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Seed Paddy Production in Trincomalee District

Cultivation - Processing - Marketing

INTEGRATED FOOD SECURITY PROGRAMMME
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1. Seed Paddy Programme in Trincomalee District

Farmers usually obtain their paddy seeds from government farms, which are operated by the Department of Agriculture (DOA). DOA also produces paddy seeds through contract growers (out-growers). Since the capacity of government farms to meet the demand of all farming communities is limited, and since the areas in the north and east of Sri Lanka lack quality seeds for many years, DOA promotes seed paddy out-growing. Table 1 shows the present potential of producing of seed paddy at major government farms in Sri Lanka.

Table 1: Production potential of seed paddy at major government farms

Station	Extent (ha)	Production potential (MT per year)	Processing capacity (MT per hour)
Hingurakgoda	340	1,680	1.6
Polonnaruwa	132	700	1.8
Malwatte	n.a.	630	1.8
Maha Iluppallama	122	560	1.8
Aluttalama	80	420	1.2
Pelwehara	78	400	1.2
Kantale	54	141	1.8

Source: Hulangamuwa, 1999 and data from DOA

After harvest the paddy seeds are certified by the seed certification unit of DOA according to a standard procedure. This includes the examination and testing of the germination percentage, number of off-type grains, physical purity and occasionally also genetic purity. According to the purity standards, the seeds are categorised as either registered paddy seeds (RSP), certified paddy seeds (CSP) and commercial / consumption paddy seeds. The only and exclusive source for registered seed paddy in Trincomalee district is the government seed paddy farm in Kantale. State farms produce RSP from foundation seeds, which are developed at the Mahailupalam paddy research station.

The quantity presently produced covers only 41% of the estimated demand for the whole of Trincomalee district, which is about 345 MT per year. Transporting seed paddy from Kantale to DS Divisional centres and villages was constrained by the security situation. The poor road network and the transport costs are added constraints.

To contribute to better supply of seed paddy and to address the constraints faced by the farming community the Department of Agriculture, supported by the Integrated Food Security Programme Trincomalee, initiated a seed paddy out-growing programme in the year 2000 in the DS Division of Muthur. In 2002/2003 farmers in the DS Division of Padavisiripura started this programme with the support of DOA and IFSP.

In Muthur an extent of 10 ha was initially cultivated by about 100 farmers during Yala 2000. A quarter of an acre each was cultivated on an average. Thereafter the number of out-growers increased to 600 and the area under seed paddy to >60 ha. Farmers from the DS Division of Eachchilampattai joined. Both seasons, Maha and Yala, were covered. Table 2 shows the production achieved during the last three seasons.

To facilitate the process of certification, storage and trading of paddy, the Seed Cleaning and Sorting Centre Muthur was established at the 58th Mile Post, Kiliveddy, in September 2002. A seed cleaning and sorting machine was made available by IFSP-GTZ. The MPCS Muthur renovated and equipped a building. Altogether, Rs. 2.3 million

were invested. The seed cleaning centre is located in the middle of the rice growing areas of Kiliveddy, Palakudiyurpu, Thoppur, Mallikaithivu, Seruvila and other villages. Paddy farmers from all communities from these areas as well as from the DS Division of Eachchilampattai have easy access to the centre. The processing machine also has the capacity to clean and sort consumption paddy, pulses and various other seeds.

Table 2: Yield of the seed paddy out-growing programme (bushel)

AI Range	Maha 2001/2002	Yala 2002	Maha 2002/2003	Remark
Muthur	640	1,230	340	Failure in Maha 2002/2003 due to severe floods and violence in April and May 2003; 1 bushel = 20.5 kg ¹
Thoppur	627	1,200	0	
Sampoor	600	1,100	350	
Munnampodiveddai	675	1,275	376	
Kiliveddy	660	1,250	370	
Eachchilampattai	0	750	560	
Total	3,203	8,807	1,997	
Total in MT	65.7	180.5	40.9	

Source: Administrative report DOA 2002 and 2003

About 75% of the population in the north and east is engaged in agriculture related activities. Most of the farmers are cultivating paddy as their main source of income, either as owner cultivators, tenants or labourers. The size of the individual farms varies between >1 acre and >4 acres (DOA, 2000).

In the Muthur AO Segment farmers obtain comparatively low yields from their paddy cultivation. The main constraints are the lack of quality paddy seed, insufficient fertilisation and pest control due to poor farm budgets and restrictions on the supply of e.g. Urea (before the MOU), poor weed management, absence of extension services in areas under LTTE control, and an overall non-adherence to recommendations given by the DOA. Overall, the cultivation techniques focus on minimising the risk.

2 Objective of the Survey and Methodology

2.1 Objective

The objective of this survey is to assess the economic viability of paddy farming with emphasis on seed paddy production in selected areas of Trincomalee district. The results are expected to support the seed paddy out-growing programme initiated by the Department of Agriculture and assisted by the Integrated Food Security Programme Trincomalee. The survey results further aim at complimenting the establishing of a farmer's seed processing company.

Specific tasks addressed and questions asked are :

- What is the profitability of the production of consumption paddy?
- What is the profitability and possible sustainability of the specialised seed paddy production through out-growers?
- What is potential and possible sustainability of a seed paddy processing farmer company?

¹ Conversion rates for consumption paddy: 1 bushel = 22 kg, for certified seed paddy = 20.5 kg

2.2 Methodology

2.2.1 Study area

Trincomalee district is located in the Dry Zone of Sri Lanka. The mean annual rainfall is in the range of 756 mm to 2086 mm. The mean annual temperature is about 28.7 degrees Centigrade. Due to the low elevation the land belongs to Low Country Dry Zone (LD1 and LD2). Reddish Brown Earth (RBE) and Alluvial soils are prominent. The Alluvial soil and the agro-ecological conditions are favourable for the cultivation of paddy. The potential area under paddy in Trincomalee district is about 41,200 hectares (101,000 acres), which includes the Yala and Maha seasons. The actual area sown and harvested differs significantly from the total potential paddy lands. In the 1999/2000 season, all over Trincomalee district, a total of 24,631 ha were sown. Harvested were 21,498 ha (87%).

Three AO Segments and eleven agriculture Instructor Ranges (AI Range) provide extension and other services to the farming community. The AO Segment Muthur comprises the six AI Ranges of Muthur, Sampoor, Thoppur, Manampodiveddai, Kiliveddy and Eachchilampattai. Other AI Ranges where paddy cultivation is prominent are Kantale, Seruvila, Thampalakamam, Pankulam-Morawewa and Padavisisripura. The regional extension service of the Department of Agriculture is organised as 'Agriculture Officer (AO) Segment'.

The Muthur AO Segment addresses the DS Divisions of Muthur and Eachchilampattai with approximately 16,000 families. The total potential paddy area is 8,041 ha, of which 3,609 ha (45%) come under major irrigation schemes, 1,060 ha (13%) under minor irrigation schemes and 3,372 ha (42%) are rain fed. If the Seruvila area is included, the total potential paddy area would amount to 10.739 ha.

2.2.2 Livelihoods

The individuals and the communities in the rural areas have their own inherited traditional behaviour pattern under their specific economic and social conditions. The livelihood system approach is looking at how individuals and communities manage their economy and interact with government and market institutions (IFSP-CATAD 2001, IFSP, 2003). The livelihood system approach was applied to specifically address the aspects of seed paddy and consumption paddy cultivation.

Uncertainty

Long- and short-term conditions and opportunities respectively that are available to paddy farmers were taken into consideration. Long-term conditions are climate, government policies, economic conditions such as purchasing power, subsidies and access to services. A decisive long-term factor has been the security situation, which however, has had immediate short-term effects on the farming community in terms of coping and adjustment. Short-term factors are behavioural pattern to minimise risk, ensure safety and security against sudden outbreak of communal violence, also against market failures and seasonal price fluctuation. To overcome critical situations farmers apply their individual as well as group related strategies.

Capital assets

The farming community holds capital assets such as land, know-how and knowledge regarding cultivation pattern, methods of irrigation, harvest, storage etc. Social assets are constituted through farmer organisations, communal cultivation practices or seasonal meetings. Financial assets include farm cash for cultivation and inputs in particular, returns from sales, loans, machinery.

Services

Most farmers are grouped in farmer organisations. They are registered and are eligible for taking contracts from government as well as receiving services from government departments. Farmer organisations are commonly the implementing partners for the Departments of Agriculture, Agrarian Development, Irrigation and also development projects such as IFSP. Farmers either individually or through their organisation interact with traders for the purchase of inputs, credit arrangements and sale of harvest. Most of the traders in the Muthur AO Segment are Muslims. Trading pattern are well determined and overall show quite a static pattern.

2.2.3 Data collection

Primary data collection at farm level

A farm interview survey was conducted on 30 farmers in selected DS Divisions during the Yale season of 2003. The questions addressed the economics of the seed paddy and the consumption paddy production. With the help of Agricultural Instructors, 10 special seed paddy farmers from the seed paddy production programme of DOA were selected for the survey (Annex 3).

20 farmers were selected randomly and interviewed to compare the economics of the cultivation and production of seed paddy and consumption paddy. The survey was carried out in the main paddy production areas of the Divisions of Muthur, Eachchilampattai, Kantale and Gomarankadawala.

The interviews were conducted face-to-face, using a structured questionnaire. Information for all cost items for inputs and operations were recorded. Costs and returns, financial assets and sources, farm assets, loans and credit facilities, marketing opportunities and best management practices applied by the farmers were addressed (Annex 4). In addition, semi-structured interviews were conducted with selected persons to gather information relevant to social assets.

Interviews with key informants

As a supportive measure, semi-structured personal interviews were conducted with the staff of DOA Trincomalee, IFSP, Manager of Muthur MPCs and Assistant Director Seeds who is heading the government farm Kantale. About 30 minutes were spent for each interview. The questions related to aspects of services provided, market facilities, support for seed paddy production etc. The key informants were given the opportunity for elaborated expressions. The procedure of conducting these interviews is shown in the figure in Annex 5.

Secondary data collection

Qualitative and quantitative secondary data were collected from different sources such as IFSP publications (technical papers, working papers, minutes of sector meetings, various reports), DOA publications and administrative reports, literature and research papers. Recent newspaper clippings complimented this exercise.

2.2.4 Analytical procedure

Information gathered from the questionnaires were coded separately and processed through spreadsheet calculation. The financial and economical analysis were done including farm budgets, cash flow analysis and cost benefit analysis for paddy cultivation and also for the farmer company. The other data were used to get a proper understanding about the system of cultivating consumption and seed paddy, about the services received to the farmers and the existing market systems.

3 Results and Discussion

3.1 Production of consumption paddy

3.1.1 Financial analysis (gross margin calculation)

The gross margin was calculated for one acre of paddy cultivated. All the factors that have an influence were included. Average cost and returns were considered in the calculation. The results of the calculation are given in Table 3. They imply that the gross revenue was about Rs. 23,175 per acre. The net return to capital is 34% for a period of six months, which covers land preparation, sowing / broadcasting, maintenance, harvesting and consumption and utilisation of the revenue until the next season.

Table 3: Gross margin calculation for consumption paddy

Item	Unit	Quantity	Value in Rs.
Material			
Seed paddy	bushel	3	1,000
Fertiliser Urea	kg	90	925
TSP	kg	25	650
MOP	kg	15	330
Weedicides		2 applic.	1,350
Bags	no.	30	600
Pesticides		2 applic.	1,100
<i>Sub total</i>			<i>5,955</i>
Labour charges			
Clearing and plastering of bunds	man day	4	1,200
Sowing	man day	3	900
Fertiliser application	family labour	1	250
Weedicide application	family labour	2 applic.	150
Pesticide application	family labour	2 applic.	150
Harvesting	man day	10	3,000
Cleaning	man day	3	900
Other expenditure*			500
<i>Sub total</i>			<i>7,050</i>
Machinery costs			
Land preparation	acre		2,850
Spraying		2 applic.	300
Threshing	acre		600
Transport	bags	26	520
<i>Sub total</i>			<i>4,270</i>
Total costs / expenditure			17,275
Revenue			
Selling of paddy	bushel	45	12,000
Consumption as rice (30 bushel paddy)**	kg	449	10,175
Keeping as seed paddy	bushel	3	1,000
Gross revenue			23,175
Gross margin EFL			6,450
Net profit IFL			5,890

Explanation:

IFL: including family labour; EFL: excluding family labour; applic.: applications; average yield per acre is 78 bushels; price: Rs. 800.00 per bag, which contains 66 kg, equal to 3 bushels; * Expenses for food and minor equipment / tools such as ropes, mats, etc. ** Milling rate of paddy is 0.68, farm gate price of rice is 25/kg, and cost of milling is Rs. 35/bushel.

The net return to capital ratio indicates that an investment of Rs. 100 will generate and additional surplus of Rs. 34 within six months. The production of consumption paddy

results in an average net profit of Rs. 983 per month including allowance for the family labour.

Revenue and profit vary from area to area. The cost of cultivation is influenced by many factors. Input price, labour consumption and fluctuating wage rate during harvesting season, cost of hired machinery, land tenure and availability of capital on time are important factors. In case farmers are obtaining capital for farm inputs with delay, they are missing the suitable time for sowing. Consequently, this affects the cost of production and the yield, which in many instances coincides with the seasonal outbreak of diseases. Late cultivation and harvesting may also affect the farmer's market position. The revenue is highly influenced by the total yield, seasonal farm gate prices, transport cost for marketing and the relations between farmers and traders.

The yield varies according to the location of the land that is cultivated under either minor or major irrigation schemes. The degree of adopting good management practices are a decisive factor for success. Farmers who were cultivating under major irrigation schemes secured comparatively higher yields (115-120 bushels per acre) compared to farmers under minor irrigation scheme (65-75 bushels per acre), indicating lower yields of 43% to 37%.

Farmers who were adopting integrated pest management spent less for pest control. The over application of fertiliser results in a too early and too vigorous growth, which makes the paddy fields look greener and quickly attracts pests and insects. Farmers applying a split application of fertiliser and used organic pesticide such as Neem extract and lime were in a position to reduce the costs of pest control.

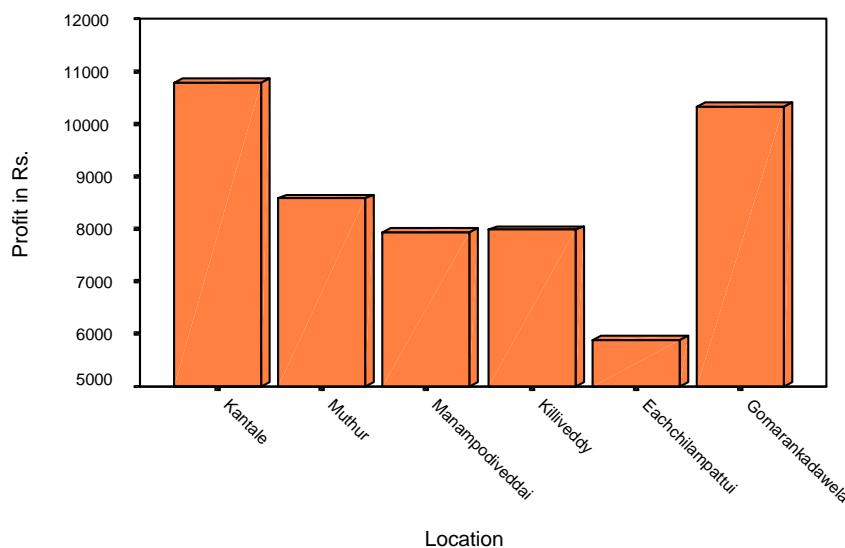


Figure 1: Profit for production of consumption paddy for different AI Ranges

Based on the factors applied in the calculation, the net profit is quite different for the paddy growing areas as shown in figure 1. Farmers in Kantale and Gomarankadawela obtain a higher profit due to higher yields. The profit in Eachchilampattai was the lowest due to low yields and various other constraints, such as poor road conditions and lack of inputs and services.

3.1.2 Expenditure analysis

The on-farm expenditure was analysed based on the performance during Yala 2003. Farmers in the AO Segment of Muthur preferred to cultivate varieties such as BG 352

and BG 358, which have a vegetation period of three and a half month. The expenditure pattern is shown in figure 2 for the direct input and labour cost items per week and as the cumulative operative expenditure for all items during the whole cultivation season .

After the initial establishment of the paddy crop, maintenance costs were rather low compared to the beginning and end of the season. The highest expenditure, predominantly for labour, was observed during the harvesting season.

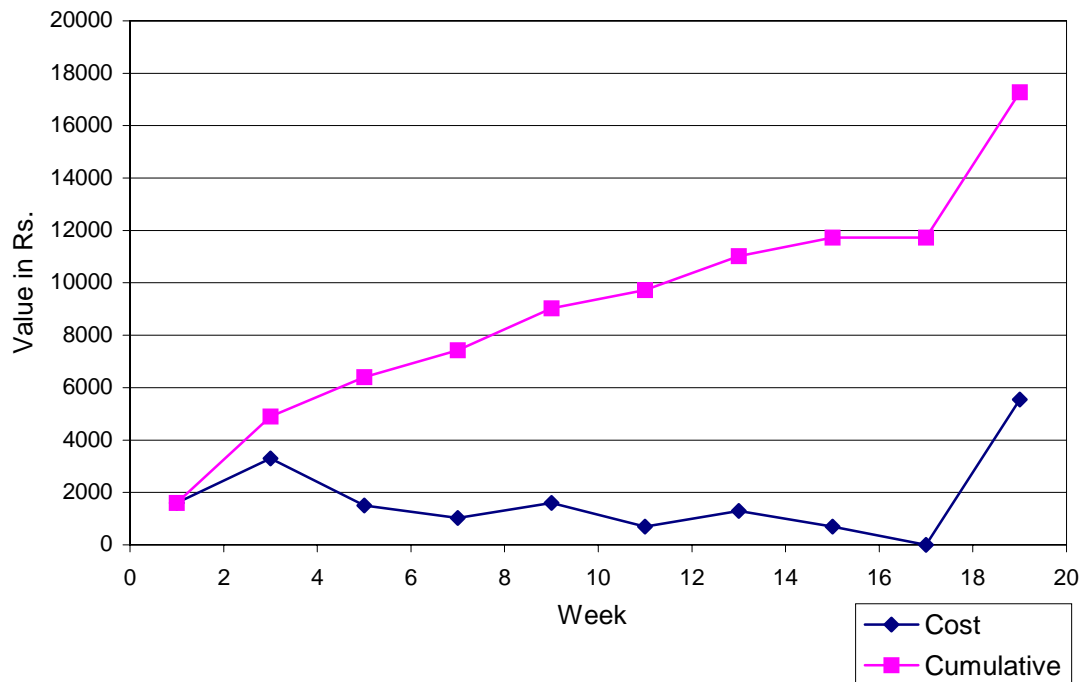


Figure 2: Expenditure pattern for the production of consumption paddy

3.1.3 Cost composition in different AI Ranges

The total cost incurred for the cultivation and production of consumption paddy differs according to location (figure 3). The total cost of cultivation includes the family labour for the surveyed farmers in selected AI Ranges. For comparison purpose, data for locations in Gomarankadawela and Kantale were included. The cost of cultivation was considerably lower in Eachchilampattai. Contrary to mechanised land preparation in government controlled areas, the main power source in Eachchilampattai are bullocks, which is cheaper than hired machinery.

The highest costs of production were recorded in the AI Range of Kiliveddy due to the high cost of inputs and hired machinery in particular, compared to the other locations. The remoteness of the area, poor road conditions as well as difficulties in obtaining quality fertiliser on time contribute to high production costs in this area. Total costs are reasonable lower in Gomarankadawela, where many farmers own tractors.

Almost 40% of the total costs were spent for farm inputs such as seeds and agri-chemicals, followed by hired labour and hired machinery. These factors directly influence the profitability of the cultivation and production of consumption paddy. Costs for family labour and own machinery were <5% and >3% respectively.

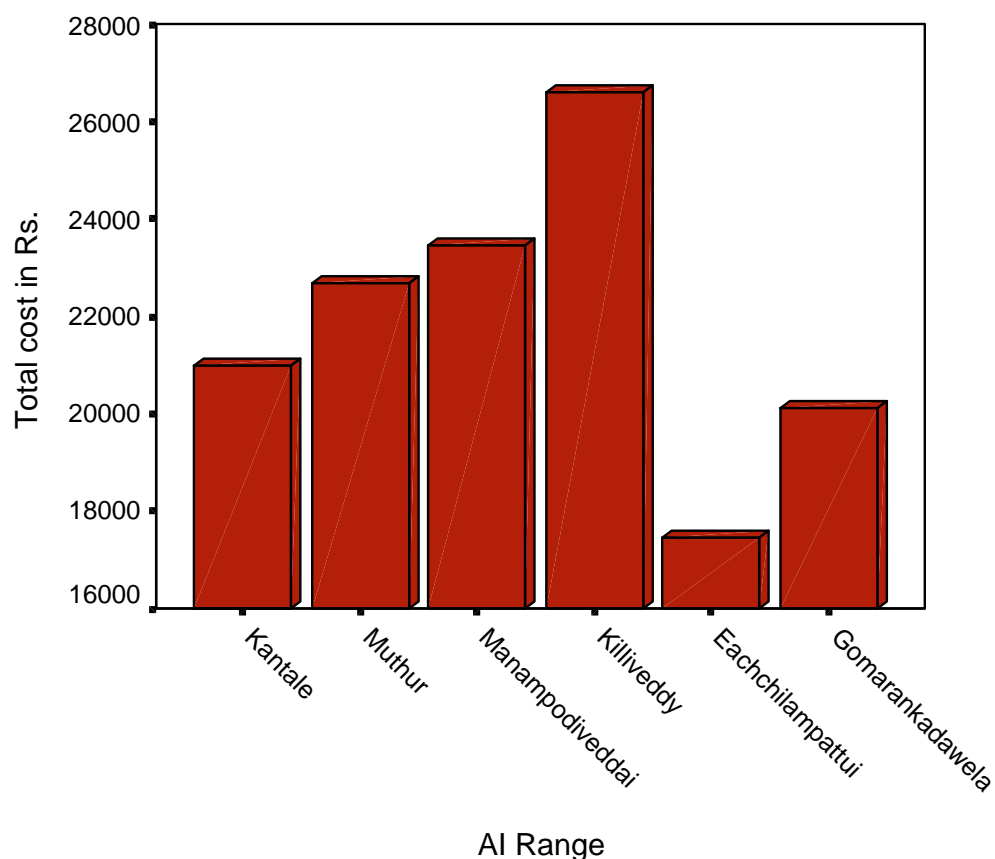


Figure 3: Total cost of production in selected AI Ranges

3.1.4 Economic analysis

Family consumption

The average of the interviewed farmers kept about 30 bushels (10 bags) of paddy for their family consumption. The cost incurred in the conversion of paddy into rice is in given in table 4.

Table 4: Value of rice consumed by farm family

	Conversion	Value in Rs.
Value of 30 bushel paddy	(30 x Rs. 800/3 Bushel – 6,790)	1,210
Conversion of paddy into rice	30 bushels harvested x 22 kg/bushel = 660 kg of paddy	
Market value of rice	660 x 0.68 = 449 kg of rice x Rs. 25.00 per kg	11,225
Operational costs (milling, storing, parboiling, etc.)	30 Bushels x Rs. 35.00	- 1,050
Cost of processing	17,655 / 78 x 30 bushels	- 6,790
Value of converted rice	(11,225 - (1,050 + 6,790))	3,385
Extra profit	(3,385 – 1,210)	2,175

Explanation:

Extraction rate of paddy is 0.68; price for Samba rice: Rs. 25.00 per kg as assumed farm gate price; cultivation is done on own land; milling cost per bushel: Rs. 25.00 and for storing and parboiling Rs.10.00

The consumption of own cultivated paddy generates an extra benefit of Rs. 2,175 per acre. Since the local millers do not provide an accurate extraction rate the output may vary. The net benefit also depends on the farm gate price, which was assumed at Rs. 25 per kg as minimum price. If the price increases or the extraction rate rises up to 0.75 the net benefit also will increase².

Investment analysis

A producer of consumption paddy is securing an average net benefit of Rs. 5,890 per acre and season. He needs to invest about Rs.17,275 initially. The return to this investment was calculated at 34%. If the farmer had saved the total of 17,275 in a fixed deposit he would have received about 10% interest, which would generate Rs. 864 for a period of six months. Compared with this amount, even paddy cultivation is much more profitable, however, involves comparatively high risks.

Economy of land

Three types of land are cultivated in the Muthur area, viz. high land, middle land and low land. Locations that are somehow elevated cannot be utilised for paddy cultivation under irrigation during the Yala season. Low land in turn cannot be cultivated in the rainy season because of flooding and water logging. Middle land is most suitable for irrigation. To ensure the utilisation of high land and low land the irrigation and drainage systems need to be rehabilitated. Today these systems are inadequate. Basic investment and maintenance were not done for many years due to the conflict. As a result, farmers are not in a position to secure their income during the Maha and Yala season. More efficient land use would call for the cultivation of other field crops. However, it is not at all common to e.g. grow vegetables, bananas, maize, manioc etc. at larger scale on locations that are not suitable for irrigation.

The high degree of land fragmentation is a serious constraint for a more profitable paddy farming. The prevailing heritage practices divide and transfer land to the younger generation. Farmers usually prefer to cultivate specific varieties in their fragmented and neighbouring small fields. They have their own understanding when to sow and how to look after their paddy, which is in many cases not in line with good agricultural practices. Pest control is difficult under a diversified environment and costs increase due to frequent spraying.

The lack of capital is a major limitation for cultivating a larger extent. The main source of capital for farm inputs is provided by informal moneylenders and traders in the village. Pawning of jewellery is common during the cultivation time. The absence of saving habits amongst farmers keeps them tied to local money lenders.

The average cost of land tenure was surveyed at about Rs. 3,000 per acre. The ultimate financial benefit for farmers who cultivate their own land is Rs. 3,725. Comparing the economic analysis there was no considerable difference in the net profit between the lease of land for cultivation by a third party and the cultivation of the own land by the farm family. The only advantage for leasing land was not to get engaged in day-to-day operations and to secure a direct lump sum of cash money equal to the net profit after six months. The challenge for the cultivator is to generate a profit above the land tenure cost by applying good cultivation techniques and by securing a minimum cost combination of all farm inputs. This would require that good extension advice was available and that farmers practised advanced skills.

² Rural communities in remote / conflict affected areas who have very low cash income almost exclusively consume rice as their staple food. They hardly consume bread. Any surplus that is not marketed is kept as buffer stock for urgent ad-hoc cash requirements.

Utilisation of labour

The survey showed marked differences in the cost of production according to the labour utilisation. The wage rate fluctuates during the harvesting season because of lack of coordination and cooperation within the local farming community. Fixed wage rate arrangements are uncommon. The balancing of a seasonal labour shortage through e.g. collective and successive cooperation is not practised to the extent necessary and possible.

The significant increase in the total area cultivated in the seasons 2002 and 2003 in Sri Lanka and in the north and east in particular, is the result of the peace process. Earlier, most of the paddy land in the so called 'uncleared areas' were not cultivated. The main reason for the labour shortage in the AI Ranges in the Muthur DS Division was the migration of a considerable number of men and women (?) to paddy growing Districts in Polonnaruwa and Ampara where personal safety was ensured. During the peak harvesting season the labour shortage leads to delays and also to losses due to shedding.

The efficiency of the labour utilisation is high when farmers cultivate larger extents of land rather than fragmented plots in different locations. One farmer in Muthur stated that he needed five labourers for land preparation though he cultivated only one acre. Contrary, he was able to do this work with ten labourers on a plot of five acres.

Transplanting

Transplanting is not practised. Farmers explained that transplanting is more labour intensive and the higher yield does not match the additional costs involved. As finely paddled land is needed for transplanting, additional land preparation costs occur.

A survey from north east Thailand confirms that though transplanting is still the major method for rice cultivation, the dry direct seeding is being gradually adopted. The increase in wage rates for farm labour was quoted as main reason. However, the dry direct seeding method results in lower and unstable yields. The facts also suggest that better weed control and fertiliser management are necessary to increase the yield under this cultivation technique³.

Marketing

Over the previous years the average total production of paddy in Trincomalee district was 120,000 to 140,000 MT (metric tons) for both, Maha and Yala. per season. About 7,000 MT (average of %) are produced in the Muthur AO Segment. The bulk of the paddy is produced under major and medium irrigation schemes in the main paddy areas such as Kantale, Thampalakamam, Gomarankadawela and Padavisiripura.

In fact, Trincomalee district is a rice surplus area. Most of the paddy is 'exported' to other districts, mainly to the urban centres. The comparatively high degree of poverty and vulnerability of the population in Trincomalee district is closely related to seasonal and structural food deficit. Overall, the village population has a very limited purchasing power. Since they are short of cash money due to the unstable economic situation they need to sell the paddy immediately after harvest. However, the net profit from the sale of the crop is hardly sufficient to meet the needs of the family up to the next harvest. As observed by IFSP Trincomalee, the response to Food-for-Work (FFW), particularly if combined with a cash allowance of e.g. Rs. 50 per labour day, is highly attractive during the inter-harvesting months.

³ Sumita, T. and Ando, M., 2001. Economy of Direct Seeding of Rice in Northeast Thailand and it's future direction, JIRCAS working report 30.

The marketing set-up in the Muthur area is determined by the link between traders who are more commonly from the Muslim community and the cultivators who are mostly from the Tamil community. There exists a de facto trade monopoly. Farmers are hardly, if at all, in a position to realise a fair price for their produce. They have to sell the harvest at the price the trader offers. The remoteness of villages in the Muthur AO Segment as well as the poor road conditions contribute to a weak market position of the farmers. On the other hand, the overall trading and marketing system in Sri Lanka is said to be highly diversified and is considered competitive and efficient⁴.

Collective marketing is not common. The institutional arrangements through e.g. the Departments of Cooperatives, Agriculture, Agrarian Development or the MPCs are insufficient to support the market position of the farming community. The MPCs is purchasing only a limited quantity. Collective bargaining, however, would allow that farmers secure a far better farm gate price. The newly established Seed Processing Farmer company, which is expected to engage in paddy and rice trading, could fill a much needed gap.

Benefit-cost ratio

Benefit is the net profit from paddy production and cost is the total cost for the whole process of cultivation and production. The benefit-cost ratio of consumption paddy is given in figure 4.

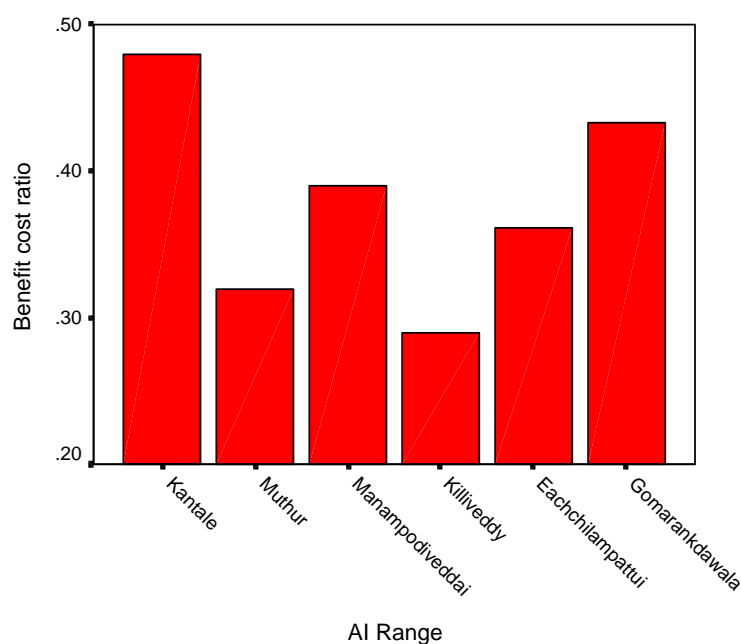


Figure 4: Benefit-cost ratio in different AI Ranges

The major factors affecting the benefit-cost ratio are the selling price of the paddy, costs for agro-chemicals, machinery and hired labour. The allocation of family labour and own machinery have a minor effect on the ratio. The benefit-cost ratio ranges from 0.29 to 0.48 per acre, which altogether confirms negative returns. Farmers in Kantale record a higher ratio due to high yield (120 to 130 bushels per acre) and comparatively lower operation costs. In Killiveddy the ratio was lowest since the overall input cost were the highest.

⁴ Elis, F., P. Senanayake and M. Smith, Food Price Policy in Sri Lanka, in: Food Policy, Vol. 22, No. 1, pp. 81-96, 1997; Kelegama, S., Food security Issues in Sri Lanka, in: Hector Kobbekaduwa Felicitation Volume, Hector Kobbekaduwa trust, Colombo 2000, pp. 207-238

3.1.5 Livelihood system analysis

Uncertainty involved in consumption paddy production

Climatic factors: The North East monsoon is the prime source for water in non-irrigated cultivation. Unpredictable weather conditions affect the cultivators. The Maha 2002-2003 season was highly affected by flood. In certain areas the costs incurred by the farmers could not be recovered and the whole investment was lost.

Stagnant paddy prices: Though fuel, labour, inputs and the machinery costs have increased, the selling price of paddy remained static over the past two years. Farmers are facing great difficulties in recovering the additional costs that have been invested for cultivation.

The common practice of selling paddy is through the village collectors and wholesale traders. The price of consumption paddy fluctuates according to the season. During the harvesting season prices drop to Rs. 9.00 to 11.00 per kg. The sale of paddy at such prices does not even cover the cost incurred in the cultivation. However, about one month later paddy prices increase again to Rs.12.50 or Rs. 13.00. Government intervention is very limited and mainly appealing to traders and MPCs to pay a guaranteed price of Rs.13.50. Farmers are more or less obliged to sell off their paddy immediately after harvest due to indebtedness, interest payable for loans and their cash requirements for the day-to-day living. Selling the paddy at a loss perpetuates the vicious circle of indebtedness, poverty and vulnerability.

Conflict: The conflict had an extremely negative effect on the paddy economy. Most of the infrastructure such as road networks, irrigation facilities, marketing, extension service and the availability of agri-chemicals were constrained. After the communal violence of April and May in Muthur the paddy economy almost collapsed. The yield from Maha 2002/2003 was to a large extent not sold prior to Yala 2003. The Yala season 2003 was lost for many families who were prevented to prepare their fields for cultivation due to the violent communal clashes in April 2003.

Capital assets deployed

Natural assets: Most of the farmers were cultivating their own land. Farmers, who were capable in generating profits out of the tenure of their land, were doing good business. Accordingly, the accessibility to land, the irrigation facilities available and the yield determine the tenure cost. Tenure costs range from Rs. 3,000 to Rs. 5,000 per acre.

Irrigation: The "Bethma" system was practised in locations during Yala, when water was the limiting factor. Under this system a limited extent was cultivated according to the water availability in the particular scheme. Bargaining and consensus amongst the participating farming families regulate the access to water.

Social assets: Almost all the farmers were members of farmer organisations in their particular area. Seasonal meetings were conducted to get decision on the varieties to be cultivated, fixing of dates for distributing water and the schedule for commencing the cultivation.

Physical assets: Usually, 3.5% of the total cost was from family labour. Farmers who have a good source of family labour were able to save a considerable amount by substituting hired labour.

Services provided

Many formal organisations such as the Departments of Agriculture, Agrarian Development and Irrigation are covering certain aspects of paddy cultivation and production. The Department of Agricultural's extension service is providing knowledge,

technology and quality paddy seed. The Department of Irrigation facilitates the allocation of water from medium and major irrigation tanks. This department maintains irrigation systems as a free service to the cultivators. The Department of Agrarian Development is also providing technology and services for minor irrigation schemes with emphasis on strengthening farmer's organisations. The proliferation of institutions is obvious. Far better coordination and complementary activities than practised today are needed.

Apart from government organisations development projects such as NEIAP or IFSP, INGOs and NGOs are supporting the advancement of the local paddy economy. IFSP is providing support through established structures, e.g. supports the seed paddy out-growing programme through the Department of Agriculture, the minor tank rehabilitation and development programme through the Department of Agrarian Development and the large scale clearing of overgrown and silted irrigation channels through Department of Irrigation.

Strategies to maximise income

In the Muthur AO Segment most of the paddy farmers are also engaged in other agricultural activities like rearing cattle, goat and poultry, home gardening or cultivating of cash crops such as banana or vegetable cultivation. Just after harvest when the paddy prices decline drastically, farmers who have the capacity and can afford to store some of their paddy for at least a month gain a good income thereafter. Those who can afford also sell a minimum portion of their harvest to cover loans, interest payable and for immediate cash requirements. Farmers with entrepreneurial skills embark on market activities to get their paddy milled and then sell it either locally or to the main market.

3.2 Seed paddy production

3.2.1 Types of seed paddy cultivators

Data were collected for all relevant cost and return items from the selected seed paddy producers who were the best cultivators in the Muthur AO Segment. All farmers cultivate under the major irrigation scheme of Allai which is a branch of the Mahaweli river.

The cultivation and production of certified seed paddy does not involve any major additional operations compared to consumption paddy. The conditions to join in the seed paddy out-growing programme are the exclusive use of registered seed paddy (RSP), which is supplied by the Department of Agriculture. Farmers have to register as seed paddy growers with DOA at a nominal fee of Rs. 400.

The Agricultural Instructors inspect the paddy field three times during the cultivation season. They provide advise and guidance on input and pest management in particular on overall maintenance practices. The first generation of certified seed paddy is called 'commercial seed paddy'. Commercial seed paddy producers practise weed control and do threshing without mixing the different varieties.

Commercial seed paddy production was predominant because this approach does not require registration under the seed paddy out-growing schemes of DOA. However, it is expected that the expansion of the out-growing scheme initiated by DOA will drive more farmers into formal agreements with the DOA. Commercial seed paddy farmers need to be encouraged to at least get their seed paddy produced cleaned, sorted and certified. Only then a medium- to longer-term change in the paddy economy would materialise.

The higher price of seed paddy, even though not certified by the DOA, ensures a 2.5 times higher return compared to the production of consumption paddy. Farmers were able to fetch a farm gate price of around Rs. 400 per bushel from commercial seed paddy.

Table 5 compares commercial seed paddy and consumption paddy production for area of one acre. Figure 5 highlights the difference between benefit cost ratios for consumption seed paddy and the commercial seed paddy production for the best cultivator from the sample.

The best five cultivators of commercial seed paddy production and consumption paddy production were selected and compared for better clarification. Compared to the cultivators of consumption paddy, the commercial seed paddy growers were well ahead, i.e. far more skilled, commercially minded and competitive. Though the commercial seed paddy production was a short-term business the benefit-cost ratio could be easily raised to >1.0 for the period of six months. However, the comparison is to a certain extent subjective since yield, costs for inputs, hired labour and machinery may vary significantly over time at different locations.

Table 5: Comparison of commercial seed paddy and consumption paddy

Item	Commercial seed paddy		Consumption paddy	
	Unit/Quantity	Value in Rs.	Unit/Quantity	Value in Rs.
Operational costs				
Land preparation	2 WT/ 4WT	2,850	2 WT/ 4WT	2,850
Cleaning of bund	2 man day	600	2 man day	600
Construction/repair of bund	2 man day	600	2 man day	600
Sowing	4 man day	1,200	4 man day	1,200
Weeding	2 applic.	150	2 applic.	150
Fertilising	1 man day	250	1 man day	250
Spraying	2 applic.	150	2 applic.	150
Harvesting	contract	3,000	contract	3,000
Threshing	hire	600	hire	600
Winnowing and packing	3 man day	900	3 man day	900
Transporting	15.00 X 26	520	15.00 X 26	520
Other expenditure*		500		500
<i>Sub total</i>		<i>11,320</i>		<i>11,320</i>
Material costs				
Seed paddy	3 bushel x 550	1,650	1 bag	1,000
Fertiliser		1,905		1,905
Weedicide	2 applic.	1,350	2 applic.	1,350
Pesticide	2 applic.	1,100	2 applic.	1,100
Bags	30 bags	600	30 bags	600
<i>Sub total</i>		<i>6,605</i>		<i>5,955</i>
Grand total		17,925		17,275
Revenue				
Selling as seed paddy (75 bushels)		30,000		
Keeping as seed paddy (3 bushels)		1,200		1,000
Consumption as rice (30 bushels of paddy)**				10,175
Selling as consumption paddy (45 bushels)				12,000
Gross revenue		31,200		23,175
Profit IFL		13,275		5,250

Explanation:

IFL: including family labour; applic.: applications; average yield of 78 bushels per acre; price: Rs. 800 per bag of 68 kg, equal to 3 bushels; price of commercial seed paddy: Rs. 400; * Food costs and minor equipment / tools such as ropes, mats, etc. ** see the table 4.

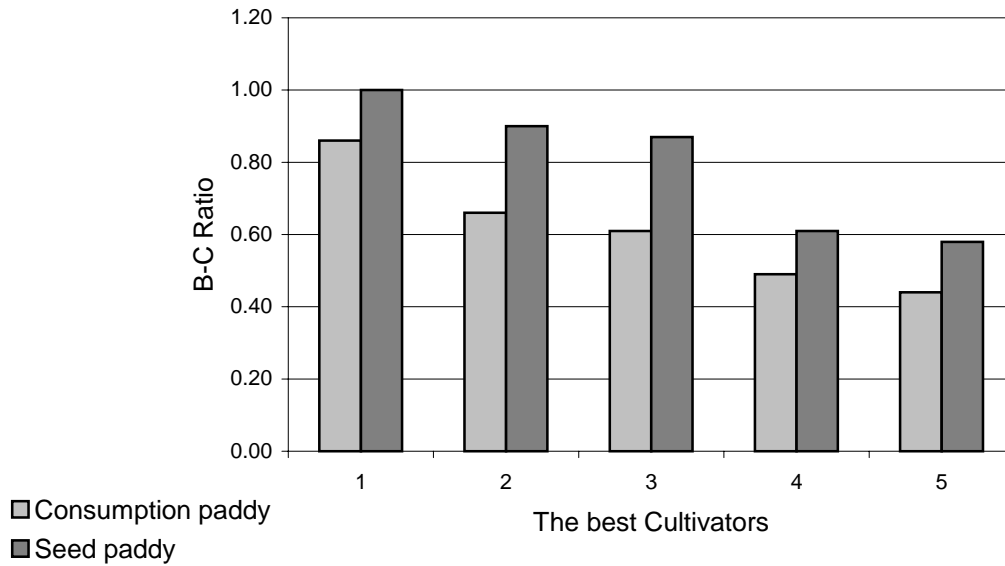


Figure 5: Benefit-cost ratio for commercial seed paddy and consumption paddy

The profit that was generated by the farmers was highly subjective to the composition of costs. Higher inputs were observed compared to the production of consumption paddy. All other cost components were more or less similar.

3.2.2 Gross margin calculation for certified seed paddy out-growers

The production of certified seed paddy became quite attractive with the seed paddy out-growing programme that was launched by Department of Agriculture and initially funded by IFSP Trincomalee. The programme commenced in the DS Divisions of Muthur and Eachchilampattai to solve the shortage of quality planting material in these areas. During the initial stage of the seed paddy out-growing programme a package of registered seed paddy and fertiliser was distributed at zero costs to selected farmers who cultivated 0.5 acres. Extension services were provided through the AI of the respective Range. The half acre fields were used as demonstration plots for the neighbouring farmers. Table 6 shows the gross margin of certified seed paddy cultivation and production.

The calculation shows that about Rs. 20,225 is secured as net profit by a registered seed paddy producer. The major factors of influence were the high price, availability of processing and marketing facilities and the comparatively adequate costs for inputs. The registering with the DOA, the removal of varieties considered not suitable to the respective location and finally, the processing opportunity of the harvested seed paddy were the additional factors for success.

The Seed Processing Centre at the 58th Mile Post became an attractive spot. By and large, farmers consider it highly beneficial to be registered as certified out-growers. The farm gate price for certified seed paddy was Rs. 500 per bushel, which is far more attractive than just growing commercial seed paddy.

It is quite obvious that the DOA needs a strong presence in seed paddy-outgrowing areas. At the same time, commercial processing and marketing would be essential prerequisites to expand the programme. The farmer company could play a key role.

Table 6: Gross margin calculation of certified seed paddy production

Item	Unit	Quantity	Value in Rs.
Material			
Registration cost	acre	1	400
Seed paddy	bushel	2	1,100
Fertiliser Urea	kg	90	925
TSP	kg	25	650
MOP	kg	15	330
Weedicides			1,350
Bags		30	600
Pesticides			1,100
<i>Sub total</i>			6,455
Labour charges			
Clearing and plastering of bund	man day	4	1,200
Sowing	man day	3	900
Fertiliser application	fam. labour	1	250
Weedicide application	fam. labour	2 applic.	150
Pesticide application	fam. labour	2 applic.	150
Harvesting	man day	10	3,000
Cleaning	MD	3	900
Removing of ODV		3	750
Other expenditures*			750
<i>Sub total</i>			8,050
Machinery costs			
Land preparation			2,850
Spraying			300
Threshing			600
Transport			520
<i>Sub total</i>			4,270
Total expenditure			18,775
Revenue - Profit			
Selling of seed paddy		75	37,500
Keeping as seed paddy		3	1,500
Gross revenue			39,000
Gross margin IFL			20,225

Explanation:

IFL: including family labour; applic: applications; average yield is 78 bushels per acre; price: Rs. 500 per bushel of 20.5 kg certified seed paddy; * Food costs and minor equipment such as ropes, mats, etc.

The production of certified seed paddy requires additional costs for registering as a seed paddy out-grower, removal of non-desired paddy varieties, threshing of paddy grains without mixing with other varieties and finally, processing. For these operations additional costs of about Rs. 2,500 will occur. However, the net return far exceeds that of commercial seed paddy or consumption paddy.

Challenges faced by the seed paddy farmers in the respective AI Range were addressed while conducting the interviews. For the programme to be sustainable, the lack of registered seed paddy needs to be overcome. The recommended appropriate varieties (BG 352, BG 358) need to be supplied timely. Insufficient water supply and the lack of marketing facilities were commonly quoted as constraints that needed to be overcome in all AI Ranges. Better transport and market facilities for the procurement of inputs such as fertiliser and agro-chemicals are essential in the AI Ranges of Muthur, Sampoor and Eachchilampattai in particular.

3.2.3 Potential for producing seed paddy

Farmers are able to earn an additional net profit of Rs. 8,025 when changing from consumption paddy to commercial seed paddy. Further, if the timely supply of registered seed paddy was ensured, farmers who participate in the out-growing programme for certified seed paddy realised an additional net profit of Rs. 6,954 per acre compared to the profit from commercial seed paddy. Altogether, certified seed paddy producers would increase their net profits by Rs. 14,975 per acre compared to just producing consumption paddy. This is an increase of 285%.

To achieve the goal of sustainable certified seed paddy out-growing sound skills and knowledge of farmers how best to cultivate, a very strict adherence to varieties recommended by DOA for the respective agro-ecological area and / or location, good fertilisation, weed management and improved harvesting techniques would be required.

The net benefit ratio of commercial seed paddy compared to consumption seed paddy production was calculated based on the performance of farmers who applied best agricultural practices in the Muthur AO Segment. Figure 6 shows the results.

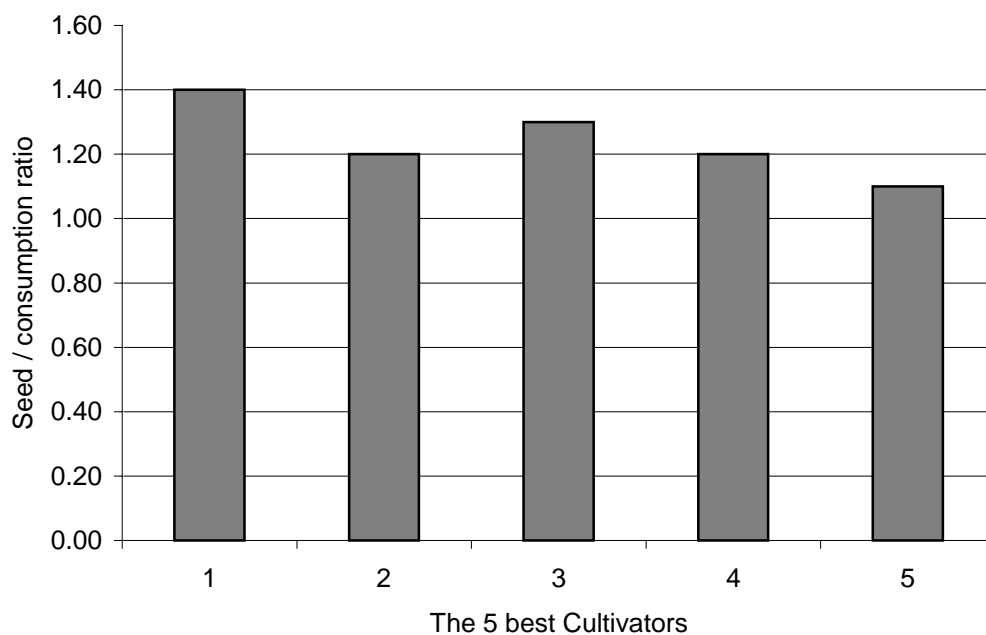


Figure 6: Net profit ratio of consumption paddy compared to commercial seed paddy

The ratio for the five best cultivators ranges from >1.1 to 1.4. This implies that through this exclusive cultivation commercial seed paddy farmers were able to obtain a 1.1 to 1.4 higher profit compared to the production of consumption paddy. If farmers turn to certified seed paddy production, their profit ratio will show an additional significant increase. Conditions are to get registered by the DOA as a registered seed paddy producer and to comply with the rules and regulations for certified seed paddy out-growing. Though extension services are being provided free of charge at present, farmers would be obliged to cover costs in future.

3.3 Sustainability of paddy production

3.3.1 Sustainability of consumption paddy

The net revenue of Rs. 5,250 for consumption paddy, which was the out come of six month of operation is absolutely low regarding the efforts of the full time engaged farmer. The monthly income of the family is does not exceed Rs. 875 per month. Nevertheless, paddy farming constitutes the livelihood of hundreds of thousands of families. However, farmers who have developed basic entrepreneurial skills will find niche markets for value added products as milled rice instead of raw paddy.

Farmers also work towards reducing costs through deploying family labour or own machinery. The increase of the area under cultivation will result in reduced unit cost of production and would allow to gain economics of scale. Joining the certified seed paddy out-growing programme is another option that farmers would catapult out of sheer survival.

Though the consumption paddy production does not give adequate income, cultivation will not be given up at all. Securing the families food security and beyond, making use of the local resources for village food security and livelihoods, to which the minor tank significantly contributes, is one of the main goals why paddy cultivation is continued by the farming communities.

There is quite a potential for value added products other than selling raw paddy. For raw paddy the profit margin per bushel is Rs. 45 whereas for milled rice it is Rs. 117. By converting paddy into rice an additional Rs. 72 net return per bushel could be generated. Table 7 shows profit margins that could be obtained by converting paddy into rice.

Table 7: Profit margin by conversion of paddy to rice

Activity	Conversion	Value in Rs.
Conversion of paddy into rice	1,716kg paddy x 0.68 = 1,167kg of rice x Rs. 25	29,172
Operation costs (Milling, storing, parboiling, etc.)	78 x Rs. 35	- 2,730
Cost of production		-17,275
Net benefit of selling rice		9,167
If 78 bushels were sold as paddy		20,800
Net benefit of direct selling of paddy		3,525
Additional net benefit of conversion of paddy into rice		5,642

Explanation:

Extraction rate of paddy 0.68; assumption of price for Samba rice is Rs.25 as farm gate price; consider that own land was cultivated, the milling cost per bushel would be Rs. 25 and for storing, drying and parboiling Rs.10.

3.3.2 Sustainability of seed paddy production

The production of commercial seed paddy is 2.5 time or 150% higher than the production of consumption paddy. The income could be further increased up to Rs. 6,954 or 285% by switching to the production of certified seed paddy. For an average season, about 113,000 bushels of seed paddy or 2,260 metric tons are required for the Muthur AO Segment only. It is obvious that there is adequate potential for providing quality seed paddy and certified seeds in particular and that farmers could realise good profits.

3.4 Potential for a seed processing farmer company

In the Muthur AO Segment a total of 37,540 acres of paddy are cultivated. About 113 thousand bushels of seed paddy are required per season. If one tenth of the total seed paddy requirement (11,000 bushels) is produced locally, the farming community could realise an additional benefit of Rs. 2.8 million (Rs. 259 x 11,000) per season, subject to the effective cost of cultivation and local and regional market conditions. An average individual certified seed paddy producer has the capacity to generate Rs. 259 per bushel as net profit compared to Rs. 75 per bushel for consumption paddy.

The establishment of a farmer company as initiated by DOA and IFSP would fill a gap in promoting certified seed paddy out-growing. Additionally, such a farmer company could get engaged in the processing of consumption paddy, pulses and related products, trading of seed paddy and consumption paddy, trading of agricultural inputs and all kinds of activities, which would promote agri-business in the area.

The conceptual and business framework for the farmer company is shown in Annex 1. Table 8 shows the cash flow of operating a farmer company for seed paddy processing and trading of agricultural inputs and products. Annex 2 provides details and assumptions for the establishment and operation for a period of five years.

According to the calculation the farmer company would be in a position to realise a small operational profit already after the first season and year respectively. However, the net benefit and profit respectively after full recovery of the capital costs and paying a 15% interest on the paid-in share capital would show negative results for years one to three. Thereafter, positive results are anticipated. Farmers who hold shares could expect a very good dividend, subject of course to an efficient and business minded management of the company. Capital costs are expected to be fully recovered. The company should be able to generate surplus profits to be used for expanding business and / or to built-up reserves.

Since the calculation works on rather conservative assumptions, a sensitivity analysis would not really change the positive expectations. By and large, the establishment of a farmer company is highly beneficial as a commercial enterprise as well as service provider to the regional farming community.

After four consecutive seasons (2000 – 2003) of promoting seed paddy out-growing farmers have developed capacities that should result in a high degree of sustainability. The collective strength for seed paddy out-growing is established in six AI Ranges in the Muthur AO Segment amongst up to 600 farmers. The support provided by DOA, IFSP and MPCs to start the seed processing company has resulted in a strong demand for expanding the programme.

The assets such as the seed processing plant and the building would allow to not only operate the company but also to expand into related activities such as trading of seed paddy and consumption paddy, other farm products and agri-chemicals. The experience and skills gained could serve as good model for other farmer companies in the north and east. Considering these factors the cultivation, production and processing of certified seed paddy appears to be highly beneficial.

Table 8: Cash flow of operating the farmer company for seed paddy processing at an assumed coverage of 10% of demand (Rs. '000)

Item	Initiative 2002/2003	Year 1 2003/2004	Year 2 2004/2005	Year 3 2005/2006	Year 4 2006/2007
Capital formation					
Share holders (no.)	150	200	250	300	300
Share capital paid-in	300	400	500	600	600
Loan for investment		50	50	100	200
Initial and subsequent investment (at 10% depreciation p.a.)	2500		200		200
Machine cost	170	170	170	170	170
Building and facilities	80	80	100	100	100
<i>Total</i>	<i>250</i>	<i>250</i>	<i>270</i>	<i>270</i>	<i>270</i>
Costs of operations					
Purchase of registered seed paddy ex Research Station (RSP Samba)	69	138	138	173	173
Purchase of certified seed paddy from out-growers (CSP ex local growers)	1,600	3,200	3,200	4,000	4,000
Purchase of agri-chemicals	129	259	388	518	647
Transport, storage, handling, marketing	9	18	19	23	24
<i>Sub-total</i>	<i>1,807</i>	<i>3,615</i>	<i>3,745</i>	<i>4,714</i>	<i>4,844</i>
Handling and administration costs					
Overall administration	25	55	55	65	65
Management, staff	54	424	434	444	444
Interest on working capital	132	294	302	368	377
Electricity	50	100	100	120	120
Telephone	0	30	15	15	15
Machine operator	18	72	72	72	72
Labourers, security guard	30	150	150	150	150
Rent of building	3	12	12	14	14
Overall maintenance	25	25	27	27	27
Fees, bank charges, other	25	40	40	40	45
<i>Sub-total</i>	<i>362</i>	<i>1,202</i>	<i>1,207</i>	<i>1,315</i>	<i>1,329</i>
Total operation and handling costs	2,169	4,817	4,952	6,029	6,173
Revenue					
Sale of RSP	102	144	144	180	180
Sale of CSP	2,000	4,000	4,000	5,000	5,000
Sale of agri-chemicals	199	398	597	796	995
Cleaning and sorting fee	120	240	240	300	300
Bank interest on loan to farmers	39	52	65	78	78
Total Revenue	2,460	4,834	5,046	6,354	6,553
Operational benefit	291	17	94	325	380
Capital costs	250	250	270	270	270
Interest on share capital (15%)	0	60	75	90	90
Net benefit before dividends to shareholders and transfer to reserves	41	-293	-251	-35	20

Explanation:

Annex 2 gives a comprehensive financial projection and lists all assumptions.

4 Conclusions and Recommendations

The production of consumption paddy has very low profit margin and, in fact, shows an overall negative result. The standard of the cultivation technique and the inputs necessary for a viable production are rather low. Full time engaged farmers face financial difficulties due to the seasonality of paddy prices, unfavourable market conditions, unpredictable weather conditions and comparatively high costs for farm inputs. Against this scenario, paddy is still cultivated to secure the family food requirements and because there are very limited opportunities for alternative use of the farm capital assets. The household and the village food security is achieved through the paddy production.

The lack of quality seed paddy is one of the major reason that affect the yield. Low yields directly reduce the returns and profits. Commercial seed paddy production, however, not certified, fills the gap to a certain extent. It involves more or less similar practices as for the production of consumption paddy, except that the cultivators practise better management, but generates a 2.5 time increase in returns.

The cultivation and production of certified seed paddy is profitable. It further contributes to improvements in the local and regional paddy economy. Certified paddy seeds could be sold at Rs. 500 per bushel. The additional investment needed is Rs.2,500 per acre against an almost threefold return. The certified seed paddy production generates high profit margins. Good land and weed management, pest control and harvesting with out mixing with other varieties are essential preconditions.

Getting engaged in certified seed paddy production through the out-growing programme of the DOA appears to be highly sustainable and viable in economic terms. Considering that the government seed processing farm Kantale produces about 14,000 bushels of paddy seeds, against an estimated demand of 113,000 bushels in the AO Segment of Muthur alone, seed paddy out-growing has a good potential to fill the gap.

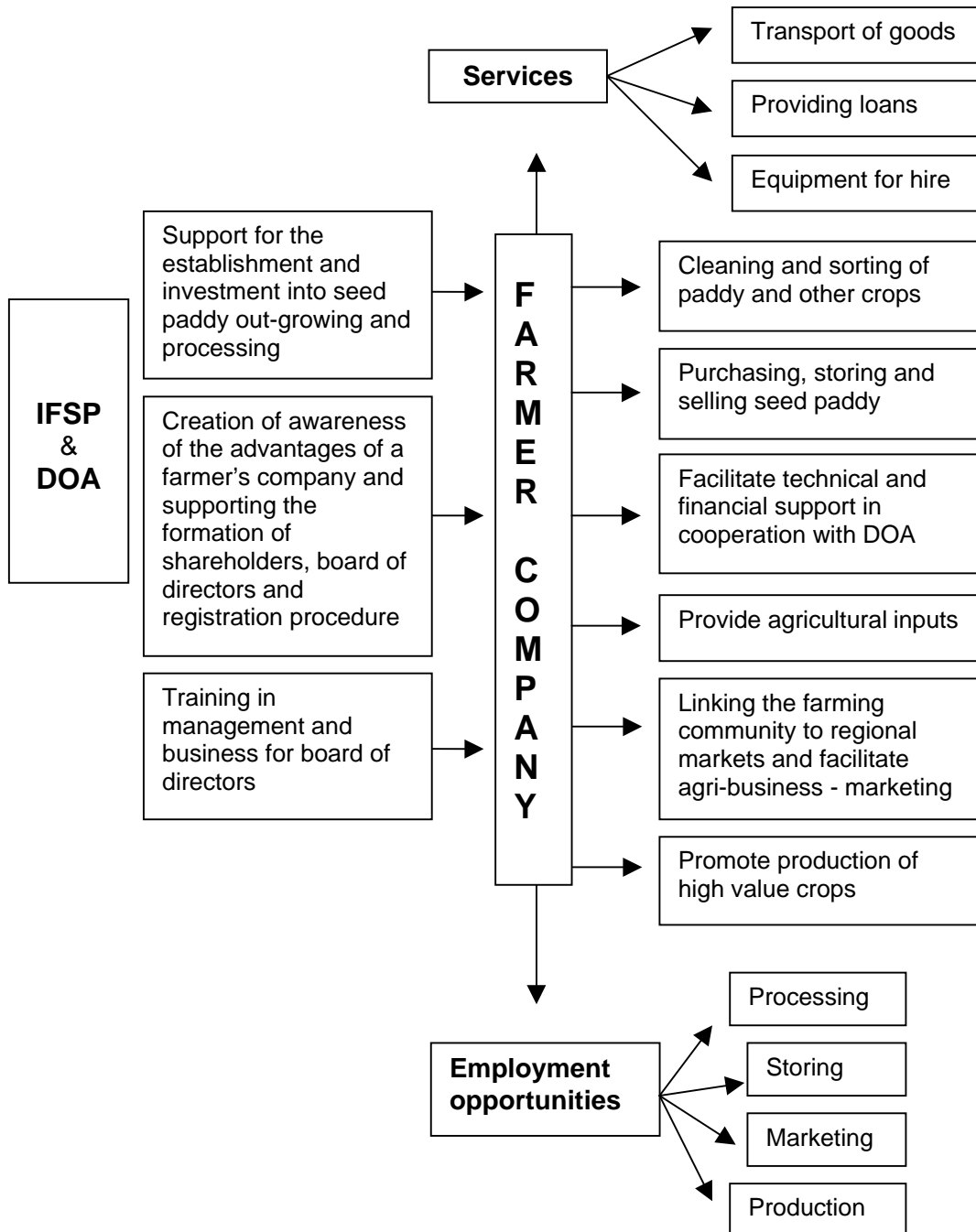
The operation of a seed processing farmer company complements the seed paddy out-growing programme. It is shown that the company established in October 2003 has good potential in commercial terms and also with respect to provide services for the regional farming community.

Additional recommendations focus on the identification of niche markets for direct marketing of consumption paddy, to reduce marketing cost and risks. Value added products such as processed rice and other rice-based products, which generate high benefits, need to be propagated more vigorously by the service providers. This would involve the promotion of entrepreneurial characteristics amongst the local farming community for getting more competent in acting in the ever changing market environment. Better and stronger cooperation through farmer's groups and active involvement if the seed processing company would strengthen the market position of the local and regional farming community.

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Annex 1: Conceptual and business framework of the farmer company



Annex 2: Financial Projection for Seed Paddy Farmer Company ('000 Rs.)

	Item	Parameter			Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
		Unit	Rate (Rs.)	Quantity	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008
1.	Capital formation									
	Shareholders	no.			150	200	250	300	300	300
	Paid-in shares	no.	10	200 shares	2,000	2,000	2,000	2,000	2,000	2,000
	Value of paid-in shares		000 Rs.		300	400	500	600	600	600
2.	Basic and subsequent investment	at 10% depreciation p.a.		Machine Building	1700					
	Machine cost	unit	000 Rs.		170	170	170	170	170	170
	Building, facilities	building	000 Rs.		80	80	100	100	100	120
	<i>Total</i>				250	250	270	270	270	290
3.	Operations									
	Purchase of registered seed paddy (RSP, ex R&D)	bushel (1bu=22.5 kg)	575	acc. to need	69	138	138	173	173	259
	Purchase of certified seed paddy from farmers (CSP)	bushel (1bu=20.5 kg)	400	acc. to need	1,600	3,200	3,200	4,000	4,000	6,000
	Purchase of agri-chemicals	set	3,235	acc. to need	129	259	388	518	647	647
	Transport, storage, handling, marketing	Lump sum, 0.5% of value			9	18	19	23	24	35
	<i>Total</i>				1,807	3,615	3,745	4,714	4,844	6,940
4.	Handling and Administration									
	Interest on working capital (50% of O&H costs at 13%)				132	294	302	368	377	515
	Manager	Part time	5,000	month	5	60	60	60	60	60
	Accountant	Full time	8,000	year	8	96	96	96	96	96
	Clerk & storekeeper (1+1)	Full time	6,000	year	12	144	144	144	144	144
	Machine operator & technician	Full time	6,000	year	18	72	72	72	72	72
	Labourers, security (2+1)	Full / part time	5,000	year	30	150	150	150	150	150
	Fee for board meeting	7 directors	2,000	6 times p.a.	14	84	84	84	84	84
	Costs for shareholder meeting	Meetings	100	2 times p.a.	15	40	50	60	60	60
	Annual audit	Lump sum		1 times p.a.	15	30	30	30	30	30
	Electricity	Lump sum			50	100	100	120	120	140
	Telephone / communication	Lump sum			0	30	15	15	15	15
	Building rent	Lump sum			3	12	12	14	14	14
	Maintenance	10% of depr.			25	25	27	27	27	29
	Overall administration	Lump sum			10	25	25	35	35	40
	Fees, bank charges, other	Lump sum			25	40	40	40	45	50
	<i>Total</i>				362	1,202	1,207	1,315	1,329	1,499
5.	Total Operations and Handling (3.+4.)				2,169	4,817	4,952	6,029	6,173	8,439

	Item	Parameter		Base Year	Year 1	Year 2	Year 3	Year 4	Year 5	
		Unit	Rate (Rs.)	Quantity	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008
6.	Revenue									
	Sale of registered seed paddy (RSP, ex R&D)	bushel (1bu=20.5 kg)	600	acc. to demand	102	144	144	180	180	270
	Sale of certified seed paddy from farmers (CSP)	bushel (1bu=20.5 kg)	500	acc. to demand	2,000	4,000	4,000	5,000	5,000	7,500
	Sale of agri-chemicals	set	4,975		199	398	597	796	995	995
	Cleaning and sorting fee	bushel	30	all supply	120	240	240	300	300	450
	Interest on loan to farmers	paid-in shares	13%	100%	39	52	65	78	78	78
	<i>Total</i>				<i>2,460</i>	<i>4,834</i>	<i>5,046</i>	<i>6,354</i>	<i>6,553</i>	<i>9,293</i>
7.	Operational benefit / profit				291	17	94	325	380	854
8.	Capital costs									
	Depreciation				250	250	270	270	270	290
	Interest on share capital	paid-in shares	15%		0	60	75	90	90	90
	<i>Total</i>				<i>250</i>	<i>310</i>	<i>345</i>	<i>360</i>	<i>360</i>	<i>380</i>
9.	Net benefit before dividend on share capital / reserves				41	-293	-251	-35	20	474

Assumptions

- Capital formation: 150 initial shareholders, 50 additional farmers join p.a. until year 3 for a total of 300 shareholder farmers.
Shares: Rs. 10 per share; shareholders have to buy 200 shares each.
- Investment: Rs. 200,000 for expansion of building and facilities in year 2 and 5; depreciation is 10% p.a. from first year on.
- Operations: Main purpose of farmer company is seed paddy processing, seed paddy trading and trading of agrochemicals; secondary activities include loans to farmers and trading in agricultural commodities; area under seed paddy out-growing is 40 acres in initial year, 50 acres in first and second year, 50 acres in third and fourth year and 75 acres from fifth year on; 2 seasons assumed for cultivation, i.e. Maha and Yala.
Yield from seed paddy cultivation assumed at 100 bushels per acre; contracts are conducted with specialised growers who follow DOA's concept of certified seed paddy out-growing in high(er) potential areas.
40 standard sets of agri-chemicals are procured for sale in initial year and thereafter increase according to increase of acreage under seed paddy.
- Handling: Established business is assumed from beginning of first year with the registration of the company and official taking over office by a manager who is to be employed by the board of directors and endorsed by the shareholders; manager should do his work on part-time base.
Bank loan for working capital assumed at 50% of all operations and handling costs.
Interest assumed at 13% p.a.
- Revenue: Mode of seed paddy business with outgrowers is as follows: i) RSP is purchased for 40 acres cultivated in initial season; acreage increases up to 75 acres until year 5; ii) RSP is bought at Rs. 575 per bushel and sold at Rs. 600. iii) CSP is bought at Rs. 400 per bushel and sold at Rs. 500, no losses assumed, i.e. all stock purchased is assumed sold at the end of the season; no carry over assumed for simplicity of calculation; All agri-chemicals are assumed to be sold. Paid-in share capital assumed as loan to farmers at 13% p.a.

Annex 3

Criteria for the Selection of Paddy Farmers in the AI Ranges of Muthur, Sampoor, Kiliveddy Manampoveddai and Eachchilampattai

1. Having 3 to 5 acres own land or cultivating tenure land.
2. Regularly participating in the training and meetings organised by the Department of Agriculture.
3. Is in a position / has own machinery, other relevant agricultural instruments and storing facilities.
4. Is cultivating paddy from his own capital and has the ability to store the harvest for the market.
5. Is capable to investing in paddy cultivation as an investment.

Annex 4

Questionnaire

No. of Questionnaire:

1. Background information

1.1 Name of the farmer.....

1.2 Address:.....

a) DS Division: b) AI range:..... c) Village.....

a) Age (yrs):.....b) Education (yrs) c)Occupation (Full/ Part time).....

1.1 Family details:

<i>Family members</i>	<i>Number</i>	<i>Remarks</i>
Total members		
Involving in farming		Full time/ Part time
Involving in other work		Occupation

1.2 Type of cultivation

<i>Activity</i>	<i>Maha 2002/2003</i>			<i>Yala 2003</i>		
	<i>Extent</i>	<i>Irrigation</i>	<i>Yield</i>	<i>Extent</i>	<i>Irrigation</i>	<i>Yield</i>
Comm Paddy						
Seed Paddy						

1.3 Assets and ownership in Yala 2003:

<i>Asset</i>	<i>Ownership</i>	
	<i>Owned</i>	<i>Tenured / Hired / Borrowed +IR</i>
Land (acres)		
Machinery (code- a)		
Capital (Rs)		

Code a: 1-2W tractor, 2- 4W tractor, 3- hand sprayer, 4-harvesters, 5-bullock cart

2.0 Cost of Production (2003 Yala)

2.1 Cost of farm inputs per acre in Yala 2003

<i>Item</i>	<i>Quantity</i>	<i>Unit costs</i>	<i>Total cost</i>	<i>Source of inputs</i>
Seed paddy				
Weedicides				
Pesticides				
Fertiliser i) TSP ii) Urea iii) TDM				
Bags				
Land				
Other cost				
Additional costs incurred in Maha 02/03				
Total cost				

2.2 Operational costs for Yala 2003 in Rs. per acre

Operation	Labour				Machinery		Total cost	
	Unit cost: man days.....				Own	Hired	IFL	EFL
	No.FL	No.HL	Cost FL	Cost HL				
Land preparation - 1 st plough - 2 nd plough - Puddling - Levelling								
Clean bunds								
Bund Const ⁿ								
Sowing								
Weeding								
Fertilising								
Spraying								
Irrigation								
Harvesting								
Threshing								
Winnowing & packing								
Transporting - to store - to market								
Processing								
Registration								
Other cost								
Total								
Extra costs Maha 02/03								

2.3 Details in accessing the seed paddy?

Season	Specific variety	Price (Rs)	Source	Problems
Yala				
Maha				

2.4 What are the major problems you encountered while doing paddy cultivation?

.....

2.5 What are the remedies you suggest for above problems?

.....

3.0 Revenue

3.1 Revenue from total paddy production

Item	Quantity	Unit Price	Revenue	Remarks
Total yield (Bushels)				
Selling as consumption paddy Selling - 1 Selling - 2				
Keeping for consumption				Certified/ Commercial
Keeping as seed paddy				

Selling as seed paddy				
Straw				
Gross revenue				

3.2 To whom are you selling your products?

	<i>Wholesaler</i>	<i>Village trader</i>	<i>Travelling collector</i>	<i>Other</i>
Preference (Rank 1 to 4)				
Price you gain (Rs)				
Problem (Code- a)				

Code a: (1- Price, 2- Grading, 3 – Transport, 4- Storage 5- Other)

3.3 Other field crops cultivated:

<i>Type of the crop (Pulses/Grains)</i>	<i>Yala</i>			<i>Maha</i>		
	<i>Yield</i>	<i>Unit price</i>	<i>Source of Market</i>	<i>Yield</i>	<i>Unit price</i>	<i>Source of Market</i>
1						
2						
3						

3.4 Respondents comments

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3.5 Observations by the interviewer

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.....

.....

Date

Time.....

Procedure of conducting interviews

