Chapter 8 EVALUATION OF PROJECT

8-1 Economic and Social Effects

The Project is scheduled to cater for the whole aspects related with the post-harvest processing in Burma, to review the problems arising therein on a collective scale, to research and survey the paddy and rice distribution system as well, and then to have such research findings reflected on administrative policies, through set up of PTAC in which organization, responsibilities and activity routine are along with this line. Therefore, it can be concluded that there is much feasibility in succeeding in improvement of post-harvest processing in this Project.

Considering the possibility that the renovated processing and distribution system is likely to induce the motivation and creativity on the part of farmers, thus accelerating the development of agricultural production accoplanied by encouragement of small and medium scale industries in rural community, the benefits described here definitely bring out the social impacts of the most significant dimensions. It is noted in many other countries, including Japan, that straightening up of post-harvest processing and marketing have greatly accelerated development of agricultural production and related industries to a large extent.

Though it is difficult to estimate the benefits generated by the Project quantatively and accurately, the direct effects resulting from the successful implementation of the Project are expected to amount to many folds of the investment amount. Further, there will be a huge amount of indirect effects emanating from the Project. These may be listed as below:

1. Direct effects derived from improvement of post-harvest processing

   a) Up-grading of Burmese rice quality
   b) Establishment and expansion of rice export market through this
   c) Technical improvement in drying, storing, milling, etc.
   d) Reduction in post-harvest grain loss.

2. Indirect effects resulting therefrom

e) Improvement of the technical level of farmers
f) Promotion of post-harvest processing equipment manufacturing industry in Burma
g) Expansion and promotion of rural industries
h) Nutritious betterment of people
i) Others

8–2 Financial Viability

In the event the construction budget for this Project is appropriated and the facilities installed at the site, the operation and maintenance of such facilities will be done for the account of Government of Burma.

Burmese government officials have expressed their promise to include the PTAC operation and maintenance cost into a part of AFPTC's own budget, under Ministry of Trade. Since the estimated PTAC operation and maintenance budget is to run at about 1.5 million Kyat (ref. Page 136), excluding the depreciation, represneting around 0.2% of the AFPTC annual budget, it is the most probable that AFPTC will be able to secure such budget, considering the utmost importance of PTAC.

Meanwhile, the proposed project is based on a policy to minimize items of import reauirements, utilizing the locally-available material as much as possible.

In the event when the initial supply of spare parts and consumables have been depleted through maintenance work of buildings and facilities, they will need to be filled up by importing their replacements. As necessary foreign exchange budget for such imports is appropriated by AFPTC, there is no predictable problem.

As such import may take a lengthy time period, the material procurement program needs to take into account such time factor, in order to ensure incessant research activity.

8–3 Technical Feasibility of Research Operations and Facility Maintenance

At the moment, PTAC staff and their candidates appear aggressively and seriously disposed to cater for the situation, and therefore they will be able to carry out the PTAC management satisfactorily.

However, regarding the field of post-harvest processing, as is no different elsewhere in the world, Burma lacks in comprehensive administrative agency, industries and scientific field, and this results in the scarcity of competent staff who is capable of making collective approach to the subject, though there may be few experts in respective technical matters. To upgrade the management of organization and facility further and enhance its functions, it is essential to build up ability development of these people, along with their enlarged perspectives and accumulated experience. And also, to further enhance the effect of the Project, it is better to provide the guidance in laboratory management and research activity through engagement of foreign technical experts and overseas training etc.

As the PTAC is aimed at consolidating respective research achievements and putting them into practical application, it is essential to provide a solid perspective about PTAC management, coupled with concrete guidance for individual researchers.

Further, there should be a common understanding about the nature and assignment of PTAC organization in between key managers including director and deputy director, and ranks of researcher, assuring free and exhaustive discussions among these people, thus leading to developing a homogeneous structure.

In that event, it is essential to have a universal udnerstanding as mentioned earlier, coupled with absence of significant disparity in scientific attainments of indivisual researchers.

Otherwise respective research department is likely to stop cooperating with each other, and tend to pursue arbitrary and self-completing research method without trusting other research departments. This is often observed in many of research institutes today. Though such state might be tolerable in the case of the basic research institute of purely academic nature, practical research institute such as PTAC would be unable to function properly on this account.

The present status of inidividual research and activity themes is observed as stated below;

1. Survey and research on physico, chemical and biological properties of paddy and rice.

   Regarding differences in plant characteristics of individual varieties, there has been already a fair deal of research activity under way in agricultural sector, while the properties of grain have been so far investigated by AFPTC.

   Henceforth, it is essential to continue such research activity more collectively and systematically, so as to clarify the effects of grain quality and properties on phases of post-harvest processing coupled with fact-finding of impurities, moisture content and ambient temperature prevailing during phases of harvest, threshing, drying, collection etc. in rural areas.

   In proceeding with survey and research, there will be necessity to have the learning of basic technology and knowledge specific to this sub-sector, along with understanding of the nature of problems arising in succeeding phases such as drying, storage, pest control, milling, etc, through which orientation of research activity may be

clarified.

Without clear understanding of the problems to be solved researchers in this field are liable to heap up a pile of data that are of no use.

On this regard PTAC will help post-harvest researchers cooperate closely with those of other research areas so as to facilitate orientating their research themes into correct directions on a broader perspectives, thus upgrading their capability. This will surely be accelerated further by proper technical advices from foreign experts.

2. Quality control and grading standardization of paddy and rice.

Quality control does not take hold of some specific process. It needs to be enforced throughout all phases of post-harvest processing and distribution in their own peculiar technical processes.

The main objective of this area is to determine the most critical quality factors and what state of quality can possibly be maintained in each and all steps of processing and marketing.

Hence it is essential to standardize the qualitative criteria. However, if such criteria are determined very far apart from the current technical level of post-harvest processing and/or its potentiality for renovation in foreseeable future, it will be impossible to enforce them and will rather be neglected in reality. Researchers of this area are therefore obligated to have in-depth knowledge of overall technology in all phases of post-harvest processing and also of the actualities of commodity distribution in the market.

It is fortunate that AFPTC has fostered such competant personnel and there is no doubt the research activity of this area can be pursued along satisfactorily. To implement it more efficiently and effectively, however, it is advisable to have the learning of comparable evidences and regulations enforced in other parts of the world.

3. Milling technology

As in Burma there are a great number of people with abundant field experience in rice milling, research activity of this area can be made satisfactorily on their initiatives.

Nevertheless, Burma's rice milling technology has been forced to remain in low level, for reason that a majority of rice mills are government-controled, inactivating the principle of competition and obstructing any incentive for innovation.

Therefore, in addition to research activity of milling technology itself, it is essential to study and formulate a plan of policy to encourage technical renovation of rice mills, in concert with the Economy and Marketing Department, etc.

Among the major technical themes is a renovation of existing European type milling equipment, which might be placed on right path by comparatively evaluating them with the recently introduced Japanese-style milling technology and other imported equipment.

Further, there will need to formulate a policy to encourage the local milling machinery manufacturing industry, which is presently in a disastrous state, and therefore also to make full utilization of PTAC's workshop for making prototypes, modification and development.

Though these call for the ability to design and fabicate the machinery, there appears a sufficient number of competent personnel might be available. In renovating milling technology as whole, it is essential to make approaches both on operation and management of mills and on technical process from precleaning to broken rice separation and packaging. This will be made possible if proper cooperation with other research departments were assured. Technical assistance from overseas is advisable as it will provide a new angle of view in attending to these problems.

4. Paddy drying technology

Developing countries have generally ignored the importance of paddy drying technology, resulting in lack of qualified personnel. Burma is not the exception.

Henceforth, as PTAC will initiate and promote collective research activity on post-harvest processing, the importance of paddy drying will become increasingly recognized, leading to rapidly strengthening of the research.

Technical assistance from overseas is sure to prove effective in accelerating such efforts.

5. Paddy storage, pest control and michrobes

As energetic efforts have already been made in this area, research activity can be continued satisfactorily by Burmese staff alone.

6. Parboiling

Research and development of parboiling technology is related to its export policy. In the face of foreseeable shift in international market from low quality parboiled rice to higher one, it is essential to extend a great amount of efforts toward improving paddy quality and collection system, in parallel with upgrading of parboiling technology. This will be made possible in cooperation with other research departments. It will also be necessary to collect data about international parboiled rice market and overseas parboiling technology.

7. Rice bran oil production and bran utilization

Regarding rice bran oil extraction systems, there is plentiful knowledge and experience already available, and therefore research activity can be continued satisfactorily by Burmese technicians alone. However, to make up for a scarcity of competent technicians it is essential to intensify their strengthening and training, thus ensuring the sustained development in years ahead. Technical aid from overseas is therefore needed.

8. Renovation of post-harvest processing technology in the level of farmers.

Rather than seeking for the prototype production and development of innovative implements, it is far more improtant to make technological extension and stimulate their motive, though this appears cumbersome.

The former is possible by the cooperated effort of PTAC research department, while the latter will also be possible by formulating encouraging measures.

9. Promotional measures for post-harvest processing machinery manufacturing industry

   It is unrealistic to depend totally on import for the introduction of large quantities of driers, parboiling equipment, farming machinery, conveying system, etc. The promotion of indigenous manufacturing industry is a must in upgrading of post-harvest processing technology. Though PTAC's contribution might be on a relatively limited scale, it is possible to locate obstructions and to renovate the existing government and private-owned factories even marginally.

10. Prototype production of post-harvest processing machinery, and production of laboratory equipment and instruments.

    This will be made possible by placing competent personnel in the workshop.

11. Research and investigation on paddy and rice marketing, and their export boost.

    This will be made possible by Burmese staff themselves. It is however advisable to grasp in-depth knowledge about examples and achievements made by the world countries in this aspect.

12. Improvement to management control of rice mills and rice bran oil mills and development of numerical control and monitoring system on stock and circulation of paddy and rice.

    This will be made possible by Burmese staff alone, though it is advisable to stimulate its progress by receiving technical aid from overseas.

13. Technical information collection and the retrieval system.

    This is possible to perform by Burmese staff themselves.

14. Publication, extension and publicity activity of research achievements.

    This can be successfully implemented, provided its importance has become fully recognized by all the ranks of researchers.

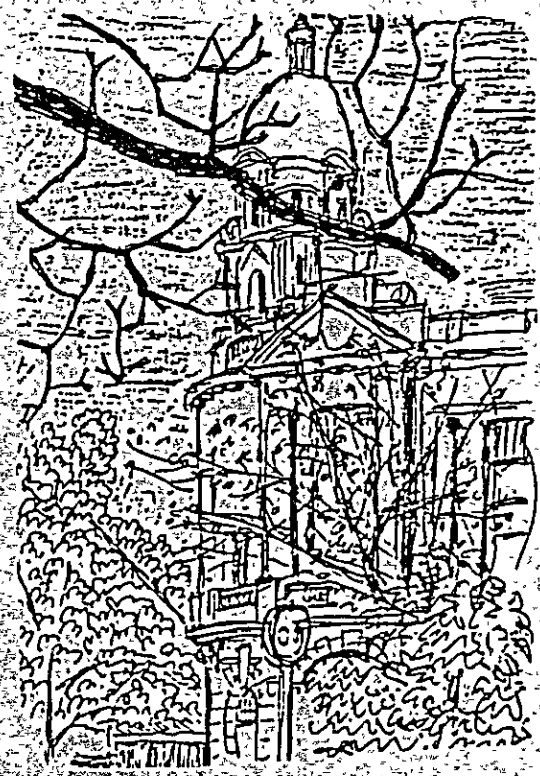
15. Establishment of operating routine for collective management and research activity of PTAC as a whole.

    No doubt, this is possible, though it is advisable to have the learning of overseas comparable institutes' perfomance. Foremost, it is essential to be provided with technical aid from overseas in this area.

Evaluations have been made as described above about the possibilities and measures to be taken by the Burmese side in respect of respective research field. As for the maintenance and management of building and facility other type of practical capability relatively different from research activities is required.

However, in this area, as accumulations of practical experiences are already available through management of the existing AFPTC institutes, there should not arise any appreciable problem.

Chapter 9 CONCLUSION AND RECOMMENDATIONS



Chapter 9 CONCLUSION AND RECOMMENDATIONS

9–1 Conclusion

As are described earlier, in the face of Burma depending upon rice and cereal export for its dominant foreign exchange earnings, the Project, aimed at strengthening its international competitiveness through improvement of the grain quality, has been evaluated in terms of economic and social effects, budgetary arrangement, organization and management, and technical feasibility of facility maintenance and control, it is observed that the Project will contribute greatly in Burma's export promotion and economic development and it should be implemented as early as possible.

9–2 Recommendations

To demonstrate various benefits generated by implementing the Project to the maximum extent, it is essential to ensure the smooth operation of PTAC. Since this is largely dependant upon the self-support efforts by the concerned people of Burma, the following recommendations are put up for serious consideration:

1. Recruitment of PTAC officials

   AFPTC is planning to recruit 84 staff-members by March 1985, when PTAC is scheduled to be completed, over the Four Year Development Plan. It is strongly desired that such recruitment program be performed in total so as to ensure the smooth operation immediately after the completion of the buildings and facilities.

2. Upgrading of technical ability and capability of PTAC officials

   As are described earlier, research and other activities of PTAC seemed to be assured satisfactorily by present and future staff with AFPTC officials working as the nucleus. However, in order to bring forth the maximum possible achievements within a relatively short span of time, it is considered essential to perform for training of PTAC recruitee including candidates for upgrading their technical ability. To help doing this, it is recommended to make more extensive use of foreign aid which includes programs for overseas

training, dispatch of technical experts, supply of equipment, etc.

3. Replenishment of operation and maintenance material and maintenance of facilities

For smooth operation and management of PTAC, adding to the recruit of qualified staff and their training, it is essential to establish the maintenance and procurement system catering for the timely service of research equipment and material and replenishment of consumables and spare parts, coupled with periodical inspection system.

4. Shortening of the Construction Period

Grant Aid Program must be implemented within 24 months after signing of the Exchange of Notes. But this project requires 27 months including the period for filling work.

Therefore, the governments of both Japan and Burma need to take this point into consideration and discuss the measures to make the construction period as short as possible.

APPENDIX

1-1 Data on Survey

1-1-1 Member List of the Basic Design Survey Team
(28 days from March 8 to April 4, 1982)

Leader	Mr. Kazuhisa Matsuoka	(General Affairs) Deputy Head Basic Design Division Grant Aid Department Japan International Cooperation Agency
Deputy Leader	Mr. Takeo Ohmura	(Post-Harvest Technology Specialist) Purchase Division Operation Department Food Agency The Ministry of Agriculture, Forestry and Fisheries
Member	Mr. Kazuyuki Ishii	(Post-Harvest Technology Specialist) Inspection Division Management Department Food Agency The Ministry of Agriculture, Forestry and Fisheries
Member Acting Leader	Mr. Ryosuke Akasaka	(Architect) Director Design Department Eiji Niwa Architects & Engineers
Member Deputy Acting Leader	Mr. Yasumasa Koga	(Post-Harvest Technology Specialist) Technical Advisor Consultants Department Overseas Merchandise Inspection Co., Ltd.

Member	Mr. Kunio Kasuya	(Architect) Head Design Division Design Department Eiji Niwa Architests & Engineers
Member	Mr. Kenji Ando	(Mechanical Engineer) Deputy Head Installation Division Design Department Eiji Niwa Architects & Engineers
Member	Mr. Etsujiro Tamura	(Coordinator) Eiji Niwa Architects & Engineers

1-1-2 Member of List of Basic Design Report Mission
(7 days from September 12 to September 18, 1982)

Leader	Mr. Toichi Iwata	(General Affairs) Administration Division Grant Aid Department Japan International Cooperation Agency
Deputy leader	Mr. Takeo Ohmuro	as mentioned above
Member	Mr. Ryosuke Akasaka	- " -
- " -	Mr. Yasumasa Koga	- " -
- " -	Mr. Tatsuya Sudo	(Cordinator) Eiji Niwa Architects of Engineering

1-1-3 Itinerary of Basic Design Survey Team

Date	Activity
March 8th (Mon.)	Leaving Tokyo Arriving at Bangkok. Stay at Bangkok.
March 9th (Tues.)	Observation of rice mill in Bangkok (in Rice Experimental Station, Krongluang), Oil and Fats Industry Testing Room of Kasetsaat University, and others. Leaving Bangkok and arriving at Rangoon. Orientation of Mission (in Inya Lake Hotel). attended by First Secretary Mr. Ueda of Japanese Embassy, and Messrs. Takeda, Sawada and Sakamoto of JICA.
March 10th (Wed.)	Courtesy call and meeting with AFPTC (AFPTC Office). Courtesy call to Director General, Foreign Economic Relations Department.
March 11th (Thurs.)	Observation of proposed sites for PTAC (in Parami and Deningon). Observation of rice mill, Neikban. Observation of rice mill, U Phya.
March 12th (Fri.)	Meeting with AFPTC (AFPTC office) Meeting with Construction Corporation (AFPTC office).
March 13th (Sat.)	Meeting with AFPTC (AFPTC office).
March 14th (Sun.)	Intra-meeting of Mission Making of the Arrangement Plan, and sorting the data collected.
March 15th (Mon.)	Meeting with City Planning Bureau, Rangoon City Municipality (AFPTC). Field observation of Rangoon Consolidated Hospital. Observation of Burma Pharmaceutical Research & Development Center. Meeting with Electrical Power Corporation (AFPTC office)

Date	Activity
March 15th (Mon.)	Mission members, Messrs. Kasuya and Ando arrive at Rangoon.
March 16th (Tues.)	Meeting with Fire Service Department, Rangoon Municipality (AFPTC office). Observation of proposed site for PTAC (in Parami and Denyngon).
March 17th (Wed.)	Meeting on water supply with Rangoon City Development Committee (in Parami) Meeting with Rangoon City Development Committee (AFPTC office). Meeting with Construction Corporation (CC's office). Meeting with Electric Power Corporation (AFPTC office).
March 18th (Thurs.)	Meeting with AFPTC (AFPTC office). Dinner party (sponsored by AFPTC).
March 19th (Fri.)	Obseraation of proposed site for PTAC (Parami) Meeting on water supply with Rangoon City Development Committee (AFPTC office). Sorting data accumulated. Making of Preliminary Arrangement Plan.
March 21st (Sun.)	Making of basic design drawing. Sorting and analysis of data collected. Mission members. Messrs. Ohmuro and Ishii leave Rangoon for Japan/
March 22nd (Mon.)	Meeting with AFPTC (AFPTC office). Meeting with Construction Corporation (CC's office). Observation of Burma Pharmaceutical Research and Development Center.
March 23rd (Tues.)	Meeting with Mission leader, Mr. Matsuoka (at Inya Lake Hotel). Meeting with Burma Broadcasting Service (AFPTC office).

Date	Activity
March 23rd (Tues.)	Field observation of construction work in Rangoon city. Realignment of Mission's study items.
March 24th (Wed.)	Meeting with AFPTC (AFPTC office). Signing of Minutes of Discussions. Mission leader, Mr. Matsuoka leaves Rangoon for Japan.
March 25th (Thurs.)	Observation of rice mills (three mills) in Rangoon City. Sorting and analysis of data collected.
March 26th (Fri.)	Sorting data collected. Evolving the Arrangement Plan.
March 27th (Sat.)	Sorting data collected. Making of Plan and Arrangement Plan.
March 28th (Sun.)	Sorting data collected. Making of Plan, and computation of area required.
March 29th (Mon.)	Observation of paddy storage and bran oil plant (in Syriam). Sorting data collected. Making of Study Report (brief report).
March 30th (Tues.)	Observation of Pharmaceutical Research and Development Center. Observation of Consolidated Hospital. Sorting of data collected. Making of brief Study Report.
March 31st (Wed.)	Meeting with AFPTC. Sorting data collected. Intra-meeting of Mission.
April 1st (Thurs.)	Briefing about the Study to Japanese Embassy (attended by First Secretary, Mr. Motosugi and Mr. Takeda of JICA) Final reporting and meeting with AFPTC. Courtesy call to Construction Corporation.

Date	Activity
April 2nd (Fri.)	Sorting data collected. Observation of northern districts of Rangoon City. Intra-meeting of Mission.
April 3rd (Sat.)	Meeting and greeting with AFPTC. Lunch party (sponsored by AFPTC). Leaving Rangoon. Arriving at Bangkok. Stay at Bangkok.
April 4th (Sun.)	Leaving Bangkok. Arriving at Tokyo.

1-1-4 Itinerary of Draft Final Report Mission

Date	Activity
Sept. 12th (Sun.)	Leaving Tokyo Arriving and Stay at Bangkok
Sept. 13th (Mon.)	Leaving Bangkok and Arriving at Rangoon Visit Japanese Embassy, Rangoon to explain the mission's objectives and to discuss about the mission's activity schedule. Attended by Ambassador Mr. Tachibana, Councilor Mr. Hirai, and First Secretaries, Motosugi and Takashima.
Sept. 14th (Tues.)	Courtesy Call to Ministry of Trade. Attended by First Secretaries, Messrs. Motosugi and Takashima. Courtesy call to Foreign Economic Relations Department. Attended by First Secretary, Mr. Takashima. Courtesy Call and meeting with AFPTC (AFPTC Office). Attended by First Secretaries, Messrs. Motosugi and Takashima. Visit Japanese Embassy, to report about the results of meeting with AFPTC. Attended by First Secretaries, Messrs. Motosugi and Takashima. Observation of the proposed construction site, Parami. Attended by First Secretary Mr. Takashima.
Sept. 15th (Wed.)	Meeting with AFPTC (AFPTC Office) Courtesy call and meeting with Construction Corporation (CC's office). Meeting with AFPTC (AFPTC Office) Dinner party (sponsored by AFPTC)
Sept. 16th (Thurs.)	Observation of Parami construction site. Meeting with AFPTC (AFPTC Office) Meeting with Electric Power Corporation (AFPTC Office)

Date	Activity
Sept. 17th (Fri.)	Visit Japanese Embassy, to report about Mission's activity results. Attended by Councilor Mr. Hirai, and First Secretaries, Messrs. Motosugi and Takashima. Meeting with AFPTC (AFPTC Office) Signing the Minutes of Discussions (AFPTC Office) Lunchen Party (sponsored by JICA) Leaving Rangoon and Arriving at Bangkok. Stay at Bangkok.
Sept. 18th (Sat.)	Leaving Bangkok and arriving at Tokyo.

1-1-5 Burmese officials concerned

AFPTC

COLONEL NYUNT SWE	MANAGING DIRECTOR
U AUNG KYI	GENERAL MANAGER PLANNING & FINANCE
U KYAW MAUNG	DEPUTY GENERAL MANAGER PLANNING & STATISTIC
U TUN NYUNT	ASSISTANT GENERAL MANAGER PLANNING & STATISTIC
LT COLONEL OHN KHIN	GENERAL MANAGER MILLING DEPARTMENT
U NAY DUN	ELECTRICAL ENGINEER MILLING DEPARTMENT

PTAC (70 PANSODAN STREET, RANGOON, BURMA) 77050

U SAW AUNG	DIRECTOR
DAW MYINT MYINT THWE	MANAGER ADMINISTRATION CUM STORAGE
U MYO OO	RICE MILLING ENGINEER PROCESSING & DRYING
U THAN NGWE	BRAN OIL ENGINEER BRAN OIL MILL
U SAW CECIL KYI	STORAGE MANAGER
U TIN WIN	MANAGER QUALITY CONTROL
DAW AYE MYINT OO	UPPER DIVISION CLERK (ENTOMOLOGIST) PEST CONTROL
DAW YI YI NYUNT	UPPER DIVISION CLERK (ENTOMOLOGIST) PEST CONTROL
DAW YIN YIN KYI	APPRENTICE (3) QUALITY CONTROL
U SOE MAUNG	APPRENTICE (3) BRAN OIL EXTRACTION

DAW NWE NWE YI	APPRENTICE (3) LIBRARIAN
DAW OHN MYINT	TECHNICIAN 4 ECONOMIC DEPARTMENT
U TUN TIN	TECHNICIAN 5 PROCESSING DEPARTMENT

CC

U WIN KYU	SENIOR OFFICER I
U THAUNG SEIN	SENIOR OFFICER II
U KYAW THEIN	ESTIMATER
Y THAN AUNG	SOIL ENGINEER
U NGWE TUN	WATER SUPPLY ENGINEER
DAW KHIN SEIN OO	ELECTRICAL ENGINEER
U SEIN WIN	ASSISTANT WATER SUPPLY ENGINEER

TP

U SAN TUN AUNG	DIRECTOR DEPARTMENT OF HOUSING

EPC

U TUN SHEIN	EXECUTIVE ENGINEER (RANGOON DIVISION)
U KYAN MYINT	DIVISIONAL ENGINEER (RANGOON DIVISION)

FSD

U THAN MYINT	DEPUTY DIRECTOR (AQ)
U BA YI	ASSISTANT DEPUTY DIRECTOR

RCDC

U THEIN TAN	ASSISTANT ENGINEER I ENGINEERING DEPARTMENT (WATER & SEWERAGE)
U NYUNT KHIN	ASSISTANT ENGINEER WATER & SEWERAGE DEPARTMENT
DAW HELEN LUN PUM	SECRETARY/LIAISON RANGOON WATER SUPPLY PROJECT (ADB)

PTC

U SOE THA	MANAGER RANGOON TELEPHONE
U AUNG THAN	COMMUNICATION ENGINEER GRADE -3 RANGOON TELEPHONE
U KYAW THEIN	DIVISIONAL MANAGER RANGOON DIVISION

Ministry of Trade

U Maung Maung Khin	Director General
Lt. Col. Thaw-dar Sein	Add. Director, International Trade Dept.
U Tin Maung Maung Galay	Director
U Thein Shwe	Dy. Director, Planning Dept.
Daw Than Myint	Head, Minister's Office

FERD

U Khin Maung	Dy. Director General
U Myint Htee	Asst. Director
U Thein Aung Lwin	Asst. Director
U Tin Myint	Asst. Director
U Khin Maung Win	Add. Director
U Than Mying	Chief of Section

1-1-6 Minutes of Discussion (Basic Design Survey Team)

MINUTES OF DISCUSSION

BETWEEN

BASIC DESIGN MISSION (JICA)

AND

A.F.P.T.C.

March 1982.

MINUTES OF DISCUSSION
ON
POST-HARVEST TECHNOLOGY APPLICATION CENTRE
(F.T.A.C.)
IN
THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

At the request of the Government of the Socialist Republic of the Union of Burma (GOB) for a grant capital aid in establishing the PTAC, the Government of Japan (GOJ) has sent a Mission to carry out the Basic Design Study (the Study) on the PTAC Project (the Project) from 9th. March 1982 to 3rd. April 1982.

The Mission visited the Project site and held a series of discussion with the Agricultural and Farm Produce Trade Corporation (AFPTC) under the Ministry of Trade and authorities concerned of the GOB.

Both parties have agreed to recommend their respective Governments and authorities concerned to examine the major points of understanding reached between them, which is included as Annex 1, towards the realization of the Project.

24th March 1982
Rangoon

(Col. Nyunt Swe)
Managing Director
A.F.P.T.C.

(KAZUHISA MATSUOKA)
Leader
JICA Mission

MAJOR POINTS OF UNDERSTANDING

I. Outline of the Project

The outline of the Project described in the inception report was basically agreed upon by the both parties.

II. Project Site

Since the Governmentoof Burma has not finalized the construction site yet, she promised the Mission to inform her decision as soon as possible. The site shall be selected from Parami or Danyingon quarters.

III. Basic Design Study

JICA carries out the field study in time with the activities described in the Inception Report. However regarding the preparation of Draft Final Report in Japan, it will be carried out only after receiving final decision of the selected site by the Government of Burma. The Study will include the preliminary engineering for all facilities of the Project.

IV. Facilities Necessary for the Project

Facilities necessary for the Project are listed with priority order as follows :

Facilities	Priority
1. Administrative offices	A
2. Laboratories and testing rooms	A
3. Library	A
4. Meeting room with audio-visual equipment	A
5. Dark room	A
6. Electric power generating room	A
7. Workshop	A
8. Standard rice mill	A
9. Oil and fats industrial laboratory	A
10. Comparative rice milling laboratory	A
11. Parboil testing room	A
12. Paddy storage testing facilities	A

13. Dryer testing room	A
14. Paddy Storage	B
15. Drying Yard	B
16. Pond	C
17. Canteen	C
18. Guard room and others	

V. Equipment Necessary for the Project

Equipment items necessary forthe PTAC activities are listed in priority order as follows :

1. Planning, Promotion and Budget Dept:

B

wall - charts

C

desk and chairs
shelves
desk for conference use
black boards
Miscellaneous
Others

2. Administration Dept:

(a) Library

B

books

C

Bookshelves
subscription of foreign periodicals
Reference cards
desks and chairs

(b) Office

A

typewriters
copying machines
calculating machine
mimeographer
inter - com

B ← miscellaneous

Stationary

C

desks and chairs
Shelves

(c) Auditorium — A

movie projector,
projecting screen
slide projector,
over-head projector
loud-speaker
amplifier
tape deck

Video camera
video deck
TV set
miscellaneous
— C

Chairs
desks for conference use

(d) Garage — B

repairing outfit,
fuel service tank
car washer

micro bus
passenger car
truck
motorcycles
bicycles
— C

(e) Canteen

tables
chairs
cupboard

(f) Kitchen — A

fan
refrigerator

— B

kitchen utensils
kitchen tables
cupboard

(g) Miscellaneous — C

Lavatory
boxes
Heating room
Couch
tables
Notice board
Guard room

(h) Dark room — A

dark room

photo DPE outfit
camera
miscellaneous.

(i) Emergency power generating room — A

diesel power generator
fuel service tank
main tank

Miscellaneous

Others

3. Workshop

(a) Metalic processing tools

A

engine lathe
desk drilling machine
cut - off grinder
pipe bender
AC operated welding machine (300 A)
a set of gas welding machines
spot - welding machine
desk grinder
vices
drilling machine
portable grinder
DC (engine operated) welding machine
air compressor (7.5 K.W)
chain block
electric winch
~~batholith~~ surface plate
a set of hand tools
painting coating utencils
measuring instruments (mechanical/electric)
a set of forging equipment
manual hydraulic press
electric shears
bending press
parts linsing basin
jacks for garage use

B

tool cabinet
miscellaneous

worktable
tools
shelves

(b) Wood - Working tools

A

electric wood-planning machine (with table)
electric band saw
electric circular saw
router
chain - saw
vices
a set of hand tools
drilling machine

B

Worktable
Shelves

(c) Common materials A

draft fan
fan
electric cleaner
overhead trolley
stool (movable)
safety helmets
stretching ladder
miscellaneous
Others

4. Quality Control and Standardization Test:

A

muffled furnace
dehydrator
various grain moisture meter
test samples pulverizer
precision scales
desiccators
pyrostat
rigidity tester
whiteness meter
various balances
grain testing instruments
glasswares for laboratory
various chemicals
purified water collecting device
draft fan
refrigerator
centrifugal sepenator
various strainers
electric rice - cooker
grain crack inspector
Kjildahl equipment
Miscellaneous
Others

5. Storage Handling and Pest Control Dept:

(a) Storage & Handling

aeration equipment — A — Test paddy storage (concrete) (steel)

~~Ventilation facility~~

temperature – ~~measuring equipment~~ moisture monitor device

miscellaneous

Others

Dryer testing laboratory (Common use with processing Dept:)

Various conveyors

grain handling equipment

miscellaneous

Others

Grain testing room (Common use with processing Dept:)

Drafting room (Common use with processing Dept:) — B — test paddy storage (concrete) (temporary)

(b) Pest Control equipment

A

Pest Control Equipment – Pest Control equipments & — Chemicals.

Equipments & material for fumigation.

6. Processing Dept:

(a) Grain Testing Room

A

Test dryer (for many small batches)

Test paddy husker

Test rice whitener (continuous friction – type)

Test rice whitener (batch friction – type)

Test rice whitener (abrasion – type)

Test broken separator (round hole)

Test broken separator (indent – type)

Test aspirator

Test stoner

Sample divider

Rubber testing instrument

Fans

Manometer

Anemometer

Barometer

Tachometer

Calipers

miscellaneous

B

Test broken separator (Slit - type)
Magnifier
Air compressor (0.75 K.W.)
Multi - purpose circuit tester

(b) Drafting Room

A

Draftsman's outfit

B

Reference - materials
Miscellaneous
Paddy husker (rubber roll - type)
Paddy separator (compartment - type)
Paddy separator (tray - type)
Rice whitener (cone - type)
Rice whitener (horizontal abrasion - type)
Rice whitener (vertical abrasion - type)
Broken separator (indent - type)
Automatic balance
Fans
Cyclones
Dynamometer

C

Paddy husker (~~centrifugal~~ - type)
Reference materials
Paddy husker (centrifugal type)
Paddy separator (static screen - type)
Rice whitener (air blowing friction - type)
Rice whitener (Engelberg)
Broken separator (vibrating sieve)
Broken separator (slit - type)
Conveyor machines
Tanks
Switching valves
Operation / indicator board
Measuring instrument

(k) Parboil Testing Room (annex)

A

Soaking tank
Parboiling tank
Dryer
Boiler (1t)
Conveyors

B

Steam & water supply tube
Switch valves
Pumps
Water filteration facility
Drying yard
Operation / Indicator board

(c) Measuring instruments

(d) Dryer Testing Room (Annex)

A

Continuous vertical flow - type dryer
Accessories for the above (tank conveyor)
Flat-bed dryer
Circulation - type dryer
Husk furnace
Testing instruments

B

Paddy pre-cleaner
Oil fired furnace
Fans
Various ducts
Switching valves
Dust collecting equipment

(e) Paddy Warehouse

A

Conveyors
Fans

~~(f) Paddy warehouse~~

B

Paddy Warehouse (500 T)

(g) Standard Rice Mill

A

A set of paddy ~~whitener~~ mill
Capacity 2T/H complete with accessories
Paddy cleaner
Paddy husker
Paddy separator
Rice whitener
Length grader
Stoner
Weigher / packer
Bag sewing machine
Operation board
Indication equipment

B

Paddy tank
Feeding hopper
Immature rice separator
Vibration sieve
Mixed rice tank
White rice cleaner
Automatic scale
Operation tank
Conveyor
Dust collector
measuring instruments
miscellaneous
others

7. Bran Utilization Dept:

(a) Oil Laboratory

A

Chemical experimental apparatus for oil and fats
Ventilation equipment
Small boiler
Refrigerator
Centrifugal separator
GLC
TLC
Saponification value tester equipment
Iodine value tester equipment
Peroxide value tester equipment
Non-saponificable matter tester equipment
UV and visual light spectroscopic analyzer
miscellaneous
others

B

Chemicals for oil and fats
Soxhlet extraction units
DNA verifier
protein analyzer
moisture measuring instrument
thermometers

(b) Oil and Fats Industrial Laboratory (Annex)

A

Rice bran cleaner
Expeller
Hydraulic press
Distillation vessel
Extraction vessel

Filter press
steam/ water ejector
condensor
reaction vessel (for discolor[illegible])
" " (for neutraliz[illegible])
evaporation vessel
air compressor
refrigerator
ventilators
pumps
feed pulverizer - cum - mixer
operation board
water supply and drainage system
measuring instruments
explosion / pressure - proof c[illegible] equipment
piping materials,
valves
frames
miscellaneous
others

B

Boiler (oil - fired)

8. Marketing and Economy Department

B

Reference materials
miscellaneous

C

desks and chairs
bookshelves

1982.9.22. 五

1-1-7 Minutes of Discussion (Basic Design Report Mission)

MINUTES OF DISCUSSION

BETWEEN

DRAFT FINAL REPORT MISSION (JICA)

AND

A. F. P. T. C.

Sept. 1982.

MINUTES OF DISCUSSION

ON

POST-HARVEST TECHNOLOGY APPLICATION CENTRE

(P.T.A.C)

IN

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

A mission despatched by the Japan International Co-operation Agency (JICA) visited Burma from 13th. to 17th. September 1982 for the purpose of submission and explanation of the Draft Final Report of the Basic Design Study on the PTAC project (the Project).

The Mission had series of discussions with the Agricultural and Farm Produce Trade Corporation (AFPTC) under the Ministry of Trade and authorities concerned of the Government of the Socialist Republic of the Union of Burma.

Both parties have agreed to recommend their respective Government and authorities concerned to examine the major points of understanding reached between them, which is attached to the minutes as Annex 1 towards the realization of the Project.

17th. September 1982
Rangoon.

(Col. Nyunt Swe)
Managing Director
A.F.P.T.C.

(TOICHI IWATA)
Leader
JICA Mission

MAJOR POINTS OF UNDERSTANDING

I. Draft Final Report

The report principally satisfied the Burmese side and appropriate alterations agreed during discussions will be incorporated in the Final Report.

II. Executing Agency

When the project is realized, AFPTC is the executing agency for the project and is responsible for the implementation of the preparatory works and construction works of the project.

III. Land Filling Work

AFPTC revises the budget and starts the work as soon as possible in this fiscal year so that the work shall be finished by the start of next rainy season. Agreed and minimum necessary area for land filling is about 17,000 m^2

IV. Burmese Contribution to the Project

When the project is realized AFPTC shall execute in the timely manner their contribution items described below :

1. Construction Works of Facilities
   1). Canteen
   2). Director's residence
   3). Staff living quarters.
   4). Garage
   5). Guardman's room

6). Paddy storage

7). Paddy storage testing facility (wooden-made and bamboo-made).

8). Drying yard

9). Pond

2. Bridge construction within this fiscal year.

3. Infrastructure Works

1). Water supply distribution works

2). Drainage distribution works

3). Septic tank construction works

4). Electricity supply and distribution works.

5). Telephone incoming works.

4. Outdoor Works

1). Landscaping works

2). Fencing works

3). Others

5. Furniture, office appliances, curtains, carpets.

6. Equipment listed with priority order B and C in the minutes of discussion made on 24th. March 1982.

7. Other necessary duties (such as prompt unloading and customs clearance, tax exemption, etc.) that will be described in the Exchange of Notes.

V. Japan's scope of work

1. Construction Works of Facilities

1). Main building

2). Testing room buildings

3). Workshop

4). Boiler room

5). Power receiving/generator room

6). Pumping station

7). Paddy storage testing facility (concrete-made silo and corrugated steel silo).

2. Supply of equipment listed with priority A in the minutes of discussion made on 24th. March 1982.

VI. Technical Cooperation

A request for technical cooperation is made from Burma side. Japanese side replied that the matter would be conveyed to the authoritie's concerned.

1-1-8 Summary of Observation of Rice Mills, Paddy and Rice Storage and Edible Oil Mills (in Thailand, Burma and Japan)

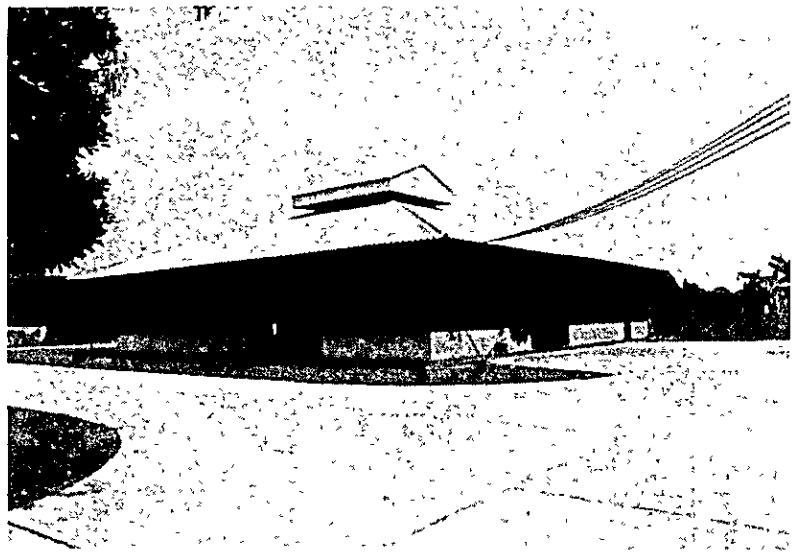
Facilities	Rice mill (oil mill)	White rice storage	Paddy storage	Others
Kronluang Rice Experimental Station (Bangkok) (Photo 1)	Paddy 1-ton/hr made by Thai company (Pingkaeo) Roof-slated, Wall-wooden, Floor-concrete.			Workshop for rice processing machinery Now testing flash type husker, Appolo type huller, husk furnace, etc.
AFPTC-owned Neikban Rice Mill (Rangoon) (Photo 2,3,& 4)	White rice:100ton/24hrs. Roof:slated, Wall:slated, Floor:concrete. Made by Schule, West Germany. Established in 1961. Under grant capital aid (Machinery of K900,000). Operating crew of 26 in 3 shifts. Storage crew of 16, totaling to 42 staff. Labourer: Rice mill 90 Storage 145 Total 235	White rice Storage Capacity: 9,000tons Roof:slated, Wall:slated, Floor:concrete.	Paddy storage Capacity: 2,400tons Roof:slated, Wall:slated, Floor:concrete	400 V, 20A x 4 Motor aggregate capacity:240KW. Established in 1960, with road and buildings completed at Kyat one million. (Kyat 900,000 equipment provided by West Germany, and Kyat 100,000 provided by Burma.) Barge transport (a gang of 21 people), unloading averaging 4 - 5 hours (paddy), loading averaging 5 - 6 hours (rice).

Facilities	Rice mill (oil mill)	White rice storage	Paddy storage	Others
Kwin Chaung Rice Mill (Rangoon) (Photo 5 & 6)	White rice:100ton/24hrs. Made by Schule Company, the same maker as under item (2). Roof: plated, Wall: slated, Floor:concrete.	80'x 40'x 15' 25,000 bkt Corrugated steel-structure	China-type cylindrical storage 2,000 bkt Roof:steel-plated, Wall:overlayed with a mix of mud and straw, Floor:concrete. 80'x 40'x 15'. Roof:steel-plated, Wall:bamboo-made, Floor:bamboo-made.	240 KW, 200 kVA Five power failures/month White rice storage: 80'x 40'x 2 units. 300 ton (Kyat 220,000)
AFPTC-owned Hantanyun Rice Mill (Rangoon)	Combined capacity of two units: polished rice 50 tons/24hrs. Heavily dilapidated. Performance in 1981: white rice production of 6,107 tons, operation totaling to 4,639 hrs.	144'x 52' 50,000 bkt 160'x 40' 50,000 bkt Roof:steel-plated, Wall:wooden-made		249 kW x 75% = 180 kVA. Transformer: 250 kVA x 80% 3 - 4 power failures/month (each for duration of 30 - 40 minutes), with frequent occurances in rainy season.
U Phya Rice Mill (custom milling for farmers), Insein, Denyngon.	Capacity: paddy 500 bkt/12hrs. With 22 HP motors. Staff: a owner, a operator, 2 labours, totalling to 4 people. Oprration 180 days annually			

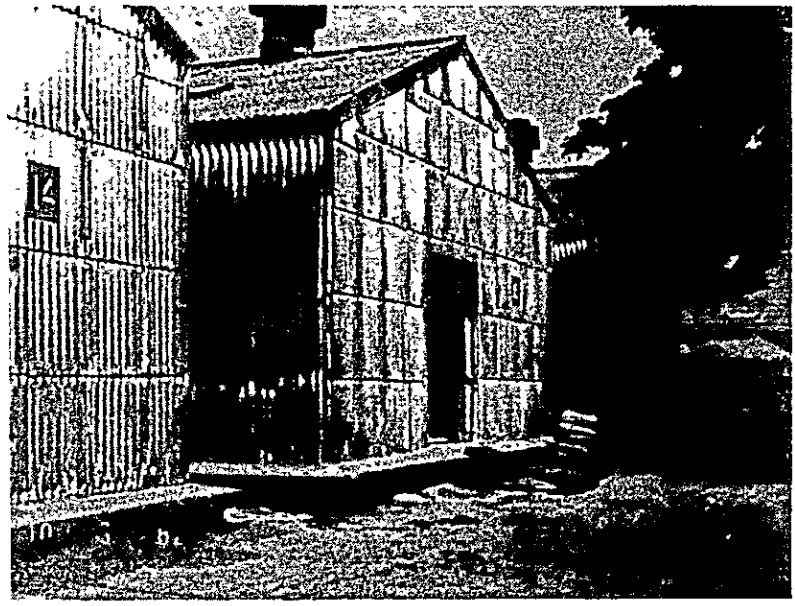
Facilities	Rice mill (oil mill)	White rice storage	Paddy storage	Others
Paddy storage complex, for the 90th Light Infantry Regiment (Sjriam) (Photo 7)			80'x 40' (15,000bkt normal) presently 8,000bkt. Roof: thatched, Wall: bamboo-made, Floor:bamboo-made.	New storage: 21 units Old storage: 55 units, totalling to 76 units.
Tiger Pagoda Paddy storage complex (Sjriam) (Photo 8 & 9)			80'x 40' 15,000bkt 60'x 40' 25,000bkt Roof: Thatched, Wall: bamboo-made, Floor:bamboo-made.	Will last for three years. Kyat 30,000 spent for each unit.
Oil seed laboratory, Kasetsaat University (Bangkok) (Photo 10)	Capital grant aid from Japan (1972). Small plant for hydraulic pressing, solvent extraction and refining. (for Kapok, rapeseed and soyabean, etc.) 200 kg/batch.			Oil and fat laboratory is provided. Experts have been deputed from the Japan's Industrial Experimental Station, Tropical Agricultural Research Centre, etc.

Facilities	Rice mill (oil mill)	White rice storage	Paddy storage	Others
Kyauktan 11th Bran Oil Extraction Plant (Kyauktan)	Bran 20 ton/24 hrs in batch type. Made by Boso Oil company (1966). 1981 performance: Bran processing 3,452 tons, crude oil production 365 tons. Three shifts, each with 3 crews, totalling 9 crews. Heavy loss of solvents. Lack of spare parts. Roof: slated and steel-plated, Wall: steel-plated, Floor:concrete.			Built in 1966. Power of 60 HP. Pump for boiler:15HP + 15HP.
Tokyo Oil and Fat Mfg. Co., Ltd.				
Japan Grain Surveyors Association, Central Laboratory (Tokyo)				Sanitary test, Nutritious test, grading test, quality and shape test.

1. Rice Mill
(Kronluang Rice
Experimental
Station)

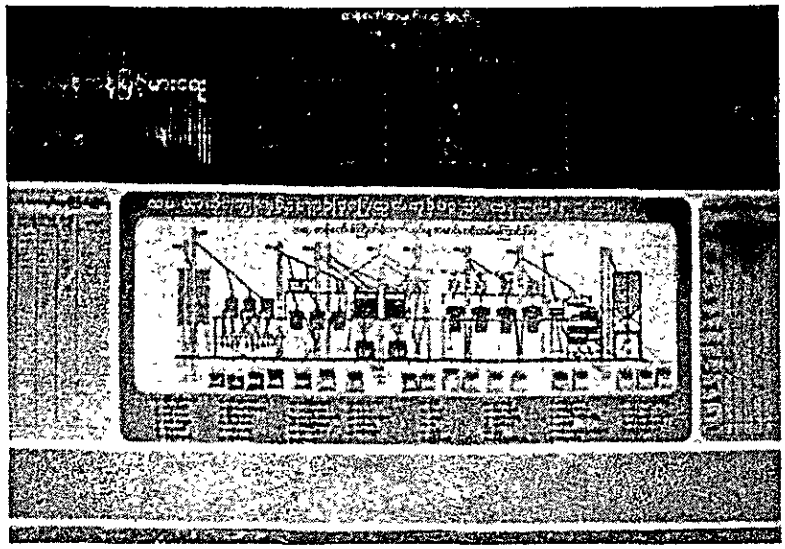


2. Paddy Storage and
Out-door Piling
of Paddy
(Neikban Rice
Mill)

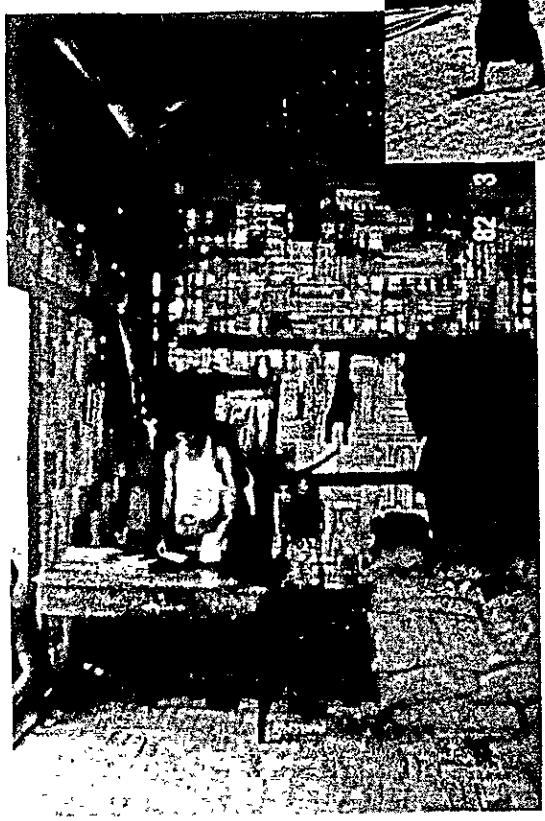


3. Paddy Storage and
Feeder Road
(gravel)
(ditto)

4. Flow Diagram of Rice Mill (ditto)

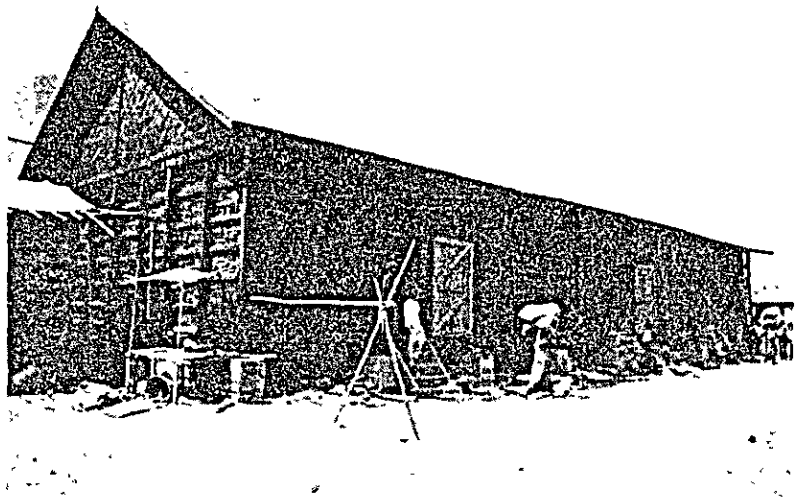


5. Experimental Paddy Storage (China type) at Kwin Chaung Rice Mill

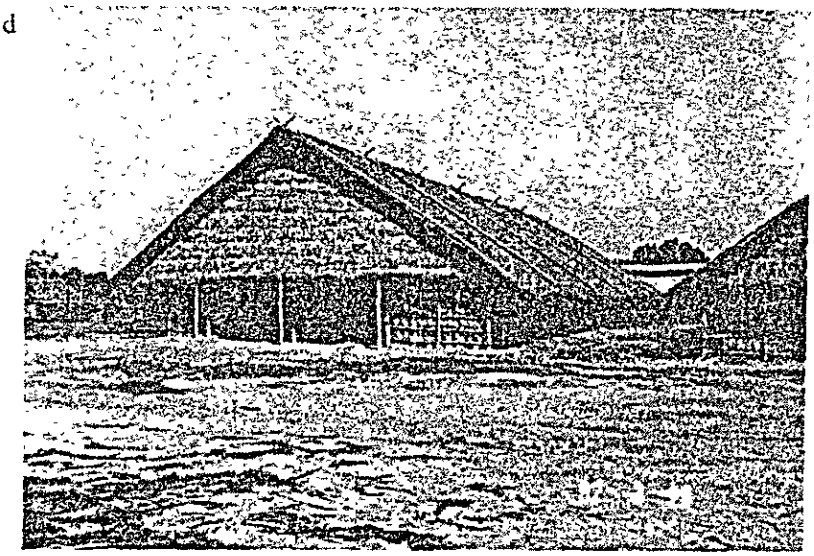


6. Management Staff, White Rice Storage at Kwin Chaung Rice Mill

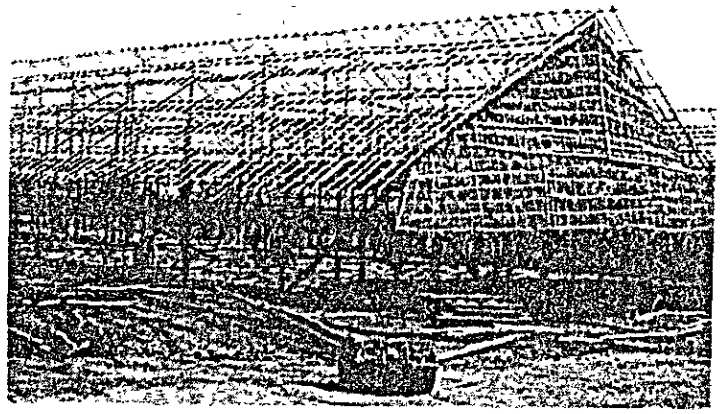
7. Wooden Paddy Storage in Sjirian



8. Temporary Paddy Shed

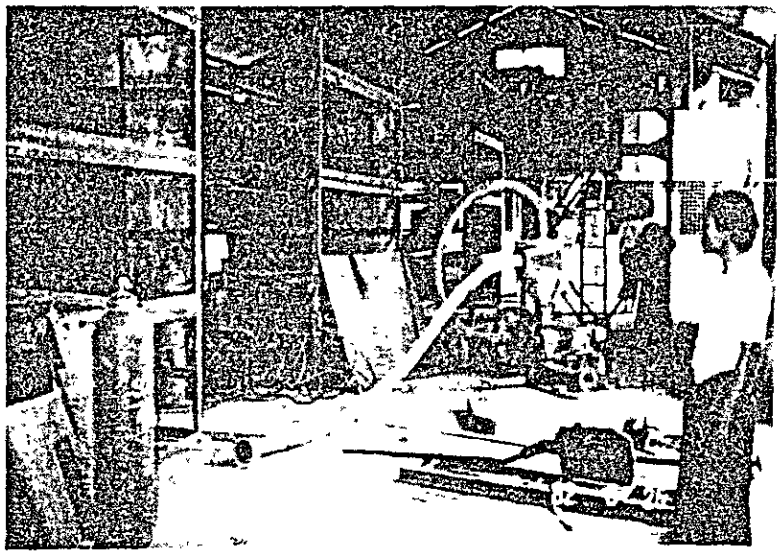


9. Same as above, under construction

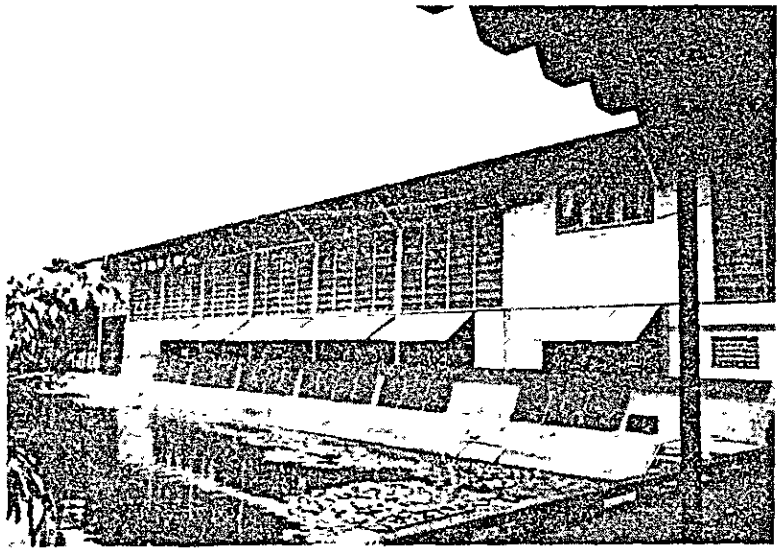


10. Oil Seed Laboratory, Kasetsat University. Thailand

11. Workshop of AFPTC

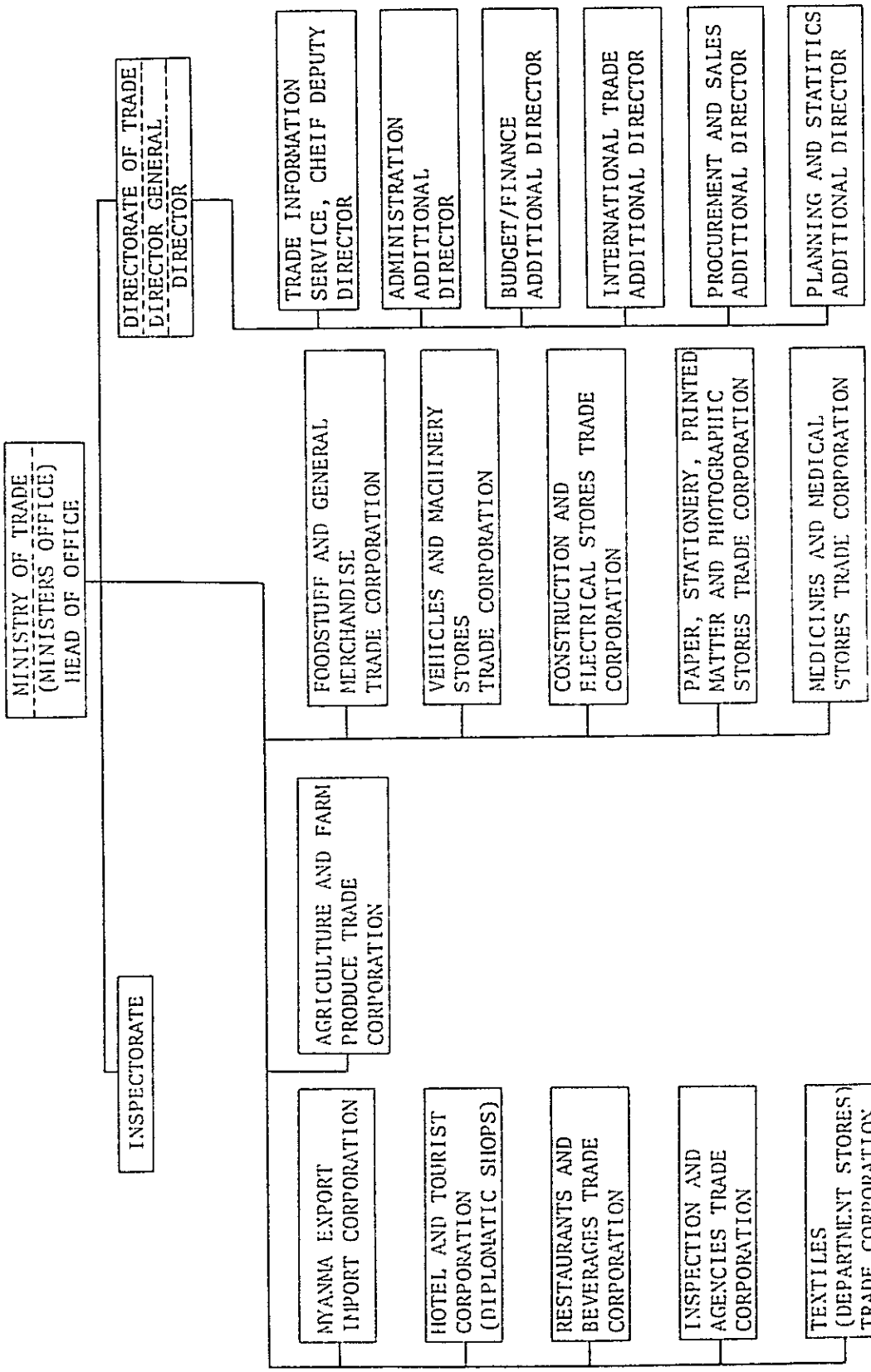


12. Workshop (Agricultural Engineering Dept. Ministry of Agriculture, Thailand)



1-2 Data on Burmese Officials Concerned

1-2-1 Organization of Ministry of Trade



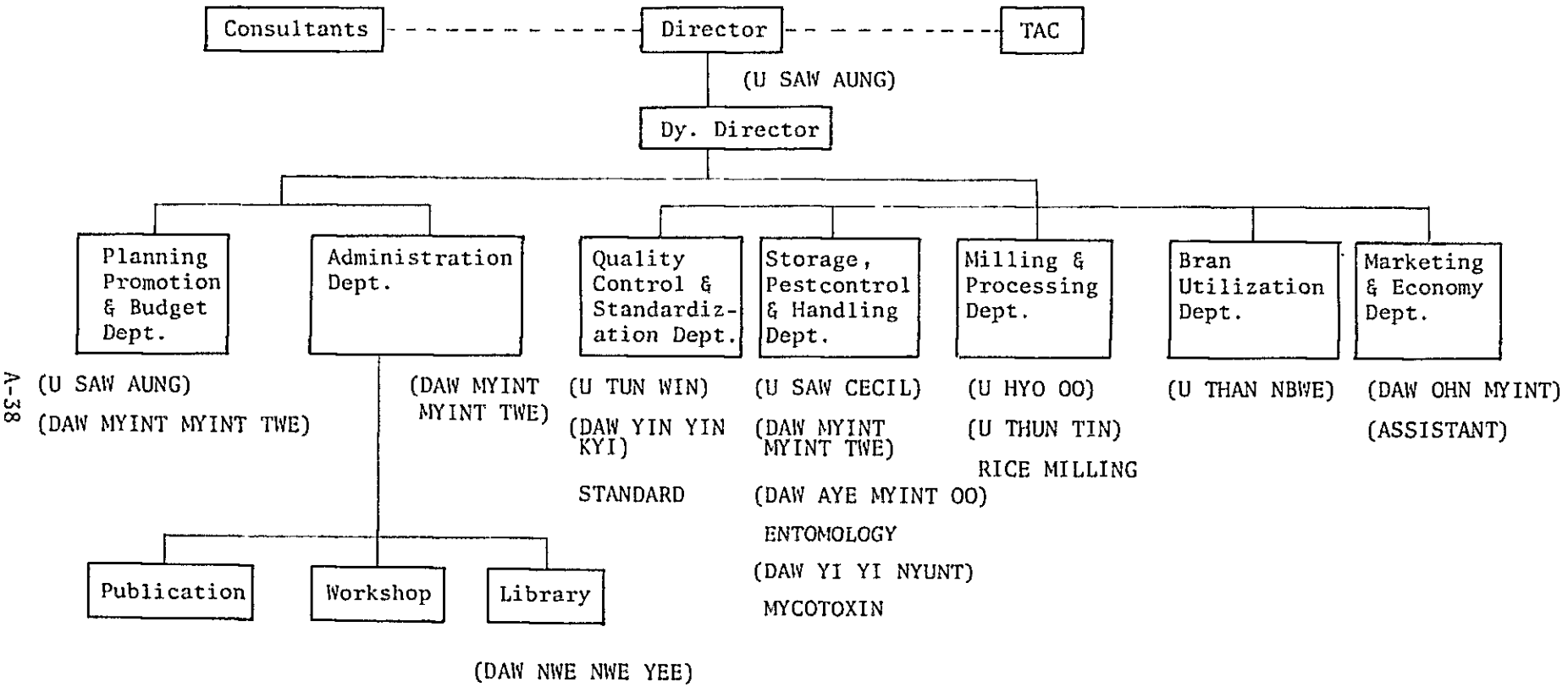
Source: AFPTC

1-2-2 Organization of AFPTC

TOTAL STAFF STRENGTH

NO.	PARTICULARS	H Q	FIELD	TOTAL
1	MANAGEMENT	129	933	1062
2	TECHNICAL	20	116	136
3	CLERICAL	366	2120	2486
4	MILL/DEPOT	205	16510	16715
5	OTHERS	40	1189	1229
	TOTAL	760	20868	21628

1-2-3 Temporary Disposition of Existing PTAC Staff



Present Situation of Arrangement of Staff in P.T.A.C.

Name	Post	Education	Research Experience	Overseas Training Experience
U Saw Aung	Project Director	B.Sc. D.M.A.	-	1. Storage (T.S.P.C.,UK) 2. Management in AIM, Philippines. 3. Study tour to India 4. Rice Procesimg covege japan 1976.3 week
Daw Myint Myint Thwe.	Manager	B.Sc.(Biology)	-	Rice Milling Paddy dryers
U Myo Oo	Rice Mill Engineer	B.E.(Mechanical)	-	Rice Milling Paddy dryers
U Than Ngwe	Bran Oil Engineer	B.E.(Chemical)	-	Bran Oil Extraction in Japan.
U Saw Cecil Kyi.	Storage Manager	B.Sc.(Chemistry)	-	Storage in TSPC., U.K. 4 week
U Tin Win	Manager	B.Sc.(Botany)	-	-
Daw Aye Myint Oo	Upper Division Clerk.	M.Sc.(Storage Entomology)	(9) years of research experience on Entomo-logy.	TPI (UK) 1982.2 2½ week
Daw Yi Yi Nyunt.	Upper Division Clerk.	M.Sc. Storage Entomology (Thesis)	-	-
Daw Yin Yin Kyi	Apprentice grade (3)	B.Sc.(Botany)	-	-
Daw Nwe Nwe Yee	"	B.Sc.(zoology)	-	-
U Soe Maung	"	B.Sc.(Botany)	-	-
Daw Ohn Myint	Technician (4)	B.A.(Eco)	-	-
U Htun Tin	Technician (5)	-	-	-

1-3 Data on PTAC's Operation

1-3-1 Recruitment Programme

Recruitment Programme for the year 1982-83

Sr.No.	Designation	Qualification	Quantity
1.	Manager (Milling & Drying)	B.E (Mech:)	1
2.	Manager (Bran Oil Extradtion & by-product Utilization)	B.E.(Chem:) or M.Sc. (I.C)	1
(3)	Manager (Quality Control) (Chemical)	MSSc. (Chemistry)	1
	(Physical)	M/Sc (Physics)	1
(4)	Manager (Admin:)	Any degree with 5 years experiende	1
	Assistant Manager (Cum Secretary)	Any degree with 3 years experience English Proficiency)	1
(5)	Manager (Budget & Accounts)	B.Com: or Equivalent with 3 years experience	1
6.	Manager (Economic)	M.Eco:	1
7.	Manager (Storage Structures & Handling)	B.E. (Civil)	1
		Total	9

1 - 3 - 2

Expert Needed

SR No.	Priority	Subject Concerne	Duration	Year
1.	A-2	Quality Control Expert	6 man/months	82/83
2.	A-1	Grain Technologist	6 m/m	82/83
3.	A-3	Grain Storage Expert	12 m/m	83/84
4.	B-2	Oil and Fats Processing Expert	6 m/m	84/85
5.	A-4	Grain Processing & Machinery Expert	4 m/m	83/84
6.	B-4	Technical Extension Specialist	3 m/m	84/85
7.	A-5	Pest Control Expert	6 m/m	83/84
8.	B-1	Parboiling & Drying Expert	6 m/m	83/84
9.	B-3	Agri-business Management (or) System Analysis	6 m/m	85/86
		Total	55 m/m	

1-3-3 List of Trainees Needed for Overseas Training

SR. No.	Subjects	Qualification	Period	Country Proposed for Training	1982/83	1983/84
1.	Quality Control (Chemical) (Physical)	BSc/MSc (Chems) BSc/MSc / BAg	6. 12 months 6. 12 months	Japan/UK Japan/USA	1 1	- -
2.	Grain Storage Structures	BE.	6. 12 months	USA/Japan	1	1
3.	Processing, Parboiling & Drying	BE. (Mechs)	6. 12 months	Indonesia/Malaysia USA/India	1	1
4.	Agricultural By-product Utilization (Eg: Bran, Husk)	BE. (Chems)	6. 12 months	Japan/India	-	1
5.	Storage & Pest Control	BSc/MSc (Betang)	6 months	UK/Japan	-	1
6.	Pest Control (Chemical)	BSc/MSc (Chemistry)	6 months	UK/Japan	-	1
7.	Workshop Technology & Management	BR. (Mechs)	6 months	Japan/UK	-	1
8.	Agri-Business Management	BA/BSc with diploma in management	6 months	Philippine/India	-	1
9.	Instrumentation	BR. (Electrical)	6 months	Japan	-	1
10.	Librarian	BA/BSc	6 months	UK/Japan	-	1
11.	Communications, aide, training methods	BSc	6 months	Japan/UK	-	1
				Total	4	10

LIST OF PERSONNEL TRAINED ABROAD FOR A LONG OR SHORT TERM TRAINING

(DURING THE YEAR 1981 - 82)

Sr: No:	NAME OF TRAINING	SUBJECT STUDIED	NO. OF TRAIN-EES	DURATION	COUNTRY	R E M A R
1.	PRESERVATION OF STORED CEREALS		1	2 MONTHS	AUSTRALIA	COLOMBO
2.	GROUP TRAINING COURSE IN POST-HARVEST RICE PROCESSING		4	3 "	JAPAN	"
3.	DETERMINATION AND PREVENTION OF POST-HARVEST FOOD LOSSES		5	1 "	U.S.A.	WORLD B/
4.	RICE BRAN OIL EXTRACTION		1	3 "	JAPAN.	A.D.B.
5.	SHORT TERM COURSE IN RICE MILL ENGINEERS PROGRAMME		1	2 "	INDIA	"
6.	ON THE JOB TRAINING FOR DATA PROCESSING IN AGRICULTURAL ECONOMICS		1	8 "	U.K.	COLOMBO
7.	MANAGEMENT DEVELOPMENT PROGRAMME		1	3 "	PHILLIPINES	A.D.B.
8.	PALM OIL FAMILIAZATION COURSE		2	10 DAYS	MALAYSIA	
9.	STORAGE OF DURABLE AGRICULTURAL PRODUCTS IN THE TROPICS		1	16 WEEKS	U.K.	A.D.B.
10.	THE SPECIALISTS COURSE IN AFFLIED STORED PRODUCTS ENTOMOLOGY		2	3 MONTHS	"	COLOMBO.
			19			

1-3-5 Anticipated Activities of individual departments of PTAC

(1) Planning, Promotion and Budget Department

1) Planning and adjustment of activity programs of individual departments overall PTAC:

a) Surveys
b) Research and development
c) Guidance and extension
d) Personnel recruitment and equipment procurement
e) Training of PTAC staff
f) Publication and promotion of research achievements.

2) Publication and promotion of findings, cooperation with other research institutes, and efforts for incorporating findings into administrative policies.

3) Editing of periodical and non-periodical publications (Clerical work of publication is assigned to Administration Department.)

4) Budget planning and Execution.

(2) Administration Department

1) Personnel control (Recruitment and discharge, attendance sheet, ability and deligence evaluation, payroll control and other clerical work)

2) All of managemental work (Planning and execution of maintenance, procurement and other administrative work relating to building, equipment, guard, pilferage, fire insurance, canteen, and related facilities, electricity, water and roads, etc.)

3) Management and operation of library: data collection and retrieval service

4) Management and operation of workshop: assistance work for other departments.

5) Typing, copying and printing.

6) Publication work (following the editing by Planning, Promotion and Budget Dept.)

7) Arrangement of conferences and meetings.

8) Communications and transportation (Management and maintenance of telephone, and operation repair of vehicles, etc.).

9) Accounting, receipts and disbursments.

(3) Quality Control and Standardization Department

1) Survey on quality of paddy in farm level, collected paddy, stored paddy, milled rice under contract basis, exported rice, free-marketed rice etc.

2) Survey of paddy quality, in terms of variety, year of production and production area.

3) Survey of rice quality in the world market.

4) Identification and analysis of factors in improving the quality of domestic-marketed rice and exported rice.

5) Survey on existing quality of collected paddy, and measures for the upgrading.

6) Planning of improving measures of quality inspection on purchasing the paddy, as well as development and procurement of inspection instruments for the purpose. (in cooperation with Milling and Processing Dept. and Marketing and Economy Dept.)

7) Discussion with related agencies for improving quality inspection at time of paddy purchase. Planning for equipment procurement and personnel training.

8) Improvement of quality standards of paddy and rice and measures for their enforcement, as well as preparation of samples and their distribution etc.

9) Survey of quality of parboiled rice in world market and in Burma, coupled with research on their upgrading.

(4) Storage, Pest Control and Handling Dept.

1) Overall survey on post-harvest handling of paddy (transport routes, month, period, handling method, contamination conditions, storing conditions, type of storage, the period and other status, etc.)

2) Survey on existing handling method at time of paddy collection, and its renovative measures.

3) Survey on existing paddy storage conditions in respect of permanent stores, semi-permanent stores, temporary stores and open-yard piling, coupled with finding of major probelms and their corrective measures.

4) Planning of renovative measures of paddy storage identification of inherant obstacles and finding of their solution.

5) Planning of counter-measures against in-storage insects-, microbes-, birds-, and rodent- pests as well as making of their implementation programs.

6) Comparative study on paddy warehouse construction and bulk handling facility. Planning of their renovative measures.

7) Renovative plan and the implementation program on paddy and rice transport and handling methods.

8) Study on in-bin drying methods, and their practice. (in cooperation with Milling and Processing Dept.)

9) Survey on storing conditions of white rice and planning of their improvement and the implementation programs.

(5) Milling and Processing Department

1) Research on improving threshing and drying methods in farm level, and planning of the practical measures. (in consultation with Agricultural Corporation, Ministry of Agriculture.)

2) Research on paddy inspection on collection and cleaning methods, and planning of renovative measures. (in consultation with Quality Control and Standardization Dept.)

3) Comprative study and research on merits and demerits and adaptability among flat-bed driers, continuous-flow driers, batch-circulation type driers, in-bin dryers, etc. (in consultation with Storage, Pest Control and Handling Dept.)

4) Survey and research on locally-built driers in terms of performance, price, manufacturing capability, etc. Making of production program and technical improvement plans.

5) Making of drying program for second crop paddy, as well as survey, research and procurement programs for necessary equipment and materials.

6) Survey on existing rice mills in Burma, and identification of their major problems.

7) Survey on extent and technical level of hand milling. Research on their corrective measures and implementation programs.

8) Analysis of defects found in existing rice mills in regard to personnel, facility, technical, and institutional problems. Clarification of priorities and corrective measures.

9) Survey on indegeneous rice milling machinery and component manufacturers. (their production capacity, products, technical level, supply and demand situation, pricing, etc.)

10) Survey on existing status of boilers, steam engines and other prime movers now being employed, identification of the major problems, and study on the corrective measures and planning of implementation programs.

11) Survey on existing parboiling facility and its operating conditions. Planning of corrective measures and making of their implementation programs. Survey on parboiling systems is other countries.

12) Development and production program of husk-fired furnace for paddy drier.

13) Development and production program of husk-fired furnace for farm use.

14) Survey on Engerberg type rice mills regarding to their production numbers, number of units in use and their operating conditions. Study on their renovation/replacement plans, together with analysis of their technical and institutional difficulties.

(6) Bran Utilization Department

1) Survey on existing rice bran production and utilization situations. (quantity, production period, price, consumer/buyers, comprative price study in relation to other feed materials, its share in domestic feed market, buying price on oil extraction, price of bran crude and refined oil, export volume and its potential, etc.)

2) Survey on existing bran oil factories regarding to their facility, personnel, operating conditions and obstacles. Planning of their renovative measures.

3) Survey on quality, characteristics, the fluctuation, distribution, etc. of rice bran, bran cake, bran crude oil, bran edible oil and bran oil of other use. Identification of their problems, and the corrective measures.

4) Study on potentiality and adaptability of bran oil extraction by use of expeller in Burma. Planning of implementation programs.

5) Study on solvent oil extraction in terms of technical, managemental and locational aspects. Making of its development plan.

6) Study on oil refinery in terms of technical, managemental and locational aspects. Planning of its development programs.

7) Survey, research and planning on posibility of coupling rice mill and bran stibilizer/expeller.

8) Research on processing, bran cake germ utilization, etc. Making of their implementation programs.

9) Study on upgrading the bran oil processing.

(7) Marketing and Economy Department

1) Assessment and study on potentiality of paddy quality improvement through enforcement of alternative measures on paddy buying price, white rice selling price and distribution system, along with foreseeable changes in farmers' income, rippling effect on free-market rice, estimated increments of foreign exchange earning owing to betterment of exported rice, related social impacts and its affordability within the framework of governmental budget.

2) Planning of the most optimum program on paddy collection period and quantity in relation to paddy transport and storage capability. Analysis of bottlenecks in distribution system.

3) Survey on world rice market in terms of quality, price, selling system, terms of sale, statistics, historical transition and future prospects, market trends etc. Making of appropriate counter-measures to be taken by Burma. Planning of implementation programs on varieties to be grown, quality of white rice, price, terms of sale, paddy collection system, international publicity, sales promotion activity, etc.

1-4 List of Equipment Proposed for PTAC

1-4-1 Planning, Promotion and Budget Department

1-4-2 Administration Department

1-4-7 Economy and Marketing Department

Item	Quantity
[Offices]	
Desks	46
Chairs	46
Desks for conference use	40
Chairs for conference use	90
Storage box	4
Chart box	8
Unicase	10
Letter case	10
Filing cabinet	10
Locker	30
Hangar stand	10
Check writer	1
Time clock (Time Recorder)	1
Revolving book stand	5
Book stand	10
Greenboard (for both side)	2
" (with schedule)	7
Revolving blackboard	2
Wall blackboard	7
Brackboard sponge	10
A set of drawing furniture	3
Fire proof safe	2
Alminium foot-stool	2
Counter table	2
Rack	5
News-rack	3
Umbrella stand	3
Cart	2
Wall-charts	3

Item	Quantity
Recorder (Cassette type taperecorder)	1
Amp, stereo microphone, speaker unit	1 set
Recorder (Portable cassette type taperecorder)	2
Cassette tape-60 min. use	100
Recorder (Open reel type)	1 set
Open reel tape	10
Movie projector (16 m/m optical magnetics for regenerators)	1
Movie projector (8 m/m film)	1
Movie camera (8 m/m zoom lens x 6)	1
8 m/m film sound editor	1
Overhead projector	1
Slide projector	1
Loud speaker	1
Typewriters (English)	4
" (Burmese)	2
Copying machine (Xerox A3 size contractable print type)	1
" (A1 size blue print type)	1
Printing machine	1
Calculating machines (+10 figures)	10
" (+12 figures)	5
Video Tape Recorder (NTSC)	1
" (PAL)	1
Video camera	2
amplifier	2
speaker	2
player	2
Video tape	60
Inter-com	1 set
TV set	3
[Library]	
Catalog card case (48 drawers)	2
Card (500 sheets, various colour label, bookpocket, seal press, card case, election card, label, binder etc.)	1 set
Magazine shelf	2

Item	Quantity
PR-magazine case	1
a set of book binding tools	1 set
Bookmending kit (stapler, tape, cover)	1 set
Newspapershelf	1
Display-shelf	2
Bookshelf	20
Visitors desk	4
Chairs	10
Counter desk with drawer	1
Chair for counter	2
Card file for counter	1 set
Study desk for researcher	4
Personal-computer (CPU)	2
- related instruments (CRT, FDD, Printer etc.)	2 set
- related software	1 set
Copy machine (PPC type)	1
Chart case	4
Booktruck	2
Bulletin board	2
Micro-film-reader	1
Micro cabinet	11
Micro-reader desk	1
Reference books	3000
Perodicals	150
Dictionaries, Encyclopedias	100
[Dark room and photographic instruments]	
Camera (Single-eye reflex)	2
Additional lens	2 sets
Electronic flash	2
Compact camera	2
Tripod leg	2
Filter set	2 sets

Item	Quantity
Close-up device	2
Camera cabinet	1
Film developing set	1 set
Enlarger	1
Sink	1
Air cooler	1
Ventilator	1
Print-trimmer, Nega-film cabinet, curtain	1 set
[Workshop]	
Engine lathe (Center distance 55 cm, 2.2 KW)	1
Universal milling machine	1
Bench drilling machine (swing 350 mm, 3-13 mm, 0.4 KW)	2
Stand drilling machine (swing 530 mm,- 40 mm, 1.5 KW)	1
Cut-off grinder with spare discs	2
Pipe bender, manual hydrawlic type	1
AC arc welder (200 A) with electrodes	2
A set of gas welder with rods	1
Spot-welding machines	1
Bench grinder	2
Vices	5
Portable grinder	2
DC (engine operated) arc welder	1
Air compressor (7.5 KW)	2
Chain block	2
Electric winch	1
Surface plate	1
Electric shears	1
Manual hydraulic press	1
Bending press	1
Garage jacks	2
Parts cleaner	1
Tool shelves	5
Custody case for measuring instruments	2
Worktable	5

Item	Quantity
A set of forging equipment	1
Spring press	1
A set of painting tools	1
Portable electric drill and various attachment	2
Spare part shelves	4
Electric planning machine [For wood work]	1
Electric band saw ["]	1
Electric circular saw ["]	1
Router ["]	1
Chain-saw ["]	1
Vices ["]	3
Worktable ["]	5
Wood-drilling machine ["]	1
Electric zig saw ["]	1
Portable electric circular saw ["]	1
Floor standing fan	4
Overhead trolley	1
Vacum cleaner	2
A set of hand tools	1 set
Socket-wrench	
Box wrench	
Adjustable wrench 150 mm	
" 250 mm	
" 375 mm	
Open-ended spanner	
Pliers 150 mm	
" 250 mm	
Cutting pliers	
Nose pliers	
Nippers	
Screw driver (-)	
" (+)	
Hack saw	

Item	Quantity
Peen-ball hammer	
Copper hammer	
Tin smith scissors	
Grease gun	
Hand riveter (with rivet)	
A set of center punches	
A set of leather punches	
Various chisels	
Torque wrench	
Various wire brushes	
Iron bar	
Vice pliers	
Various files	
Various C-cramps	
Nail extractor	
Water pump pliers	
Shovel	
Pick	
Pescussion driver	
Hydraulic jack	
Safety helmets	
Safety belt	
Stretching ladder	
Scaffold	
Tool box	
Gasoline torch lamp	
Carpenter tools (plane, saw, axe, wood chisel, marking gauge, hand drill, wood file, whetstone etc.)	1 set
Meters and gauges	
Vernier calipers	
Measuring tape (2 m)	
Tachometer	
Hydrometer for battery	

Item	
Multi-purpose circuit tester	
Megger	
Wattmeter	
Straight edge (60 cm)	
Thickness gauge	
Pitch gauge	
Mercury thermometer	
Measuring tape (50 m)	
Upper plate automatic weighing machine 2 kg	
Balance 100 g	
Automatic platform scale 100 kg	
Spring balance 5, 10, 20, 50 kg	
A set square	
Protractor	
Hardness meter	
Messuring cylinder (500 cc)	
[Garage]	
Car-repairing outfit	1 lot
Fuel service tank	1
Car washer	1
Micro bus	1
Passenger car	2
Truck	2
Motor cycle	5
Bycicle	10
[Canteen]	
Tables	12
Chairs	48
Cupboard	2
[Kitchen]	
Refrigerator	1
Kitchen utensils	1 lot
Kitchen tables	2
Cupboard	4

1-4-3 Quality Control and Standardization Department

Item	Quantity
[Grain test room - physical]	
Test sample pulverizer (Willy)	1
" (Cyclo-mill)	1
Grain grader	1
Grain cutter	2
Microscope	2
Specimen set	2
Microtome	1
Sieves (round)	1 set
" (slit)	1 set
Dockage tester	1
Whiteness meter	1
Rigidity tester	1
Balances	2
Precision scales	1
Upper plate spring balance	2
Platform weighing scale	1
Analytical balance	1
Descicaters	5
Grain moisture meter (infrared ray type)	1
" (electric resistance type)	2
" (capacitance type)	2
Grain shape tester	2
Mirror plate	5
Inspection light	4
" (with magnifier)	4
Grain fluoroscopy	1
Ripe measuring instrument	1
Hectolitre/kg scale	1
Grain counter	1
Centrifuge (electric)	1
" (manual)	2

Item	Quantity
Electric heater	5
Muffled furnace	1
Crucible	10
Crucible tongs	10
Hydrometer set	2
Thermometer	10
Recording thermo-hygrometer	2
Max. and Min. thermometer	4
Repose angle meter	1
Dehydrator	2
Manual sample grinder	2
Electric heat seal machine	2
Barometer (mercury)	1
" (aneroid)	2
Illuminometer	1
Calculator	5
Programable calculator	3
Vernier calipers	3
Vacuum cleaner	1
Measuring vessel	10
Vibrating sieves	1
[Grain Laboratory – chemical]	
Measuring instrument for protein	1 set
" for protein, oil and ash	1 set
Vibrator	2
A set of cooked rice testing equipment	1 set
A set of rice taste test	1 set
Texturo meter	1
Amirograph	1
Draft chamber	1
Testing table	4
Inspection table (general)	2
" (measurable)	2
Pure water producer	2

Item	Quantity
Sink	2
Cabinet for samples	2
Hot plate	2
Refrigerator	2
Grass-wares (test tube, evaporating basin, beaker, burette, pipette, cylinder, flask, various type flask, etc.)	1 set
Chemicals and reagents	1 lot

1-4-4 Storage, Pest Control and Handling Department

Item	Quantity
[Pest Control Laboratory]	
(Pest Control Equipment)	
Microscope	2
Magnifier	4
Projector	1
Breeding box (air conditioned)	1
Desiccater	5
Fumigation container	1
Sample photograph of harmful insects and animals	1 set
Sieves	1 set
Sample devider	2
Balanes	2
Sound detecter to insects and animals	1
(Testing Facility of Microbes and Mycotoxins)	
Air conditioned chamber	1
Sterilized chamber	1
Cultivation chamber	1
Microscope	2
Measuring instruments	2 sets
Micotoxin testing equipment	1 set
[Storage Test Facility]	
Pest control set	1 set
Chemicals and equipment for fumigation	1 set
Temperature measuring instrument	1 set

Item	Quantity
Portable thermistor thermometer	1 set
Hopper feeder for paddy, paddy precleaner, paddy conveyers	1 set
Sampling inspection units	1 set
Trier	1 set
[Paddy and Rice Handling Equipment]	
Various conveyers (belts, chains, buckets)	1 set
Fork lift (2 ton gasoline engines)	1
Wooden pallet	20

1-4-5 Milling and Processing Department

Item	Quantity
[Milling test laboratory]	
Testing dryer	1
" husker	1
" whitener (continuous friction type)	1
" " (batch abrasion type)	1
" " (batch friction type)	1
" stoner	1
" winnower	1
" thresher	1
Sample divider (large)	1
" " (small)	1
Rubber hardness meter	1
Magnifier	3
Testing broken separator (slit and round hole)	1
" " (indent type)	1
Air compressor	1
Manometer	1
Pitot tube	1
Anemometer (propeller type)	1
" (heat wire type)	1
Barometer	1
Tachometer	2
Vernier calipers	3
Multi-purpose circuit tester	3
Megger	1
Clamp meter	1
Current testing driver	2
Manual test huskers	4
[Comparative milling test room]	
Paddy precleaner	1
" husker (disc type)	1

Item	Quantity
Paddy husker (rubber roll type)	1
" (impact type)	1
Paddy separator (oscillation type)	1
" " (compartment type)	1
" " (screen type)	1
Rice whitener (non-vitrified cone type)	1
" " (vitrified cone type)	1
" " (horizontal abrasion type)	1
" " (air blowing friction type)	1
" " (Engelberg type)	1
Broken separator (round hole sieves)	1
" " (slit sieves)	1
" " (indent type)	1
Automatic weigher	2
Conveyors	1 set
Fans	1 set
Cyclones and bag filters	1 set
Tanks	1 set
Operation control board	2
Dynamometer	1
Meters and gauges	1 set
[Standard rice milling unit]	
Milling capacity: 2 ton paddy/hour	1 set
Paddy day bin	
Precleaner	
Automatic weigher	
Stoner	
Paddy husker	
" separator	
Thickness grader	
Rice whiteners	
Rice brusher	

Item	Quantity
Vibrating sieves	
Length grader	
Automatic weigher	
Bag-sewing machine	
Operation tanks	
Rice holding tanks	
Conveyors	
Dust collection devices	
Operation control board	
[Parboiling & drying testing room]	
Flat-bed dryer	1
Continuous vertical-flow dryer	1
Conveyors for the same	1 set
Circutating dryer	1
Precleaner	2
Husk furnace	1
Dust collection device	1 set
Boiler (oil-fired package type, with all accessories)	1 set
Pumps	1 lot
Automatic weigher	
Stoner	
Thickness grader	1
Conveyors	1 set
Valves & pipes	1 lot
Operation control board	1
Meters & gauges	1 set
Valves joints & pipes for parboiling facilities	1 lot
Soaking tank	1 lot
Parboiling tank	1 lot
Water filtration facility	1
Oil fired furnace	1

Item	Quantity
[Paddy warehouse]	
Precleaner	1
Bucket elevator	1 set
Flow conveyor for feeding	1 set
Belt conveyor for discharge	1 set
Discharge gates	1 lot
Fans	1 set
[Drafting & designing room]	
Drafters	4
Map cases	6
Drafting equipments	4 sets
Templates	1 set

1-4-6 Bran Utilization Department

Item	Quantity
[Oil & Fats Laboratory]	
Oil analysing equipment (soxlet extraction units, water bath, temp.-controlled drying box, vacuum drying box, vacuum pump, etc.)	1 Set
FFA verifier (flasks, indicators, titration equipment, dessicator, etc.)	"
Saponification value testing equipment (circulating cooler, flasks, reagents, temp.-controlled water tub, etc.)	"
Iodine value testing equipment (flasks, reagents, titration device, etc.)	"
Non-saponifiable matter testing equipment (flasks, separation funnels, cooler, dessicators, etc.)	"
Peroxide value testing equipment (nitrogen gas cylinder, stoppered flasks, etc.)	"
Total nitrogenous & crude protain testing equipment (asbestos wire net, Kieldahl flasks, distillation device, steam evaporator, etc.)	"
Moisture testing equipment (temp.-controlled drying box, constant volume bottle, distillator thermometer, infra-red ray moisture meter, etc.)	"
Oil & fats analysing equipment (TLC, ultra-violet ray radiation device, colorimeter, GLC, etc.)	"
General and measuring instruments (various glass apparatus, centrifugal separtor, refrigerator, balances, drafting instrument, thermometer, PH gauge, distillation equipment, magnetic instruments, wood, lubbar, sink, plastic tensils, stirring apparatus, Kipp apparatus, shaking equipment, etc.)	"
[Oil and Fats Industrial Testing Room]	
Bran oil filter press equipment (expeller, hydraulic press, filter press, scales, pumps, hopper, tanks, conveyers motors, etc.)	"

Item	Quantity
Bran oil extraction equipment (sieve, heat dryer, oil extraction vessel, miscella distillator solvent condenser, water separator, solvent service tank, solvent recovery equipment, oil pumps solvent pump, water pump, adsorbent pump, tanks, conveyers, motors)	1 set
Bran oil refining equipment (deacidifying reaction vessel, centrifuge separator, discoloration vessel, filter press, deodorizing vessel, oil heat unit, oil cool unit, steam injector, barometric condenser, vacuum pump, wax arrester, wintering apparatus, solvent recovery equipment, solvent service tank, miscella pump, oil pump, air compressor, conveyers, motors, etc.)	"
Related equipment (piping, wiring, insulating materials, installation table, working table, operation board, various valves, measuring instruments, ventilator, dust collector, etc.)	"
Boiler - 150 kg/H, 7 kg/km^2 (Water softener, valves, pressure gauge, fuel service tank, etc.)	"
Feed Powdering and mixing machine	"

1-5 Post-Harvest Technology Research and Training Center Established in South-East Asian Countries

1. Post-harvest Technology Center, Indian Institute of Technology

(a) Location: Kharagpur, West Bengal, India.

(b) Year of establishement: 1970

(c) Outline of the facilities:

Site area: 20,000 m^2

Floor space: 3,500 m^2

Major equipment: Research workshop and laboratories for drying, milling, grading, storage, by-products utilization, properties, etc. Prototype "Satake" rice mill and other assocated equipment such as polishing, drying, storage, parboil, etc.

(d) Number of staff: Total 52.

(e) Initial investment for building, equipment etc.: Rs 2 million

Annual operational budget: Rs 1 million

(f) Kinds of works to be undertaken:

(i) Research in post-harvest processing of crops.

(ii) Training in rice milling for managers, engineers and technicians.

(iii) Education upto the levels of M. Tech and Ph. D. in the area of post-harvest engineering.

(iv) Extension work in PHT, design and development and testing of processing machinery.

(g) Major constraints so far encountered:

(i) Specified research equipment and instruments are not available in the country.

(ii) Industrial experties in the field are not available in the country.

(h) Future prospects for improvement/strengthening:
Prospects are bright. Government of India, Ministry of Agriculture, Department of Food is providing necessary funds for further development of the Center.

(i) Any suggestions for the newly set-up post-harvest technology research/training center:
They should be very well connected to the Departments of Agriculture, Department of Food, Departments of Grain Supply and Handling as they are the user agencies of these technologists. The Center's recommendations then would be more valid.

(j) Name of person whom to be contacted from now on:
Dr. N.G. Bhole
Professor & Head,
Post-harvest Technology Center,
Indian Institute of Technology,
Kharagpur, W.B., India, 721302

2. Central Food Technological Research Institute

(a) Location: Mysore, Mysore State, India

(b) Year of establishment: 1950

(c) Supervisory Body: Council of Scientific and Industrial Research, Ministry of Science and Technology.

(d) Outline of the facilities

Site area: 58.27 ha
Offices: 7,041 m^2
Laboratories: 20,120 m^2
Pilot plants: 1,805 m^2
Stores & workshops: 3,602 m^2
Livingquarters/hostel: 9,678 m^2
Library: (a) Number of Books 13,850
(b) Back Volumes of periodicals 17,032
(c) Subscriptions to:
- Journals (technical) Total: 434
- Reviews/Periodicals: 10
- Bulletins/News Letters: 300
- Annual Reports: 338
(d) Others: Overseas and domestic patents and Michro films etc.

(e) Number of staff: Scientists & Technologists 359,
Technicians 56,
Establishment & Services 491,
Total 906 staff-members

(f) Annual operational budget (1977):

- Salaries & Wages : Rs. 85 lakhs
- Research & Development: Rs. 33 lakhs
- Others : Rs. 35 lakhs
Total : Rs. 153 lakhs

(g) Kinds of works to be undertaken:

(i) Miximum utilization of the available scientific and technological knowledge.

(ii) Applied research based on the available scientific knowledge.

(iii) Application oriented basic research to fill the gap of knowledge in technology.

(iv) Basic research to develop new knowledge that may be needed to support the future technological developments.

(v) Training of personnel to meet the needs of research and development, industry and the Government agencies concerned.

(h) Name of person whom to be contacted from now on:

V.H. Potty
Head
Industrial Development & Consultancy Services, CFTRI,
Mysore-570013, India.

3. Food Technology Research and Training Centre

(a) Location: Tambun, West Java, Indonesia

(b) Year of establishment: 1968

(c) Supervisory Body: National Logistics Agency (BULOG)

(d) Outline of the facilities:

(i) Office:

- Classroom seating about 50 persons
- Library
- Administration room
- Meeting room
- Staff rooms
- Two temporary laboratory rooms
- Meeting hall

(ii) Laboratory:

- Grain processing laboratory
- Biochemical and chemical laboratory
- Microbiological laboratory
- Entomological laboratory
- Cold storage room for sample preservation
- Equipment storage room
- Instrument maintenance and repair room
- Glassware washing rooms
- Two lecture rooms seating about 100 persons
- Printing room
- Photo room and dark room for documentation purpose
- Conference room
- Staff rooms
- Administration room

(iii) Training facilities:

- Class room (fully air-conditioned. Equipped with slide projector, overhead projector and video cassette.)

- Dormitory with capacity for 38 persons
  (equipped with a dining room, discussion room, kitchen, bathroom, etc.)
- Guest house for eight people
  (fully air-conditione. Equipped with TV set, etc.)
- Recreation facilities
  (such as a badminton court, a volley ball court, table tennis, video films).

(iv) Existing post-harvest facilities:

- 2 warehouses for bag storage (cap. 7,200 tons).
- 1 warehouse for bag or bulk storage (cap. 3,600 tons).
- 1 modified warehouse for bulk storage and drying (cap. 3,600 tons).
- Silos
- Workshop
- Various kinds of dryers
- Various kinds of rice mills

(e) Kinds of works to be undertaken:

(i) Research and development in the field of procurement and processing.

(ii) Research and development in the field of quality preservation.

(iii) To calibrate, test and improve in the field of instrumentation.

(iv) To provide training programs on post-harvest processing operation.

(f) Name of person to be contacted from now on:

Mr. Hartono,
Food Technology Research and Training Centre,
B.P.T.P. - BULOG,
Tambun, Bakasi, West Java, Indonesia.

4. NFA-NAPHIRE-CLSU National Post Harvest Training and Processnng Center */

(a) Location: CLSU compound, Munos, Nueva Ecija Philippines

(b) Year of establishiment: Calendar year 1982.

(c) Outline of the facilities:

Site area: Ten (10) Hectares

Floor space

Training building	- 1,099 square meters
Dormitory building	- 1,599 square meters
Solar dehumidified warehouse	- 1,950 square meters
Downdraft warehouse	- 1,950 square meters
Humidity controlled warehouse	- 1,950 square meters
In-bin bulk storage warehouse	- 1,950 square meters
Conventional in-bag (flat) warehouse	- 1,950 square meters

Major equipment

- 2 TPH continuous flow drying plant
- 5 TPH rice milling plant
- 60 TPD parboiling plant
- Husk fed thermal power plant
- Complete set of physical and bio-chemical laboratory equipment and instruments.
- Complete set of audio-visual equipment
- Motorpool equipment
- 50 tons weighbridge
- Transport vehicles

*/ - NFA - National Food Authority
- NAPHIRE - National Post-Harvest Institute for Research and Extension
- CLSU - Central Luzon State University
- Buildings and equipment are expected to be completed by the end of 1982.

Number of staff: Twenty (20)

Their qualification

- With academic backgrounds in agricultural engineering, development communication and related sciences.
- With trainings on management, post-harvest engineering, economics effective communications, etc.
- Actual experiences in post-harvest operations, supervisory and management activities.
- Actual experiences in the conduct of post-harvest researchs and trainings.

Initial investment for building equipment, etc.

- Training and dormitory building - ₱ 6.19 M.
- Warehouse buildings - 13.20 M.
- Equipment - 5.00 M.

Operational budget

Calendar year 1982 - ₱ 554,366.00

(f) Kinds of works to be undertaken

(i) Design and develop training modules and mannuals

(ii) Publish journals, newsletters, brochures, press releases on post-harvest technology.

(iii) Produce instructional audio-visual materials

(iv) Organize, supervise and conduct training, seminars and workshop program on post-harvest operations and efficiencies.

(g) Major constraints so far encountered

(i) Insufficient trained manpower to implement and conduct National Training Programs.

(ii) Insufficient Government funds for the immediate completion of the training and processing center.

(h) Future prospects for improvement/strengthening

(i) Propose and negotiate for funding from foreign institutions such as the ASEAN-EEC, IDRC, study in the Region of the Royal Government of Netherlands, etc. for the immediate completion of the project

(ii) Upon completion of the project and once fully operational all national and international training programs on post-harvest to be held in the Philippines shall be conducted in the Training and Processing Center.

(i) Name of person whom to be contracted from Now On.

Mr. MAXIMO G. RAMOS
Deputy Executive Director
NAPHIRE, NFA
FTI, Complex
3rd Floor Administration Bldg.
Taguig, Metro Manila

2. ビルマ国に於ける農業生産・流通・収穫後の過程に関する統計資料

2－1　経営規模別農家戸数と耕地面積

Position of Peasant Families and Land Area Occupied

Sr. No.	Size of Holdings	1978/79				1979/80				1980/81(Provisional Actual)				1981/82 (Provisional)			
		Numbers		Percentage		Numbers		Percentage		Numbers		Percentage		Numbers		Percentage	
		Peasant Families	Acres	Peasant Families	Acres	Peasant Families	Acres	Peasant Families	Acres	Peasant Families	Acres	Peasant Families	Acres	Peasant Families	Acres	Peasant Families	Acres
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Under 5 acres	2645789	5916190	61.60	24.73	2619973	5960532	61.35	24.79	2616566	5998462	61,10	24,80	2621785	6074310	61,18	25.07
2	5 to 10 acres	1023283	7351650	23.83	30.73	1029799	7391048	24.12	30.74	1050979	7538921	24,54	31,16	1053768	7506839	24,59	30.99
3	10 to 20 acres	510082	7127446	11.88	29.79	505215	7098113	11.83	29.52	499262	7015024	11,66	29,00	498153	7090891	11,62	29.27
4	20 to 50 acres	113466	3084969	2.64	12.90	112661	3061600	2,64	12,74	112856	3087484	2,64	12,76	109127	3014992	2,55	12,45
5	50 to 100 acres	1902	123498	0.04	0.52	1966	126582	0,05	0.53	2061	136231	0,05	0,56	1929	127934	0,05	0,53
6	100 acres and above	519	317618	0.01	1.33	627	403843	0,01	1,68	641	415744	0,01	1,72	610	410186	0,01	1,69
	Total	4295041	23921371	100.00	100.00	4270241	24041798	100.00	100.00	4282365	24191866	100.00	100.00	4285372	24225152	100.00	100.00

Note:- Land area occupied by peasant families includes cultivated and fallow lands.

Sown Acreage of Main Crops

(Thousand acres)

Serial No.	Crops	1961/62	1969/70	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81 (Provisional Actual)	1981/82 (Provisional)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Paddy	11359	12243	12300	12014	12575	12793	12858	12547	12690	12957	12420	12668	12610
2	Wheat	98	166	156	137	156	227	232	233	235	216	206	306	256
3	Maize	199*	179	250	235	219	215	203	199	207	224	251	374	474
4	Matpe	123	130	189	184	164	164	121	88	164	203	210	210	198
5	Pedisein	80	106	95	84	76	72	60	55	62	72	81	102	104
6	Butter bean	73	142	196	207	183	180	158	143	158	158	162	118	199
7	Sultapya	10	84	126	134	107	122	117	126	137	140	143	146	123
8	Soya bean	38	46	50	51	52	54	56	61	59	58	36	63	68
9	Gram	291	350	457	449	379	373	385	434	442	423	282	408	580
10	Pesingon	161	156	194	179	185	197	166	119	90	125	135	170	185
11	Other pulses	608	617	548	573	541	623	593	640	637	630	652	778	734
12	Groundnut	1396	1510	1674	1563	1638	1666	1696	1507	1481	1378	1200	1271	1522
13	Sesamum	1530	2258	2292	2256	2660	2609	2464	2630	2696	3087	2563	3231	3448
14	Sunflower					8	9	10	25	89	136	84	143	264
15	Cotton	469	362	554	532	527	542	514	402	405	461	480	546	585
16	Jute	24	104	226	288	291	167	148	136	176	256	261	250	122
17	Rubber	155	219	214	214	213	211	207	204	204	202	202	200	199
18	Sugarcane	95	201	273	292	235	211	247	251	260	266	236	248	274
19	Burmese tobacco	106	120	153	147	98	99	124	160	145	123	117	123	121
20	Virginia tobacco	7	12	16	14	10	13	12	15	18	29	30	22	28
21	Other crops	2191	2756	2738	2949	2960	2926	2960	3188	3224	3224	3533	3428	3400
	Total	19013	21761	22701	22502	23277	23473	23331	23163	23579	24368	23304	24805	25494

* Includes maize sheet and maize cob varieties.

Production of Main Crops

(Thousand tons)

Serial No.	Crops	1961/62	1969/70	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81 (Provisional Actual)	1981/82 (Provisional)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Paddy (ton)	6726	7859	8046	7241	8466	8448	9062	9172	9313	10362	10283	13107	13923
	(Basket in Lakhs)	3275	3827	3918	3526	4123	4114	4413	4466	4535	5046	5007	6383	6780
2	Wheat	15	33	26	26	24	63	56	75	92	41	89	115	116
3	Maize	55	47	57	55	61	64	60	57	74	76	124	164	228
4	Matpe	27	17	29	32	24	23	15	12	39	44	66	58	56
5	Pediaein	8	10	7	6	6	6	5	6	6	8	8	10	13
6	Butter bean	12	26	41	36	41	36	34	32	40	40	56	49	73
7	Sultapya	2	12	23	22	13	16	17	26	30	28	22	29	28
8	Soya bean	10	12	13	13	12	13	12	16	16	16	15	17	18
9	Gram	45	60	89	60	54	66	67	93	100	94	38	101	154
10	Pesingon	24	23	29	22	31	28	24	19	13	20	20	26	33
11	Other pulses	126	109	82	74	83	93	82	110	112	109	140	112	125
12	Groundnut	387	437	478	377	405	459	404	416	457	384	337	431	558
13	Sesamum	75	100	111	69	152	94	132	91	109	206	108	155	167
14	Sunflower					1	1	1	3	13	14	9	21	45
15	Cotton	21	34	42	43	37	42	37	31	41	51	49	73	107
16	Jute	6	22	65	88	78	39	37	27	55	94	95	97	32
17	Rubber	25	13	14	15	15	15	14	15	15	15	15	16	16
18	Sugarcane	1072	1291	1606	2000	1661	1185	1605	1600	1763	1812	1438	2003	2569
19	Burmese tobacco	35	38	51	50	32	35	44	58	54	44	47	48	46
20	Virginia tobacco (Green)	13	14	18	16	10	19	12	21	24	46	40	28	40

2-4 Agricultural Production by Type of Crops

The progress of agricultural production by type of crops is shown in the table below

Agricultural Production by Type of crops
(Quantum Index 1969/70=100)

Serial No.	Type of Crops	1961/62	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81 (Provisional Actual)	1981/82 (Provisional)
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Cereals	82.8	102.3	92.6	107.8	108.2	115.7	118.2	120.9	132.0	137.3	169.4	180.2
2	Beans and pulses	91.3	118.9	99.8	100.6	108.8	101.2	125.8	140.3	139.4	139.9	152.8	189.6
3	Oil seeds	84.1	110.4	81.6	110.0	102.1	104.3	93.9	109.4	127.1	89.3	120.8	156.0
4	Fibre	45.5	200.6	252.6	216.8	146.0	134.8	106.2	181.4	277.9	277.9	317.6	246.2
5	Other industrial crops	70.6	110.3	121.5	113.6	108.5	117.3	117.3	129.8	123.5	116.1	141.1	146.3
6	Tobacco & allied products	58.7	128.9	130.1	104.6	111.2	122.4	147.7	143.5	134.1	139.6	137.9	136.1
7	Spices	69.3	90.7	107.0	87.5	94.2	90.1	125.6	122.0	100.8	139.8	111.8	125.6
8	Other edible crops	63.6	109.3	114.9	122.2	119.4	125.2	138.9	135.1	138.2	204.1	160.8	161.9
9	Medicinal plants		716.7	866.7	200.9	100.0	166.7	233.3	666.7	500.0	216.7	200.0	250.0
10	Other inedible crops	59.9	113.6	105.4	116.0	116.6	122.9	14 2	131.4	139.5	143.9	158.5	167.4
	Total	76.6	108.2	100.4	110.5	108.8	113.8	119.0	124.6	132.6	137.8	154.4	167.8

2 – 5 Targets for the Selected Crops in 1982/83

(In thousand)

Serial No.			Crops	Sown Acreage	Unit	Output	
						Yield per Acre	Output
1			2	3	4	5	6
1			Cereals	13815			
	1		Paddy	12541	Basket	52.80	644410
	2		Wheat	256	"	18.01	4195
	3		Maize	551	"	21.66	11017
		1	Maize (Seeds)	551	"	21.66	11017
	4		Millet	467	"	8.18	3535
2			Beans and Pulses	1753			
	1		Matpe	156	Basket	10.40	1332
	2		Pedisein	102	"	5.16	464
	3		Butter Bean	197	"	15.78	2884
	4		Bocate	81	"	9.18	715
	5		Sultani	15	"	9.17	126
	6		Sultapya	142	"	8.23	1060
	7		Soya Bean	70	"	8.92	591
	8		Gram	559	"	10.05	5166
	9		Pesingon	194	"	6.27	1123
	10		Peyin	38	"	10.46	347
	11		Pegyi	199	"	7.08	1314

Targets for the Selected Crops in 1982/83 (Continued)

(In thousand)

Serial No.			Crops	Sown Acreage	Unit	Output	
						Yield per Acre	Output
1			2	3	4	5	6
3			Oil Seeds	5208			
	1		Groundnut	1796	Basket	34.60	59641
		1	Groundnut (Monsoon)	933	"	28.52	25345
		2	Groundnut (Winter)	863	"	41.06	34296
	2		Sesamum	3181	"	3.98	9790
		1	Sesamum (Monsoon)	2466	"	3.93	7322
		2	Sesamum (Winter)	715	"	4.16	2468
	3		Sunflower	231	"	23.62	4872
4			Fibre	862			
	1		Cotton	612	Viss	138.62	76731
		1	Wagyi	147	"	83.96	11443
		2	Wagale	21	"	60.43	1062
		3	Mahlaing 5/6	227	"	80.02	17026
		4	Long staple cotton	217	"	252.57	47200
	2		Jute	250	"	271.13	61945
5			Industrial Crops	474			
	1		Rubber	203	Lb.	314.29	35665
	2		Sugarcane	271			
		1	Sugarcane (Matured)	137	Long ton	21.82	2776
		2	Sugarcane (In-matured)	134			

Targets for the Selected Crops in 1982/83 (Continued)

(In thousand)

Serial No.			Crops	Sown Acreage	Unit	Output	
						Yield per Acre	Output
1			2	3	4	5	6
6			Narcotics Crops	175			
	1		Burmese Tobacco	143	Viss	250.64	35300
	2		Virginia Tobacco (Green)	32	"	697.76	21274
7			Spices	226	"		
	1		Chillies	150	"		
		1	Chillies (Dried)	150	"	128.78	17900
	2		Onion	54	"	1708.31	88976
	3		Garlic	22	"	755.00	15909
8			Other edible crops	68			
	1		Potatoes	40	Viss	2148.72	79503
	2		Coffee	10	"	116.11	792
	3		Tapioca	18	"	2504.75	43718
9			Other crops	2848			
			Total	25429			

Irrigated Area by Crops
(Including multiple cropping area)

(Acres)

Serial No.		Crops	1977/78	1978/79	1979/80	1980/81 (Provi-sional Actual)	1981/82 (Provi - sional)
1		2	3	4	5	6	7
1		Cereals	2121959	2252371	2092632	2208515	2179422
	1	Paddy	2118223	2246769	2057817	2157434	2131995
	2	Wheat	1202	912	29106	41820	32980
	3	Maize	2340	4351	5357	8944	13996
	4	Others	194	339	352	317	451
2		Other food crops	391170	392339	357384	457062	569784
	1	Sesamum	130235	152336	106220	172230	250134
	2	Groundnut	9951	7614	5739	8286	8097
	3	Pulses	74933	72501	64399	84540	100734
	4	Sugarcane	18656	18873	16249	21399	22190
	5	Others	157395	141015	164777	170607	188629
3		Other non-food crops	245128	323622	327724	285601	200412
	1	Cotton	104973	123867	128778	88452	114726
	2	Jute	128544	185506	184543	178798	64816
	3	Others	11611	14249	14403	18351	20870
		Total	2758257	2968332	2777740	2951178	2949618

Production and Utilization of Main Agricultural Crops

(TONS)

Sr. No.	Crops	Unit	1961/62				1977/78				1978/79			
			Production	Exports	Imports	Domestic use	Production	Exports	Imports	Domestic use 1/	Production	Exports	Imports	Domestic use 1/
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Rice	Metric Ton	4034951	1702988		2331963	5494782	571462		4923320	5615692	160373		5455319
2	Wheat	Long Ton	14577		9893 2/	24470	92212		2500 2/	94712	40982		5167 2/	46149
3	Maize	"	54827	21546		33281	94674	10466		84208	95248	9929		85319
4	Pulses	"	260000	119133 3/		140867	355861	33458 3/		322403	359478	25262 3/		334216
5	Groundnut	"	387114			387114	456989			456989	383997			383997
6	Sessamum	"	75270			75270	109347			109347	206247			206247
7	Chillies 4/	"	23806	1000		22806	32741			32741	25870			25870
8	Onion	"	68206			68206	133424			133424	105899			105899
9	Garlic	"	21000			21000	22310			22310	22029			22029
10	Potatoes	"	53000	4914		48086	53427	2		53425	54031	2		54029
11	Jute	"	6280	806	12665	18139	54912	10077		44835	94321	25534		68787
12	Cotton	"	15200	10678 5/	175	5/	13800		7341	21141	17143		4033	21176
13	Sugar-cane	"	1072009			1072009	1762896			1762896	1811665			1811665
14	Rubber	"	24847	10533		14314	14784	7448		7336	15200	10202		4998
15	Burmese tobacco	"	35560			35560	54211			54211	43766			43766
16	Virginia tobacco (cured)	"	2000	10		1990	4318			4318	4724			4724

1/ Domestic use includes domestic consumption, stocks, various uses and wastages

2/ Wheat flour import being converted in terms of wheat grain.

3/ Gram split export being converted in terms of gram whole

4/ Green chillies being converted in terms of dried chillies.

5/ Use from stock

Production and Utilization of Main Agricultural Crops (Continued)

Sr. No.	Crops	Unit	1979/80 (Actual)				1980/81 (Provisional Actual)				1981/82 (Provisional)			
			Production	Exports	Imports	Domestic use [1]	Production	Exports	Imports	Domestic use [1]	Production	Exports	Imports	Domestic use [1]
1	2	3	16	17	18	19	20	21	22	23	24	25	26	27
1	Rice	Metric Ton	5917000	736053		5180947	6110000	631192		5478808	6495000	884000		5611000
2	Wheat	Long Ton	89417		28875 [2]	118292	114919		6103 [2]	121022	115866		6719 [2]	122585
3	Maize (seeds)	"	151353	19983		131370	179507	9555		169952	245345	19684		225661
4	Pulses	"	364661	63994 [3]		300667	401502	71439 [3]		330063	499684	103386 [3]		396298
5	Groundnut	"	336799			336799	430703			430703	558129			558129
6	Sesamum	"	108204			108204	154675			154675	166697			166697
7	Chillies [4]	"	37926			37926	30897			30897	31677			31677
8	Onion	"	150403			150403	105754			105754	136463			136463
9	Garlic	"	25599			25599	24828			24828	26888			26888
10	Potatoes	"	119494			119494	136780	239		136541	117354			117354
11	Jute	"	95092	21139		73953	97082	65149		31933	32443	40000 [5]		
12	Cotton	"	16450	846	2521	18125	24269	425	5472	29316	35965	542	3937	39355
13	Sugar-cane	"	1438260			1438260	2003197			2003197	2569422			2569422
14	Rubber	"	15438	9506		5932	15585	10012		5573	15718	10000		5718
15	Burmese tobacco	"	46551			46551	47621			47621	46438			46438
16	Virginia tobacco (cured)	"	5586			5586	4795	197		4598	3432			3432

Utilization of Chemical Fertilizers by Crops

(Metric Ton)

Serial No.	Crops	1977/78	1978/79	1979/80	1980/81 (Provi-sional Actual)	1981/82 (Provi-sional)
1	2	3	4	5	6	7
1	Paddy	106412	161618	173904	201523	204297
2	Wheat	370	841	1331	6768	2018
3	Maize	894	1209	1803	2884	3028
4	Millet				147	100
5	Groundnut	4969	5532	8937	17381	6083
6	Sessamum	277		26	608	1411
7	Sunflower	854	605	995	703	944
8	Cotton	4610	3412	5449	5636	5191
9	Jute	9194	9912	7343	4460	1816
10	Rubber	186	518	301	734	1018
11	Pulses	757	690	1509	1429	1783
12	Chillies	58				
13	Onions/Garlic	2				
14	Potatoes	570	371	352	1229	774
15	Sugarcane	4363	3910	4769	5235	4997
16	Vegetables	690	268	331	35	188
17	Mulberry	42	77	97	55	8
18	Palm Oil	131	1282	709	523	707
19	Others	1464	1976	1116	1919	5013
	Total	135843	192221	208972	251269	239376

Draught Cattle and Agricultural Implements

(In thousand)

Serial No.	Year	Draught Cattle	Spike Harrow	Inter Culti-vator	Plough Share	Rotary Harrow	Cart
1	2	3	4	5	6	7	8
1	1964/65	3880	1756	116	1597	266	942
2	1974/75	5018	2126	92	1899	267	1331
3	1975/76	5087	2150	93	1908	274	1358
4	1976/77	5180	2165	93	1944	276	1371
5	1977/78	5333	2194	96	1990	283	1395
6	1978/79	5564	2263	98	2059	302	1433
7	1979/80	5734	2317	99	2129	301	1450
8	1980/81 (Provisional Actual)	5877	2376	100	2178	314	1474
9	1981/82 (Provisional)	5960	2393	101	2206	317	1483

Note:- The number of draught cattle is inclusive of trained young buffaloes and cattle. The number of heads utilized for agricultural purposes during the year shows the end-stock.

Paddy & Rice Production and Marketing

(Long Ton)

Sr. No.	Particular	Year				
		1977-78	1978-79	1979-80 Provisional Actual	1980-81 Provisional	1981-82 Plan
1	2	3	4	5	6	7
1.	Paddy Production	9313000	10362000	1028000	13107000	12737000
2.	Rice Production	5408100	5527000	5824000	6013000	*6900000
3.	Seed & Losses	54081	55270	58240	60130	* 69000
4.	Export	562437	*160360	736067	630040	884000
5.	Domestic use	4791483	5311370	5029693	5322830	5768000

Remarks (*) Rice and Broken Rice

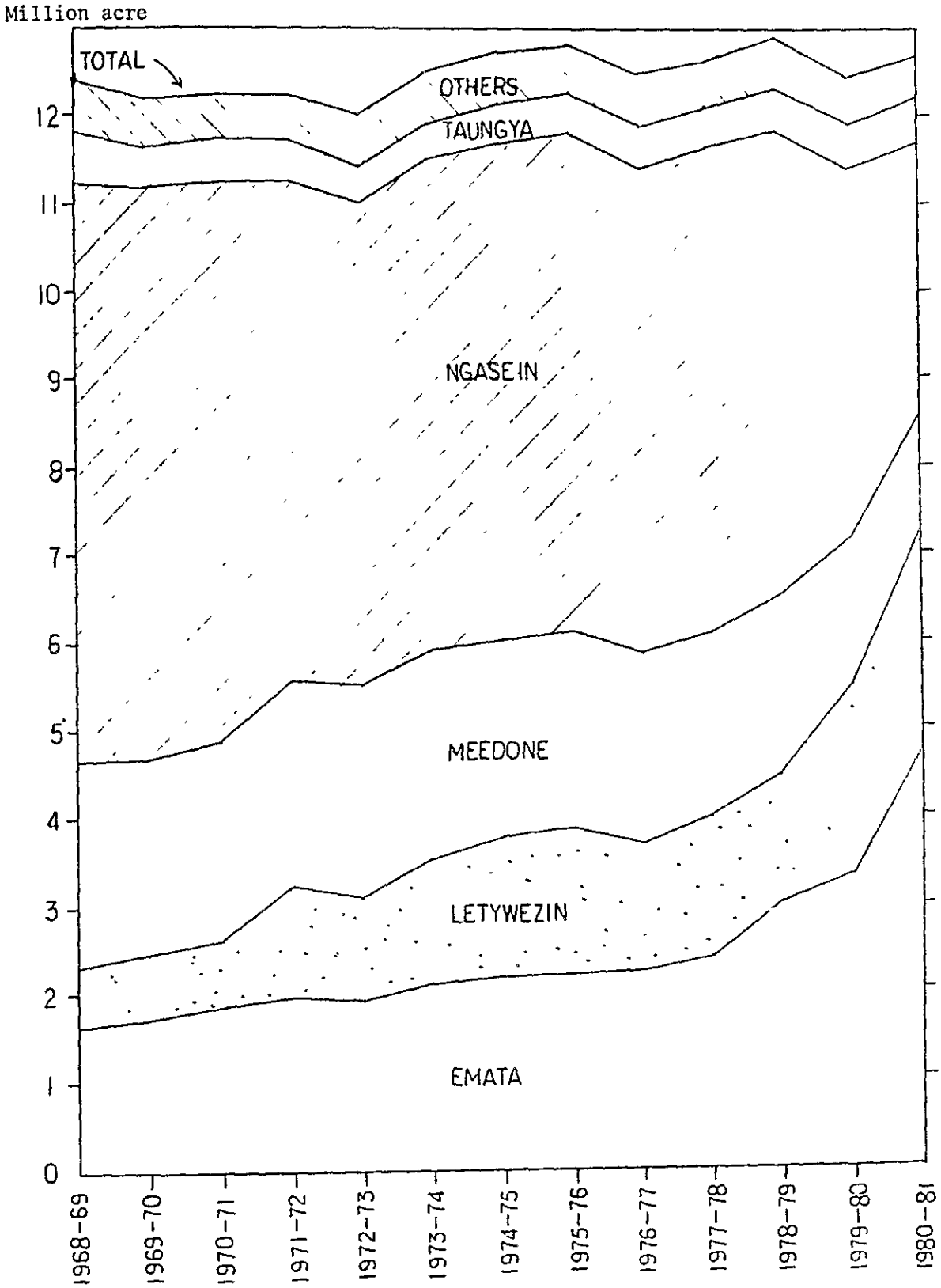
出所：AFPTC 1981. 12

2-11 Paddy Production, Sown Area, Harvested Area and Yield per Hectare in each Division/State (1980-1981)

Division/State	Sown Area (000 ha)	Harvested Area (000 ha)	Yield per Unit Area (Paddy tonne/ha)	Paddy Production (000 tonne)
Irrawaddy Div.	1,354	1,321	3.2	4,195
Pegu Division	909	867	3.3	2,876
Rangoon Div.	526	503	3.3	1,643
Sagaing Div.	501	429	2.5	1,060
Arakan State	346	341	2.1	720
Shan State	342	334	2.0	676
Mon State	274	267	2.4	634
Mandalay Div.	253	184	2.6	480
Karen State	192	188	1.4	265
Magwe Division	163	110	2.2	242
Kachin State	121	119	2.3	272
Tenasserim Div.	86	81	2.1	171
	36	35	1.4	49
Kayah State	24	23	1.5	34

Source: Computed from Rice Production in Burma 1982, Agriculture Corporation.

2-12 Transition of Major Sown Paddy Varieties



Source: AC and OMIC

Paddy Procurement Prices and Specifications for 1980-81 Year Crop

Grades within Each Group of Paddy	1980-81 Crop Procurement Price per 100 bkts of Paddy with effect from 1.10.78 until further Notification is issued (In Kyats)	Permissible Moisture Content in selected townships* of Sagaing Division in Chakthin & Kohtaung to village group of Kanbalu Township and in Arakan State, Chin State, Kachin State, Shan State & Kayah State.				Permissible Dust and Impurities Per Bkt	Dismissible Foreign Grain	Permissible Red Grain	Permissible Immatured Grain	Permissible Grain	Coloured Grain
		Other Locations								From Oct. to End June	July and Onwards
		From Oct. to End Feb. (%)	March & Onwards (%)	From Oct. to End Feb. (%)	March & Onwards (%)	(lbs)	(%)	(%)	(%)	(%)	(%)
Ngasein Group											
(1) Ordinary Grade	900	17	16	15	14	.50	3	12	3	3	6
(2) Special Grade	990	17	16	15	14	.50	2	4	3	Not Permissible	Not Permissible
(3) 1st class special Grade	1060	17	16	15	14	.50	1	2	3	"	"
Needone Group											
(1) Ordinary	940	17	16	15	14	50	8	6	3	3	6
(2) Special	1,000	17	16	15	14	.50	4	2	3	Not Permissible	Not Permissible
(3) 1st class Special	1,060	17	16	15	14	.50	2	1	3	"	"
Emata Group											
(1) Ordinary	955	17	16	15	14	.50	5	6	3	3	6
(2) Special	1,050	17	16	15	14	.50	3	2	3	Not Permissible	Not Permissible
(3) 1st class special	1,125	17	16	15	14	.50	1	1	3	"	"
Ngakywe Group											
(1) Ordinary	1,090	17	16	15	14	50	8	6	3	3	6
(2) Special	1,200	17	16	15	14	.50	4	2	3	Not Permissible	Not Permissible
(3) 1st class special	1,300	17	16	15	14	.50	2	1	3	"	"
Kaukhyin Group											
(1) Ordinary	900	17	16	15	14	.50	10	6	3	3	6
(2) Special	990	17	16	15	14	.50	8	2	3	Not Permissible	Not Permissible
(3) 1st class special	1,060	17	16	15	14	.50	6	1	3	"	"

Remarks: (1) If foreign grain, red grain and coloured grain compose of more than the permissible amount, 1st class special grade is to be degraded as special grade and special grade to be degraded as ordinary grade for all groups of paddy.

(2) Permissible amount of "CHALKY GRAIN" in the 1st class special grade and special grade of Emata Group, are to be determined by the Agricultural and Farm Produce Trade Corporation.

* Selected Townships - Homalin, Mawlaik, Upaung Pyin, Imum, Kalewa, Kalemyo, Minkin, Katha, Indaw, Hteegyain, Bhamauk, Kawlin, Wuntho, and Pinlebu.

Source - AFPT

Purchase Prices of Paddy by Group

(Kyat per 100 baskets)

Sr. No.		Type of Commodity	1962/63 to 1965/66	1966/67	1967/68 to 1971/72	1972/73	1973/74	1974/75 to 1976/77	1977/78 to 1979/80	1980/81 to 1981/82
1		2	3	4	5	6	7	8	9	10
1		Ngasein Group								
	1	Ordinary	310	340	358	425	600	900	900	900
	2	Quality seed	325	355	373		615	920	940	990
	3	First grade quality seed	330	360	378		620	930	970	1060
2		Meedon Group								
	1	Ordinary	325	355	373	442	625	940	940	940
	2	Quality seed	340	370	388		640	960	980	1000
	3	First grade quality seed	345	375	393		645	970	1010	1060
3		Emata Group								
	1	Ordinary	330	360	378	448	634	955	955	955
	2	Quality seed	345	380	398		654	980	1000	1050
	3	First grade quality seed	350	390	408		664	995	1035	1125

Purchase Prices of Paddy by Group (Continued)

(Kyat per 100 baskets)

Sr. No.		Type of Commodity	1962/63 to 1965/66	1966/67	1967/68 to 1971/72	1972/73*	1973/74	1974/75 to 1976/77	1977/78 to 1979/80	1980/81 to 1981/82
1		2	3	4	5	6	7	8	9	10
4		Ngakywe Group								
	1	Ordinary	385	415	433	514	726	1090	1090	1090
	2	Quality seed	400	430	448		741	1110	1130	1200
	3	First grade quality seed	410	440	458		751	1120	1160	1300
5		Kauknyin Group								
	1	Ordinary	300	330	348	413	584	875	900	900
	2	Quality seed	310	340	358		594	890	940	990
	3	First grade quality seed	330	360	378		604	905	970	1060
6		Special Emata Group								
	1	Ordinary								1035
	2	Quality seed								1140
	3	First grade quality seed								1220

* In 1972/73, purchase prices of paddy are fixed only by group, prices for quality and grade-wise are not specified.

2-15 Actual Procurement Volume of Paddy by Government Versus Total Production Volume

Transition during the recent five years

Year	Paddy total production volume	Target and actual production volume by government	Purchase % to total production
	Unit: 1000 Basket	(1000 ton)	(%)
1976/77	446,660	Target: 156,000 (3,200)	31.5
	(9,170)	Actual: 140,700 (2,890)	
1977/78	453,100	Target: 160,700 (3,300)	23.6
	(9,300)	Actual: 107,080 (2,200)	
1978/79	495,690	Target: 164,000 (3,370)	36.5
	(10,360)	Actual: 186,400 (3,790)	
1979/80	481,000	Target: 184,900 (3,860)	35.3
	(10,280)	Actual: 171,600 (3,460)	
1980/81	630,000	Target: 180,000	30.4
	(13,100)	Actual: 192,000	

(remarks) Adjusted for transportation loss, etc

Source: Ministry of Agriculture and Forestry (April, 1981)

2-16 No. of Buying Depots by Type by Division of 1978-79

State/Division	Type of Buying Depots				Total
	Field	Mill	Warehouse	Mobile	
KACHIN STATE	3	8	13	5	29
KAREN STATE	9	3	-	-	12
SAGAING DIVISION	24	20	76	14	134
TENASSERIM DIVISION	1	7	5	5	18
PEGU DIVISION	60	72	49	16	197
MAGWE DIVISION	3	12	10	-	25
MANDALAY DIVISION	17	21	21	-	59
MON STATE	18	26	4	-	48
ARAKAN STATE	35	6	10	-	51
RANGOON DIVISION	43	35	19	-	97
IRRAWADDY DIVISION	54	120	50	4	228
TOTAL:	267	330	257	44	898

SOURCE: AFPTC

2-18 Size of Major Varieties of Paddy and White Rice Grain

Varieties	Type	Paddy		White	
		Leugth mm	Leugth Breadth	Leugth mm	Leugth Breadth
Emata	A	9.41 & Above	3.30 & Above	7.00 & Above	3.00 & Above
Letywezin	B	8.40 - 9.80	2.80 - 3.30	6.00 - 7.00	2.40 - 3.00
Ngasein	C	7.75 - 9.00	2.40 - 2.81	5.60 - 6.40	2.00 - 2.40
Meedone	D	7.35 - 8.60	2.00 - 2.40	5.00 - 6.00	1.60 - 2.00
Byat	E	9.00 & Above	2.25 - 3.00	6.40 - 7.35	2.10 - 2.50

Source: AFPTC

2-19 Rice Mills and the Milling Capacities (Rated capacity in tons per 8 hour shift) by State and Division (1980-1981)

State/Division	AFPTC-owned		AFPTC-contracted		Sub-total		Private-owned rice mill (Wunza mill)		Total	
	Numbers	Capacity	Numbers	Capacity	Numbers	Capacity	Numbers	Capacity	Numbers	Capacity
Kachin	-	-	21	117	21	117	15	55	36	172
Kayah	1	8	-	-	1	8	16	51	17	59
Karen	1	8	8	42	9	50	52	206	61	256
Sagaing	7	49	121	949	128	998	7	35	135	1,033
Tenasserim	-	-	18	72	18	72	34	71	52	143
Pegu	11	242	225	2,385	236	2,627	230	1,179	466	3,406
Magwe	3	15	32	259	35	274	13	50.5	48	324.5
Mandalay	-	-	73	516	73	516	39	163	112	679
Mon	-	-	45	533	45	533	97	527	142	1,060
Arakan	8	126	23	209	31	335	19	65	50	400
Rangoon	7	145	107	1,104	114	1,249	69	273	283	1,522
Shan	-	-	-	-	-	-	40	117.5	40	117.5
Irrawaddy	7	164	219	2,626	226	2,790	319	1,650	545	4,440
Total	45	757	892	8,812	937	9,569	950	4,443	1,887	14,012

Source: AFPTC, December 1981

Milling Hire Charges September.1980

Sr: No.	Rice	Quality	Milling Hire Charges per 100 Baskets of Paddy Ks. Ps.
1.	Ngakywe Group		
1.	Ngakywe Super	5%	50.12
2.	Ngakywe Super	10%	47.28
3.	Ngakywe Burma	15%	39.22
4.	Ngakywe Burma	25%	39.22
5.	Ngakywe Bazaar Quality	38%	37.52
6.	Ngakywe Brown Rice		26.55
7.	Ngakywe Full Boiled	12%	58.50
	Emata Group		
1.	Emata Zeeya Super	5%	58.41
2.	Emata Super	10%	55.47
3.	Zeeya Super	10%	55.47
4.	Emata Burma	15%	49.21
5.	Emata Burma	25%	48.13
6.	Emata SMS	35%	38.35
7.	Emata Brown Rice		26.55
8.	Long Boiled	10%	63.92
9.	Emata Full Boiled	12%	58.50
	Keedon Group		
1.	Keedon Super	5%	50.02
2.	Keedon Super	10%	47.28
3.	Keedon Burma	15%	39.22
4.	Keedon	25%	39.22
5.	Keedon Bazaar Quality	38%	37.52
6.	Keedon Brown Rice		26.55
7.	Keedon Full Boiled	12%	58.50
	Ngaseom Group		
1.	Ngasein Super	5%	50.39
2.	Ngasein Super	10%	47.94
3.	Ngasein Burma	15%	45.65
4.	Ngasein Burma	25%	44.66
5.	Ngasein SMS	35%	34.50
6.	Ngasein Brown Rice		26.55
7.	Ngasein Full Boiled	12%	58.50
8.	Milchar (1)	8%	69.09
9.	Milchar (2)	10%	63.45
	Kauk-Hnyin Group		
1.	Kauk-Hnyin SMA	35%	38.35

Source: AFPTC

2-21 Grade Standards of White Rice and Broken Rice for Export

Export Standard of White Rice

Sr: No.	QUALITY	MILLING STANDARD	SEPARATION				BROKENS	SIZE OF BIG BROKENS	SIZE OF BROKENS	FOREIGN GRAINS	CONDITION
			PADDY	RED	HEAD RICE	BIG BROKENS					
1.	Emata Super	5% 1 Red Streak	-	-	80	15	5	0.65 & Above	0.35 & Above	6%	White rice milled from Emata Type of Paddy.
2.	Emata Super	10% 1 Red Streak	-	-	75	15	10	- do -	- do -	6%	- do -
3.	Emata Burma	15% 2 Red Streaks	-	-	65	20	15	0.625 & Above	1 & 2	6%	White rice milled from Emata Type of Paddy.
4.	Emata Burma	25%	-	-	60	15	25	- do -	- do -	6%	- do -
5.	Emata Loonzain Special	5% Husked	1	3	89	-	7		+.40 -.75	2%	Cargo rice milled from Emata type of Paddy.
6.	Yahine S.M.S.	35% 2 Red Streaks	-	-	50	15	35	- do -	1,2&3	6%	White rice milled from Yahine type of Paddy.
7.	Ngakywe Burma	15% 1 Red Streak	-	-	70	15	15	- do -	1 & 2	10%	White rice milled from Ngakywe type of Paddy.
8.	Meedone Burma	15% 1 Red Streak	-	-	70	15	15	- do -	- do -	10%	White rice milled from Meedone type of Paddy.
9.	Zeera Super	5% 1 Red Streak	-	-	80	15	5	0.65 & Above	0.35 & Above	6%	White rice milled from Letywezin type of Paddy.
10.	Zeera Super	10%	-	-	75	15	10	- do -	- do -	6%	- do -
11.	Zeera Burma	15% 2 Red Streaks	-	-	65	20	15	- do - Above	1 & 2	6%	White rice milled from Letywezin type of Paddy.

Sr: No.	QUALITY	MILLING STANDARD	SEPARATION				BROKENS	SIZE OF BIG BROKENS	SIZE OF BROKENS	FOREIGN GRAINS	CONDITION
			PADDY	RED	HEAD RICE	BIG BROKENS					
12.	Zeera Burma	25% 2 Red Streaks			60	15	25	0.625 & Above	1 & 2	6%	- do -
13.	Bingala S.M.S.	35% 2 Red Streaks	-	-	50	15	35	0.625 & Above	1,2&3	6%	- do -
14.	Dawebyan S.M.S.	35% 2 Red Streaks	-	-	50	15	35	- do -	- do -	6%	- do -
15.	Ngasein Burma	15% 1/2 Red Streak	-	-	70	15	15	- do -	1 & 2		White rice milled from Ngasein type of Paddy.
16.	Ngasein Burma	25% 1 Red Streak	-	-	60	15	25	Above 0.5	1,2&3		- do -
17.	Ngasein S.M.S.	35% 2 to 3 Red Streaks	-	-	50	15	35	- do -	- do -		- do -
18.	Ngasein Loonzain (Special)	5% Husked	1	6	93		7	- do -	+.40 -.75	2%	Cargo rice milled from Ngasein type of Paddy.
19.	Long Boiled	10% 1 Red Streak	-	-	80	10	10	0.625 & Above	1 & 2	6%	Boiled rice milled from Emata type of Paddy.
20.	Milchar No. 1 Perborlen	8% 1 Red Streak	-	-	80	12	8	Above 0.5	- do -	-	Boiled ricemmilled from Ngasein type of Paddy.
21.	Ngasein Full Boiled	12% 3 to 4 Red Streaks	-	-	74	14	12	Above 0.45	- do -	-	- do -

Export Standard of Broken Rice

Sr. No.	QUALITY	MILLING STANDARD	COMPOSITION					TOLERANCE
			EXTRA	1	2	3	4	
22.	A Extra	As produced from millings of super of all Varieties	100	40				10% Lesser Grades
23.	A Extra & 01	" "	60	40	-	-	-	5% "
24.	A1 & 2 (Mixed)	" "	-	50	50	-	-	5% "
25.	A2, 3 & 4 Mixed	" "	-	-	25	50	25	5% "
26.	B Extra & 1	As produced from millings of Emata S.M.S. and Burma 15% and 25%	60	40	-	-	-	5% "
27.	B1 & 2 (Mixed)	As produced from millings of Ngasein and Meedone Burma 15% - 25% and Emata of any millings	-	50	50	-	-	5% "
28.	B2, 3 & 4 (Mixed)	" "	-	-	25	50	25	5% "
29.	Ordinary 2, 3 & 4 (Mixed)	As produced from millings of Ngasein S.M.S. and Meedone Bazaar milling	-	-	25	50	25	5% "
30.	Boiled Broken Rice 2, 3 & 4 (Mixed)	As produced from millings of Milchar No. 2 and Ngasein Full Boiled	-	-	25	50	25	5% "

Agricultural and Farm Produce Trade Corporation.

Paddy Storage Number and Capacity by State and Division by the end of 1981 – 82.

(capacity- 1000 TON)

Sr. No.	State/Division	Paddy Storage Owned & Hired (in 1979-80)		35-Warehouses Programme under ADB - I		State Owned (64) Warehouses Programme.		Semipermanent Storage (294)		Semipermanent Storage (200)		Total	
		Nos.	Capacity	Nos.	Capacity	Nos.	Capacity	Nos.	Capacity	Nos.	Capacity	Nos.	Capacity
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	KACHIN STATE	101	36	–	–	–	–	18	9	–	–	119	45
2	KAYAH STATE	2	0.3	–	–	–	–	2	1	–	–	4	1
3	KAREN STATE	5	3	–	–	–	–	3	2	–	–	8	5
4	SAGAING DIVISION	579	126	1	1	2	1	19	10	10	5	611	143
5	TENASSERIM DIVISION	50	17	–	–	–	–	2	1	–	–	52	18
6	PEGU DIVISION	776	454	1	1	1	1	53	28	32	17	863	500
7	MAGWE DIVISION	50	19	–	–	–	–	5	3	–	–	55	22
8	MANDALAY DIVISION	152	45	–	–	–	–	–	–	–	–	152	45
9	MON STATE	192	83	–	–	1	0.5	–	–	7	4	200	87
10	ARAKAN STATE	185	88	2	2	4	3	–	–	7	4	196	97
11	RANGOON DIVISION	650	334	–	–	5	4	80	42	64	33	809	413
12	SHAN STATE	–	–	–	–	–	–	–	–	–	–	–	–
13	IRRAWADDY DIVISION	1124	633	3	3	22	13	112	59	80	42	1341	749
	TOTAL:-	3874	1839	7	7	35	22	294	154	200	105	4410	2127

Remarks

1979-80 Paddy Storage	Nos.	Capacity
(1) Corporation Owned Paddy Storage	2411	1181
(2) Hired & Owned Paddy Storage	1463	659
Total:	3874	1839

3.12.81

A-102

2-23 Outline of Peoples Engineering Industry 2

NAME PEOPLES ENGINEERING INDUSTRY 2.

LOCATION No.102, Rangoon - Insein Road
Mayangone township
Rangoon.

AREA 4.005 Acres.

CAPITAL

INVESTMENT 4925000/- (1980-81)

PRODUCTION 10937000/- (1980-81)

STRENGTH 395

RATIO OF ANNUAL INCOME AND OPERATION COST.

Year	Production	Income	Operation Cost	Ratio
1979-80	96.26	101.27	81.5	80.48
1980-81	109.37	120.75	90.81	82.00

Target: 100%

STATUS QUO OF GOVERNMENT AGENCIES, PEI 2, IN CHARGE OF THE MANAGEMENT AND GUIDANCE OF PRODUCTION AND SUPPLY OF POST-HARVEST PROCESSING EQUIPMENT.

Since 1950, some of the parts of rice mill machineries have been manufacturing in Burma. With the strength of 90 workers Burma Industrial Production Co.Ltd. (Now PEI2) started their production of 5 rice mill plants of capacity 25 tons/24hours and also other machineries, such as under Runner disc sheller, whitening cones, paddy seperator etc., .

Government nationalized BIP Co. Ltd, in 1963 and it becomes PEI 2 and from 1965, demand or rice mill machineries decreased and no work orders were given in manufacturing rice mill machineries since 1970. Production trend had changed and no procurement of required raw materials of manufacturing such commodities skilled workers from rice mill machineries section were shifted to other section such as Bolts and Nuts, General Fitting etc., .

And in 1975-76 there were some plans to manufacture some of the rice mill machineries . The Production Capacity of PEI 2 is as follows;

1. It can manufacture up to 50 tons/24 hrs: rice mill plants.

1. For Rice Mill Plant

a) 25 tons/24 hrs: Capacity _____ 3 Nos./year

b) 50 tons/24 hrs: " ----- 2 Nos./year

For Rice Mill Machineries

(a)	Under Runner Disc Sheller 4'	-	8 Nos./year
(b)	Whitening cones 3'	-	8 " /year
(c)	Paddy seperator 60 Compts:	-	5 "/year
(d)	White Rice seperator and double sieve	-	6 Nos/year
(e)	Husk asperator and double sieve	-	6 Nos/year
(f)	Mill Frame (100 tons/24 hrs:)	-	8 Nos/year
(g)	Elevator 6" bracket - 25'height	-	30 " /year
(h)	Hopper 8' x 4'	-	24 " /year

Situation of skilled workers in manufacturing Rice mill machineries ;

Shop	Workers Exist	Skilled workers
Foundry shop	47	7
Machine shop	32	7
Rice mill machineries & assembly shop	14	4
Carpenter y shop	12	3

Future Activities Plan

In 1981-82 fiscal year, BSCIC [illegible] manufacturing one 50 ton/24 hrs Rice mill plant (complete set except Prime mover) and one 25 tons/24 hrs Rice mill plant (complete set except prime mover) for the corperative society . During the four years plan , BSCIC [illegible] Co-operative will give work order of manufacturing 50 nos. of Rice mills plants ranging capacity 50 tons/24 hrs and 25 tons/24 hrs: .

RECORD OF RICE MILL MACHINERIES MANUFACTURED BY FSI 2 DURING 1963 - 1970

Sr. No.	Partic ular	Year	Size	A/U	Quantity
1	Rotary Sieve complete set	1963	6'6" x 4'6"	Set.	1
2	Rice Mill plant No. 9	"	No.9	"	1
3	Rotary sieve (double) complete set	1964	-	"	1
4	Rotary sieve	1964	-	No.	8
5	Rice mill Plant No.9	"	No.9	Set	1
6	Elevator 5" bucket	"	41	Nos.	2
7	Rotary sieve	"	7' - 6' x 5'	"	1
8	MS Cyclone	1965	No.9	Set.	6
9	Rotary Sieve	"	4" x 11"	Set	1
10	Paddy sampling probe	"	-	Nos.	101
11	Damage	"	-	"	120
12	"	"	-	"	80
13	"	"	-	"	40
14	"	"	-	"	80
15	"	"	-	"	40
16	Rice mill No.9	"	No.9	Set	1
17	Paddy sampling probes.	"	-	No.	20
18	Under Runner disc sheller.	"	3½'	Nos.	2
19	Elevator post	1968	25' height	"	1
20	Seed processing machines	"	-	Set	1
21	Chimney	"	-	"	5
22	Elevator 5' bucket	1968	25' height	Nos.	4
23	Paddy seperator	"	45 Compts.	"	1
24	Rotary sieve and aspirator (double tray)	"	6' x 4'	"	1
25	Threshing machines	1969	-	Set	3
26	Paddy seperator Rocker	1970	1" x 18"	"	1
27	Conveyor	"	9"Ø x 18"x6"	"	11
28	Frame	"	4" x 2"	"	2
29	M.S shafting	"	8"Ø x 6" Ø	"	2
30	M.S. Chennel	"	1½' x 11"	"	1
31	M.S. Gesset Plate	"	4"x2"x3/4"Ø	R. Ht	306
32	Pipe	"	3/4' Ø	"	604
33	Motor Frame	"	1'8" x 9½'	Nos.	2
34	Under Runner Disc sheller	"	3'	"	1
35	" " " "	"	3'	"	1
36	Whitening Cones	"	2'	"	2
37	Asperator	"	2'Ø x 8'Ø	"	1
38	Paddy seperator	"	11' x 5' x1½"	Set	1
39	Elevator Head Boot	"	-	"	2

P E 1 2

Statement showing Production Target and Actual production

Kyats in thousand

Particular	U/U	1979-80 Production Target	1979-80 Actual Production	1980-81 Production Target	1980-81 Actual Production	1981-82 Production Target	1981-82 Actual Production
1 Engine Boring	-	-	-	550.00	637.96	600.00	
2 Spare Parts	Ton	400.00	1638.66	1427.90	245.60	1600.00	
3 Ball Bearings	-	661.48	126.14	1072.28	104.11		
4 General Fitting		4323.74	6463.24	6897.45	8403.42	6300.00	
5 Bolts and Nuts		150.00	159.99	-	17.35	-	
		1620.00	1839.62		183.88		
6 (a) Foundry				100	75.32	110	
(b) Foundry		74.00	30.10	10	29.72	12	
		605.02	246.00	66.48	261.96	106.20	
7 Tool pipe		40.00	25.12	30	74.59	106	
		29.76	312.59	389.76	1110.67	1436.55	
Total : -		1000.00	9606.91	10425.87	110937.60	10042.75	

RECORD OF RICE MILL MACHINERIES MANUFACTURED BY PEI 2 DURING 1975-1981

S. No.	Particular	Year	Size	A/U	Quantity	Remark
1	Under Runner Disc Sheller	1975-76	5½'	No.	6	For AFPTC
2	Pulley	1976-77	16" x 7"x2"	No.	60	"
3	Mild steel shafting	"	2"Ø x 6'8"	"	20	"
4	Eccentric	"	3" Ø x 2"	"	20	"
5	Pulley	"	15" Øx 6"x2"	"	4	"
6	Probe	"	-	"	300	"
7	Under Runner disc sheller	"	3'1/2'	"	3	"
8	Husk Asperator Unit	"	-	Set	2	"
9	C I Pulley	1977-78	15" Øx6" x2"	Nos.	3	3
0	"	"	6"Ø x 6" x 2"	"	4	"
1	CI weight pulley	"	14" Ø x 7"x2"	"	6	"
2	Polishing Cones	"	3'	"	7	"
	Elevator Head,Foot for 6" bucket	"	25' height	Set	9	"
	Paddy seperator	"	60 Compts.	No.	1	"
	" "	"	54 Compts.	"	4	"
	Under Runner disc sheller	"	3½'	"	7	"
	Under Runner disc sheller (Schule type)	"	4'	"	2	"
	Paddy seperator Zig Zag	"	-	Nos.	150	"
	Elevator Head Foot single	"	-	Set	8	"
	double	"	-	"	2	"
0	Predleaning Unit Hopper	1978-79	6' x 6'x 6'	No.	1	"
1	Bin	"	8'x 4'x 4'	"	2	"
	Cyclone	"	2'x 2'x 6'	"	1	"
1	Mill Frame	"	28'x 12'x96"	Set	1	"
2	Elevator 7" bucket	"	25' ht:	"	1	"
3	White rice sieve asperator	"	- -	set	2	"
4	Whitening Cones	"	2½'	No.	2	"
	" "	"	3½'	"	1	"
	" "	"	3'	"	2	"
	Under Runner Disc Sheller (upper disc)	"	32" x 3½'	"	2	"
	Cone Pulley	"	32" x 3"	"	1	"
	Whitening Cones	1979-80	3'	Nos.	2	"
	Under Runner Disc sheller	" "	3½'	"	2	"
	Paddy seperator	" "	45 Compts.	"	1	"
	Paddy seperator spring	" "	2½' or 2¼'	"	12	"
	Elevator 6"	1980-81	42' ht:	set	3	"
	Bin	" "	-	No.	4	"
	Bin	" "	-	"	4	"

2-24 Case of the Biggest Rice Mill Machineries Manufacturers in Private Sector

Burma National Foundry
Manufacturer of Rice Mill
No.84,Tawadaintha Street
Rangoon. Phone 70507

List of Manufactured goods		Production Capacity	Estimated Annual Production	Price
1. Under Runner Disc Sheller	3'6"	10	1	1500 /-
2. " " " "	3'0"	10	2	1000/-
3. " " " "	2'6"	10	3	750/-
4. " " " "	2'0"	20	10	500/-
5. Polishing Cones	20"	15	10	1200/-
6. Pulley assorted size	-	-	-	-
7. Accentric	-	-	-	-
8 Paddy separator spring	-	-	-	-
9. " " Rocker	-	-	-	-
10. " " spring Box	-	-	-	-
11. Miscellaneous others	-	-	-	-

It is oneof the biggest rice mill machineries manufacturers in private sector. The quantity of manufactured goods are entirely relied on the demand from the rice millers. Annual Sales is round about 200000/- and raw material used in manufacturing is procured from the local old C.I.machineries, frames etc.,

Burmese National Engineering Workshop
No. 393, Lower Kemendine Road,
Ahlone Township, Rangoon.

List of manufactured goods	Production Capacity	Estimated Annual Production	Price
1. Under Runner disc sheeler	3' 8	1	10000/-
2. " " "	2' 6" 10	2	7500/-
3. " " "	2'0" 12	3	5000/-
4. Whitening Cones	16" -	2	7000/-
5. " "	18" -	2	10000/-
6. " "	20" -	2	12000/-
7. Other Rice Mill Machineries			

Once, U Kyo Hla was one of the technicians in F.A. Schule Co./ BURMA which has been manufacturing rice mill machineries since pre-war days. Private manufacturers are solely depended on the demand from the Rice millers. Most of the Rice mill machineries such as under runner disc shellers, whitening cones, were not easily worned out except some of the parts such as M.S Shafting, Ball Bearing, etc,. So the demand of these machineries are very few except in the case of constructing new Rice mills. So the production trend has changed to other commodities and these workshops. become general workshop.

U Maung Maung Khin
Paddy Separator Manufacturing and repair shop
No. 50, Lake-Kan Road,
Rangoon.

List of manufactured goods	Production Capacity	Estimated Annual Production	Price
Paddy seperator 45 Compts:	24	10	[illegible]/-

It is the ~~master~~ maker of paddy seperator and it also repairs the old ones. Production is relied on the demand and raw material is procured from the open market. So the material cost is very high and it becomes to [illegible] for 45 compts type paddy seperator. They also repair existing over in the private rice mill on contract basis.

U Pargyi and Sons.
Paddy seperator manufacturing and repair shop.
No.51, 121st, Streer,
MaUgon, Rangoon.

List of manufacturer.	Production Capacity	Estimated Annual Production	[illegible]
Paddy seperator 45 Compts:	12	2	If the [illegible] would be and provide the [illegible] 100 [illegible]

It is a small scale home industry.

2 – 25

List of Wunza Rice Mills Permitted to Install During the Year 1979 to 1982.

Capacity - 8 hrs - 1 shift

SR No.	Division	1979 - 80		1980 - 81		1981 - 82		Total	
		No.	Capacity	No.	Capacity	No.	Capacity	No.	Capacity
1.	Rangoon	-	-	-	-	5	9 tons	5	9 tons
2.	Pegu A	-	-	-	-	-	-	-	-
3.	Irrawaddy	51	255	72	172	20	100	103	527
4.	Mon State	10	23 tons	17	51 tons	3	17 tons	30	91 tons
5.	Arakan State	1		-	-	-	-	1	
	Total	62	278 tons	49	223 tons	28	126 tons	139	627 tons

Source: AFPTC

In-service Training in A.F.P.T.C.

Sr: No:	Training	Period	Trainees	No. of staff so far trained
1	Finance and Accounts Training Course	2 weeks	Top Budget Staffs.	111
2	Stores Accounting Procedure Training Course	"	Ledger Staffs.	107
3	Storage and Pest Control Training Course	"	Storage Staffs	83
4	Pest Control Training Course	"	Pest Control Staffs at Divisions.	12
5	Rice Bran Oil Mill Technical Training Course	"	Lab. Technician at Bran Oil Mill.	103
6	Procurement Depot Discharge Training Course	"	Depot Staff at Divisions.	483
7	Rice Mills Management Course	"	Factory Managers.	79
8	Paddy/Rice Industries	"	Township Managers	125
9	Basic Rice Mill and Processing Supervision Course	"	Mill Staffs.	137
10.	Repairing and Maintenance of Weighing Scales and Moisture Meters.	"	Procurement depot and Storage Depot Staffs.	234

Rice Bran Oil Mill in Burma

Rangoon Division - (7 Mills)

Sr:No.	Mill No.	Name of Oil Mill	Towhship	Capacity
Rangoon				
1.	01	Rice Bran Oil Mill	Kamayut	25 T/D
2.	02	-do-	Thingangyun	25 T/D
3.	03	-do-	Insein	25 T/D
4.	11	-do-	Kyauktan	20/T/D
5.	21	-do- (Sein Kyaw)	Thaketa	40 T/D
6.	20	General Oil Mill	Thingangyun	40 T/D
7.	22	Yadana Oil Mill	Kamayut	40 T/D
8.				
Pegu Division - (6 Mills)				
8.	04	Rice Bran Oil Mill	Paungde	25 T/D
9.	07	-do-	Letpadan	25 T/D
10.	18	-do-	Zigon	15 T/D
11.	08	-do-	Nyaunglebine	25 T/D
12.	09	-do-	Pegu	25 T/D
13.	19	-do-	Phyu	15 T/D
Irrawaddy Division - (7 Mills)				
14.	05	Rice Bran Oil Mill	Henzada	25 T/D
15.	12	-do-	Pyapon	15 T/D
16.	13	-do-	Kyaiklat	15 T/D
17.	14	-do-	Bogale	15 T/D
18.	15	-do-	Myaungmya	15 T/C
19.	16	-do-	Moulmeingyun	15 T/D
20.	17	-do-	Bassein	40 T/D
Mon State (1 Mill)				
21.	10	Rice Bran Oil Mill	Moulmein	25 T/D
Arakan State (1 Mill)				
22.	06	Rice Bran Oil Mill	Sittwe	25 T/D.
	Total	22 Mill		535 T/D

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2-28 Edible Oil Production

Edible Oil Production

(In '000 tons)

	1979-80 (Provisional Actual)	1980-81 (Provisional)	1981-82 (Plan)
1. Ground Nut Oil	71.9	88.4	103.0
2. Sessamum Oil	56.5	57.3	58.5
3. Cotton Seed Oil	0.6	0.6	0.6
4. Sunflower Seed Oil	3.6	10.7	11.0
5. Rice Bran Oil	1.6	1.9	2.3
6. Vegetable Oil & Magarine	0.5	0.4	0.4
7. Coconut Oil	1.4	0.9	1.0
Total	136.1	160.2	176.8

2-29 Purchase Prices of Maize and Beans by Government (1980/81)

Item	Unit (/basket)	Price (K)
MAIZE	55	20
MATPE(BLACKMATPE)	72	50
PEDISEIN	72	40
BUTTER BEAN	69	30
SULTANI	69	30
SULTAPYA	69	30
DESINGONE	72	35
PEYIN	72	30

Source: AFPTC, December, 1981

2-30 Procurement and Export Volume of Purchase and Beans

Unit: Purchase; Long ton
Export; Metric ton

	Year							
	1977 - 78		1978 - 79		1979 - 80		1980-81(assumpt.)	
	Purchase	Export	Purchase	Export	Purchase	Export	Purchase	Export
Matpe	24,003	3,101	35,694	7,586	48,829	31,718	49,182	54,624
Pediseiv	1,441	297	517	698	99	949	1,798	50
Butter Bean	11,942	11,862	9,081	9,629	8,376	9,625	8,619	6,536
Bocate	2,359	1,296	92	-	7	1,092	136	-
Sultani/pya	10,488	5,109	4,552	2,012	1,909	10,565	3,447	2,564
Toordhall	3,351	2,612	11,183	2,241	2,269	3,948	17,134	3,127
Peyin	4,952	2,478	3,063	1,210	559	3,979	1,493	2,883
White Bean	7	11	2	-	-	60	-	-
Gram Split	-	244	-	114	-	-	-	-
Gram Whole	4,554	3,657	520	324	-	-	-	-
Redflat Bean	746	-	42	405	-	239	5	-
Penauk	23	-	38	-	-	40	-	-
Pelun	72	-	3	-	-	-	-	-

Source: AFPTC, December, 1981