thrift and Credit Union Cooperatives*

	Households
Number of cooperatives	9
Members	6,574
	Bahts in millions
Share capital	99.11
Reserve funds	6.71
Other funds	1.80

(Contd.)

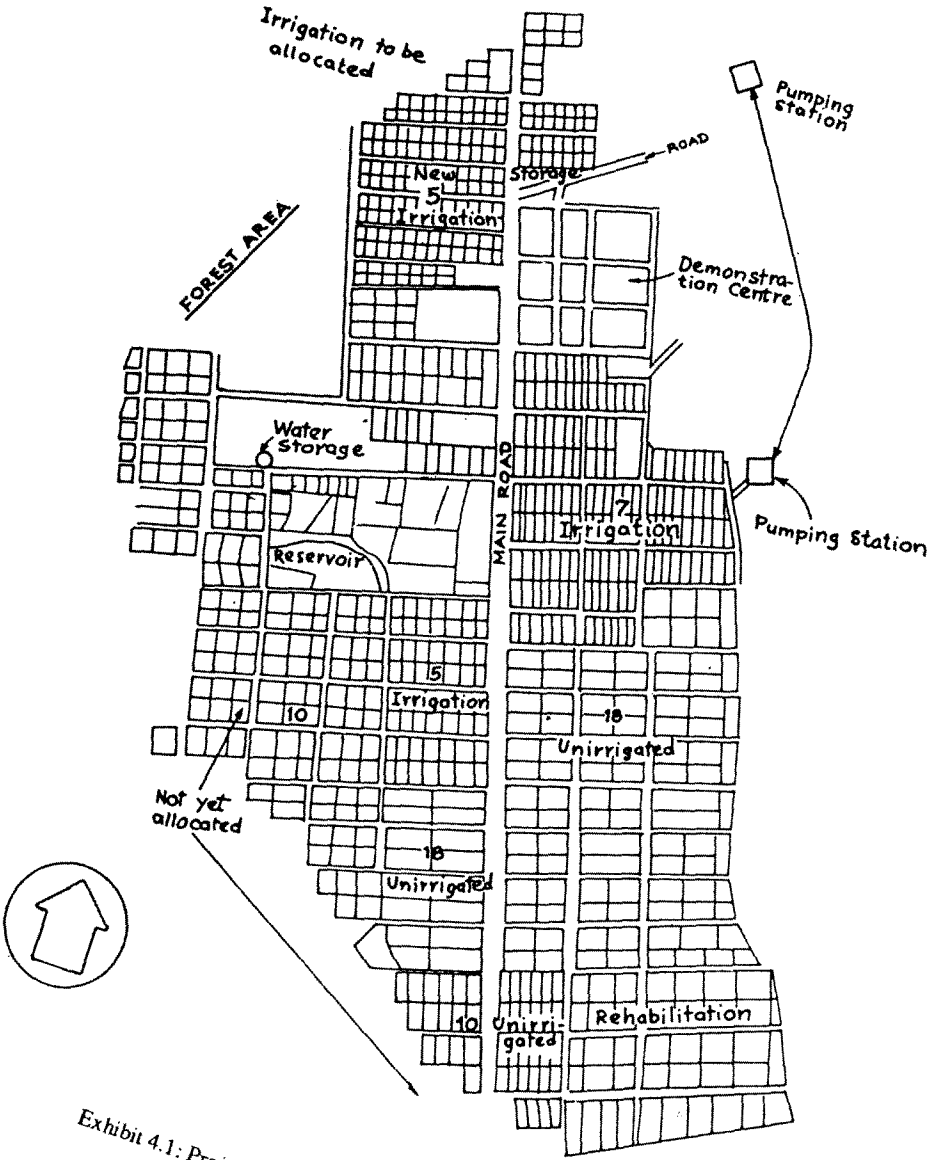


Exhibit 4.1: Project Area layout

Gross profits	14.20
Operating funds	127.27
Lending loans to members	
-Emergency loans	36.74
(23,848 contracts)	
-Common loans	96.46
(2,537 contracts)	
Cooperative deposits	6.85

4. *Cooperative Stores*

	Households
Number of cooperatives	4
Members	822
	Bahts in millions
Share capital	.36
Reserve funds	.53
Other funds	.16
Gross profits	.52
Operating funds	2.09
Cooperative deposits	.34
Selling consumer goods	3.93

5. *Phetchaburi Agricultural Cooperative Federation Ltd.*

	Primary cooperatives
Members	11
	Bahts in millions
Share capital	.16
Operating funds	10.61
Gross profits	.23
Selling goods	
(white rice, broken rice and rice bran)	4.40

Exhibit 5

A background note on Hubkapong cooperative village prepared by the technical division of the cooperative promotion department.

Location

Hubkapong village is situated in the area between Tambon Khao Yai and Tambon Cha-am, about 40, km from the town of Petchaburi and 34 Km from Hua-Hin.

Weather and Soil Conditions

Hubkapong is about 6 km from the seaside. Its area covers approximately 2,000 hectares with the average width of 2.8 km and 7 km in length. The northern and western parts of the area are surrounded with mountains. Habkapong is approximately 40 m above sea level. The texture of soil is sandy and the PH levels of soil vary from 5.5 to 6.5. The average annual rainfall is about 700 mm, but the fall

of rain is fluctuated considerably causing a long period of drought. The weather is dry and windy, the average humidity is 62 to 80 per cent, the highest temperature is 35.1 C. while the lowest is 16.4 C. and a period of cold weather lasts about two to three weeks.

Historical Background of the First Cooperative Demonstration Centre of Hubkapong

It was in 1964 while His Majesty the King paid a visit to his subjects in the districts nearby Hua-Hin. He had found that a group of 82 families of vegetable growers were troubled with shortage of funds to do their farming. His Majesty accepted them under his patronage and provided an amount of Bahts 300,000 from his personal funds as a loan to these farmers towards their production needs but none of these farmers was able to pay back the debt. It appeared that they were landless farmers and got the lease hold from the Public Welfare Department at about 0.16 to 0.32 hectares per family, which was not sufficient to earn their living.

Being concerned with his subject's hardship, His Majesty the King then assigned His Excellency M.L. Dej Snithwongs who was the president of National Economic Development Executive Commission and the Privy Councillor at that time to set up a project by allotting a plot of land in the area of Phetchaburi and Prachuab Kirikhan Province for allocation to the landless farmers by using cooperative practice.

This project interested the government of Israel which volunteered to give assistance in the aspect of agricultural development. The Thai - Israel Rural Development Project was approved by the government in August 1966, and the area of Hubkapong was selected to be the location of the demonstration centre of the project.

With the cooperation from the authorities concerned, the survey was made to prepare a soil map and soil analysis reports as well as the survey of water sources. The Israeli government gave assistance in land development, irrigation system arrangement and agricultural techniques by providing experts, equipment and fellowships for training in Israel. The Thai - Israel Rural Development Project started in 1966 and ended in 1971.

Objectives of the Project

The objectives of the project were:

1) To establish the agricultural demonstration and experimentation centre for study and research to promote cultivation and animal raising in the low fertility land and in areas of limited water sources as well as to demonstrate the techniques of farming.
2) To experiment land reform by developing barren land allocating it to landless farmers to make use of the land but ownership of land not to be given.
3) To set up a model village by grouping farmers to organize agricultural cooperatives using cooperative methods in production marketing.
4) To serve as the centre for promotion and dissemination of agricultural techniques to farmers, students and the public.

In 1966, clearance of 80 hectares was completed to set up the agricultural demonstration centre by dividing land into three plots each of 20 hectares for the purpose of experimentation on:

1) Sprinkle irrigation system.
2) Surface irrigation system.
3) Non-irrigation system.

After the land had been developed, the vegetable growers comprising 82 families from the nearby district of Cha-am and 46 families of the former inhabitants of this area were firstly allocated land and settled in this project area. Each family was given 4 hectares of land; while 1.12 hectares of home plot was partly irrigated the remaining 2.88 hectares of farm plot depended solely on rain water. The project provided an amount of Bahts 6,000 as a loan fund to each family for the expenses of house construction and agricultural supply.

These migrated farmers united themselves to form a village with government assistance to meet the target of being a model village. In addition, they were familiarized with the principles and practices of cooperative working. When they realized the benefits accruing from being cooperative members, they applied to organize a cooperative. It was registered as the Hubkapong Agricultural Cooperative in 1971 and has been regarded as the cooperative model village since then.

Division of Land:

As farmers in Hubkapong jointly organized the agricultural cooperative, the ownership of land in the project area which covers about 2,008 hectares was given to the cooperative by His Majesty the King. Therefore, the land in which members of the cooperative hold for earning their living shall not be sold or transferred but the right to utilize the land could be exercised by their successors of the heirs.

The project area which has been irrigated and allocated to farmers is approximately 1,483.36 hectares. The area of 1,600 hectares which is adjacent to the mountains was allocated to the forestry department for forestry replanting programmes initiated by His Majesty the King to develop the water resources. In addition, reservoirs were constructed in this project by the Royal Irrigation Department. The remaining land is the dwelling area comprising a school, temple, central office, office of the cooperative, cooperative store and health centre. There are roads which help facilitate communication and transportation of members' farm products.

Organization of Cooperative Village:

At present, Hubkapong cooperative village has the characteristic of a complete model cooperative village which has been developed both in terms of the economic and social aspects. Village houses are commonly arranged in compact groupings with the provision of roads and water supply for both consumption and farming in the 1.12 hectares home plots. The advantages of this layout are that the cost of infrastructure is lower and the arrangements for welfare and security services are more convenient.

Water Resources and Irrigation System:

The survey indicated that water from the artisian well is limited and not sufficient for agricultural use. At present there are two electric powered pumping stations in the project area to pump water from the Khuen-petch irrigation canal to be stored in the two water tanks of 1,000 cubic meters each which are placed on a higher level to supply water to the village covering about 320 hectares.

As the two pumping stations cannot supply sufficient water for all members houses at the same time, members have to take turns in consuming water; each family receives water for four hours every other day. Members have to pay for the

water cost at Bahts 400 per month per family.

Occupational Promotion:

The first cooperative demonstration centre of Hubkapong has made an experimentation plot to promote the cultivation of various kinds of crops, taking into account the suitability to the condition of land as well as market potentiality for the crops.

The main crops growing in the village are asparagus, maize, red roselle, sugar cane and pineapple. Besides, promotion of handicrafts as a supplementary occupation of the members has been initiated by Her Majesty the Queen with the objective to increase the member's income. Bamboo tree and plants such as *sisal* have been encouraged to be grown in poor soils to use them as raw materials for making handicraft products like basketry. In addition, the processing of pineapple and stored gooseberry into marketing as well as making juices is also promoted.

The Operation of Hubkapong Agricultural Cooperative Ltd.

After the registration of the Hubkapong Agricultural Cooperative Ltd., on August 12,1971, the cooperative admitted the 82 families of vegetable growing farmers and 46 families of farmers from Prachuab Kirikhan Province to settle down in the Hubkapong village. Each family was given 4 hectares; of which 1.12 hectares was the home plot and 2.88 hectares was the farm plot. Some kinds of vegetables, asparagus and red roselle were mainly grown in the area of home plots while sugar cane and pineapple were grown in the farm plot.

The operational results of the cooperative in the commencing year 1972 as compared with those in 1985 are as follows:

Year	1972	1985
Membership (families)	135	324
Operating fund (Bahts)	253,647	6,061,998
Share capital (Bahts)	17,500	546,450
Reserve fund (Bahts)	60,662	850,022
Net surplus (Bahts)	3,376	464,740

It can be stated that the implementation of this Royal project has met with satisfactory results in improving the socio-economic status of the farmer members and in developing the barren land which otherwise would have been left idle. This achievement has led to the establishment of 10 more demonstration centres with similar objectives throughout the country.

TO FUND OR NOT TO FUND

The Nasik District Eucalyptus Grower's Cooperative Society was set up in 1985 to collectively help farmers to practice scientific cultivation of eucalyptus and ensure remunerative prices for their produce. The society aimed at: (a) giving production support to its members; (b) processing their eucalyptus into pulp and paper, and (c) marketing trees as well as finished products. Any farmer domiciled in the district, and willing to grow in one acre or 20 *gunthas* of eucalyptus, could become a member of the society by agreeing to subscribe to the share capital of Rs. 1000. However, membership was offered if they paid Rs. 50 per acre to begin with. (see Exhibit 1 for bye-laws of the society.) Any region having rainfall ranging from 10 to 100 inches, and any land having soil depth of 7 feet, was recommended as suitable for eucalyptus cultivation. It was expected that escapcement of 10 feet between rows and 3 feet between trees would accommodate, 1,452 plants per acre. The society had made arrangements with the social forestry department to issue permits to its members to obtain 1,500 saplings per acre of plantation from the departmental nurseries. It had also approached the district level cooperative and nationalized banks to extend credit of Rs. 6,500 per acre to the member farmers against repayments guarantee given by the society. The credit scheme faced some problems and was not operationalized.

The society hired the expert help from the Tata Consultancy Services, Bombay, to identify all possible products that could be manufactured using eucalyptus as a raw material, and to make recommendations in the light of the prevailing market conditions (See Exhibit 2). On the basis of this report, the society took a decision to set up an eucalyptus-based paper plant. The society in the meantime successfully initiated steps to acquire a plot of land near a water reservoir. It had also obtained permission from the government of Maharashtra to supply 25 lakh gallons of water a

day for the plant. The Parkhe consultants of Pune were then contacted to prepare a project report for the paper plant costing Rs. 14.60 crores (see Exhibit 3). The society had also approached the government seeking its participation in the share capital in the ratio 1 : 5. The matter was under the active consideration of the government. The *taluka*-wise area planted under eucalyptus was as follows :

Table 1
***Taluka*-wise Area Under Eucalyptus of Members of the Nasik District Eucalyptus Growers Cooperative**

Taluka	Area under eucalyptus (acres)	Number of members
Niphad	4941	1011
Nasik	1015	227
Dindori	770	186
Yeola	657	162
Malegaon	595	137
Sinnar	462	242
Chandwad	371	135
Nandgaon	352	43
Igatpuri	315	58
Satana	221	53
Kalwan	213	43
Peth	31	8
Surgana	16	6
Total	9969	2311

By August 1986, the total number of seedlings planted were estimated to be 1.44 crores. Out of 2,311 member farmers, 224 had paid the entire amount of share capital at the rate of Rs. 1000 per acre, whereas 2,087 members enrolled themselves by paying Rs. 50 per acre. The total share capital contributed by the members of the society was Rs. 5,46,660.

The society then approached the National Cooperative Development Bank of India (NCDBI) for a long-term loan for its paper plant by giving all the information contained in the project report. The Managing Director of NCDBI instructed the head of the project appraisal department to appraise the project.

Exhibit 1

Essential provisions of the bye-laws of Nasik district, Nilgiri (Eucalyptus) Growers Cooperative Society Ltd.

1. *Aims and Objectives*
   - i) To promote plantation of eucalyptus trees on a large scale.
   - ii) To give guidance for plantation of eucalyptus trees.
   - iii) To protect and provide assistance for healthy growth of the eucalyptus trees grown by the members of the society.
   - iv) To purchase and sell eucalyptus trees grown by the members and also other trees grown in the area of operation.
   - v) To undertake processing activity to fully utilize main products and by-products and to sell the finished goods.
   - vi) To carry out research on eucalyptus cultivation and its use.
   - vii) To provide extension services to members on cultivation practices and also arrange for supply of seeds, manure and agricultural implements for cultivation of eucalyptus and other agricultural crops and to give advances to the members for the development of agriculture and agricultural produce against security of eucalyptus plantation.
   - viii) To encourage plantation of other trees at places where it is not possible to plant eucalyptus trees.
   - ix) To undertake any other activity for the development and welfare of the society and its members and help in the formation of institutions to promote welfare and development of people living within the area of operation of the society.
   - x) To do all things necessary or expedient for the achievement of the objects specified in these by-laws.

2. *Area of Operation*
   The area of operation of the society will be the Nasik district.

3. *Funds*
   Funds may be raised by any of the following modes :-
   - i) Issue of shares.
   - ii) Receiving deposits and guarantees.
   - iii) Raising loans and drawing overdrafts.
   - iv) Donations, grants and other financial aid.
   - v) Entrance fee, share transfer fee and nomination fees.

4. *Share Capital*
   The authorised share capital of the society shall be Rs 4,10,00,000 (Rupees four crores and ten lakhs only) divided into 4,100 shares as under:-
   - i) Each share of the face value of Rs 1000/- in all 20,900 shares of the value of Rs 2,09,00,000 is to be issued to the producer members and while Rs 50 will be paid in applying for shares on allotment each member shall pay Rs 200 to 250 and the balance he shall pay following a call from the board of directors. Further, the board of directors shall fix a

ratio of the area of land with the area under eucalyptus. The minimum of this ratio would be 20 *guntha* or one acre per share.

ii) Each share of the face value of Rs 1000 in all 20,900 preferential redeemable shares valued at Rs 2,09,00,000 will be issued to the state of Maharashtra. The refund of the amount shall be at the option of the government. This share capital shall have a preference at the time of winding up of the society and distributing the dividend. The society may refund the share capital to the state even before the time limit but subject to the condition that an amount equivalent to the redeemable preference share shall be collected by the society by way of non-refundable deposit or reserve fund. So long as the redeemable shares are held, the society shall not accept deposits from producer members except compulsory deposit or raise loans or raise debentures without permission of the government.

5. *The share amount of the grower members shall be paid as under*

i) The face value of each share shall be Rs 1000. Out of that amount Rs 50 per share shall be paid along with the application in the prescribed form of the society.

ii) Within one month on receipt of intimation or issue of each share, Rs 200 to 250 shall be paid.

iii) The balance will be paid as and when called for within one month of the written notice by the Board of Directors. (The Board of Directors shall have powers to extend the time limit for payment of call money.).

6. Any person who is residing within the area of operation of the society and who is growing eucalyptus trees in a minimum area of 20 *gunthas*/one acre, will be eligible for admission as A-class (producer) member of the society.

7. *Board of Directors*

i) The management of the affairs of the society shall vest certain powers in a committee consisting of a minimum of 15 members. Out of them the number of members of the Board of Directors to be elected shall not be less than from A class (producers) members. The election of the committee shall be after every five years.

ii) However, after the registration of the society, a provisional committee of not less than 11 members shall be constituted in accordance with Rule 59 (4). The provisional committee shall continue in office till the new committee is elected in accordance with the provision of Rule 60 (5) or for the period not exceeding five years. However, for reasons, by recommendation of the general body meeting, and approval of the registering authority, the tenure of such committee may be extended for a further period of one to five years. Such extension shall not be for more than 10 years from the date of constitution of the committee.

iii) For the election of Board of Directors, there shall be a minimum of five or a maximum of 11 constituencies. The Board of Directors shall constitute constituencies (Gats). The number of directors to be elected from each Gat shall be in proportion to A class members. It shall be one in the minimum and three in the maximum.

iv) The nominated board could comprise an expert co-opted by the Board and a representative of the Registrar.

8. *Business of the Society*

There shall be fixed relationship of one share for 20 *gunthas* to one acre of eucalyptus trees between the eucalyptus acreage of the grower member and the number of shares issued and subscribed. A grower member shall not be allotted more shares than are due to his registered eucalyptus acreage at the above-mentioned ratio. If the shares subscribed to are less than the aforesaid eucalyptus acreage, the member concerned will be deemed to have given three years time to bring about parity between his registered acreage and the shares held by him. Where the member is continuously cultivating more eucalyptus trees than in proportion to his share holding as prescribed above, he shall purchase additional shares within three months from the date of receipt of notice from the society in this behalf. The board of directors shall have powers to recover the outstanding share amount from the return payable to him against his eucalyptus trees supplies. In case such a member is not willing to purchase additional shares in proportion as above, the society shall pay the return of such trees grown in excess area at the rate to be paid to the non-members.

9. The Board of Directors shall have power to draw up a programme of eucalyptus plantation within the area of operation of the society and to give appropriate instructions to the grower members in this regard taking into consideration the society's eucalyptus trees requirement. A grower member shall be bound to carry out such instructions in respect of other matters concerned with his production of eucalyptus trees, such as, maximum acreage. He may keep such trees having regard to the acreage of lands held by him and his resources, irrigation, selection of seed, date of planting, quality and extent of manuring crops, protection etc. If the grower member fails to comply with all these instructions he shall be liable for action under By-law No 21A.

10. The Board of Directors may arrange for harvesting and transporting eucalyptus trees grown by members or may determine the point at which the trees shall be delivered by the members. The expenses incurred for the arrangement made by the Board of Directors shall be borne by the society.

11. If any member fails to bring and supply his eucalyptus trees as laid down in the by-law, the Board of Directors under the provisions of by-law No 9A shall have power to forfeit all his shares and shall be liable to make good the loss to the society on account of default. The Board of Directors shall determine such amount of loss. If any member refuses to bring or supply eucalyptus trees grown by him to the society, the society shall have the right to attach the said trees and take them into possession and transport them to the place required.

12. Subject to the provisions contained in Section 47 of the Maharashtra Co-operative Societies Act, any amount due from any member of the society shall have first charge on the eucalyptus trees grown by the member and shall be recovered from the return of the eucalyptus trees.

13. *Fixing of return of eucalyptus trees*

The rate for eucalyptus trees grown by the member shall be fixed by the Board of Directors. Such rate shall be fixed in respect of standing trees in the field. The Board of Directors after taking into consideration the by-laws of the society,

the aims and objects of the society and the financial position of the society in that particular year, shall fix the rate for every year and shall pay the return at that rate.
14. If necessary the society may purchase the eucalyptus trees from the persons other than members. The rate to be paid to them shall be fixed by the Board of Directors.
15. Out of the return payable to the member, for the eucalyptus trees, the society shall deduct his non-refundable deposit amount not less than Re.1 per tonne of eucalyptus supplied by him to the society and the said rate shall be fixed by the board. The rate shall be adequate to meet the complete liability on account of repayment of long-term loans borrowed by the society. The society shall have the right to accept the deposits without interest for its benefit.
16. If the Board of Directors feel it necessary, in addition to the non-refundable deposits, the deposit commensurate with the quantity of trees in tonnes as fixed by the Board of Directors will be accepted and will be utilized for capital expenditure. Until the loan taken from the Industrial Finance Corporation or other institutions for capital expenditure is not refunded the rate of interest on such deposits shall not be more than the rate of interest of Industrial Finance Corporation of India. After repayment of loan, interest shall be paid up to 10 per cent per annum.

17. *Net Surplus*

Before arriving at the net surplus, the management shall provide the following:

i) Return payable to members for the supply of eucalyptus trees to members and non-members.
ii) The expenditure incurred for production sale and for the business of the society.
iii) Interest payable on loans deposits and debentures.
iv) Cess of land, taxes of municipality and other taxes to be paid and the amount required for working of the society.
v) All establishment charges including salaries of employees, allowances, honorarium to be paid to the Board of Directors and other amounts to be paid to the employees.
vi) Depreciation on the machinery, buildings and other immovable properties as per Income Tax Act.
vii) Development rebate as per provisions of Income Tax Act and sale tax and other taxes.
(viii) Subject to the provisions of Section 65 of the Maharashtra Coop. Societies' Act, approval of the Board of Directors to the fund to be appropriated.
ix) Making provisions for payment of subscriptions, to the State Educational Coop. Institutions, the balance remaining thereafter shall be appropriated as under:
   A. 25 per cent shall be carried to reserve fund.
   B. Dividend on shares at the rate not exceeding 9 per cent. However, till the amount of shares issued to the government is not refunded, dividend shall not be more than 6 per cent.
   C. If the Board of Directors feel it necessary with prior sanction of the registering authority, an amount not exceeding 10 per cent of the net

profit may be utilized for religious and charitable purposes.

18. *Reserve Fund*

All entrance fees, share transfer fees and the amout forfeited shares, fees of registration of shares (amount of damages) and capital profit shall be credited to the reserve fund.

19. *Miscellaneous*

None of the by-laws hereinabove contained shall be amended except by vote of majority consisting of not less than two-thirds of the number of members present at the general meeting convened for the purpose. The notice of the meeting shall specify the proposed text of the amendment and shall be given within the period laid down in the by-laws. The amendment shall not be effective until it has been approved and registered by the registrar of co-operative societies.

20. The society shall become a member of the Central Co-operative Bank and the Maharashtra State Co-operative Sangh and it may also become a member of any other all India, State, Regional, District or *Taluka* level society which is concerned with the business of the society.

PROMOTER'S SIGNATURES

Exhibit II

Evaluation of Alternative Uses of Eucalyptus a Summary Consultant's Report

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1.1 Nasik Zilla Nilgiri Utpadak Sahakari Sanstha Limited, the client firm, has undertaken eucalyptus (hybrid) plantation in Nasik district on mass scale during 1983. There has been such an appreciable response from the farmers for eucalyptus plantation that in one single year (1983) more than 50 lakh eucalyptus (hybrid) seedlings have been planted. Yet, more and more farmers were coming forward and demanding eucalyptus saplings. The forest corporation, in turn, had taken keen interest in supplying them. Never before had the corporation supplied saplings on such a large scale. All these tree growing farmers have been the members of the above said cooperative society.

1.2 This cooperative movement in eucalyptus plantation was indeed unique, perhaps the first of its kind in the entire country. The chairman of this society, Vinayakrao Patil, an MLA of Maharashtra is the man behind this movement.

1.3 Eucalyptus (hybrid) is a fast growing species and the farmer gets the yield - wood - after every five year for 25 years. The client firm desires to take up an economically viable project based on eucalyptus wood, collected from its farmer members so that the farmers get better price for their investment directly or indirectly and a few local people get employment opportunities in the district itself. Keeping this view in mind, the client firm approached Tata Consultancy Services, Bombay with a request to identify projects based on eucalyptus wood, within the investment range of about Rs. 20 crores.

Eucalyptus tree

1.4 In India, eucalyptus was first introduced 200 years ago on the Nandi Hills in Karnataka. Later, these trees were planted on the Nilgiri Hills. In the last two decades or so, eucalyptus acquired prominence as a source of raw material for rayon grade and paper grade pulp. The forest departments took up plantation of this tree under their social forestry scheme. In fact, growing eucalyptus is included in the 20-point programme of the Government of India.

1.5 There are 600 species of eucalyptus which can be grown in diverse climatic conditions. In India, however, we observe mostly the following four species grown:

a) Eucalyptus tereticornis (hybrid).
b) E. Globulus.
c) E. Grandis.
d) E. Camaldulensis.

Industrial Uses

1.6 Eucalyptus is a deciduous tree, yielding hard wood. Essentially, it is very good as a fuel wood. It is also used for making charcoal. However, as eucalyptus wood pulp has a short-fibre length (0.6 to 1.4 mm) as compared to the 3 to 4 mm fibre length of softwood pulp, this pulp alone does not yield fine varieties of paper. Nevertheless, it adds to the strength of the paper when blended with other pulp such as bamboo and bagasse.

1.7 Its major use is, however, in making rayon grade pulp. Some attempts to manufacture rayon grade pulp from "other hardwoods" have been made but without any success.

1.8 Eucalyptus wood can also be used to manufacture hardboards. From its bark, oxalic acid can be obtained. Eucalyptus pallets are used for storing foodgrains.

1.9 Eucalyptus wood has high calorific value, meaning thereby that large amounts of energy are released on burning the wood. Hence this wood can be used for electricity generation.

1.10 Among the simplest utilities, we observe eucalyptus can be used in the construction work in rural areas. From specific species grown in high altitudes eucalyptus oil is obtained on commerical scale by distillation method, using eucalyptus leaves and branches.

Yield

1.11 The tree grows straight nearly 70 to 75 feet high and has a diameter of 14 to 15 cm. Up to 45 feet, it is very straight and then there are branches. The yield rate depends on agro-economic conditions and also on the species grown. The average yield is 10 to 15 tonnes in irrigated land. The yield also depends on whether it is conventional planting or high density planting.

Projects Considered

1.12 In this report we have identified different projects that could be based on eucalyptus wood. We have presented a few project profiles for the major uses such as paper grade pulp making, writing/printing paper, hardboard and rayon grade pulp. In addition since eucalyptus is good fuel wood, we

have prepared a profile on power generation based on tops and lops. We have also studied miscellaneous uses like oxalic acid, eucalyptus oil and making match-box sticks. We have not prepared project profiles for these products as the investment ideas for them were rejected by us for reasons explained at appropriate places.

1.13 A project profile is a document which contains all information that is normally covered in a project report, such as, supply-demand aspects, capital cost and profitability. The difference, however, is that details given in a project profile are not regularly obtained through surveys, calling quotations, etc. They are based on desk research and discussions with knowledgeable persons in the respective fields. The conclusions in a project profile should therefore be considered as only illustrative and not exhaustive.

1.14 Desk research included going through all the available literature on eucalyptus as well as government documents and reports pertaining to different products made from eucalyptus.

1.15 Field survey involved collecting details of input requirements for different identified projects. Discussions were also held with the manufacturers of the different products, such as, paper, board, oxalic acid and matchbox.. For confirming to the information thus collected discussions were held with the concerned authorities from research institutes, associations and other institutions like SICOM. A few machinery manufacturers were also contacted to collect the details of plant and machinery/equipment for making pulp, paper, etc.

I. (*Paper*) *Pulp Making*

1.16 At present paper/paper board making units are facing, among others, problem of acute shortage of raw materials. Those units consuming bamboo pulp in large quantities are not getting enough quantity of bamboo as the bamboo forests are dwindling year after year. They are using more of hardwood to the extent of 30 to 40 per cent of their total raw material requirements.

1.17 Government is encouraging paper mills to use more of bagasse and agricultural waste to reduce the dependence on forest wood. Those mills consuming bagasse pulp to the extent of 75 per cent or more of their raw material requirements are given excise concessions. In fact, most of the small units are economically viable mainly because of this excise concessions. Many times the small units also face shortage of bagasse/agriculture waste. These units may use eucalyptus wood pulp if available at reasonable price.

1.18 With this background, a mother pulp unit providing pulp to the needy mills would certainly be a welcome venture for the paper manufacturers. At present, there is only one such unit in the country. The Central Pulp Mills, Gujarat—selling bamboo pulp. However, it is reported that its selling price is not attractive to the needy units. On the other hand, the uneconomic price compelled the unit to diversify into paper making so that the unit would have captive consumption of its pulp to some extent. The unit has an annual capacity of 40,000 tonnes of wood pulp. The capacity for paper making is 16,500 tonnes per annum.

1.19 If the above experience of the Central Pulp Mills is any guide, it would appear that while there is a need for pulp, it would be difficult for the pulp units to supply at remunerative prices to themselves. In this connection we may refer to SICOM's paper project (50,000 tonnes of newspaper and 50,000 tonnes of writing and printing paper) at Aurangabad and that they need 75,000 to 80,000 tonnes of eucalyptus wood per annum. The client firm can have discussions with SICOM with regard to the price which can be obtained for eucalyptus wood pulp. Our feeling is that the price finally agreeable to SICOM could be unremunerative to the client firm. In case, the client firm desires to look into this idea, it may be observed that an economical paper grade pulp making unit should be of a capacity of 100 tonnes per day. The required investment would be around Rs. 30 crores.

II *Writing and Printing Paper*

1.20 The demand for writing and printing paper is increasing at a rate of 6 to 7 per cent as against the growth in actual production of 5 per cent in the past few years. As education spreads, and the standard of living rises, demand for paper goes up considerably, more so in respect of writing and printing paper.

1.21 At present India's per capita annual consumption of paper is abysmally low at 2 kg, as against 272 kg in the USA. To bridge the gap between demand and supply, government has to import writing and printing paper. Government also allows import of waste paper and mechanical wood pulp to paper mills so that there would be more supply to match the demand.

1.22 Indigenous production of paper and paper boards is placed at 12 lakh tonnes (1982). By 1985, the planners anticipate the demand for paper to go up to 15 lakh tonnes. If the per capita consumption is to increase to 3.5 kg by the turn of the century, approximately 30 lakh tonnes would be the total demand for paper and paper board by them. Of this total demand nearly 60 per cent demand would emanate from consumers of writing and printing paper.

1.23 A 50 tonnes per day (tpd) capacity paper plant requires a capital investment of Rs. 17 crores. If this unit uses bagasse pulp (75 per cent) and the balance (25 per cent) eucalyptus wood pulp, the unit would get excise concession. Under normal conditions such a paper mill may have 15 to 20 per cent of return on its capital investment. We are recommending the client firm for consideration of a bagasse based paper mill. The annual requirement of bagasse and eucalyptus wood for a 50 tpd unit would be 75,000 tonnes and 12,000 tonnes respectively. The availability of bagasse should be verified before a decision is taken to consider such a project.

1.24 We have not recommended paper board. Demand for it can be met by the existing units which consume mostly waste paper, collected rags, etc.

III. *Hardboard*

1.25 Hardboard manufacturing could be considered as a good venture. For a 25,000 tonnes capacity unit the capital investment needed is of the order of Rs. 12 crores. The hardboards are used as partitions in the offices and houses. Mirror backs and photo frame backs are also made of hardboard. In the packaging industry, hardboards have replaced plywood to some extent.

1.26 In the country, there are only two units, Anil Hardboards, Bombay and Western Indian Plywood Ltd., Kerala manufacturing hardboards. Their installed capacity is 32,000 tonnes per annum. The production of hardboards in 1981-82 was around 28,000 tonnes. Anil Hardboards has now obtained a licence to increase its capacity to 30,000 tonnes from the present capacity of 12,000 tonnes. The company's expansion plans would be over by 1984-85 end. Thus the total installed capacity of hardboards in the country would be 50,000 tonnes by 1984-85. The estimated demand for hardboards by 1988-89 is of the order of 55,000 tonnes. If 75 per cent is the capacity utilisation of the existing plants, assuming no further capacity increases (during the last three years, no unit has been given any letter of intent or licence for hardboard), the likely supply would be 37,500 tonnes. In that case there may be a gap of 18,000 tonnes by 1988-89.

1.27 However, eucalyptus wood is comparatively a costly material for hardboard as compared to wastewood used by hardboard units. True, eucalyptus wood gives qualitatively superior hardboard but on cost consideration, the market would be very limited. Moreover, Anil Hardboards have agriculture waste and make hardboards. It is therefore feared that eucalyptus based hardboard, would face stiff competition on cost consideration. The project is not hence recommended.

IV. *Rayon grade pulp/viscose staple fibre/HMM fibre*

1.28 In India, only two units namely, Gwalior Rayon and South India Viscose have been manufacturing rayon grade pulp. Recently A.P. Rayons has commenced production of such pulp, but it is facing many problems including shortage of raw material. The total installed capacity of rayon grade pulp industry is sufficient to take care of the likely demand in future. However, as the existing units are facing shortage of basic raw material wood—particularly of eucalyptus—any new unit having its own plantation may get enough of a market. Unfortunately, a small unit of 50 tonnes per day is uneconomical and a rayon grade pulp making unit of an economical size of 100 tonnes per day needs a huge investment of Rs. 60 to 65 crores. We have therefore not recommended rayon grade pulp making venture.

1.29 We have further studied the demand-supply aspects for viscose staple fibre and rayon filament viscose fibre/filament. Moreover, from the point of economic viability, viscose fibre is not an attractive proposition. The existing units are making losses at present.

1.30 Therefore, we considered 'value added' item like high wet modulus (HWM) fibre which is a superior variety of viscose staple fibre and has better prospects. From 5,000 tonnes capacity plant for HWM fibre, we may get a minimum profit of Rs. 50 to 60 lakhs per annum. This unit would need nearly 15,000 tonnes of eucalyptus wood every year which is not difficult for the client firm. The client firm may consider this proposal which would need an investment of the order of Rs. 21 crores. The total manpower for such a unit would be about 300 persons.

V. *15 MW Power Unit*

1.31 Wood based power station for a 15 MW capacity has been considered as a

viable proposal, involving a capital investment of Rs 15 crores. As we know, power shortage in India has been almost endemic. The demand is always more than supply. In the U.S.A. 40 to 50 MW stations have been installed wherever wood is in plenty and easily available. In India, however, power based on wood cannot be economical against hydel power. However, we are considering in our power project the upper portion of eucalyptus tree-tops and lops that is, above 45 feet. Our calculations indicate that a 15 MW unit would require nearly 45,000 tonnes of dry wood annually, which means 10,000 to 12,000 hectares of land should be under eucalyptus plantation (per hectare yield is 20 tonnes of wood and 25 per cent of this would be from tops and lops of eucalyptus trees). This unit would be based on imported technology. It would employ about 80 to 90 persons. If the power generated is linked to the state grid, marketing problems are taken care of. This is subject to government approval.

Paper Mill-Cum-Power House

1.32 If the above suggestion is accepted the client firm may consider another proposal wherein the paper mill of smaller size say 40 tpd may get power from the captive power house of 3 to 5 MW capacity. The total investment of such a unit would not exceed Rs 18 crores. Similarly, for HWM fibre, the client firm may have a power house of 3 to 5 MW for captive consumption purpose.

Other Products

1.33 We have considered other products, such as, speciality papers, making match sticks, obtaining eucalyptus oil, oxalic acid and nitrocellulose unit. Speciality paper market is quite limited and in any case requirement of eucalyptus wood pulp is also very small. Match sticks cannot be made out of eucalyptus (hybrid). Eucalyptus oil made from this variety is not commercially viable. Oxalic acid has a limited demand. An explosive grade nitrocellulose unit would require an investment of Rs. 50 crores which is beyond the contemplated limits. All these products are not recommended.

Recommendations

1.35 On the basis of the present report we recommend the client firm to consider a 50 tpd paper plant or a combined project of 40 tpd paper plant with a 3 MW power project, assuming bagasse availability. The total cost for such a project would be Rs. 18 crores. Alternatively, the client firm may consider manufacturing rayon grade pulp and further produce high wet modulus fibre. This unit would have a minimum capacity of 5,000 tonnes of HWM fibre per annum and may have its own 3 to 5 MW power unit for captive consumption. The technical know-how for such a unit will have to be imported. Such a unit would need a total investment of Rs 22 crores or so.

Exhibit 3
Project Proposal

CHAPTER I

1.00 *Introduction*

1.01 Nasik Zilla Nilgiri Utpadak Sahakari Sanstha Ltd. (the Sanstha) has been established to undertake plantations on a large scale of eucalyptus trees. The cooperative is formed by many members who have undertaken to plant, grow and harvest eucalyptus wood. For utilisation of wood so collected the Sanstha initially approached Tata Economic Consultancy Services. A report was submitted by them in which various alternatives for use of eucalyptus wood were outlined for the decision of Sanstha.

1.02 After consideration of the various alternatives, the chairman and Board of Directors of the Sanstha entrusted Parkhe Consultants Pvt ltd. (PCPL) to suggest appropriate steps to implement suitable projects. Accordingly, PCPL instituted various studies and the present report is a result of these studies.

1.03 PCPL has come to the conclusion that the basic wood utilisation pattern would be as follows:

1.3.a Sale of processed trees on the basis of utilisation as poles, supports and crafters.

1.3.b Establishment of a pulp and paper mill to manufacture superior grades of writing and printing papers.

1.04 The project as now envisaged is unique in many respects.
It is a well-known fact that the paper industry in the country is suffering from acute shortage of virgin sources of pulpable raw material. Agricultural residues as an alternative are posing their own problems. Depletion of forest resources is making the future viability of the industry critical and questionable.

1.05 The proposed project plans to look at this problem from a different end. While most of the paper projects in the country look at any proposal from the technological aspect of paper making with the latest machinery, high yielding process etc., the proposed project starts on the premise of sustained available raw material in the form of eucalyptus trees. On the basis of this the proposed pulp and paper mill is designed.

1.06 The project is promoted by the cooperative society wherein the members are committed to supply the produce from a definite acreage to the mill. The price of the raw material is not the basis of transaction, rather a share in the profits generated by industrial and commercial activities is the aim.

1.07 The total acreage planned by the Sanstha would be very much in excess of the anticipated requirement of pulpable wood for the present paper mill capacity.

Accordingly, additional avenues of wood disposal had to be explored. It is expected that profits generated by the paper mill would be clubbed together with the profits generated by the sales realization from the forest division to allow a fair margin to the farmer members of the cooperative society.

1.08 This important aspect has to be taken into consideration when profitability or viability of the project is considered.

1.09 The total project thus emerging is not just of a pulp and paper mill but is a truly forest based multi-product industry and as such the project deserves encouragement and support. When implemented, this would be the first project of its kind in the country. The success of this could be an example to other promoters in the country and in turn lead to an overall rethinking on the vital question of raw material resources for paper industry. It would as well serve as a model for different cooperatives in other parts of the country where the farmers combine together to look to social forestry as a business proposition wherein adequate returns for the farmers' efforts are assured.

CHAPTER II

2.00 *Salient Features of the Project*

2.01 The project is promoted by eucalyptus growers themselves. Hence raw material on a sustained continuous basis is fully assured.

2.02 The proposed project is a multi-product project. Hence cushioning against market fluctuations is provided.

2.03 In various segments such as construction poles, paper, fuel-wood and construction wood, each product fulfils an unsatisfied demand.

2.04 As project profitability for the farmers is assured, substantial area development is expected in each *taluka* where eucalyptus plantations come up.

2.05 Even in the case of excessive wood supplies, or in the case of an unexpected paper mill shut down on a prolonged basis, profitability of the project is not hampered. This is based on the assumption that wood in any form either as logs, as chips, or as firewood would find ready market at attractive prices. The generation of surplus funds for repayment of term loans is assured.

2.06 Cost-benefit planning for wood plantations has been made on the basis of alternative use of some land. Thus, if a farmer member of the cooperative had planted some other cash crop, such as sugar cane for example, his average earning in Nasik district has been considered and compared with the cost and earnings of eucalyptus plantations. As there is no disadvantage to the farmer, possibility of reduction of land under plantations is negligible.

2.07 Even in the case of paper production the product mix has been planned to ensure perennial market demands. There is thus little possibility of the project having marketing problems.

2.08 The planning for sale of poles, either as supports, or as beams in construction has been done on the basis of the existing market requirements. These have been verified with the department of forest depot. There is no possibility of unsold stocks remaining with the cooperative.

2.09 The project implementation period of 30 months can possibly be shortened through correct planning. This may reflect in reduction of interest during construction.

2.10 There is no gestation period on the raw material side. Sufficient land has already been planted with saplings. By the time the paper mill is in operation the present plantations would be ready for harvesting. Thus the possibility of initial raw material shortage is minimal.

2.11 The cooperative can play a very distinct role on the socio-economic scene of Nasik district. They can provide, if they choose to, 300 row house dwellings per annum. Logs from plantation and lime sludge from chemical recovery plant would provide the necessary material for construction of such dwellings.

2.12 If the cooperative decides to and if financial assistance under soft loans is made available, they can establish a wood fired high pressure boiler to produce both steam and power to be fully self-sufficient.

CHAPTER III

3.00 *Description of Operations of the Sanstha*

3.01 Nasik Zillah Nilgiri Utpadak Sahakari Sanstha Ltd., was registered on June 20, 1983 under registration No. NSK/NLG/118. The authorised share capital is in the order of Rs. 410 lakhs, of which Rs 201 lakhs are to be contributed by farmer members and shares worth Rs 209 lakhs are expected to be contributed by the government. The value of each share is Rs 1000. Against the authorised share capital the present issued and subscribed share capital represents contribution by about 1,800 members who have purchased 3,577 share valued at Rs 35.77 lakhs. Against these subscribed shares the paid-up value represents Rs 4.02 lakhs.

3.02 As informed by the Sanstha, eligibility of membership is contributed of one share as well as cultivation of minimum 20 *gunthas* or one acre of land under eucalyptus.

3.03 As per the information furnished by the Sanstha the total area under planting at present is 7,000 acres of which 60 per cent is under irrigated land and 40 per cent under non-irrigated land.

3.04 The registered office of the Sanstha is at Sandeep Apartments, Trimbak Road, Nasik–422 002

3.05 The Sanstha has been established for development of Nilgiri forest. Among other aims and objectives are assisting members and other farmers to undertake intensive cultivation of hybrid eucalyptus, supply of seeds, saplings and fertilizer etc. leading to the maximum yield per acre. It is also a principle aim of the Sanstha, to purchase Niligiri trees duly harvested and to resell them or use them for further processing.

3.06 As per the present planning, the Sanstha is advising the farmer members on the growth and method of planting of eucalyptus saplings and on the method of caring for them and nurturing them to adequate girth sizes and heights. The Santha has obtained from the social forestry department, government of Maharashtra, lakhs of saplings and have distributed the same to farmer members. The ultimate aim of the Sanstha is to bring under cultivation 25,000 acres of land by 1988.

3.07 The saplings to reach the harvest cycle in respect of eucalyptus is five years. After each harvest, fresh growth takes place and the farmer can

obtain a total of five harvests at intervals of five years each. The present estimation is of 35 tonnes per acre per harvesting every five years on irrigated lands, and 15 tonnes per acre per harvesting on non-irrigated lands. In certain cases higher yields on irrigated lands of 60 to 70 tonnes have also been observed. However, for consideration of this report, lower yields as mentioned above have been considered.

3.08 On the basis of this yield it will be observed that a total of 37,760 tonnes of wood will be available per year, and PCPL has bifurcated this available quantity as follows :

a) 35,000 tonnes for pulp and paper mill.

b) 2,760 tonnes for sale as poles, supports or for construction.

3.09 The Sanstha has evolved a special system of assisting farmers to undertake eucalyptus cultivation. For such farmer members who wish to plant eucalyptus, the Sanstha assists in obtaining the loans from the banks. These loans are guaranteed by the Sanstha and the Sanstha also undertakes to deduct the dues to the bank by way of interest and capital before paying the farmers the residual amount.

3.10 Advantages of such schemes are obvious. The farmer is assured support during the lean years till the trees are ready for harvesting. The Sanstha guarantees sale of farm produce at a satisfactory price. The bank is assured of repayment of its loans by the Sanstha. Such interdependence of three principal parties, has been instrumental in developing a nearly foolproof method of ensuring development of plantations and raw material availability on a large scale.

3.11 Since the underlying principle is of cooperation the aim for the Santha is to maximize the return to farmer members on lines similar to those of sugar cooperative . Accordingly, the Sanstha would aim to distribute maximum portion of its profits to the farmer members and maximize their returns.

3.12 In consideration of this unique structure, in the financial sections pertaining to different sections, raw material cost of logs has not been considered. Dividend returns to individual farmers members will be the price for the logs. Therefore it may vary from year to year. The profitability of the division has to take this unique aspect into consideration.

3.13 While considering the cost aspect for eucalyptus wood it is presumed that the farmer would deliver cut trees at his expense. He is expected to cut off branches, tops and lops as well as remove such skin or bark as is present on the individual log. He is expected to cut the individual tree into logs of the size of 4 to 6 feet. These are loaded for transportation to the manufacturing site. Prior to admission in the stock figures, such delivered logs would be weighed at the mill site. It is this weight that would be considered for claim of payment against supplies of wood logs.

CHAPTER IV

4.00 *Project Justification*

4.01 *Present Status and Demand Projection*

4.01.1 The paper industry in India is nearly 100 years old. It has been classified

as a priority industry. However, actual annual production has consistently fallen short of demand. This led to a situation where it is desirable to establish additional manufacturing capacity to meet the increasing demand for various types of paper.

4.02 *Present Status of the Paper Industry in India*

At the beginning of 1985, there were 249 units in the paper industry with a total installed capacity of 2,349,990 tonnes of paper per annum. The category-wise break-up of these units, in terms of installed capacity, is as follows:

Table No. IV. 1

Sl. No.	Capacity tonnes per annum	No. of units	Total installed capacity
1.	More than 20,000 tonnes	23	1,172,360
2.	10,000 to 20,000 tonnes	15	235,800
3.	5,000 to 10,000 tonnes	68	565,225
4.	2,000 to 5,000 tonnes	80	279,860
5.	Up to 2,000 tonnes	63	96,745
	Total	249	2,349,990

4.03 The paper industry has been growing both in terms of units as well as installed capacity. This can be observed from the following Table, which gives the state-wise distribution of paper units in India, indicating the position as on January 1, 1981 and January 1, 1985.

Table No. IV.2

Sr. No.	State	No. of units		Capacity tons		Percentage growth	
		1.1.81	1.1.85	1.1.81	1.1.85	No. of units	Capacity
1.	West Bengal	14	18	204280	234460	28.57	14.77
2.	Bihar	3	6	76500	87600	100	14.50
3.	Orissa	3	5	144500	155800	66.66	7.82
4.	Andhra Pradesh	8	15	257600	329050	87.50	27.73
5.	Tamil Nadu	5	14	83200	128585	180	54.55
6.	Karnataka	9	13	119420	160370	44.44	34.29
7.	Kerala	2	2	35700	35700	0	0
8.	Gujarat	26	38	130340	196745	46.15	50.94
9.	Mahdya Pradesh	5	11	116550	149150	120	27.97
10.	Maharashtra	24	35	187720	287320	45.83	45.32
11.	Uttar Pradesh	19	41	104630	209020	115.79	99.77
12.	Punjab	3	15	29000	115700	400	298.96
13.	Haryana	11	15	108300	124830	36.36	15.26
14.	Rajasthan	2	7	10500	35450	250	237.6

15. Pondicherry	1	1	9000	9000	0	0
16. Chandigarh	1	1	1500	1500	0	0
17. Assam	2	2	28000	28000	0	0
18. Nagaland		1		33000		
Total	138	249	1656740	2349990	80.43	41.84

The above Table indicates that while the growth in the number of units over the last four years is 80.43 per cent the trend has been towards the establishment of a larger number of units of smaller capacity.

4.04 *Demand and Consumption of Paper in India*

4.04.1 The demand for paper and paper products can be generally linked to the levels of literacy and the standards of living of the population. The literacy levels in India have shown a consistently rising trend. Between 1971 and 1981, the general level of literacy rose from 29.5 per cent to about 37 per cent. In some states such as Maharashtra, the level of literacy increased by almost 20 per cent to about 48 per cent. It can be safely assumed that the level of literacy will continue to rise in the future. The above fact when coupled with the growth in the country's gross domestic product, is expected to stimulate the demand for paper in India. The following Table shows the trend for demand of paper from 1976 up to the present time, and the projected demand up to 2000.

Table No IV.3

Year	Demand/tonnes*	Percentage growth in demand	
		Over previous years	Over 1985-86 demand
1975-76	880,200	-	-
1980-81	1,250,000	42.01	-
1985-86	1,463,000	17.04	-
1989-90	1,748,000	19.48	19.48
1994-95	2,218,000	26.89	51.61
1999-2000	2,836,000	27.82	93.77

* Exclusive of Newsprint.

From the above Table, it can be observed that the demand for paper and paper products will continue to grow in future; and the total growth will be nearly 93.77 per cent between now and the year 2000.

4.05 *Per Capita Consumption of Paper*

4.05.1 Even though the demand, consumption and production of paper are growing continuously, it is a fact that the per capita consumption of paper in India is extremely low. While India ranks 24th in the world in terms of total production, it ranks 110th in terms of percapita consumption. Looking at the demand figure for 1985-86 mentioned above, and the corresponding population estimate of about 734 million, the per capita consumption (exclusive of newsprint) is only about 2 kg. In some advanced countries such as the U.S.A. and Germany, the per capita consumption is

over 250 kg. Obviously India is not likely to reach saturation levels of paper consumption in the foreseeable future.

4.05.2 The following Table indicates the current per capita consumption of paper in India, along with the projected estimates up to the year 2000. The expected rate of growth in per capita consumption is also indicated along side.

Table No. IV. 4

Year	Population million	Estimated demand million	Per capita consumption kg	% growth in per capita consumption	
				Over previous 5 years period	Over 1985 per capita consumption
1985	734.0	1.463	1.99	-	-
1990	801.0	1.748	2.18	9.54	9.54
1995	872.6	2.218	2.54	16.51	27.64
2000	945.6	2.835	2.99	17.72	50.25

From the above data, it can be seen that even though per capita consumption in India will continue to grow, it may remain low and fall short of saturation levels even by 2000.

4.05 *Creation of Additional Manufacturing Capacity*

4.05.1 As mentioned in Table IV.1 above, there are at present 249 paper units in India, with a total installed capacity of 2,349,990 tonnes. The capacity utilization in the paper industry is about 68 per cent at present. From Table IV. 2 above, it is seen that over the last four to five years, the number of paper units has grown by 41.84 per cent. On the other hand, demand is expected to grow by 93.77 per cent over the next 15 years as can be observed from Table IV. 3.

4.05.2 Considering the above data, and assuming that capacity utilization in the paper industry will improve to, say, 70 per cent or 80 per cent, it is possible to estimate the additional capacity that will have to be created to meet the projected demand as indicated in the Table IV. 5 attached hereto. Also, considering the trend in establishment of paper units over the last five years it is possible to estimate the number of units that will have to be established to meet the expected demand. This is indicated in TABLE IV. 5.

From the data, it is seen that depending on the rate of utilization, capacity will have to be increased by between 50 and 70 per cent; and the number of additional units between 200 and 350.

4.05.3 From the above data, it may be concluded that:

4.05.3a Production of paper in India has consistently fallen short of demand.

4.05.3b The demand for paper is expected to grow by over 90% per cent over the next 15 years.

4.05.3c The paper industry is growing at a considerable rate with the growth in

Table No. IV. 5

Year	Demand tonnes	Capacity required to meet demand			% increase over 84-85 existing			No. of additional units asper 1984-85 trend		
		@ 70% Cap. utili-sation	@ 75% Cap. utili-sation	@ 80% Cap. utili-sation	@ 70% Cap. utili-sation	@ 75% Cap. utili-sation	@ 80% Cap. utili-sation	@ 70% Cap. utili-sation	@ 75% Cap. utili-sation	@ 80% Cap. utili-sation
1985	1463000	2090000	2951000	1829000	--	--	--	--	--	--
1990	1748000	2497142	2331000	2185000	6.26	--	--	30	--	--
1995	2218000	3168571	2957000	2772000	34.83	25.83	17.96	167	124	85
2000	2835000	4050000	3775000	3539000	72.34	60.63	50.60	346	290	242

Assumption:

1) Present trend of establishing smaller plants of 20 to 50 tpd and 70 tpd will continue in view of constraints on establishment of larger plants.
2) Increase in capacity of existing units is considered equivalent to establishment of new units.
3) Capacity utilization will continue to improve.

number of units being faster than the growth in installed capacity.

4.05.3d Considerable additional capacity will have to be created to meet the projected demand over the next 15 years or so, even with higher utilization of present capacities.

4.05.3e Hence, establishment of new paper units is desirable as one of the steps to be taken to meet the projected demand for paper and paper products.

4.05.3 Further, considering the constraints on establishment of large plants such as, availability of capital, raw material and power as well as the trend in the last few years in the paper industry, it may be concluded that establishment of smaller paper mills between say 20 and 50 tpd will be the means of creation of additional manufacturing capacity in India.

4.06 In India the trend has been towards establishment of paper mills of smaller capacity. In fact many mills established recently in India would be considered abroad as non-viable due to their small size. Some of the reasons for this are:

4.06.1 Paper industry is very capital intensive and to establish large paper mills as is prevalent in the developed countries would require hundreds of crores of investment: for example to establish a 100 tpd paper mill, the investment would be nearly Rs 80 to 100 crores. Not many entrepreneurs in India can mobilize such large amounts of money.

4.06.2 On the other hand, small mills would require lower investment, for example, establishment three paper mills of 30 tpd capacity would require an investment of about Rs 45 crores.

4.06.3 Smaller mills also achieve the objective of dispersal of industries to various regions. This prevents concentration of a few large manufacturing facilities in a small region, and helps towards achieving the society's desirable goal of balanced regional growth.

4.06.4 Excise benefits are also available for smaller mills.

4.07 From the above, it is apparent that in Indian conditions, the establishment of smaller paper mills, which would not be considered viable in developed countries, is desirable. The proposed project may be considered in the light of the above as a desirable step.

Annexure No. IV A
Profitability Statement

(Rs in lakhs)

(A) Sales Realization	..	1130.00
(B) Income received on account of sale of poles	..	67.12
		1197.12
(C) *Cost of Production*		
1. Raw material	..	87.16
2. Chemicals	..	182.21
3. Utilities	..	271.37
4. Consumables	..	44.18
5. Salaries and wages	..	38.13
6. Factory overheads	..	23.25
7. Administrative overheads	..	35.03

8.	Interest on long-term loan	100.80
9.	Interest on working capital	24.63
10.	Depreciation	112.77
(D)	Total cost of production	919.53
(E)	Net surplus/loss (A - D)	277.59
(F)	Excise concessions	65.24
(G)	Total net profit/net loss	342.83
(H)	Contribution to member farmers	298.15
(I)	Net profit/loss	44.68

Annexure No. IV B
Important Ratios

These ratios are inclusive of excise concessions.

1.	GROSS MARGIN TO GROSS SALES	-	21.57%	
	Gross margin	258.25	(EBIT)	
	Gross sales	1197.12		
2.	PRE-TAX PROFIT TO GROSS SALES	-	3.73%	
	Pre-tax profit	44.68		
	Gross sales	1197.12		
3.	RETURN ON INVESTMENT			9.96%
	Profit before interest on Long-term loan	145.48		
	Total investment	1460.00		
4.	RETURN ON NETWORTH			37.23%
	Pre-tax profit	44.68		
	Networth	120.00		
5.	FIXED ASSETS TURNOVER			1.16%
	Fixed assets	1390.59		
	Gross turnover	1197.12		
6.	NETWORK TO TOTAL FIXED ASSETS	-		0.086%
	Networth	120.00		
	Fixed assets	1390.59		
7.	PRETAX PROFIT TO TOTAL FIXED ASSETS			3.21%
	Pre-tax profit	44.68		
	Total fixed assets	1340.59		
8.	PAYBACK PERIOD			10.04 years

Ratio Analysis

1. NET OPERATING MARGIN RATIO

$$\frac{\text{Operating Profit}}{\text{Net Sales}} = \frac{275.92}{1197.12} = 23.05$$

2. CURRENT RATIO

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

(Contd.)

Table No. 13.14
Sales Realization (Paper)

(Rs. in lakhs)

Particular	Tonnes	Rate Rs/ tonne	Disc. Rs/ tonne	Rate Rs/ tonne	9300 Tonnes @ 85%	6975 Tonnes @ 75%	4650 Tonnes @ 50%
Maplitho SS.	3750	13250	550	12700	476.250	357.188	238.125
Manifold	750	16500	550	15950	119.625	89.719	59.812
Creamwove-47 gsm.	1550	12000	500	11500	178.250	133.689	89.125
Creamwove-54	3250	11450	500	10950	355.875	266.901	177.938
Total	–	–	–	–	1130.00	847.497	565.000

		- 282.40 / 136.84	=	2.06
3. CASH RATIO	-	Current Assets -Inventories / Current Liabilities		
		- 282.40 - 251.47 / 136.84		
	=	0.226		
4. FIXED ASSETS RATIO	-	Fixed Assets / Term Funds/Networth plus Long-Term Loans		
	=	1390.59 / 840	=	1.65
5. FIXED CHARGE COVER RATIO		2.74		
Operating Profit	=	275.92 / 100.80	=	2.74

Annexure No. - IV C
Break even Percentages

(Rs in lakhs)

Total cost break even	
1. Total cost break even including excise concessions.	107.37
2. Total cash break even including excise concessions.	71.24

CHAPTER V

5.00 *Raw Material and Plantation Details*

5.01 As listed in the previous section, demand for paper, exclusively of newsprint, will be about 2.835 million tonnes by the year 2000. To produce this much paper, raw material required will be over 8 to 12 million tonnes. Therefore availability of raw material is likely to be a major constraint in the growth of the paper industry in the coming years.

5.02 The paper industry in India has been traditionally dependent on forest based raw material, principally bamboo, for their raw material. However, with the rapid depletion of forests, the industry is now increasingly looking to other sources of raw materials. Besides bamboo, mills are now using raw material such as hardwoods, bagasse, rice and wheat straw and also recycling waste paper on an ever increasing scale. The increasing scarcity of forest based raw material is illustrated by the fact that India possesses only 2.9 per cent of the world's forest and these forests cover only about 22 per cent of the country's land area. The following Table gives the availability of forest area in some selected countries of the world.

Table No. V.1

Country	Land area (million hectares)	Forest area (million hectares)	% of forest area to land area
Canada	997.6	443.0	44.4
U.S.S.R.	2240.2	910.0	40.6
Australia	768.7	34.8	4.5
Burma	67.8	45.9	66.8
U.S.A.	936.3	296.1	31.6
Mexico	197.2	43.7	22.1
Japan	36.9	25.5	69.1
India	328.1	74.6	22.7

5.03 It is obvious that due to increasing demand and decreasing forests the paper industry will be in serious trouble unless large scale plantation of fast growing pulp wood species is undertaken to meet the future needs of the industry. Large scale afforestation is also desirable from the socio-economic and environmental point of view.

5.04 As a tropical country, India is required to look to hardwoods, such as eucalyptus and sababul. Eucalyptus is in particular a very versatile species which can be used not only for making pulp for the paper industry, but also as timber for making rafters, beams, poles etc.

Eucalyptus is a fast growing species and a plantation can be available for harvesting within four to five years of planting the trees. The species is also easy to cultivate, and can be grown on soils that would not be suitable for other crops. The economics of growing eucalyptus is also fairly attractive for the farmers. In states, such as, Gujarat, farmers have derived considerable economic benefits from the large scale plantation of eucalyptus.

5.05 The members of the Nasik Zilla Nilgiri Utpadak Sahakari Sanstha Ltd. have already planted eucalyptus trees on nearly 7000 acres; and ultimately intend to increase the acreage to 25,000 acres. The following Table gives the details of location of the plantations and their expected yield.

Table No. V.2

S.No	Location of plantations	Plantation acres	Total yield tonnes
1.	Igatpuri	63	1,701
2.	Nasik	361	9,747
3.	Niphad	4,335	1,17,045
4.	Sinnar	337	9,099
5.	Chandwad	297	8,019
6.	Yeola	336	9,072
7.	Malegaon	409	11,043
8.	Nandgaon	243	6,561
9.	Satana	104	2,808
10.	Kalwan	80	2,160

11.	Peth	12	324
12.	Surgana	14	378
13.	Dindori	379	10,233
	Total	6,970	1,88,190

Yield: 35 tonnes/acre irrigated
15 tonnes/acre non-irrigated.

5.06 The proposed project would provide a ready market for the produce of these plantations, and the members of the cooperative would derive considerable economic benefits from the projects.

5.07 Another advantage of establishing a project based on eucalyptus would be that elaborate transport arrangements will not have to be made to transport the harvested wood. Most of the plantations are located within a reasonable distance from the proposed site of the paper plant, as can be readily observed from the Table below:

Table No. V.3

S.No.	Location of plantation	Approximately distance from proposed site km
1.	Igatpuri	20
2.	Nasik	48
3.	Niphad	80
4.	Sinnar	48
5.	Chandwad	112
6.	Yeola	112
7.	Malegaon	150
8.	Nandgaon	150
9.	Satana	150
10.	Kalwan	100
11.	Peth	80
12.	Suragana	150
13.	Dindori	50

5.08 The proposed project is to plan utilization of all the eucalyptus trees planted by the member growers of the Sanstha.

5.09 Since eucalyptus is being grown as a crop and is not a wild growth, the efforts every individual farmer makes on cultivation, as well as, whether the lands are irrigated or non-irrigated, makes the difference between the yield per acre. While irrigated plantation is capable of yielding about 35 tonnes of eucalyptus wood on AD basis per acre, non-irrigated plantations would yield only 15 tonnes of eucalyptus wood on AD basis per acre. These are the basic yields that have been considered in this project.

5.10 The promoters have indicated that of the total 7000 acres under plantations, about 60 per cent of the total area is irrigated and the balance 40 per cent is

non irrigatted.

5.11 It is proposed that harvesting of eucalyptus planted should be on a five year cycle basis, so that one-fifth of the total acreage under plantation at present or 1,400 acres, would be available for harvesting every year. At the time of harvesting a 15 cm projection of eucalyptus trees is allowed to remain in the soil to permit regrowth. Eucalyptus trees once planted can permit a total of five harvests.

5.12 Utilization of eucalyptus wood has to be considered on a whole tree basis. At present two major end uses are:

a) As pupable wood

b) As poles for centring/supports, rafters, or house frame members.

5.13 It is presumed that each tree harvested would have a 6 m long piece with an average diameter of 8 to 10 inches. This can be sold off as a pole. The balance quantity from the tree would first be checked for use as pulpable wood of some quantity is left which cannot be pulped it can be disposed of as fuel wood. The basis of calculation regarding availability of wood from plantations is detailed in Annexure No. V.A. attached hereto.

5.14 *Cotton Waste*

5.14.01 Eucalyptus pulp fibre being short in length needs blending with long fibre pulp to the tune of 10 to 15 per cent. The blending not only improves the quality of paper but also improves paper machine runability. Cotton waste fibre is one of the excellent indigenously available long fibre material. For the proposed project 10 per cent cotton waste fibre blending with eucalyptus pulp has been considered. As the possibility of getting cotton waste from the surrounding areas is limited, the Sanstha would be well advised to enter into long-term contracts with suppliers in Bombay to ensure continuous delivery of material to the mill.

5.15 *Waste Paper*

5.15.01 Although good quality of writing and printing variety paper can be produced with the above-mentioned pulp furnish, a third street of raw material, waste paper, also has been considered. This is with a view to compensating any temporary shortfall of other raw material. On an average 5 per cent recycled fibre furnish will be used. Availability of waste paper is not expected to be a problem in view of the fact that under the new import policy of the Government of India, waste paper can be imported duty free into the country. It is recommended that the proposed mill enter into long-term contracts with waste paper suppliers to ensure continuous delivery of raw material.

5.16 From the above, one can observe that as the assured source of raw material already exists for the proposed paper project, namely the eucalyptus plantations in existence which would produce enough wood to meet the needs of the proposed project. Hence availability of raw material, which is a major constraint for the paper industry, would not be a problem in the case of the Sanstha.

Annexure No. - V.A
Basis for Calculations of Eucalyptus Wood Availability for Pulping

1.	No. of eucalyptus trees/acre (as informed by promoters)	1452.00	
2.	Area of plantation covered in Nasik district so far.	6970.00	acres
3.	60% of area of plantation as irrigated	4180.00	acres
4.	40% of area of plantation as non-irriagated	2790.00	acres
5.	Assuming cutting of eucalyptus tree after every five years, irrigated field available for cutting per year	836.00	acres
	Non-irrigated field available for cutting per year	558.00	acres
6.	Yield of eucalyptus logs on A.D. basis from irrigated fields @ 35 tonnes/acre	29260.00	tonnes
7.	Yield of eucalyptus logs on A.D. basis from non-irrigated fields @ 15 tonnes/acre	8370.00	tonnes
8.	Total yield of eucalyptus logs from irrigated fields/year	37630.00	tonnes
9.	Total requirement of eucalyptus wood on A.D. basis for pulp making. 30 TPD x 3.76 per day of pulp x 310 working days/year . . . . .say	35000.00	tonnes
	Balance eucalyptus available to be sold as poles	2630.00	tonnes
10.	Assuming an average weight of pole is 12 kg number of poles available for selling.	219167.00	Nos
11.	12.5 % of poles assumed as rejected being of inferior quality	27396.00	Nos
12.	Total number of poles available for sale.	191770.00	Nos

As seen from the above figures the total receipt of eucalyptus logs by the Sanstha from its member farmers is 37,630 tonnes per annum. Of this, about 35,000 tonnes is expected to be consumed by the paper mills. As explained elsewhere, in the first and second year of operations, the paper mill is expected to operate at 50 and 75 per cent capacity utilization level. This would mean that 17,484 tonnes in the first year and 8,742 tonnes in second year would not be utilized by the paper mill in these two year's operation. It is proposed that the Sanstha would dispose of, during these two years only, the above quantities of wood by tree sale. It is assumed that the sale would be for purpose of firewood, for charcoal making or for other purposes. The rate considered for sale is at Rs 800 per tonnes. The proceeds of this sale are reflected in the profit and loss account for the respective years. From the third year onwards the full quantity of 35,000 tonnes is expected to be utilized.

Annexure No. V.B
Notes on Eucalyptus Plantation

1) Eucalyptus is a hardwood species native to Australia. It was introduced in India in 1773 in Nandi Hills, near Bangalore. From there the species were transplanted in 1843 to the Nilgiris in South India. It has been the most widely used species for raising plantations in denuded and barren lands and also for

replacing low value natural crops.

2) Extensive plantations of eucalyptus have been raised in countries such as Brazil, Portugal and Spain. In India, large scale plantation of eucalyptus has taken place in Gujarat, Madhya Pradesh and Karnataka.
3. The eucalyptus is a very versatile species and has been put to a large number of uses. Besides being used as fuel wood, its timber has been used for making rafters, beams and poles. Oil used for medicinal and industrial applications can be extracted from the leaves of eucalyptus.
4. Eucalyptus is now being used as a pulpable raw material for paper making. In countries such as Brazil, Spain and Portugal, large plantations of eucalyptus have been established which are used to feed large pulp mills. Even though fibre length of eucalyptus is short as compared to softwood, the technology for manufacturing pulp and paper from eucalyptus has now been well established.
5. In India, it has been observed that intensive plantation of eucalyptus can give considerable economic benefits to farmers. Eucalyptus is a fast growing species which can be grown on even the poorer quality soils. The water and fertilizer requirements of eucalyptus are also less in comparison with cash crops, such as, sugar cane. Also, as the tree is not edible, there is no danger from grazing sheep and cattle during the growth period.
6. Eucalyptus is a fast growing species and the tree reaches a height of about 40 to 60 feet in five years. The plantation becomes ready for harvesting within five years of planting. The species is a good coppicer and four harvests can be obtained from one plantation.

CHAPTER VI

6.0 *Process Description*

6.1 Eucalyptus trees yield hardwood. It is being used as basic raw material for paper making in various continents. Several mills in India are also using eucalyptus wood for paper making. Because of its short fibre length (0.6 to 1.55 mm), 10 to 15 per cent fibre is blended with pulp comprising rags cotton linters pulp and imported pulp, waste paper for making good quality writing and printing paper.

6.2 *Manufacturing Process*

6.2.1 *Eucalyptus Pulping*

After removing the lops and tops eucalyptus wood is cut into pieces of 4 to 6 feet in length. Wood logs are cleaned manually in the plantation to minimize transportation cost. Cleaned wood is transported to the factory site and sorted in piles in the woodyard.

6.2.2 Wood is chipped into small pieces of 3/4 inches to 1 inch sizes by specially designed wood chippers. Chips are screened and washed in further processes before conveying them to a giant silo storage.

6.2.3 Oversized chips and silvers are recycled to a rechipper and taken back to the system. Wood dust generated during chipping is stored separately. The use of wood dust in multifuel fired boiler for steam generation after drying its moisture to a desired level, as practised in other mills, is recommended for this mill.

6.2.4 Screened and washed wood chips are taken to the cooking section by pneumatic belt conveying system. Cooking is done in pressure vessels called digesters under controlled temperature and pressure after adding cooking chemicals.

6.2.5 Cooking of eucalyptus can be done by any of the following processes :

1) Sulphate process (Kraft process)
2) Sulphite process
3) Neutral-sulphite, semi-chemical process.
4) Soda process.

6.2.6 For the proposed project, eucalyptus will be cooked by "Kraft Process" at a pressure of 6.5 to 7.5 kg/cm^2, pressure and at 165° to 170° C temperature. With the addition of 14 to 16 per cent active alkali, sulphidity of cooking liquor is maintained between 15 and 20 per cent with the addition of salt cake.

6.2.7 The whole mass in the digester is steamed to raise the temperature up to a desired level within two to two and a half hours and it is retained under pressure for another two hours before blowing in the blow tank. During cooking operation liquor penetrates into chips and starts dissolving lignin in the chips. This selective reaction of cooking chemicals and lignin is controlled by sulphidity of cooking liquor.

6.2.8 The pulp from the blow tank is washed, screened and cleaned in stages. For this project a three-stage counter current vaccum washing has been recommended. This has been done specifically to minimize soda losses from the washing plant and also to get higher concentration for black liquor. This is further concentrated in the evaporator section of the chemical recovery plant. The final washed pulp permanganate number will be in the range of 14 to 16.

6.2.9 Washed pulp is then passed through three-stage screening section for the removal of uncooked or partially cooked material. The accepts from centrifugal screen are further cleaned by processing the pulp through a series of centricleaners. Here lighter pulp fibres get separated from sand, sieves and specks. Rejects are drained. At decker thickener, pulp received from centricleaning system is thickened to 6 to 8% consistency and stored in a chest. Though here the pulp is clean it has brown colour, because of the presence of a part of lignin and other colouring materials.

6.2.10 Removal of lignin and colouring materials is done in the bleaching section in stages. For that various methods are followed, such as:

1) CEH	C	=	Chlorination,
2) CEHH	E	=	Extraction
	H	=	Hybchlorite
3) CEHH P	P	=	Hydrogen peroxide.

Bleaching method is selected based on the raw materials and the final brightness requirement.

6.2.11 For eucalyptus pulp bleaching, CEH system will produce 76° to 80° pv brightness with a recommended consumption of total chlorine of 9 to 11 per cent. This will also need 2 to 3 per cent NaOH for caustic extraction and buffering stages. The bleached pulp obtained from this process will ideally suitable for producing quality writing and printing paper.

6.3 *Cotton Linters/Rags Streel*

6.3.1 Cotton linters/rags are first conveyed to a sorter table where unwanted materials, such as, synthetic fibre, oily rags and yarns, are removed manually. These are then cut to size in cutters to an acceptable length and are cleaned by passing them through a dusting drum. The cleaned material is then conveyed to the digester top. The material is charged manually and 6 to 8 per cent caustic soda solution based on the total weight of cotton linters/rags is added. Rags are cooked under a steam pressure of 4 to 5 kg/cm2 and after release of pressure are transferred to a dumping pit. From here the cooked material is fed to breaker-beaters. These beaters would be of Hollander type with washing drums having the necessary lowering and lifting arrangements. Washing as well as bleaching is done in these beater chests by adding hypochlorite to bring pulp to the desired brightness. It is then cleaned by passing it through a centricleaning system and thickened in a thickener and stored in the chest at 3 to 4 per cent consistency. Bleached pulp is refined or beaten to the desired freeness and supplied to the blending chest for proportional mixing with eucalyptus pulp.

6.4 *Waste Paper Streel*

Waste paper, obtained in baled form is stored in a godown and slushed in a hydrapulper after removing wire, plastics and other foreign material. Slushed pulp is passed through a deflaker for better dispersion of fibre. The pulp slurry is thoroughly cleaned after passing it through centricleaners and thickened in gravity thickener up to 3 to 4 per cent consistency and stored in a chest. This pulp is blended with eucalyptus pulp and cotton linter pulp for making the final pulp furnish as per requirements.

6.5 *Stock Preperation And Approach Flow System*

6.5.1 Eucalyptus pulp stock at 3 to 4 per cent consistency from the pulp mill is pumped to the refining section provided in the stock preparation area.

6.5.2 Refined stock of the desired degree of freeness is stored in a pulp chest. The degree of refining is dependent upon the type of paper to be manufactured.

CHAPTER VII

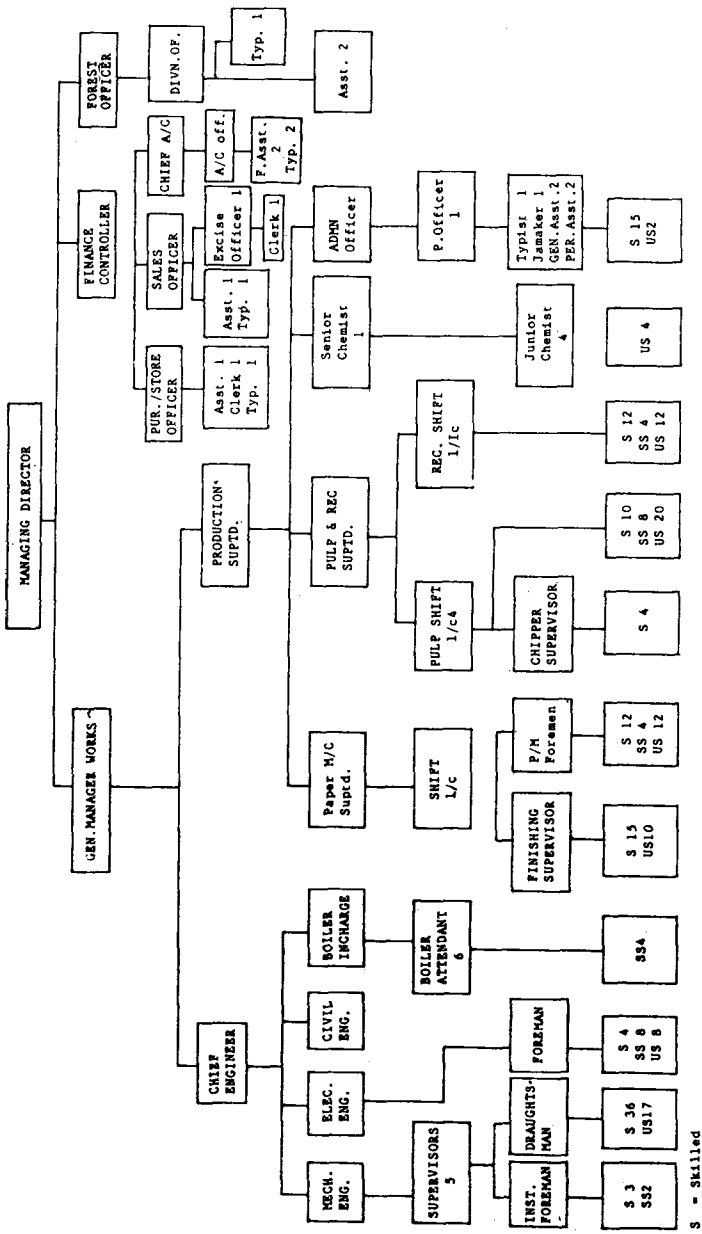
7.0 *Organization Pattern and Manpower Requirement*

7.1 The following schedule indicates anticipated manpower requirement for the proposed paper plant. The wage rates have been considered in accordance with scales currently applicable in the area surrounding the paper plant and are exclusive of statutory and other benefits. A general manager would be appointed to look after the daily activities of the mill and he would be assisted by the respective departmental heads.

7.2 The total manpower requirement is estimated as 66 officers and staff and a labour force of about 238 persons. Manpower required for material handling up to the consuming point and after the discharge point for coal, eucalyptus wood, lime, chlorine, ash, sludge, chemical, finished paper etc., has not been taken into account. It is expected that the promoter's will make necessary arrangements through labour contractors.

7.3 The organization chart is shown in Annexure - XII-A.

Proposed Organizational Chart



CHAPTER VIII

Explanatory Notes to Financial Working

1) *Cost of the Project*
The total cost of the project has been established at Rs 1460 lakhs. This project cost is inclusive of margin money required for working capital and all other pre-operative expenses. The details of the project cost are in Table 13.1. The details of the working capital are explained separately.

2) *Source of Funds*
The Sanstha is a registered cooperative unit. To encourage establishment of industries by the cooperative sector, the government of Maharashtra has announced various incentives from time to time. One of the major incentives is the government contribution to own funds for any industrial project. A formula was prepared in the case of some proposed cooperative spinning mills in Vidharba. It is proposed that the same formula is applied to the project under consideration. As per this formula, the Sanstha would raise from its own members equity contribution to the extent of Rs. 120 lakhs. On the basis of ratio 1 : 5, the government would contribute Rs 600 lakhs. Since the project is located in an appropriate zone, incentives announced by the government of Maharashtra as administered through SICOM would be applicable in case of the proposed project and would amount to Rs 20 lakhs. Thus the total non-loan quantum of funds would amount to Rs 740 lakhs. The balance amount is expected to be raised through a long-term loan from all India financial institutions. The debt equity ratio applicable would then be 1:1.

3) *Sales Realization*
The sales realization is detailed separately according to the categories of paper proposed for production. The sales rates are inclusive of distributors discount, but excluding rate of excise duty applicable. These rates are comparable to rates of similar units in the country.

4) *Excise Rebate*
Excise concession to the extent of 50 per cent is available as the plant capacity falls within 7,500 to 16,500 tonnes capacity per annum slab as notified in the department notification.

5) *Capacity Utilization*
As per normal practice the rated capacity utilization is taken at the rate of 85 per cent though the plant is fully capable of achieving 100 per cent utilization. It is expected that the plant may reach 85 per cent production capacity at the end of the third year. In the first and second year, it is assumed that the Sanstha would reach 50 per cent and 75 per cent capacity utilization, respectively.

6) *Raw Material*

The ratio of raw material as a percentage of fibre content in writing and printing varieties of paper is taken at 75 per cent eucalyptus, 10 per cent cotton rags and 15 per cent waste paper. The total quantity required to manufacture 9,300 metric tonnes, of cotton linters and 9,300 metric tonnes of writing and printing varieties of paper is 34,968 tonnes of eucalyptus, 3,500 metric tonnes of cotton linters and 4,920 metric tonnes of waste paper. The rates at which these raw materials are purchased are all current and comparable with the type of raw materials proposed.

7) *Chemicals and Consumables*

All input prices are taken as per the current market rates and listed separately along with quantities required to manufacture one tonne of paper. All consumables, such, as stores and spares, machine clothing, packing and forwarding are taken as per current industry norms.

8) *Overheads*

Administrative overheads are calculated at the rate of Rs 100 per tonne. Sales overheads, travelling etc. are taken at the rate of about 1 per cent of the sale value.

9. *Utilities*

The cost of power purchased from MSEB is considered at the rate of Rs 0.80 per unit. It is assumed that the total movement of coal is by road and the cost of coal is calculated at the rate of Rs 650 per tonne.

10. *Debt to Equity*

The ratio of debt to equity is taken at the rate of 1:1 as previously worked out. On the basis of the above ratio, the total long-term loan required is Rs 720 lakhs. It is expected that the same amount would be raised through all India level financial institutions. The interest calculated is at the rate of 14 per cent per annum. The repayment is planned from the third year of commercial production and is made in 14 half-yearly equal instalments. Detailed repayment schedule for nine years is listed separately.

Working Capital Requirement

The margin money for working capital is estimated at Rs 64.41 lakhs. The following points are kept in mind while calculating working capital requirements :

1) To have a reasonable period of inventory for materials and chemicals to avoid stock outs and thereby loss in production.
2) To have a reasonable practical inventory period and normal lead time for delivery of the specific items.
3) To have better cash management.

The total burden of working capital interest is worked out and listed separately.

Depreciation

Depreciation is calculated at the rate of 10.56 per cent and 3.28 per cent for the plant and machinery and civil construction, respectively. Normal depreciation as per Income-Tax Act, is calculated for civil construction and plant and machinery added to its extra shift allowance at the rate of 50 per cent. Depreciation as listed in the Profit and Loss Account statement is worked out on straight line basis. In the first year cost of plant and machinery for recovery (Rs 200 lakhs) is written off and is shown in the profit and loss account.

Total Turnover

Net sale value for the different capacity utilization is Rs 565 lakhs for 50 per cent capacity utilization, Rs 847.50 lakhs for 75 per cent capacity utilization. Rs. 1130 lakhs for 85 per cent capacity utilization. As discussed earleir, total additional eucalyptus wood available after making paper would be 20,114 tonnes in the first year, 11,372 tonnes in the second year and 2,630 tonnes in the third year. In these year's 2,630 metric tonnes of eucalyptus can be sold as logs and the remaining wood can be sold in the market for charcoal. As per the information furnished by the Sanstha, this wood for charcoal is sold at the rate of Rs. 800 per tonne. Accordingly, the sale value in the first and second years as shown comes to Rs 768.99 lakhs and Rs 984.56 lakhs respectively for the first and second year of operations. This amount is bifurcated at three different places in the Profit and Loss Account statement. It is as follows:

1. In the first year net income on account of sale of poles is	Rs 67.12 lakhs
2. Net income on account of sale of logs is	Rs 139.87 lakhs
3. Net income on account of sale of paper is	Rs 562.00 lakhs
	Rs 768.99 lakhs

In the second year

1. Net income on account of sale of poles is	Rs 67.12 lakhs
2. Net income on account of sale of logs is	Rs 69.94 lakhs
3. Net income on account of sale of paper is	Rs 847.50 lakhs
	984.56 lakhs

In the third year and onwards when the plant reaches its estimated capacity utilization to manufacture 9,300 metric tonnes of paper, only 2,630 tonnes would be left for the purpose of selling in the form of logs. The value of such sales would amount to Rs 67.12 lakhs.

Table No. 13.1
Total Project Investment

(Rs in lakhs)

S. No.	*Particulars*	*Amount*
1.	Land and site development	10.00
2.	Civil construction	140.00
3.	Plant and machinery	1060.59
4.	Pre-operative expenses including consultancy	35.00

5.	Interest during construction	150.00
6.	Margin money required for working capital	64.41
	Total Rs	1460.00

Table No. 13.2
Means of Finance

(Rs in lacs)

S. No.	*Particulars*	*Amount*	*Amount*
1.	Total project investment		1460.00
2.	Equity share capital	120.00	
3.	Government particular	600.00	
4.	Incentives/subsidies	20.00	
5.	Long-term loan	720.00	
		1460.00	1460 00

CURRENT TRENDS IN MANAGEMENT OF AGRIBUSINESS COOPERATIVE

This section is divided into three parts. The first part provides a theoretical framework to differentiate the agricultural cooperatives from the agribusiness cooperatives. The second part presents current trends in management of agribusiness cooperatives as they emerge from the case studies. The third part only summarizes the conditions necessary for successful operation and management of agribusiness cooperatives in South-East Asian countries.

I. *Framework of Trend Analysis*

According to Goldberg (1968) "an agribusiness commodity system encompasses all the participants involved in the production, processing, and marketing of a single farm product. Such a system includes farm suppliers, farmers, storage operators, processors, wholesalers, and retailers involved in a commodity flow from initial inputs to the final consumer." Agribusiness cooperatives are defined here as the collectivities of farm producers working on universal principles of cooperation and significantly involved directly, or by way of integration, in some or all parts of the functions associated with a commodity flow from supply of inputs to retailing of various outputs. Drilon (1971), who has studied some of the agricultural commodities in South-East Asia, observed that in developing countries, which are basically agricultural in their economy, agribusiness as an approach is a very useful tool for linking the agricultural sector with the industrial sector.

Agribusiness cooperatives differ significantly from other private or public firms involved in agribusiness as the former not only have to worry about agribusiness as an enterprise, but also about the cooperatives as a form of a complex organization. Gupta and Gaikwad (1986) prefer to treat cooperatives of two types : conventional (mercantile)

and advanced (integrated production oriented). We feel that this distinction needs to be sharpened better by making reference to the mix of activities and mode of integration in a commodity flow. Better classification could be agricultural cooperatives as against the agribusiness cooperatives. Agribusiness is relatively a broader concept than agriculture which popularly refers to farming as an occupation. Cooperatives extending full or partial support to their members to improve the efficiency of farming as an occupation or crop-animal husbandry can be called as agricultural cooperatives.Agribusiness cooperatives can include functions in relation to agricultural cooperatives; but in addition, they may also cover functions, such as, agro-processing and output marketing. Classifications, such as, conventional or advanced cooperatives denote values. A primary society encouraging mushroom cultivation among its members for export may work on a traditional pattern of input supply and still may be advanced in its thinking and management styles. Small scale irrigation cooperatives dealing with only single input have been quite successful at many places. On the other hand, some of the integrated cooperatives may be facing serious problems (See Case Unfrozen Shrimp).

A single commodity business cooperative having primary producers of that commodity or the cooperative of such primary producers, as members, and undertaking market oriented business and managerial functions to promote economic interests of the member producers should be treated as an agribusiness cooperative (see chart below).

Agribusiness Cooperatives

Single commodity producers cooperative supplying inputs and/or marketing outputs	and / or	Single commodity agro-processing cooperative	and / or	Single commodity output marketing cooperative

As the President of DEKOPIN of Indonesia (See Case on Farmer, Cooperatives and Government) points out, agricultural cooperatives at primary level are really multi-purpose societies because their farmer members are either involved in multiple activities or have multiple needs. Agricultural cooperatives provide inputs for multiple crops unless the region itself is a single crop region. Agricultural cooperatives having a diverse client group cannot take a single commodity approach and have to concentrate on the requirement of a farmer-agricultural system. Whereas, the agribusiness cooperatives concentrate

on the requirements of a commodity system, backward integration, forward integration, and processing become feasible only when a single commodity approach is adopted. Therefore, agribusiness alone can provide opportunities for adoption of the value addition and the cost reduction strategies on an appreciable level. Agribusiness potentially offers a wide range of integration arrangement, but an agribusiness cooperative need not involve itself in all of them. Depending on the commodity system, and the range of returns, an agribusiness cooperative may prefer to select only certain functions or output options for integration. The structure of agribusiness cooperatives, therefore, may not turn out to be the same. It is possible for an agribusiness cooperative to have an access to the output of other functions through contractual integration (See Goldberg 1968 and also Case on Tanayamma Cold Storage). The integration systems attempted by the organizations studied by the authors were as follows:

Agribusiness functions	Commodity specific functions integrated by organizations in cases on							
	1 Broil-ers	2 Rice	3 Shrimp	4 Eucal-yptus	5 Prawn	6 Milk	7 Vege-table	8 Eucal-yptus
Input supply	x	x	x	x	x	x	x	x
Storage operations		x	x			x	x	
Processing		x	x	x		x		x
Wholesaling		x	x	x	x	x	x	x
Retailing	x					x	x	

II.*Current Trends in Agribusiness Cooperatives*

1. The importance of agribusiness cooperatives as organizations for reaching small farmers to increase their income through integrated commodity sytems is getting realized and accepted throughout the South-East Asian Countries; though the pace of such realization is rather slow and unsystematic. The emergence of agribusiness cooperatives has to be seen from the development perspectives of the newly emerging economies (See Chart 1).

2. As a policy, the South-East Asian countries have not only encouraged the setting up of agricultural cooperatives, but have also effectively used this village level network as an instrument for implementing national programmes of agricultural development. Given the initial problems of food scarcity, import of foodgrains, low productiv-

ity of landwater-labour resources, lack of development infrastructure, and shortage of production specific inputs, these countries had to embark upon food production on a war footing. Being farmer bodies, the village level cooperatives were placed at a critical position to provide production support. Therefore, to undertake functions leading to production enhancement, as envisaged in the national plans, became the priority of these agricultural cooperatives. Distribution of scarce inputs got identified as their important function. As some of these countries were successfully coming out of the trying period of scarcity syndrome, a need to reassess the structure, function and utility of these agricultural cooperatives was being felt seriously at various quarters.

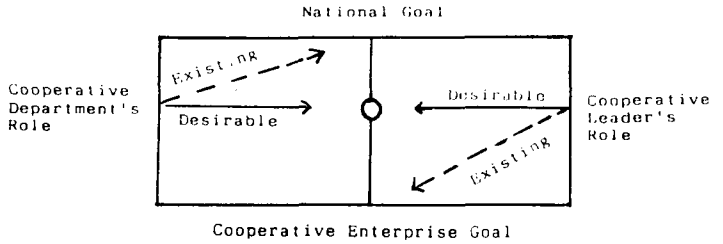
3. The awakening that cooperatives should enter into agri-business; strengthen market orientation; own the latest processing technologies, and use professional management to enhance economic status of the producers, is being increasingly felt by the enlightened farmers and their leaders. Prawn culture in Thailand (Case 5), eucalyptus cultivation in India (Cases 4 and 8), and secondary cooperatives in Indonesia (Case 1) provide testimony to this trend.

4. The intensity of awakening that cooperatives should enter into agribusiness is much stronger among the farmers and their leaders than among the departments of cooperatives. Nevertheless, the departments of cooperatives are a shade better in their appreciation of agribusiness than even the international or national financing bodies. Milk enterprise in Bangladesh (Case 6), or the asparagus project in Thailand (Case 7), as compared to aquaculture project in Thailand (Case 5) reflect this trend vividly.

5. This awakening among farmers and their leaders is not adequately matched by policy or administrative support from the government agencies. Whether it is mushroom culture (Case 2), prawn, rearing (Case 5), or eucalyptus cultivation (Case 4), the farmers are initiating agribusiness related activities on their own, and are assuming risks both on production and marketing front. For them, the existing agricultural cooperatives are also becoming redundant organizations. To strengthen agribusiness cooperatives, the national goals and the goals of cooperatives as enterprises on the one hand, and the roles of the cooperative departments and the cooperative leaders on the other hand, will have to be in consonance. The cooperative departments today perceive their role as achieving national goals, whereas, the cooperative leaders perceive their role as achieving enterprise goals.

The current stage of development in many developing countries seems ripe to make attempts to achieve the desired congruence between all the four (see diagram below). To do so, a redefinition of the role of the existing departments of cooperatives is needed to: (a) promote agribusiness cooperatives; (b) lobby for suitable policy changes at the national level; and (c) encourage enlightened leadership.

Diagram showing Existing Versus Needed Congruence



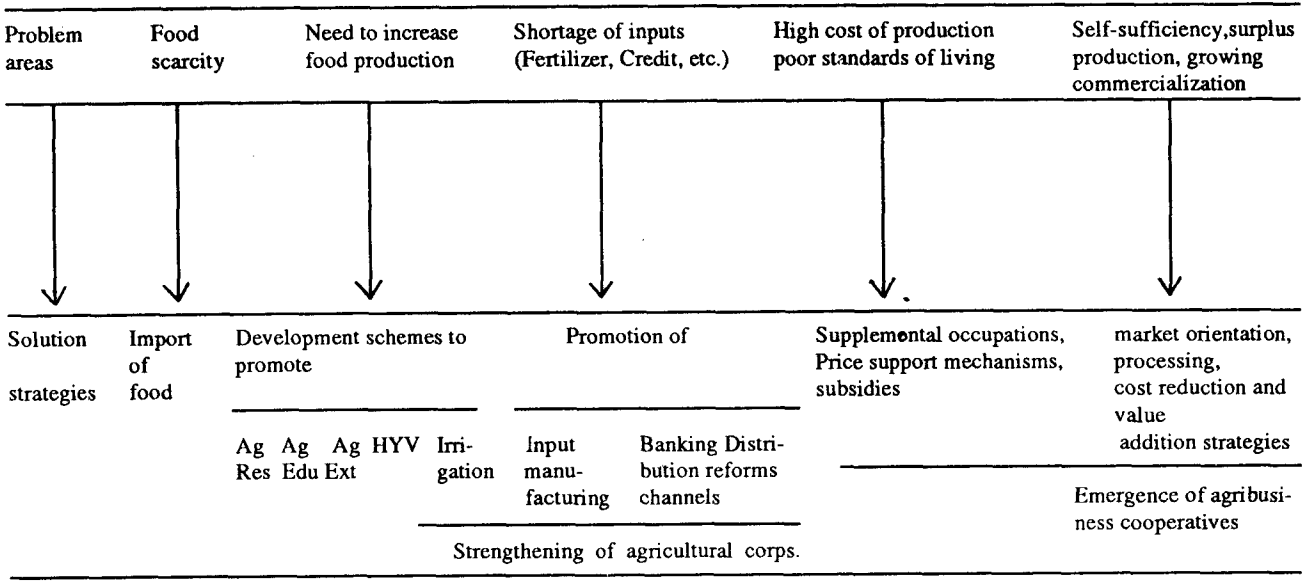
6. Cases in our study indicated three types of management styles operating in the agribusiness cooperatives. All the management styles had their own advantages as well as difficulties. These three management styles were:

i) Elected leader dominated agribusiness cooperatives
ii) Corporate manager dominated agribusiness cooperatives
iii) Project administrator dominated agribusiness cooperatives

Different management styles had different stakes in the success or failure of an agribusiness cooperative. The personal stakes in failure (and also in successes) were highest among the leaders, moderate among the corporate managers, and the lowest among the project administrators. The leader dominated agribusiness cooperatives treated the members as shareholders; whereas corporate managers and project administrators treated them as producer/workers and project beneficiaries respectively. Negotiations with members for their contributions were considered as most critical by the leader dominated systems; whereas negotiations with government for its support were considered as critical by the corporate managers, and, with the project funding authorities by the administrators.

These three management styles also preferred different types of

Chart 1
Agribusiness Cooperatives in the Development Perspective



activity mix. Leaders preferred an activity mix which was relevant to farmer producers, absolutely need-based, and income generating. Corporate managers preferred profit generating activity mix for the system. Project administrator dominated system, on the other hand, gave primacy to the target achieving activity. Market orientation was highest among leader dominated systems, followed by corporate manager dominated systems, and was lowest among the project administrators. Preferred decision-making was result oriented among leaders, accountability oriented among corportae managers, and procedure oriented among the administrators.

To get the project going was the fastest among the project administrators and the slowest among the leaders in spite of their political clout. It was because of lack of government or bureaucratic support. The risk taking ability was highest among the leaders, moderate among the corporate managers, and lowest among the project administrators. In terms of structures, the leader dominated systems preferred to instal participative of federal structure, the corporate managers the corporate structure, and the project administrators the departmental structure. Dependence on the government for continuity and growth was relatively lowest among leader dominated agribusiness cooperatives and highest among the project administration dominated system.

It is interesting to note that in India most of the successful integrated agribusiness cooperatives like sugarcane, milk, rice or banana were leader dominated. All other attempts had mixed results. In our study, eucalyptus and mushroom cases were examples of leader dominated systems; cases on milk and shrimp were corporte manager dominated enterprises; and cases on asparagus and prawn were project administration dominated agribusiness projects. Leader dominated agricultural cooperatives are slow to set up, but long to last successfully (See Chart 2). Therefore, the initiative and centre of control over agribusiness cooperatives should ideally rest with the elected leaders of the cooperative members.

Chart 2
Management Styles Operating Among Agribusiness Cooperatives and their Characteristics

Preferred management styles and practices	Agribusiness cooperatives		
	Leader dominated	Corporate manager dominated	Project administrator dominated
1. Personal stake	Highest	Moderate	Lowest
2. Member status/ treatment	Shareholder	Producer/worker	Beneficiary
3. Negotiations considered as critical	For members contribution	For government support	For project funding
4. Preferred activity mix	Member-income generating	System-profit making	Target achieving
5. Market orientation	Highest	Moderate	Lowest
6. Decision-making style	Result oriented	Accountability oriented	Procedure oriented
7. Project initiation	Slowest	Moderate	Fastest
8. Risk taking ability	Highest	Moderate	Lowest
9. Preferred structure	Participative or federal	Corporate	Departmental
10. Dependence on government for continuity and growth	Lowest	Moderate	Highest
11. Probability of stable success	Highest	Moderate	Lowest
12. Agribusiness orientation	Strongest	Moderate	Weakest

7. The role of department *vis-a-vis* agribusiness cooperatives also needs to be reassessed. The department in many a situation is assuming a managerial and decision-making role rather than a promotional role. This brings in conflict their way of handling of the cooperative leaders. Instead of encouraging leaders to identify problems and find their own solutions, the executive style of functioning of the department has tendency to slow down: (a) the emergence of professionalism (see Case 6); and (b) the leader initiative (see Cases 2 and 7). This type of departmental involvement in the enterprise operation may not give the needed push to the strengthening of commodity-based integrated argibusiness cooperatives managed by the members. Unless it is recognized that agribusiness cooperatives are not only enterprise

entities, but also represent a cooperative movement neither leadership will be developed, nor the enterprise efficiency will be achieved.

8. Predominance of the government funded programmes under the changed agrarian situation, coupled with departments' adherence to traditional style of functioning are creating conditions at places for members and their leaders to alienate from participation in agricultural cooperatives (see Cases 1 and 3). Similarly, constant experimentation with the structures and/or functions of agricultural cooperatives like those in Bangladesh (new structures for rural development) or Indonesia (role of secondary cooperatives) also reflect dissatisfaction with the utility of existing arrangements for newer opportunities. AMSAC based integrated cooperatives, therefore, offer attractive features. Farmers from these countries today feel that going beyond the farm operations is profitable. Lack of incentives to do so (case 2) or restrictions against doing so (case 1) forcing them to make private arrangements away from cooperatives. Awareness that control over markets is essential and that it can come only through processing and/or collective action is growing among the farmers. Since promotion of agribusiness through cooperatives is not the dominant theme of the government sponsored projects, the existing structure and leadership of the cooperative movement is also under a severe strain. Alienation from and the lack of faith in the movement is also one of outcomes of this situation. Commodity specific, AMSAC-based integrated and professionally managed agri-business societies can help reverse the situation and stop the process of alienation. The department of cooperatives has a challenging role to play in this respect in almost all the developing countries.

9. Market orientation is the soul of commodity-based agri-business cooperatives. Even in those projects where some integration has been attempted, market orientation was lacking in its full form (see Cases 1, 2, 3, 5, 6, and 7). The agribusiness cooperatives will have to pay more attention to aspects, such as: (i) business environment (case 1); (ii) size, scope, nature and location of markets (Case 2); (iii) sales contacting, product specialization and geographical coverage (case 3); (iv) materials handling, warehousing, transportation, technological innovation and pricing (case 5); (v) market research, vendor relationship, profitability, competitors, market testing, improvements in packaging, market segmentation and product life cycle (case 6); and, (vi) franchising, trade practices, contractual integration, transport equipment, customer requirements, retailing and cost controls (case 7).

III *Summary of Discussions*

The cases and discussions point out that agribusiness cooperatives working on AMSAC model hold a great deal of promise in South-East Asian countries for: (i) economic development of small, subsistence and for non-commercial producers; (ii) renewed development of the full potentials of the cooperative sector; and, (iii) speeding up of agricultural development; provided they: (a) adopt commodity system approach; (b) develop strong market orientation; (c) deal directly with the ultimate consumer; (d) build member-contributed capital base; (e) encourage leader dominated management styles; (f) make full use of contractual integration whenever needed; (g) adopt value-adding technology and/or product mix; (h) use professional management; (i) evaluate performance on cost efficiency norms; and above all, (j) get constantly guided by the objective of increasing the income of small producers.

References

1. Goldberg, Ray A. Agribusiness Coordination : A Systems Approach To Wheat, Soybean, And Florida Orange Economics, Boston : Harward University, 1968.
2. Drilon Jr., J.D. Agribusiness Management Resource Materials (Vol. 1). Introduction to Agribusiness Management, Tokyo : Asian Productivity Organization, 1971.
3. Gupta V.K. and V.R. Gaikwad, Guide to Management of Small Farmers Cooperatives, New Delhi : Concept Publishing Company, 1986.