

***CHAPTER 7* Rice Production/Marketing Improvement Project  
(Integration of Sector Projects)**

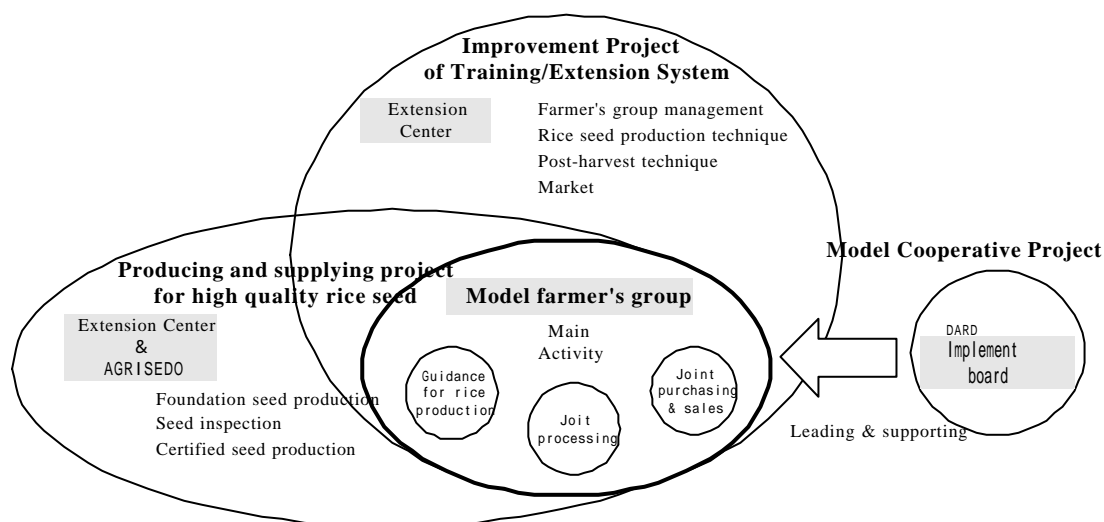
## CHAPTER 7 Rice Production/Marketing Improvement Project (Integration of Sector Projects)

### 7.1 General

Improvement of rice quality as well as increase in productivity is a major challenge for the development of rice production, the major contributor of agricultural sector, in the Study Area. To this end, an integrated approach covering all the processes from production of seed to post-harvest processing and marketing was taken.

Among each sector's projects in Master Plan, the proper projects dealing with improvement of rice production and marketing were put together as an integrated project. The particular emphases are given to 'Producing and supplying for high quality rice seed', 'Organizing the model of overall improvement of rice production by farmers' group' and 'Improvement of Training/Extension System'. Therefore, the project was formulated comprising three major components 1) "High Quality Seeds Production/Supply Project", 2) "Model Cooperative Project" and 3) "Extension and Training Project".

The basic concept is illustrated in the figure given in the top of the following page.



This integrated project has been formulated consisting from each sector's plans such as below.

Sector	Projects
Post Harvest Processing	<ul style="list-style-type: none"> <li>• Training and Extension of Post Harvest Technology</li> <li>• Post Harvesting by farmer's</li> </ul>
Marketing	<ul style="list-style-type: none"> <li>• Collective Marketing by farmer's Group</li> </ul>
Extension and Support Services	<ul style="list-style-type: none"> <li>• High Quality Rice Seeds Production/Supply Project</li> <li>• Improvement of Training/Extension System</li> </ul>
Farmers' Organization	<ul style="list-style-type: none"> <li>• Establishment/enhancement of cooperatives integrating the Projects of Various sectors</li> </ul>

## **7.2 High Quality Seed Production/Supply Project**

### **7.2.1 Background of Project**

#### **(1) Current seed production**

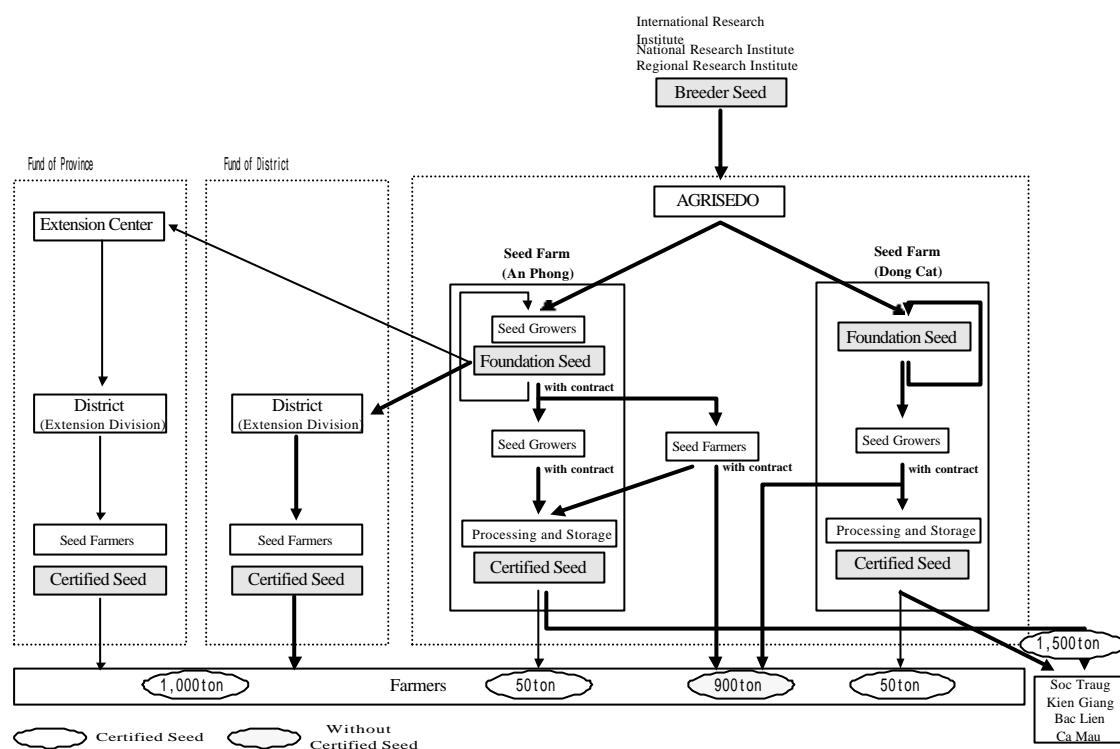
In Viet Nam, the seed production of improved variety usually follows three stages: the production of breeder seeds (B.S.), the production of foundation seeds (F.S.), and the production of certified seeds (C.S.). B.S. is produced at the National Research Institutes responsible for nationwide distribution and is provided to each province and some seed companies. B.S are multiplied as F.S at provincial level and are distributed to seed-producing farmers. C.S. grown by the seed-producing farmers are sent back to the provincial seed farms where they are inspected and certified before being shipped to rice growers.

In the case of improved strains, it is desirable to minimize the number of generations between the breeder-seed stage and C.S. to be supplied to farmers, to reduce chances for the emergence of undesirable recessives. It is ideal that the provincial stations for seed production raise B.S. But Cultivation of B.S. requires a high level of knowledge, experience and technical skill. At present in Viet Nam, personnel skilled in cultivating B.S. are insufficient in provincial level. And it will be necessary to rely for National research organizations where staffs have the required high level of skill.

In the Study Area, Agriculture and Development Service Company (AGRISED0: Provincial SOE) obtains mainly B.S. from Cuu Long Delta Rice Research Institute, Can Tho University and Institute of South Vietnam Agricultural Science. AGRISED0 produces F.S. and C.S. through two rice-seed farms and seed-producing farmers. Two rice-seed farms in the province are An Phong farm and Dong Cat farm, now producing F.S. and C.S. of 30 ha, 270 ha respectively. The total C.S output in the province is estimated at about 1,600 tons including those from seed-producing farmers (50 ha) who live outside of farms.

In addition, the Agricultural Extension Center and District Extension Divisions multiply C.S. using fund of province and district. These activities are carried out 200ha and have supplied about 1,000 tons of C.S. to the individual farmers.

Figure below shows the organizations of seed production and distribution in the province.



## (2) Present Utilization of Rice Seed

Most of the farmers utilize their own self-supplied seeds in the Study Area, according to our field survey. Of course, there are some farmers near by seed farms are getting C.S., but most of the farmers find it difficult to get C.S. due to lack of well-organized seed distribution channels in the Study Area.

In spite of the lack of access to C.S., farmers are eager to get these good seeds. In practice, rapid diffusion of new varieties is observed in the area. This may be illustrated by the fact that there is a great number of improved varieties are adopted in the Study Area.

### 1) Rice variety

Before 1995, main rice variety produced in Dong Thap was IR50404. It gives high yield but is lower in quality due to high chalkiness ratio. A rapid change in the rice varieties has been observed in recent years reflecting the requirement of the export market. Main varieties are shown in the following table.

List of Main Varieties Introduced to Farmers in Dong Thap Muoi

Year	Varieties	Year	Varieties
1990	OM997, OM1327, KSB54, KSB55	1997	VND95-26, VND95-20, VND95-10, IR60819-31
1992	IR 50404, IR50401, IR35546		CK 96, IR62914, OM1570, IR56-9656
1993	MLT99, MLT103, MLT105	1998	IR62065, OM1723, TN105, CK96-1
1994	OM269, OMF1, OM997, S976B	1999	MTL233, MTL145, OM70140, OM1308,
1995	IR66707, OM1630, OMCS94		IR64-15-12, AS1007, MTL231, MTL234,
1996	IR62065, IR62579, OMCS94		OM1490, OM2031, IR64NCM

OM, MTL, OMCS : Improved by Mekong Regional Research Institute  
VND, TN, CK, KSB : Improved by National Research Institute  
IR : Improved by International Research Institute

Source: Dong Thap Province

The introduction of so many varieties has not necessarily contributed to the improvement of rice quality so far. These situations induce mixture of varieties and uneven quality of rice. At the same time there still remain large area of IR50404 and other low quality varieties.

In general, farmers in the Study Area wish to use such kinds of improved varieties i.e.; those having high yield, short duration, resistance to disease and pest and to meet export requirement.

## **2) The seed rate**

The seed rate of paddy field in project area is 250kg/ha in general. This comparatively high rate is due to direct sowing and poor germination ratio of seed.

The seed rate depends on sowing method and seed quality, especially its germination ratio. Therefore better seed processing and quality control are important for the purity of varieties. In addition, better storage for seed is required.

## **3) The seed replacement frequency**

Judging from the performance of the two seed farms and AEC in the province, the production and supply of C.S. were about 1,600 tons. This met 1.4% of the demand in 1999. However, as substantial amount of seed are sold directly by the seed-producing farmers though not officially certified one, the seed replacement frequency seems to be much higher than the above ratio.

## **(3) Problems related to seed production**

### **1) Lack of the seed-multiplication technique**

In the seed-multiplication methods, there is little difference between F.S. and C.S. except that transplanting method is applied for F.S. and direct sowing method for C.S.

In the production of F.S., the preservation of genetic characteristics is paramount, whereas, in the production of C.S., both purity and quantity are emphasized. Consequently, cultivation methods must suit these aims. Some points in actual cultivation deserve attention. For instance, over supply of chemical fertilizers, no-isolation and dense planting are employed. Furthermore, F.S. are often used for the following F.S. production.

Finally, the seed growers need to be fully aware of the importance of seeds and to pay more attentive to their growing.

### **2) The spread of non-certified seed and the lack of the inspection facilities**

It is said that the part of the C.S. raised by the farmers is transported to seed farms; while the rest is distributed directly to paddy farmers. Circulation of non-C.S. is not desirable as the quality is not well guaranteed.

The seed inspection is conducted by the field observation and the simple inspection by the farm staff in

the production stage and the harvesting stage. No specific inspection facilities with laboratory exist. The appropriate inspection facilities and management system are required.

**3) The seed preservation of the winter-spring rice cultivation and for emergency needs**

For the Study Area, the preservation of the seed is a very important issue. Due mainly to the high moisture, the seed quality deteriorates very quickly. In the period of flood (about 4 months), the seed quality deteriorates with lower rate of germination in the following rice crop.

Also, big flood sometimes causes serious shortage of seed, as most of the farmers use their own self-supplied seeds and crop failure directly hits the farmers. Therefore, provision of seeds for emergency should be considered by public organization.

**4) The seed of the summer-autumn rice cultivation**

The seed for the summer-autumn paddy isn't provided in appropriate time. Because the seed growing season of winter-spring coincides that of the ordinary farmers and interval between W.S and net crop (S.A) is very short, it seems rather difficult to supply C.S after processing with certification. If infrastructure is improved, seed production of seed farms will be able to adjust to meet the requirement of farmers.

**5) The lack of effective seed distribution channels**

As mentioned, most of the farmers use their own self-supplied seeds, and C.S. distribution is not well organized. In addition, the seed-producing farmers under the contract with AGRISEDO are supplying their seeds to farmers without seed certification. These also make it sometimes difficult for AGRISEDO the sale of C.S. in the Study Area.

**7.2.2 Project**

**(1) Objectives**

Paddy is the most suitable and important crop in the Study Area. However, Vietnamese rice produced is generally considered to be of low quality in the international market. Therefore the export price of rice is rather low. The rice from Dong Thap area is the lower quality even in Vietnamese standard. The rice with quality has been caused by the low replacement frequency rate of seed, disordered circulation of seed with so many varieties (20-30 kinds).

In crop production, seeds are the first and principal elements and quality of product depends considerably on seeds. Having new and good seeds will surely increase the output of production. In the province, the producing and supply of C.S. were carried out by the two state rice farms and AEC and the annual seed supplying output is about 1,100 tons in the Study Area. But this meets only 1.4% of the total demand. Farmers use their own seeds produced themselves or rely on disordered seeds.

To solve this problem, it is necessary to recover the trust of certified seed, by strengthening the system of the existing seed production and the supply system including inspection system.

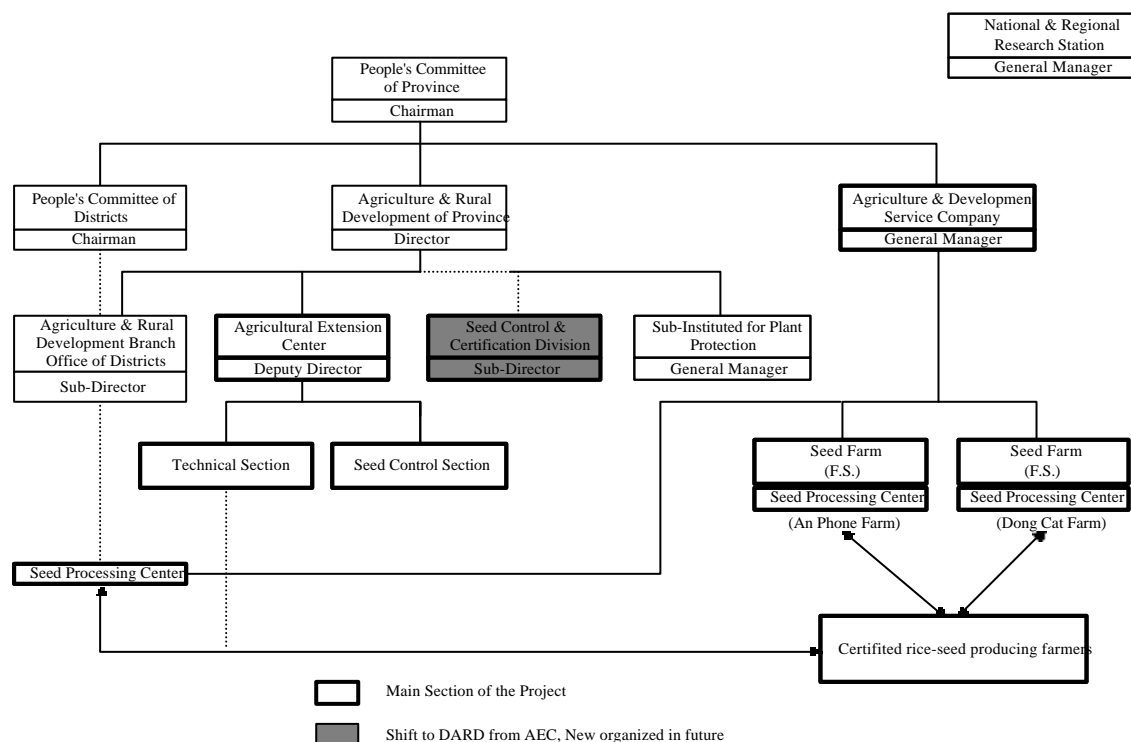
**(2) Administrative Organization**

The Department of Agriculture & Rural Development (DARD) of the People’s Committee of Dong Thap Province is responsible for the management and operation of the project, assisted by Agricultural Extension Center (AEC) and Agriculture & Development Service Company (AGRISEDO).

At present, the AGRISEDO is the major producer of rice seed. Major reformation proposed includes 1) The AEC concentrate on the adaptability examination of new rice varieties. 2) Newly establish Seed Control & Certification Division under DARD. 3) The AGRISEDO concentrates on production and distribution of F.S. and C.S.

The seed production farms under the AGRISEDO produce mainly F.S. and C.S. production is entrusted to seed farmers by contract between Seed Processing Centers and seed farmers.

In the execution of the program, it is necessary to have coordination with Other Provincial Department and National & Regional Research Institute. Other Provincial Department will give guidance to seed-producing farmers. The National & Regional Research Institute will play in important role in education and training of the staff concerned and seed-producing farmers as well.



**(3) Implementation Schedule**

The implementation schedule is shown in following table.

**THE STUDY ON INTEGRATED AGRICULTURAL DEVELOPMENT PLAN  
IN THE DONG THAP MUOI AREA VIET NAM FINAL REPORT**

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Phase 1										Phase 2									
1 . Step up Seed Farm	<Production of F.S. & C.S.>										<Concentrating production of F.S.>									
2 . Establish the Seed Control and Certification System	<Implementation of AEC>					<Establishment & implementation of SCCD>					<Implementation of SCCD>									
3 . Step up Training & Extension	<Training existing staffs & farmers, Publicity of high quality seed>										<Training of new staffs & farmers>									
4 . Establish Seed Processing Center	<Establish on seed farm & Hong Nug>					<Establish on main districts>					<Establish on all districts>									
5 . Step up C.S. Production System	<Strengthen for existing seed farmers>										<Raising new seed farmers>					<Grouping of seed farmers>				

Investment of facility
  Main implementing term

Seeing in the above table, High Quality Seed Production/Supply Project is separated two parts which one is possible to implement immediately and other part requiring time. The latter includes the increase of the demand of C.S, the seed producing farmers and the expansion of the seed supplying network and so on. Therefore, this part of implementation pursues step by step. In this plan, it implements an indispensable part to make the basis and the frame of project.

#### (4) Project Component

By the target year 2010, the paddy cultivation area will be 423,000ha in the Study Area. Therefore, based on the target rate of the renewal and required of seed per ha, the quantity of C.S. required is estimated in the target year as 8,500ton.

To produce this amount of seed, it is necessary that the reclamation of farms, the construction of the building facilities, the improvement of the method of seed growing and the fullness of the agricultural machinery.

Moreover, it is necessary to establish the seed-processing center to link the seed farms and seed farmhouses, to process and reserve C.S. that the farmhouse produced.

It is required to establish Seed Control and Certification Division for controlling quality and guarantee for seeds, to strengthen training system for seed production.

This project requires the followings.

- **Seed Farm**

- (1) Arrangement and enlargement of fields in F.S. production farms.
- (2) New construction or renovation of office, warehouse, workshop, storehouse etc.
- (3) To supply equipment and machinery needed for seed production

- **Seed Processing Center**

- (1) Construction of warehouse with office room and laboratory.
- (2) Drying facilities and seed cleaning/grading facility etc.
- (3) To post the staffs.

- **Seed Control and Certification Division** ( Location in Extension Center )

- (1) Equipment of laboratory etc.

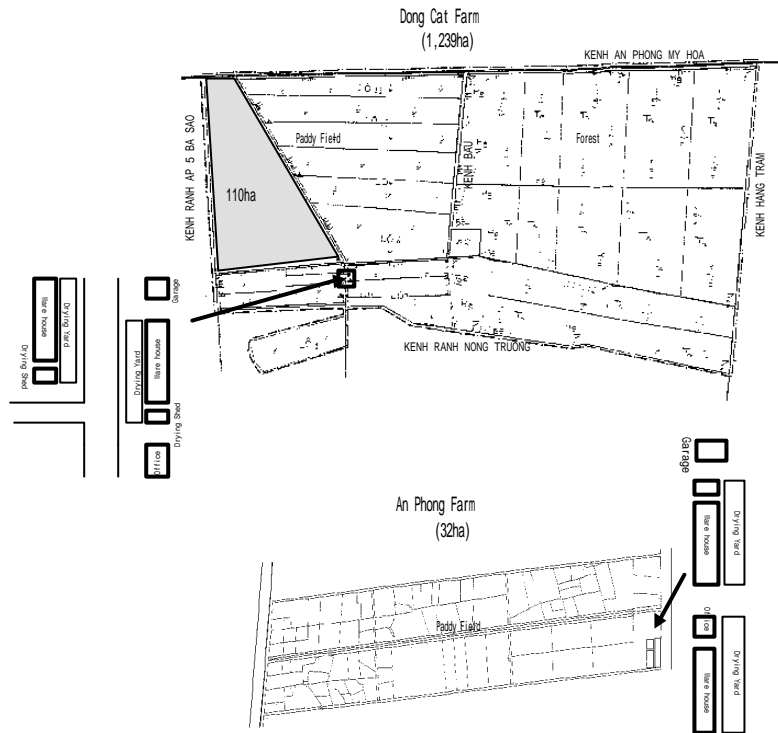


- (2) Allocation of fund the running costs for the project.

**• Extension Center**

- (1) New construction of training center with training equipment etc.
- (2) Allocation of fund the running costs for the project.

The seed farms and the facility position, which becomes the center of the project are shown in the following figure.



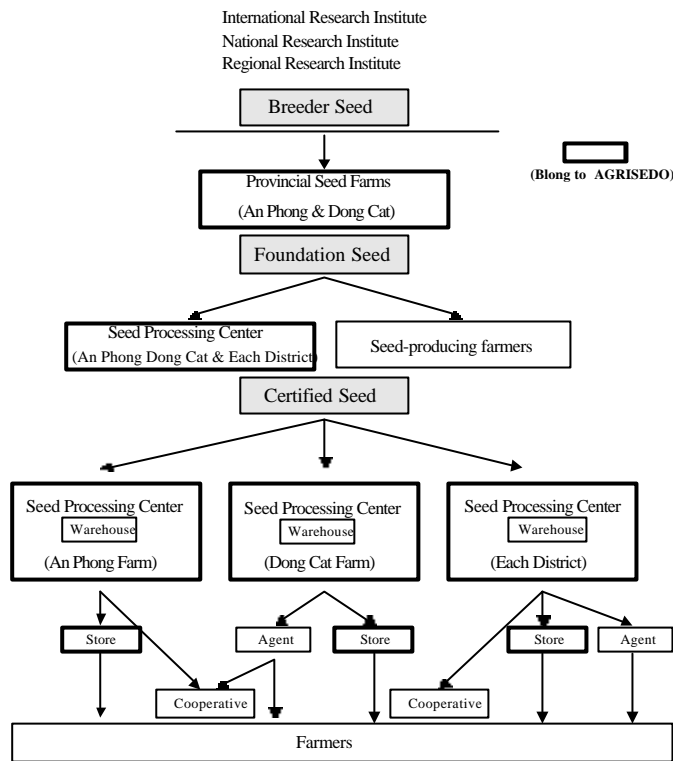
**(5) Management of the Project**

**1) Outline of Seed Distribution System**

In Viet Nam, central or regional government organizations distribute all B.S. and F.S. to provinces. In general, farmers obtain seeds directly from related organizations or from seed-producing farms. However, various channels exist for actual delivery, including those sales by individual seed farmers without certificate.

In carrying out this project, unless this negative distribution system is revised in favor of a positive one operated by official authorities, it will be impossible to stimulate further development of improved-seed cultivation. To this end, official organizations must carry out a thorough program with intensified guidance. And for the distribution of all C.S., designated and commissioned seed-farmers should be formed into groups around Seed Processing Centers which have better access to them and enabling them to cooperate in distribution. In this way a distribution system that fits most smoothly to the local condition will be evolved.

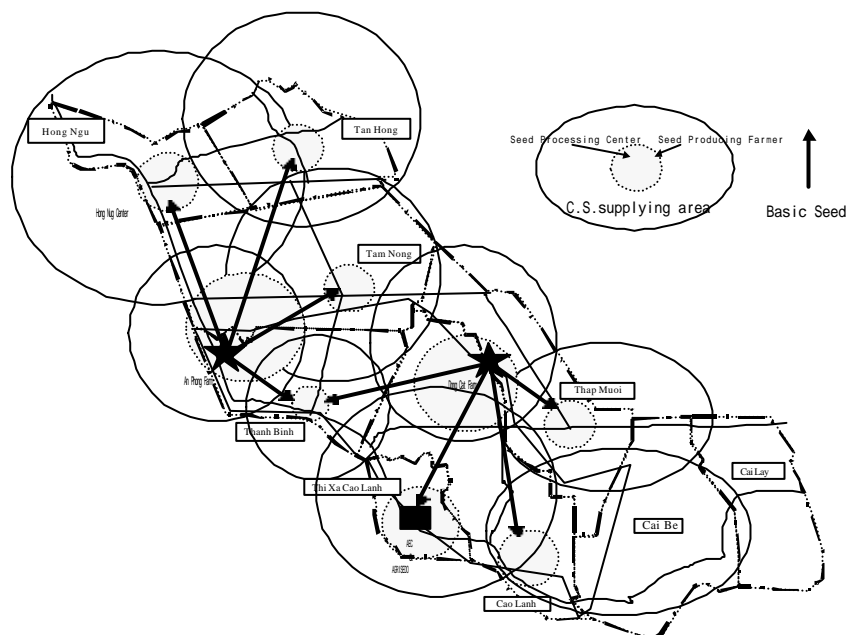
Proposed distribution system is shown in the following figure.



The cores of the system are Seed Processing Centers, being placed in both farms and one District. These Centers will be equipped with drying and cleaning machines and warehouses. They make contract with the seed-producing farmers, distribute F.S, collect C.F, do sorting-out, packing and preserving of C.F. They sell seeds through shops including those of cooperatives.

The position of Seed Station and Seed Supplying System are shown in the following figure.

Seed Station and Supplying System



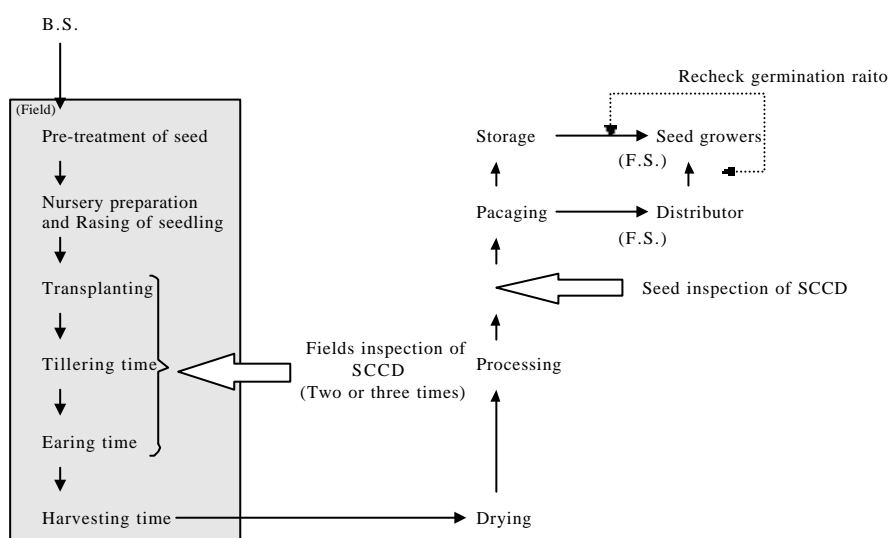
**2) Foundation Seeds (F.S.)**

F.S. are produced at provincial seed farms (An Phong Farm & Dong Cat Farm) under the AGRISED0.

**a. Production system**

Knowledge and experience are needed for the production of F.S.. In general, it is required that a strain be of good quality, uniform in characteristics, and fixity. But since genetic purity is not 100 percent, it must be devoted to preserve the genetic traits of breeder seeds while producing adequate quantities of F.S. Their function is to increase quantities of F.S. of high purity for the sake of certified seed production.

**Process of F.S production**



In cultivation of F.S., the amounts of chemical fertilizers should be less than that of ordinary paddy cultivation. Furthermore, interplant spacing should be enough to facilitate elimination of off-types during the growing period, weeding and protection from diseases and insects damage.

**b. Processing and Storage**

F.S to be produced at both farms will be processed at these farms.

Since the plan of the operation is scheduled in accordance with the plan of cultivation and collection complying with the varieties concerned, a daily receiving operation should be made basically on "one day/one variety" system. In the event of so many varieties coming in on the same day, frequency of cleaning of selection/cleaning machine will increase and result in a time loss. Therefore, it is recommended that "a period/a variety" principle be applied.

The farms should apply for the Seed Control & Certification Division's inspection before harvesting at the paddy field. Then the harvesting shall be done by cutting the stalk of paddy at the

section, about 75-100cm from the panicle. The stalk of paddy thus harvested, shall be dried in the shed or field. The paddy shall be threshed and winnowed in the traditional method.

In fact damage to the germination of paddy due to the high temperature is quite obvious. In general, in sun drying, direct sunshine should better be avoided.

**c. Distribution**

F.S produced at both farms are stored in the warehouses of both farm's Seed Processing Center and each District's Seed Processing Center and then will be distributed to the seed-producing farmers.

At present, the stipulated amounts of seed per ha of land area are 200 kilograms for ordinary paddy fields. The center packs seed in 50 kilogram sack to prevent waste at the seed-producing farmers hands.

**3) Certified Seeds (C.S.)**

Seed-producing farmers produce C.S. under contract with Seed Processing Center. In this project, seed-cultivation areas are selected around the seed farms. Within the groups of seed-cultivating farmers (from twenty to thirty) are formed into a group including key farmers who are enthusiastic agriculture, technically skilled and able to absorb new technical ideas and who therefore take the lead of other farmers in disseminating seed-raising technology.

**a. Production system (Seed producing farmer)**

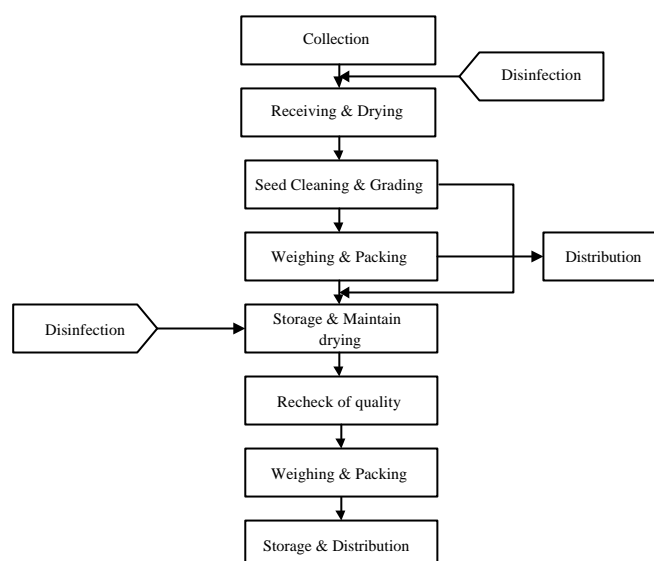
C.S.-cultivation differs from ordinary rice growing. In the case of cultivation of F.S., fertilizing must be kept at a lower level than that of ordinary rice growing since too much chemical fertilizer cause the difficulty to maintain uniformity of strain.

The seed-producing farmers should apply for the Seed Control & Certification Division's inspection before harvesting at paddy field.

The harvesting shall be done by hand cutting or machine, and threshing and winnowing shall be conducted in the traditional method. In order to avoid any kind of damage, which will affect germination rate, as well as for the rational operation of the collection of the paddy and further processing, adequate care shall be taken for the harvesting so that the paddy is harvested with the moisture content kept less than 20%.

**b. Processing and Storage (Seed Processing Center)**

C.S is processed at Seed Processing Centers located in both farms and Districts. The entire picture of the function of the processing system is shown in the following figure.



The plan of the over all operation is scheduled in accordance with the plans of cultivation and collection for each variety. For the operation on and after the seed cleaning and grading, the plan should be established in accordance with the delivery and storage schedules.

Purified paddies are to be transported to the warehouse for drying and cleaning. Seed inspectors will take sampling seeds for testing before put them in warehouse.

**c. Distribution (Seed Processing Center – Shops & Cooperatives)**

C.S is stored in the warehouse of the Centers of both farms and each District to be distributed to the farmers through shops or agents including cooperatives.

In addition, upon receipt of orders, Centers or agent deliver seeds directly to villages where either the farmer-groups or organizations ensure to smooth distribution of seeds to individual farmers.

**(6) Training**

For the successful implementation of the project for seed production, the staff members of seed farms and the seed-producing farmers need to participate in seminars and trainings provided by Training and Extension Plan. This will be referred in the 7.4 Improvement Project of Training/Extension System.

**(7) Seed Control and Certification Division (SCCD)**

SCCD is to be established for development of seed production and distribution system. The objectives of SCCD are to give guidance, and to conduct inspection and certification in the process of production and distribution of seeds for quality control.

Needless to say, the success of the project entirely depends on the seeds which have high purity and germination capacity, and also endorse sound growth of rice plant with high yielding characteristics which can meet the farmers' requirement.

In this connection, SCCS is responsible for its inspection required for each process of seed production as well as distribution and marketing together with supervisory works required.

**a. Organization**

The activity of SCCD is authorized by Director of DARD. The administration office and laboratory will be located in the Agriculture Extension Center to guide and supervise the techniques concerned.

**b. Inspection and supervision**

The objective items of SCCD are only rice seeds. Concretely speaking, the activities of the organization are:

- a) Assessment of seeds
- b) Seed tests at laboratories
- c) Issue of seed quality certificate
- d) Supervision of distributed seeds

The test items of rice-seeds at laboratories are certification of variety germination rate, germinating conditions, purity, sound kernel ratio and weight (weight of 1,000 kernel) and tests are conducted in accordance with the regulation of Agricultural Ministerial Decree. In order to certify the quality of seeds harvested and processed seeds as samples at seed farms are tested then certificates are issued for good seeds.

**(8) Operational Costs and Seed Price**

Operational costs required for the project consist of two parts as the cost of seed production/distribution and certification/inspection, managing by AGRISED and AEC. The former will include staff costs, labor charges, costs required for collection and distribution of seeds, transportation charges, the material expenses which are necessary to produce seeds, including cost of fumigants, packing material and general traffic charges etc. The latter is mainly the expense which the inspection of the seed and management office work.

The operational costs require the local currency, 13,288millionVND per year. The details are shown in Appendix.

	Operational cost Million VND
1.Seed Farm & Seed Processing Center	13,063
2.Seed Control Section	225
Total	13,288

In case of the Internal Rate of Return 10% recommended by the World Bank, the seed price is estimated

3,980VND/kg with balancing the income and expenditure which provided for the above operational cost and the project expenses (See 7.2.4) by the seed sale.

When a farmer buys this 'High quality seed', a farmhouse's expense of the seed takes 796, 000VND/ha (seed 200kgx price 3,980VND/kg) in the rough estimate. Actual burden is approximate 383, 500VND/ha (796, 000VND/ha - their own rice seed), because of the their own rice seed can be sold. When a farmhouse buys seeds once in ten cropping season (Frequency rate of seed : 10%), farmer's burden becomes 38, 350VND/ha. This is only 0.5% of the gross income 7,920, 000VND/ha (4.8ton/ha x 1,650VND).

However, it is not easy to sell seeds to raise the price in 3,980VND per kg during the sales price of about 1, 650VND/kg, the seed price is 2, 400VND/kg in the present market to make this project succeed, some public support will be necessary.

### 7.2.3 Implementation Plan

#### (1) Rice Seed Multiplication Schedule

The amounts of required seeds for the project - hereby called the "project seed" - can be calculated from farmers' demand for the seeds and expected frequency rate of seed by the target year as 2010.

Although it is very difficult to estimate the seed demand, in this project, the following methods are taken to estimate the amounts of project seed required in the target year: the first, to estimate total planting areas of paddy in the targets year from agricultural production in the Master Plans: the second, the frequency rate of seed will be gradually raised from 1.4% to 10% by 2010 (Project target year).

By improving existing seed farms, F.S. is planned to be increased to 420ton from 140ton, C.S. to 8,500ton from 2,600ton. The implementation schedule is shown as follows.

Present				Plan									
		1999 Certified Seed					2001	2002	2004	2006	2008	2010	2020
		Total product	Sold to outside	Sold to inside									
Frequency Rate of Seed		3.3%	1.9%	1.4%	Estimated Cultivated Area	ha	392,000	396,000	402,000	409,000	416,000	423,000	423,000
Cultivated Area	ha	388,710			Seed Requirement for Cultivated Area	ton	78,400	79,200	80,400	81,800	83,200	84,600	84,600
Seed	ton	77,742			(0.2t/ha)								
Certified Seeds	ton	2,600	1,500	1,100	Expected Frequency Rate of Seed		3%	3.5%	4.5%	6%	8%	10%	20%
Seed Cultivated Area	ha	520	300	220	Requirement of Certified Seeds	ton	2,509	2,772	3,618	4,908	6,656	8,460	16,920
Foundation Seeds	ton	140			Seed Cultivating land (0.2t/ha)	ha	314	347	452	614	832	1,058	2,115
Seed Cultivated Area	ha	30			Duble cropping x Finishing rate 80%								
Breeder Seed	ton	2.40			Requirement of Foundation Seeds	ton	125	139	181	245	333	423	846
					Seed Cultivating land (0.04t/ha)	ha	16	17	23	31	42	53	106
					Duble cropping x Finishing rate 80%								
					Requirement of Breeder Seed	ton	1.25	1.39	1.81	2.45	3.33	4.23	8.46

From collection to distribution some losses should be taken into consideration. In this case, it is estimated at around 20% in paddy rice, depend upon the data of seed processing.

Not all farmers who produce paddy, of course, will purchase the project seeds, but there is no means to estimate how many farmers will purchase the seeds by the target year. In a sense, the estimated amounts of the seeds will express expected demand for the project seeds.

**(2) Facility and Equipment Plan**

**1) An Phong Farm and Dong Cat Farm**

**a. Arrangement of F.S production farms.**

At present, the cultivated area of the An Phong farm and the Dong Cat farm is 32ha and 400ha respectively but the adjustment of fields are not good. Both of farms will produce all of F.S. to need in the project. And the necessary for total area is about 110ha. Also, both of farms will produce C.S. as far as there are spaces in fields. The present status of the seed farm and allocated area are shown in the following table.

Present Status of the Seed Farm and Area Allocated

Seed Farm	Present Area		Planned Area (ha)
	Total Area (ha)	Arable land (ha)	
An Phong	32	32	32
Dong Cat	1,239	400	110

In the An Phong farm, the arrangement of field is rather sufficient except irrigation facilities. However, the Dong Cat is not sufficient in the farm, must be reclaimed at all. Therefore, the arrangement of fields such as dikes, ditches for irrigation and drainage, the pump system, the road and bridge should be constructed in the plans.

The details are shown in attached drawing for Seed Farms and Buildings.

**b. Building facilities in seed farms**

As the basic building facilities at the seed farm, management office, seed storage, warehouse, drying floor, workshop and staff houses are necessary.

Moreover, at present there are some structures existing in each seed farm available for the work concerned, however, the scale of building facilities is a little different between An Phong farm and Dong Cat farm. The existing facilities in both farms will have to be more or less renovated. as shown in the below table.



**THE STUDY ON INTEGRATED AGRICULTURAL DEVELOPMENT PLAN  
IN THE DONG THAP MUOI AREA VIET NAM FINAL REPORT**

**An Phong Farm**

Building Type	Present Facilities			Present Condition		Construction Plan		
	Number of Building	Floor Space	Total Area	Buildings	Fixtures	Number of Building	Floor Space	Total Area
		m <sup>2</sup>	m <sup>2</sup>				m <sup>2</sup>	m <sup>2</sup>
Office	1	98	98	A				
Seed Storage	1	900	900	A				
Warehouse								
Drying Shed	1	32	32	C				
Drying floor (Soil)								
Drying floor (Brick)	2	500	1,000	A				
Garage(Workshop)						1	150	150

**Dong Cat Farm**

Building Type	Present Facilities			Present Condition		Construction Plan		
	Number of Building	Floor Space	Total Area	Buildings	Fixtures	Number of Building	Floor Space	Total Area
		m <sup>2</sup>	m <sup>2</sup>				m <sup>2</sup>	m <sup>2</sup>
Office	1	96	96	D		1	200	200
Seed Storage	1	138	138	D		1	900	900
Warehouse	1	100	100	D				
Drying Shed	1	150	150	D		1	225	225
Drying floor (Soil)	2	330	660	C				
Drying floor (Brick)	2	435	870	A		1	800	800
Garage(Workshop)						1	150	150
Senior Staffs' Houses	10	50	500	B				
Junior Staffs' Houses	3	20	60	B				
Other	6	32	192	B				

A: In Good condition  
 B: Minor Repair Required  
 C: Major Repair Required  
 D: Irreparable, reconstruction Required

**c. Rationalization of work in seed production and Agricultural Field Machinery**

Land preparation in seed rice growing, namely in plowing, transplanting and harvesting need much labors. Therefore these works should be all or partly done with machinery in both farms in this project.

At the present time, there are equipment and instruments, but furthermore, some additional equipment should be supplied in order to perform this project. As for other equipment, motor bicycles and boat will be provided for training of seed producing farmer and seed sales activities.

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	Existing Facilities				Facilities Plan			
	An Phong Farm		Dond Cat Farm		An Phong Farm		Dond Cat Farm	
	Capacity	Number	Capacity	Number	Capacity	Number	Capacity	Number
Power Tiller	15HP	1						
Tractor & Implements	25HP	1	15HP	3	25HP	3	25HP	4
Rice Transplanter					4rows	1	4rows	1
Nursery Unit						1		1
Combine					5hr/ha	1	5hr/ha	1
Peaper					3-4hr/ha	2	3-4hr/ha	3
Thresher	15HP	1			1ton/hr	3	1ton/hr	4
Power Sprayer					20L	3	20L	3
Dryer	15HP	3	8 t/day	2	8ton/day	1	8ton/day	1
Pre-Cleaner	4HP	2						
Vacume Cleaner	9.5HP	1	10 t/day	4	3ton/hr	1	3ton/hr	1
Water Pump	15HP	1	12HP	10		1		1
Electric Generator			3 kw/h	1				
Workshop equipment						1		1
Belt Conveyor						1		1
Boat						1		1
Motor cycle						2		2

In our observation, there is neither a workshop nor spare parts available for the existing cultivator, tractor and other agricultural field machinery which are required for the rice seed production and processing activities.

A repair workshop to be facilitated in each facility, and in there, a welding machine, grinder, small size boring machine and other working tools shall be installed for its adequate operation. At the same time, a control system shall be made for spare part maintenance.

Therefore it is necessary that in future an adequate budget shall be allowed for the supply of parts required for the facility concerned

**d. The staff of the seed farms**

Both farms should manage the seed-processing center in addition to the production of F.S. The staffs of An Phong farm should be one chief, six staff members, and ten workers. On the other hand, the staffs of An Phong farm should be two chief, thirty-five staff members, two clerk, driver and 272 workers. Present staffs of both farms are as following table.

Present staffs

Location	Staff					Worker	
	G.M.	M.Class	Staff	Checker	Driver	Full Time Worker	Part Time Worker
An Phong Farm	1		6			7	3
Dong Cat Farm	1	1	35	2	1		272

**2) Seed Processing Center**

In order to process the objective amount of C.S.; 8,400tons/year as specified by the project and controlled by each station, a total of three Seed Processing Centers shall be constructed in An Phong farm, Dong Cat farm and Hong Ngu town.

**a. Site Area and Structures**

The main structure to be constructed in each Center is a warehouse. This warehouse shall include office, laboratory and processing facilities. And building for dryers to be constructed separately.

As for the location of Hong Ngu provide for the construction of Center, at present the ownerships still belong to each private owner concerned. However, they can be easily procured by the government that is also responsible for to securing 1 ha of area which is considered to be enough for the construction.

Seed Processing Center Plan

Seed Farm	Seed Storage (m <sup>2</sup> )	Drying Shed (m <sup>2</sup> )	Drying Yard (m <sup>2</sup> )	Remark
An Phong	990	225	850	in An Phong Farm
Dong Cat	990	225	850	in Dong Cat Farm
Hong Ngu	690	225	650	

The warehouse will require ample space for installation of the processing facilities, flooring for operation, adequate frontage and height.

The building of dryer shall be utilized steel structures for minimization of cost and to protect from fire.

**b. Machinery and Processing Facilities**

All places where double cropping is possible, the Centers are to be capacitated theoretically to handle 50% of the total processing capacity as scheduled for one year's operation. For each Center annual capacity, the details are shown following table.

Location	Receiving Capacity per Day		
	Average (ton/day)	Inclusive of 20% variation (ton/day)	* Supporting Drying (ton/day)
An Phong Farm	60	72	7
Dong Cat Farm	60	72	7
Hong Nug	30	36	4

\* Basically, the seed farmer makes paddy dry up.

Meanwhile, the number of required machinery/equipment and necessary capacity, calculated on the basis of the required amount of proceeding for each Center concerned, are detailed in the following table.

As for the drying facilities, each dryer for An Phong farm, Dong Cat farm and Hong Ngu should be constructed, with 5-8ton/unit and 0.4~0.5%/hr of drying capacity.

Maintain Drying Seed Storage play an important role in seed preservation and maintain drying, and

in accordance with their capacity; 500ton for An Phong farm, 500ton Dong Cat farm shall be adequately installed.

Regarding the processing facilities, An Phong farm, Dong Cat farm and Hong Ngu needs one facility of the 3-ton throughput.

	An Phong Farm		Dond Cat Farm		Dond Cat Farm	
	Capacity	Number	Capacity	Number	Capacity	Number
Dryer	8ton/day	1	8ton/day	1	5ton/day	1
Cleaner	Use both as Farm and Center				3ton/hr	1

**c. The complement of staff**

Out of three seed processing centers, the farm staffs manage a seed-processing center of both farms. Therefore, it doesn't recruit new staffs. The staffs of Hong Nuge seed processing center should be posted one chief, staff members, and five temporary workers.

**3) Seed Control and Certification**

**a. Office**

This division has an office room in the agricultural extension center and it is equipped with the seed tester tool and the facilities.

**b. Facilities and Equipment**

The new equipment in laboratory is as follows.

Laboratory Equipment	Unit
Office utensit	1
Verifying tools	1
Sampling and distinguishing device	1
Moisture content determination device	1
Device for analysis of purity	1
Germination evaluation device	1
Keeping sample room 18 , 12m <sup>2</sup>	1

**c. Staff**

The staff of Seed Control Section in the agricultural extension center takes charge. The staffs go to each seed-processing center, and inspect seeds cooperating with the center staffs.

**7.2.4 Project Costs**

**(1) Construction and Equipment Cost**

Total construction and equipment costs required for the project are calculated as 55,695 million VND. Foreign currency shall be applied for goods to be imported on C.I.F. Ho Chi Minh City Basis, which also includes machinery, steel structures, various equipment and vehicles being produced in Viet Nam through knock-down processes.

Local currency is applied to the construction costs, machinery and equipment transportation charges between the port of Ho Chi Minh City and the site concerned, as well as the various costs for procurement of local goods.

All the estimates of the required costs are based on the market price of the relevant goods, and the rate concerned being applicable in Ho Chi Minh City as 2000 March.

It mentions details to the annex.

### **(2) Engineering Cost**

The engineering cost which covers consulting service is estimated to be 5,062 million VND as 10% of total construction cost.

	Equipment and goods	Construction	Engineering cost	Total
	Million VND	Million VND	Million VND	Million VND
1.Seed Farm	11,010	10,672	2,168	23,850
2.Seed Processing Center	239	25,338	2,557	28,134
3.Seed Control and Certification Office	3,374	0	337	3,711
Total	14,623	36,010	5,062	55,695

### **(3) Maintenance Cost**

Maintenance Cost of facilities is inside of the operational costs provided by the seed sale. For the details, it refers to 7.2.2 (8).

### **7.3 Model Cooperative Project**

#### **7.3.1 Background**

##### **(1) Selection of the Target Cooperatives**

To produce high quality paddy and conduct collective marketing in the Study Area of Master Plan through strengthening the activities of model agricultural cooperatives, four candidates of model cooperatives (Gao Giong, Binh Minh, Phu Tho and An Phu) were selected based on the study results.

The major criteria for selection are (a) geographical conditions, (b) characteristics of leaders and members, and (c) current and planned future activities. Management conditions of Phu Tho and An Phu Cooperatives are good and developed compared with other cooperatives in Dong Thap province. These two cooperatives were transferred from old collectives with successful operation experience and have expanded their activities step by step. They are located in the same commune, and cover almost all farm households in the commune as members, which prove that their organizational power is solid. On the other hand, Gao Giong and Binh Minh cooperatives are located in the different but adjacent communes and have rather poor land transportation accessibility. Especially Binh Minh has just established, organizational structure is still weak and activities are very limited. In this context, to compare four cooperatives in the viewpoints of establishment and strengthening of farmer's organization, they were selected for the further survey. Characteristics of these 4 cooperatives are summarized in the table below.

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**Comparison of the 4 Cooperatives**

	<b>Binh Minh</b>	<b>Gao Giong</b>	<b>An Phu</b>	<b>Phu Tho</b>
Year of Establishment	28 Jan. 2000	5 May 1998	6 Oct. 1998	21 Oct. 1998
Cultivated Area (ha)	521	217	413	370
Household Members	403	127	519	579
Max. Contribution by Member (Largest Farmland)	520,000 VND (5.02ha)	196,702,428 VND ( ha)	6,753,025 VND (34,500m <sup>2</sup> )	5,376,068 VND (3.03ha)
Min. Contribution (Smallest Farmland)	5,000 VND (0.05ha)	200,000 VND ( ha)	359,203 VND (1,000m <sup>2</sup> )	53,229 VND (0.03ha)
Annual Production (Profit)		280 million VND (280 million)		million)
Total Asset (Capital)	52 million VND	1,010 million VND	603 million VND	579 million VND
Current Activities				
Irrigation & Drainage				
Fertilizer Service				
Credit				
Seed production				
Pumps operated by Coop.(owned by Coop.)	6 pumps (2 pumps)	9 pumps (9 pumps)	6 pumps	5 pumps (5 pumps)
Problems referred by members				
Price of paddy is low, unstable				
Increase of agricultural material cost				
Shortage of capital for production				
Difficulty of drying paddy during rainy season				
Inferior quality of seed				
No uniformity in varieties of paddy				
Heightening dyke system				
Idea to solve the above problems considered by members				
Financial assistance				
Reduction of production cost				
Improvement of quality of product				
Advanced technology				
Good seed				
Drying machine				
Uniformity of variety				
Improve the way of marketing (joint marketing)				
Need to have someone to buy all paddy/Secure the market				
Relation with SOE				
Participation to processing				
Plans of the Year 2000	1. Purchasing 4 pumps 2. Material supply service (seed) 3. Machinery service 4. Heightening of dyke system	1. Add 230ha of irrigation area 2. Mobilizong capital to buy agricultural equipment directly from producers 3. Investing more post-harvest technology/facility	1. Selection of good variety 2. Implementaion of seed service 3. Improvement of irrigation channel	1. Implementation of seed service 2. Implementation of drying service 3. Expansion of VAC system

Source) Interview Survey by JICA Study Team in March-April 2000, "Production Plan", "Financial Report" of 4 Cooperatives

Among them, Binh Minh Cooperative is very new and its activities cannot be evaluated. Though An Phu Cooperative is located in the same commune with Phu Tho Cooperative, the former has poor location for post-harvest processing facilities and marketing. In considering of the role of model cooperative such that can provide positive impacts on the other farmers' organizations and facilitate expansion of organizations, Gao Giong and Phu Tho have the appropriate capacity. Based on the survey and discussion with local officials, Gao Giong and Phu Tho were selected as model cooperatives that can be different type models in comparison.

**(2) Present Conditions of the Model Cooperatives and the Area**

**1) Cooperative's Activities**

As a result of the survey of the two model cooperatives, Gao Giong and Phu Tho have different

characteristics as follows.

**Characteristics of the Two Cooperatives**

	Phu Tho Cooperative	Gao Giong Cooperative
Geographical Condition	Good road and water transportation	Good water transportation to the northern part of Dong Thap and Tien Giang provinces. Road transportation is not good.
Leadership / Members	Leader is very careful for the new activities but allows the members to discuss openly. He has a decision-making power taking into consideration of members' opinions. He attended some leader training courses including JICA Training Courses. He has a good reputation by local government. Women members are active in activities. One of the members is miller and he is willing to cooperate for development.	Leadership is very strong. He has very constructive ideas and very active in challenging new activities. Members are reliant on management board and conscious of their present problems and countermeasures.
Organization	Starting from irrigation/drainage service when it was a collective, the activities have been developed step by step.	Cooperative was established by voluntary groups with strong necessity. Therefore, members at the beginning have strong will of development.

Furthermore, three-day PCM Workshops were held in order to study these two cooperatives more detail. Participants are member farmers of cooperatives, staff of PC Commune, staff of province/district DARD and staff of SOE. The program and the list of participants are found in Appendix. The objectives of the workshop are;

- to make understood the related parties their problems and their background
- to make the members find out the countermeasures of the problems
- to analyze the conditions and capacities of the cooperatives to implement the project
- to have opportunities of dialogue between officials and farmers

The workshops provided the members with opportunities to understand their problems, their interrelationship and approaches to solve the problems. Also, they understood what activities and actions were necessary for each approach. Further, PCM Workshops cleared needs of the two cooperatives at immediate and future stages. However, they have not set any clear vision or strategy to materialize their ideas. The differences between Gao Giong and Phu Tho Cooperatives from the organizational viewpoint are summarized bellow.

Gao Giong	Phu Tho
1. Leadership is evident and tends to control the members.	1. Leadership is moderate and member's opinions are considered well.
2. Expectation of government support is very high but actually little support has been received.	2. Members are quite positive about their organization evaluation because of its good financial status.
3. Lack of information and inappropriate information make the members weak in planning future activities and bargaining power with collectors.	3. Members trust in the management board and good communication among members.
4. The importance of management staff training is recognized.	4. The lack of training of members and staff of management board is recognized.





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Storage	Almost all farmers sell their products to collectors soon after harvesting. They store paddy in plastic bags in a house or small shed.	Almost all farmers sell their S-A crops soon after harvesting to avoid quality change during storage. W-S crops are not sold until the market price increases. Many farmers have cylindrical storing container made by bamboo.
Milling for self-consumption	The most of farmers ask mobile rice mills coming from outside of commune. Milling charge: 2,000 VND/20kg	Farmers ask village millers. Milling charge: 1,800-2,000 VND/20kg

\* Introduction plan of mechanical dryer

Phu Tho Cooperative is planning to introduce two units of flat bed dryer

Expected time for installation : July 2000

Holding capacity: 8 tons/unit

Planned processing amount: 960 tons/30days for S-A crop, which will cover 45% of total products.

Investment: All Cooperative's fund

**Rice Mill**

Condition of Rice Mill

	Phu Tho	Gao Giong
Number	4 rice mills in the commune	3 (One owned by a cooperative member), other mobile millers
No. of R/M surveyed	2	2
Type of machinery	Combination of a under-runner type husker and a corn type whitener	Combination of a under-runner type husker and a corn type whitener
Processing wage	1,500 VND/20kg	1,800-2,000 VND/20kg
Moisture content	W-S Crop: 16-16.5% S-A Crop: more than 17%	W-S Crop: 14-15% S-A Crop: 15-16%
Recovery rate	W-S Crop: approx. 70% S-A Crop: approx. 60%	W-S Crop: 55-70% S-A Crop: 50-65%

#### 4) Marketing

	Phu Tho	Gao Giong
Selling ways of paddy	Sell to local buyers in farmyard in cash	Sell to local buyers in farmyard in cash
Conditions of location	<ul style="list-style-type: none"> <li>- Located along the Tien River in the north-west of Dong Thap province, on the transportation routes to An Giang province of paddy produced in the northern area of the province and going south of Tien River</li> <li>- Near the export rice processing factories of Angimex and Dagrimec</li> <li>- National Road A1 traversing the hamlet from south to north make it possible to collect paddy from the neighboring areas by land transportation.</li> <li>- Facing to Tien River, scale of waterway transportation is not limited.</li> </ul>	<ul style="list-style-type: none"> <li>- Along Kien An Phong-My Hoa crossing the center of Dong Thap province from east to west, on the transportation route for domestic market of paddy produced in the northern area of the province and route to export rice processing factories in Tien Giang province.</li> <li>- There is no export rice processing factories in the neighboring area.</li> <li>- Boat with 30ton capacity can be used in major waterways in the commune. Large barge can navigate in Kien An Phong-My Hoa.</li> </ul>
Relationship with local collectors	<p><u>No. of collectors</u> Local buyers: about 10 Commercial rice mill: 1</p> <p><u>Opinions by millers on collective marketing</u></p> <ul style="list-style-type: none"> <li>- Business is already stable with reliance by several export industries and negative impact cannot be considered.</li> <li>- Improvement of paddy quality in the region is expected.</li> <li>- Development of cooperatives is regional development. They are willing to cooperate with this plan.</li> </ul>	<p><u>No. of collectors</u> Local buyers: about 10 Commercial rice mill: none</p> <p><u>Opinions by buyers on collective marketing</u></p> <ul style="list-style-type: none"> <li>- Negative impact will no be considered.</li> <li>- There are some advantages such as improvement of paddy quality in the region and receiving processing services with fee locally.</li> <li>- They can cooperate in providing transportation and market information, ordering charged processing, etc.</li> </ul>

#### 7.3.2 Objectives

This project aims at income increase through quality improvement activities by farmer's groups. For this purpose, two target cooperatives were selected and they will carry out the following activities based on the objectives in each sector. These activities, processes and know-how will be diffused to other cooperatives and farmer's groups purposely and then will provide with motivation of quality improvement to the all farmers in the area.

##### (1) Production

- Improvement of paddy quality

In order to increase the selling price of paddy, unification of the varieties in the area, use of high quality seeds, appropriate renewal of seeds and improvement of technique of cultivation control will be implemented.

**(2) Post-harvest Processing**

- Improvement of drying after harvesting

In order to decrease loss after harvesting and increase selling price, drying after harvesting will be improved.

- Increase of value added

In order to maximize the economic effect by improvement of paddy quality, rice mill facilities will be equipped.

**(3) Marketing**

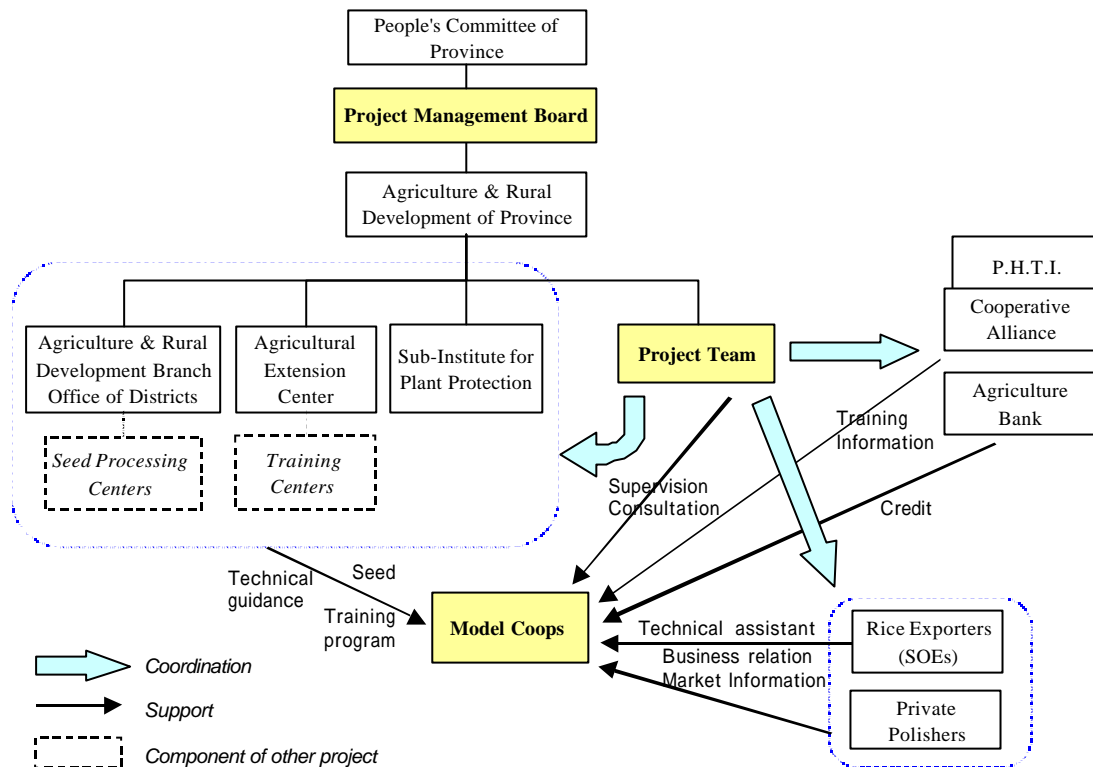
- Strengthening of selling power

In order to return the profits surely made by improvement of paddy quality, technique of quality inspection will be strengthened and collective marketing will be implemented.

**7.3.3 Project Implementation System**

**(1) Implementation System**

Province DARD will be a responsible implementing agency. As the activities cover various fields, the Project Management Board consisting of 2 model cooperatives, province DARD, Agricultural Extension Center, Cooperative Alliance, and Province PC as members and SOE and VBARD as observers will be set up. This board will operate and manage the plan and supervise and support for the model cooperatives. Project Team as immediate working unit consisting of staff of province DARD in charge of cooperatives, rice processing and marketing and rural credit will be formed and be implemented their responsibilities.

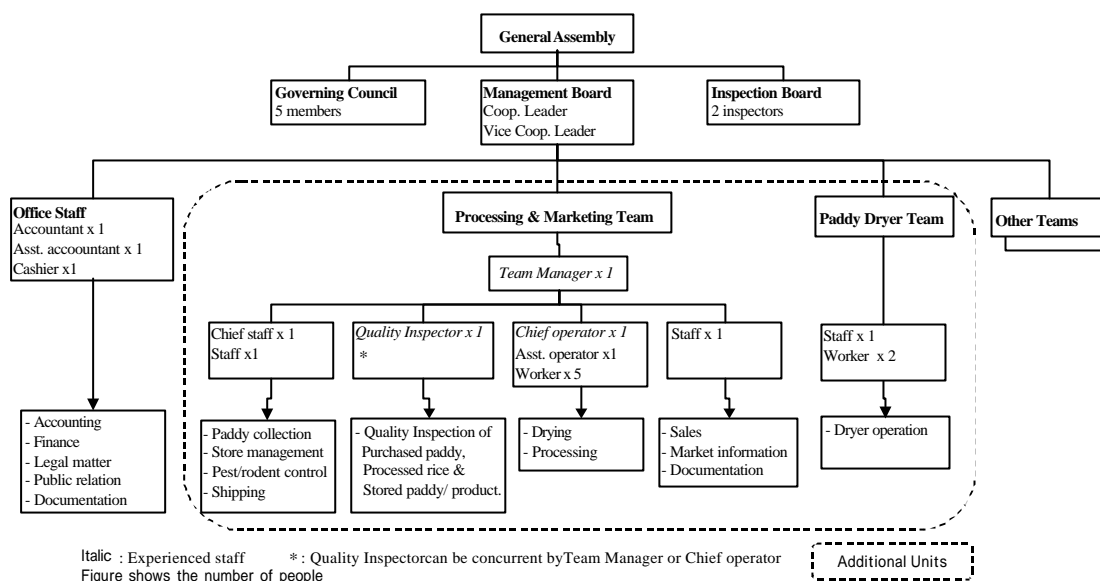


Implementation Structure

**(2) Implementation System of Model Cooperative Project**

Since the present organization of the cooperatives is based on the present activities, additional units necessary for collective marketing should be set up. In formation of business organization, experienced staff of SOE/private rice mills will be recruited, function of business in specialty of facility operation, sales, quality control will be strengthened for smooth business. The ways of decision-making and operation of the cooperatives are as present. General Assembly of the members is the highest decision-making agency and Management Board has responsibility for planning of the business and implementing the activities. General Assembly will regulate the decision-making right of the Management Board and revise regulations of functions and assignment of new staff, etc. Workers in rice mill facilities and storage will be hired temporarily during the operating period. Loading and unloading works in the collecting and shipping, labors will be contracted out by the piecework following the local custom.

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### 7.3.4 Implementation Plan

#### (1) Activity Plan

##### 1) Production

Item	Activities	Facilities/Machinery	External Support
1.Unification of regional varieties	Unify the recommended (2-3) varieties suitable for the market needs	---	Receive advice of variety selection from DARD and SOEs
2.Use of high quality seeds and proper renewal of seeds	In order to increase paddy quality, high quality seeds will be procured stably and renewed in appropriate frequency.	---	Receive the support from Seed Centers.
3.Improvement of technique of cultivation control	In order to increase paddy quality, cultivation practice such as manure and weeding, etc. will be improved.	---	Receive technical support from Agricultural Extension Center.

##### 2) Post-harvest Processing

Item	Activities	Facilities/Machinery	External Support
1.Improvement of post-harvest processing practices	Practices of post-harvest processing (mainly drying) of farmers will be improved.	---	Technical support from Agricultural Extension Center
2.Improvement of drying	Target moisture content will be set at 14.5%. Improvement of farmer's drying will be supported and mechanical dryer will be introduced to achieve the above target.	Mechanical dryer	
3.Introduction of milling	Unified and high quality paddy will be milled to get value added.	Milling facilities	
4.Improvement of quality control technology	To get the maximum economic effect through the above activities, quality control will be strengthened.	Inspection and quality control equipment	Technical support from Agricultural Extension center

### 3) Marketing

Item	Activities	Facilities/Machinery	External Support
1.Improvement of quality inspection technology	In order to improve paddy quality and strengthen farmer's bargaining power, technique of quality control will be acquired.	---	Technical support from Agricultural Extension Center and DARD
2.Collective marketing	After strengthening selling power by collective marketing, direct sale to export rice processors will be tried.	Transportation for collecting products, warehouse	Support from DARD
3.Introduction of rice milling	In order to secure the business opportunities with the above exporters, rice milling will be implemented.	Milling facility	Technical support from SOEs

### 4) Business Operation

Item	Activities	Facilities/Machinery	External Support
1.Improvement of organizational management capability of leaders and members of Management Board	In order to increase capacity of cooperative management by leaders and executive members, leader training courses will be attended.	---	Support from DARD, Agricultural Extension center, SOEs and Cooperative Alliance
2. Preparation of manual for business plan and implementation	Operation Manual for the planning of future activities will be prepared monthly and annually .	---	Support from Agricultural extension Center, DARD, Cooperative Alliance
3.Improvement of business capability of accountant and financial staff	Technique and information of accounting and financing will be obtained.	---	Technical support from DARD, Agricultural Extension Center, SOEs, Financial facilities, universities, etc.
4.Increase of business ability/mind of leaders	In order to increase business capacity of leaders, on-the-job training in industries in province will be provided.	---	Support from DARD (selection and arrangement of training places and trainees)
5.Formation of expert groups	In order to start the business effectively, staff with business experience of rice processing will be hired.	---	Support from DARD (including recommendation of trainers)

### (3) Implementation Schedule

In advance of introduction of collective marketing and rice milling, various activities related to improvement of paddy quality and business operation should be implemented. It is estimated that it takes 2 years to complete collective marketing and the procurement of facilities/machinery of rice milling/processing. Therefore, the starting time of improvement of paddy quality and business operation is the time when the procurement of the facilities/machinery is committed.

### 7.3.5 Facilities and Machinery Plan

#### (1) Basic Plan

Item	Remarks
Equipment of Post-harvest Processing at farm household level	1) Dryer Same type of a flat bed dryer with good achievements in the “Plan of Rice Post-harvest Processing (DANIDA)” being implemented in 3 provinces including Can Tho province will be introduced. Though floating dryer and mobile dryer were considered in accordance with inundation level, stable dryer will be introduced from the economic viewpoint because the target area is not serious inundated area. 2) Warehouse Cylindrical storing container made by bamboo net is cheap and purchasable by farmers. Since it is also practical and economical, its introduction will not be considered in this project.
Rice Milling Facilities	Combination of under-runner type husker and a corn type whitener is the most popular in the present market. Since this project aims at production of uniform and high quality material, rubber-rolling type husker and vertical abrasive type whitener that might get the highest recovery rate among the local facilities will be introduced
Recovery control equipment	In order to strengthen recovery control, introduction of in-line weighing equipment will be considered.
Equipment of quality control and inspection	Since there is no reliable domestic inspection equipment, Japanese products will be introduced.
Supply of charged processing service	In order to use the facilities effectively and increase income, scale and layout of the milling facilities in case of providing processing service with charge to local buyers will be considered.
Transportation facilities for collecting and shipment	Large ship for shipment is generally prepared by transportation agency and it is difficult for this project to cover this from economic and operational viewpoints. Tractors and small boats for collecting will be considered in order to promote selling by members to cooperatives

#### (2) Basic Design

##### 1) Design Conditions

##### Production Plan

Paddy production after completion of dike system improvement is set at the following figure.

	Gao Giong Cooperative			Phu Tho Cooperative		
	Cultivated Area (ha) **	Yield (ton/ha)	Paddy Production (ton)	Cultivated Area (ha)	Yield * (ton/ha)	Paddy Production (ton)
WS Crop	450	6.0	2,700	370	6.5	2,400
SA Crop	450	5.1	2,300	270	5.5	1,500
AW Crop	450	5.1	2,300	370	5.5	2,000
Total	1,350		7,300	1,010		5,900

\* As the yield is already at the high level, the figure is followed by the present condition.

\*\* The area with acid sulfate in the irrigation project area (total paddy field in the hamlet of 660ha) is excluded. The hamlet agreed on that this 450ha is used for quality improvement as the area of high quality rice production area.

##### Plan of Collecting/Storage/Processing/Shipment

Collecting time : 45 days for each crop

Processing time and amount : See the table below



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Capacity of processing : 4 ton paddy/hour

Operating time per day : Actual operating time is 14 hours/2 shifts (16 hours)

Processing recovery : 69% (material rice/paddy processed)

Shipment time : 90 days per crop

Amount of storage : See the table below

**Processing Time and Amount**

	Gao Giong Cooperative				Phu Tho Cooperative					
	Processing time	Amount of joint collecting/processing *	Amount of Contracted Processing	Total Processing Amount	Processing Amount /day	Processing time	Amount of joint collecting/processing *	Amount of Contracted processing	Total Processing Amount	Processing Amount/day
WS Crop	70 days	2,130	1,700	3,830	55	70 days	1,940	1,900	3,840	55
SA Crop	70 days	1,725	1,900	3,625	52	60 days	1,080	1,900	2,980	50
AW Crop	50 days	1,725	500	2,225	45	50 days	1,570	500	2,070	41
Annual Total	190 days	5,580	4,100	9,680		180 days	4,590	4,300	8,890	

The unit of the figures without any remarks is ton.

\* The amount of joint collecting/processing is paddy production deducted by paddy for self-consumption, labor wage payment and seed, etc.

**Amount of Joint Collecting/Processing/Storage by Month**

**Phu Tho Coop.**

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
Planting and Farming	15	WS Crop		15	10	SA Crop		10	15			15	
Collecting	20			45 days				45 days				25 days	
Processing	25 days			70 days				60 days				25 days	
Shipping	65 days			80 days				80 days				25 days	
Amount of Paddy Collected	520	0	0	880	1,060	0	0	500	580	0	0	1,050	4,590
Amount of Paddy Processed	610	0	0	560	840	540	0	380	570	130	0	960	4,590
Production of Material Paddy	421	0	0	386	580	373	0	262	393	90	0	662	3,167
Shipping Material Paddy	400	333	0	300	450	450	139	160	260	260	65	350	3,167
Storage at the end of month	333	0	0	406	756	139	0	222	365	65	0	402	
Production of by-product (Bran)	43	0	0	39	59	38	0	27	40	9	0	67	322
Production of by-product (Husk) *	146	0	0	135	201	129	0	91	137	31	0	231	1,101

□ sawing period      □ harvesting period

\* : include straw, immature grain and other inert matter.

**2) Basic Design**

- Plan of Equipment ( Common to two cooperatives )

No.	Equipment	Amount	Contents
1	Milling Facilities	1 set	4t / hr.
2	Flat bed dryer	2 sets *	8t / batch x 2
3	Equipment for quality inspection and control	1 set	
4	Equipment for information control and office machinery	1 set	
5	Equipment for the office	1 set	
6	Transportation Facility for collecting	1 set	15t boat (Gao Giong) 3-4t truck (Phu Tho)
7	Spare parts of the above	1 unit	

\* One set is equipped in the residential area.

• Facility Plan

No.	Item	Area ( m <sup>2</sup> )		
		Gao Giong	Phu Tho	
1	Office	40	30	
2	Quality inspection room	30	30	
3	Warehouse	30	30	To store parts and expendables
4	Building for rice mill	600	600	
5	Warehouse	700	600	To store paddy and material rice
6	Drying shed	100	100	outside
7	Drying Yard in the Sun	400	500	outside
8	Port	2 places	2 places	outside

### 7.3.6 Project Cost

#### 1) Cost for Facilities

No.	Facilities	Amount	Cost (million VND)	
			Gao Giong Coop.	Phu Tho Coop.
1	Milling Facilities	1 set	914	914
2	Flat bed dryer	2 sets	84	84
3	Quality inspection and control equipment	1 set	172	172
4	Equipment for information control and office machine	1 set	52	52
5	Equipment for the office	1 set	17	17
6	Transportation facilities	1 set	56	82
	Sub-total		1,295	1,321
	Total		2,616	

#### 2) Construction Cost of Facilities

No.	Facilities	Cost (million VND)	
		Gao Giong Coop.	Phu Tho Coop.
1	Construction	6,140	6,129
2	Electric Facilities	196	192
3	Miscellaneous	140	140
4	Reserve fund	647	646
	Sub-total	7,123	7,107
	Total	14,230	

**3) Consulting Service**

No.	Facilities	Cost (million VND)	
		Gao Giong Coop.	Phu Tho Coop.
1	Machinery	131	133
2	Facilities	713	711
	Sub-total	844	844
	Total	1,688	

**7.3.7 Operation Cost**

**1) Expenditure**

million VND

	Gao Giong Coop.	Phu Tho Coop.
Operation of Milling Facilities	1,060	1,028
Operation of Dryer	35	35
Purchase of Paddy	7,310	7,573
Total	8,405	8,636

**2) Income**

million VND

	Gao Giong Coop.	Phu Tho Coop.
Milling Facilities	8,518	8,742
Dryer	38	38
Total	8,556	8,780

**3) Balance**

million VND

	Gao Giong Coop.	Phu Tho Coop.
Milling Facilities	148	139
Dryer	3	3
Total	151	142

## **7.4 Improvement Project of Training/Extension System**

### **7.4.1 Objectives**

It is important to train and recruit staffs and farmers, to implement each project that concerned the rice production and marketing improvement, especially the quality improvement. Therefore, this project covers wide range of related high quality seed production/supply, post-harvest technology and cooperative activities.

The objective of the training of each sub sector is as follows.

- **Training for Seed Production/Supply Project**

In the Study Area which has a lot of problems about the seed production, seed growers need to be fully aware of the importance of seeds and to pay more attentive to their growing.

The increase of the seed production that is a basic element for agricultural produce, a special consideration and technology is quite necessary.

In this respect, for those who work in the relevant institutes and research centers, and the seed growers as well, an appropriate technical training and education is imperative and to be implemented accordingly.

- **Training for Post-harvest/Marketing**

As it is necessary to extend improved post-harvest technology to all persons and organizations concerned to the rice market from production to processing in order to promote and develop high quality rice production in the area, the following training programs will be introduced.

- 1) Improvement of farmer's practice for post-harvest processing
- 2) Improvement of rice miller's technology for processing and factory management
- 3) Extension of inspection and quality control technology to persons concerned

- **Training for Farmer's Group**

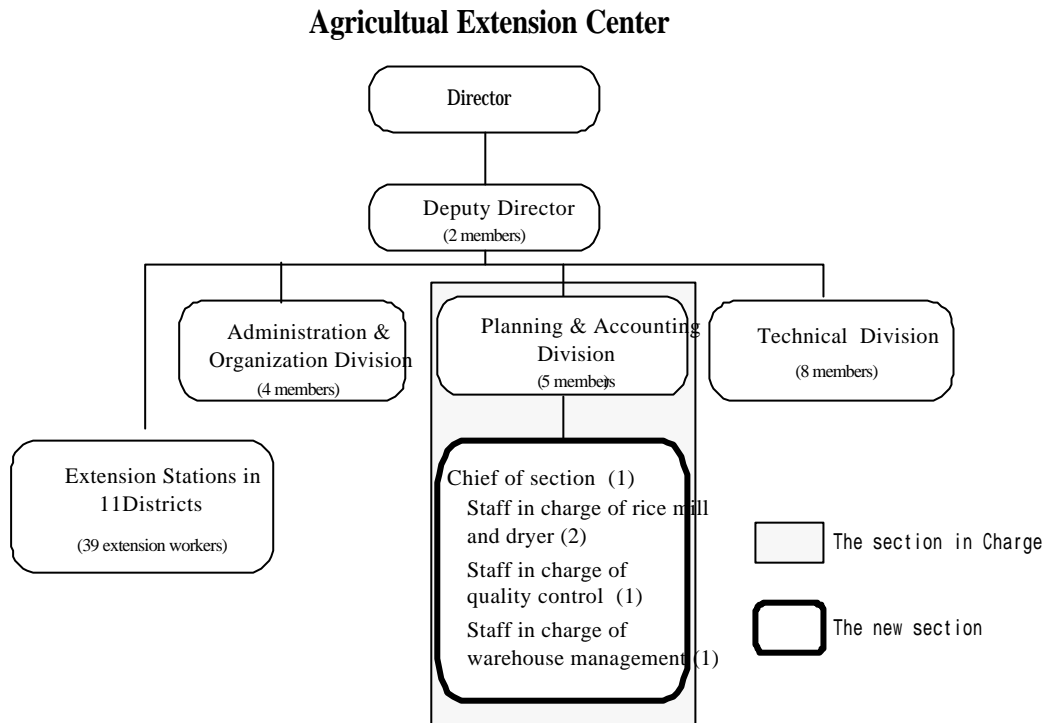
Capacities and knowledge of leaders, senior and others of farmers' organizations differ by their organization. Therefore, training program will be considered so as to meet the actual requirement of the participants. Three programs are planned, one for leaders, another for finance and accounting staff, and study tour to successful organizations for the cooperative members.

### **7.4.2 Implementation and Cooperative Organization**

Proposed training and extension project will be implemented by Agricultural Extension Center, according to the agricultural technique training to be implementing from the past.

Planning & Accounting Division of Agricultural Extension Center will take charge of the training programs and arrangement. The new section under this division established for the Project is in charge of implementation of 'Training for Prost-harvest/Marketing'. Other related offices will cooperate recruitment and dispatch of temporary lecturers and trainer incorporation with various institutes concerned.

The implementation organization is described as follows.



The implementation and the cooperation of every training program are described as follows.

• **Training for Seed Production/Supply Project**

In implementation of training and education for the seed production, exclusively selected experts would be dispatched from 1) Agricultural Institute which concerns seed improvement and cultivating technology of food crops and 2) Seed Control and Certification Service which is responsible for seed production. As the cooperation organization, Cuu Long Delta Rice Research Institute, Can Tho University, and so on, are raised.

• **Training for Prost-harvest/Marketing**

The new section established for the Project is in charge of implementation of the programs concerned. The PHTI will cooperate recruitment and dispatch of temporary trainers.

• **Training for Farmer's Group**

Agriculture Extension Center, Provincial Cooperative Alliance, SOE and DARD send staffs as lecturers, support subsidy, do monitoring and evaluation. And it employs lecturers from the bank, the business, the university, the vocational college and so on.

### 7.4.3 Scale and Method of Training

Those who assigned for seed production and its relevant industry shall be designated for the training. In detail, one is done by the Central Government on the basis of job designation and the other is made by the Provincial Government who is responsible for training of seed grower at Seed farm, through training course and traveling lecturers, including Center staff members.

The training method to the staffs and farmers relating this project, will implement with related office according to each specialty and each training program.

The training contents are shown as follows.

#### • Training for Seed Production/Supply Project

Program	Contents	Trainee	Capacity
Managing Staff Training	Meaning of extension of good variety Management and operation of the seed production project Management and system of seed growing <u>Seed control and marketing</u>	Staffs of ARD of Provinces  Staffs of AGRISED0 Staffs of ARD of Districts	Training courses/year : 4  Days/1course : 10 Trainees/1course : 20
Technical Staff Training	The technique of seed rice growing and production The way of sowing in nurseries Introduction of seed variety, evaluation of productivity and study of testing methods Crop protection and policy thereof Policies for maintenance of soil fertility Method of extension and policy thereof	Technical staffs of seed farms Staffs of seed processing center	Training courses/year : 4 Days/1course : 30  Trainees/1course : 20
Seed Producing Farmers Training	Special characteristics of good varieties Preparation of fields for seed production Seed cleaning for seed production The way of fertilizing The way of management for seed production Harvest, preservation and control of crops in good condition	Seed producing farmers	Training courses/year : 10 Days/1course : 30 Trainees/1course : 30

**• Training for Post-harvest/Marketing**

Program	Content	Trainee	Capacity
Post-harvest Processing Technology	Technology such as drying and storage	Farmers, Farmer's groups Traders, Processors Extension officers	Training courses/year : 20 Days/1course : 3 Trainees/1course : 10
Quality Inspection and Control Technology	Inspection and control technology for paddy, brown rice and white rice quality	Farmers, Farmer's groups Traders, Processors Officers	Training courses/year : 30 Days/1course : 3 Trainees/1course : 10
Factory Management Technology	Factory management and profit control technology	Farmer's groups Processors	Training courses/year : 5 Days/1course : 3 Trainees/1course : 3
Rice Processing Technology	Milling, recovery control and machinery maintenance technology	Farmer's groups Processors	Training courses/year : 5 Days/1course : 10 Trainees/1course : 10

**• Training for Farmer's Group**

Program	Contents	Trainee	Capacity
Leader training	Cooperative Law and othe related legal frame work Planning, implementation, monitoring, evaluation Public Relation ( Sales strategy )	Group leaders Government staff	Training courses/year : 6 Days/1course : 30 Trainees/1course : 50
Accounting/Finance	Preparing finacial accounting Tax system Understanding finacial seporting system	Chief accountant	Training courses/year : 12 Days/1course : 60 Trainees/1course : 25
Study Tour	Visit other developed groups	Group members	Tour/year: 2 Trainees/1course : 30

**7.4.4 Training Schedule**

The implementation schedule of training is shown as below.

**• Training for Seed Production/Supply Project**

Program	1	2	3	4	5	6	7	8	9	10	11	12
Managing Staff Training	—			—			—			—		
Technical Staff Training	—	—	—	—			—	—	—	—		
Seed Producing Farmers Training												

: No of training course

• **Training for Post-harvest/Marketing**

Program	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Post-harvest Processing Technology		***	****			***	****			***	***	
Quality Inspection and Control Technology	*	**	***	***	***	***	***	**	**	**	***	***
Factory Management Technology		-	-			-	-				-	
Rice Processing Technology		-	-			-	-				-	

• **Training for Farmer's Group**

Program	1	2	3	4	5	6	7	8	9	10	11	12
Leader Training	-		-		-		-		-		-	
Accounting/Finabce		-		-		-		-		-		-
Study Tour	-				-							

**7.4.5 Construction and Equipment Plan**

**(1) Construction**

Training Center and Rice Mill facility will be newly established as the training institute in the site of the agricultural extension center.

	m <sup>2</sup>	
Training Center		
First Floor	340	
Second Floor	240	
Training facility of rice processing		
Building for Mill	375	
Storage	75	Keeping for rice
Laboratory room	25	
Building for dryer	70	
Drying yard	60	Made of concrete

**(2) Equipment**

The training center is mainly used for sedentary lessons. It will be equipped with desks, chairs, audio-visual equipment and so on. The training facility for rice processing will equip rice mill and so on.



Name of facilities	Amount	Contents
Training Center		
Desks, Chairs etc	220	
Training equipment	1set	
Office equioment	1set	
Training facility of rice processing		
Rice mill equipment	1set	(1-2t/hr)
Equipment and tools for inspection and quality control	3sets	
Flat bed type dryer	1set	(4t/batch)

#### **7.4.6 Project Cost**

##### **(1) Construction and Equipment Cost**

Total costs required for the project are calculated as 8,661 million VND. Foreign currency shall be applied for goods to be imported on C.I.F. Ho Chi Minh City basis. Local currency is applied to the construction costs, machinery and equipment transportation charges between the port of Ho Chi Minh City and the site concerned, as well as the various costs for procurement of local goods.

All the estimates of the required costs are based on the market price of the relevant goods, and the rate concerned being applicable in Ho Chi Minh City as March 2000. It mentions details to the annex.

##### **(2) Engineering Cost**

The engineering cost which covers consulting service is estimated to be 872 million VND as 10% of total construction and equipment cost.

	Equipment and goods	Construction	Engineering cost	Total
	Million VND	Million VND	Million VND	Million VND
1.Training Center	717	4,260	502	5,479
2.Training facility rice processing	1,195	2,489	370	4,054
Total	1,912	6,749	872	9,533

##### **(3) Maintenance cost**

The maintenance cost of training center and processing facilities is estimated to be 337million VND as 5% of total construction cost.

	Maintenance cost
	Million VND
1.Training Center	213
2.Training facility rice processing	124
Total	337

