

Cooperative Agreement USAID 492-CA-1707
Project No. 498-0265

Semi-Annual Progress Report
September 1, 1984 - February 28, 1985

-1- PDARR-720

12/11/73

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General

On October 1 and 2, 1984, the Program Committee of the Board of Directors had a special review of the Agricultural Engineering Program. The following are excerpts from the report:

"The accomplishments of IRRI are impressive in relation to the small size of the department. The scientists of the Agricultural Engineering Department are to be complimented on their contributions to the design of useful equipment, their field testing and subsequent popularization. The special industrial extension projects undertaken with USAID support in the Philippines, Indonesia, Thailand, India and Egypt have played a catalytic role in generating interest in the development and distribution of improved farm implements relevant to rice cultivation. A similar program now in progress in Burma with support from CIDA is also proving to be very useful. The socio-economic studies undertaken by IRRI in collaboration with National Research System has clearly brought to light the beneficial impact of improved machinery on productivity, increase of cropping intensity and overall employment and income. The engineering department has an additional service function to other departments at IRRI."

The Board recommended that the Economics Section be moved to the Agricultural Economics Department but continue their studies on mechanization in cooperation with the Agricultural Engineering Department.

Because of the interest in mechanization in African countries a staff member at the Assistant Engineer level should be assigned to investigate the special needs of Africa.

As a result of the recommendations from the Board, the Department has reorganized as indicated in the Organizational Chart in Appendix A.

Staff Changes

Mr. Makoto Ariyoshi retired on April 20, 1985. His position will not be filled.

Dr. Yong Woon Jeon was appointed an Agricultural Engineer effective November 15 for a period of three years on a special project funded by IDRC. His work will concentrate on Grain Drying Research and the development of a flexible drying system utilizing biomass as a fuel for heat and the wind to move air through the dryer by means of a unique wind machine.

Mr. Ignacio Manalili, Assistant Engineer, was appointed coordinator of African programs and coordinator of training.

Design and Development

The major emphasis has been on completing the development of the Fertilizer Placement Machines. A manufacturer has been engaged to fabricate a number of machines. These are being tested by our test section and will be given to farmers for testing in their fields.

The development of machines for direct seeding of rice is continuing. The cultural practice and procedures for land preparation need to be developed and tested.

Country Programs

India

The project is working with 8 manufacturers to fabricate the thresher, reaper and transplanter. Numerous demonstrations have been held and 15 machines have been fabricated. One manufacturer has had cash sales of the reaper. The project staff are assisting him in fabricating his first units.

The project activities are just getting underway and support is needed for a few years before the staff can maintain a positive program.

The Advisory Committee met on 5 March, 1985. A copy of the report to the Advisory Committee is included in Appendix B.

Thailand

Training has been an important activity during the past six months. Training included monthly seminars for the Agricultural Engineering Department staff, training for the government agency staff, and training for manufacturers.

The monthly seminars are designed to upgrade the capabilities of the staff and bring new information to their attention.

The District Agricultural Officers, Agricultural Officers and Extension Specialists were given training in the IRRI designed machines so they can properly demonstrate to and train farmers in the proper use of machines.

A 12-day training course was conducted for manufacturers to help them improve their production technology.

The project staff assisted government agencies and manufacturers in conducting training for farmers.

The project conducted a survey in the farming areas to assess the acceptance of machines by farmers. The inclined plate planter, the rolling injection planter, a cyclone seeder, a push pull weeder and a buffalo plow were all introduced to farmers.

An economic study of the northeast area was initiated to determine the economic status of farmers and the status of mechanization in the area.

A detailed report of activities and plans for the next 6 months for Thailand is in Appendix C.

Indonesia

The ILO survey report on "Diffusion and Commercialization of Rice Postharvest Equipment in West Sumatra" is completed and will be distributed.

A proposal was prepared for the initiation of a Farm Equipment Research and Development program at the Research Station in Sukamandi, Balitan, and Maros.

A team of four individuals (two engineers and two economists) visited Indonesia to evaluate the Industrial Extension Program. The report and recommendations were submitted to IRRI and USAID Jakarta.

A turtle tiller, disk plough and "tapak-tapak" pump were sent from the Philippines for testing in Indonesia.

A training program for thresher manufacturers in the Aceh Province has been planned to assist in improving the quality of the workmanship of the manufacturers. This followed complaints that machines were failing prematurely.

A detailed report for Indonesia is included in Appendix D.

Philippines

The project activities for the Philippines were evaluated in October 1984. It was recommended that the project be extended for at least two years. A copy of the report was submitted to IRRI and USAID/Manila.

A major activity for the past 6 months was the promotion of the "tapak-tapak" pump in the vegetable growing areas. This effort included collaboration with MAF Regional Offices.

The transplanter is now being produced in 6 regions of the Philippines.

Ten manufacturers were assisted in developing a sheller attachment for the axial-flow thresher.

The axial flow pump was modified to produce a low cost version called a "Sipa" pump. It is sold for \$50 and a number are being fabricated for field evaluation.

A training course on financial management and organization was held in Region 12 for a newly formed Association of Manufacturers.

A detailed report and plan of future activities for the Philippines is included in Appendix E.

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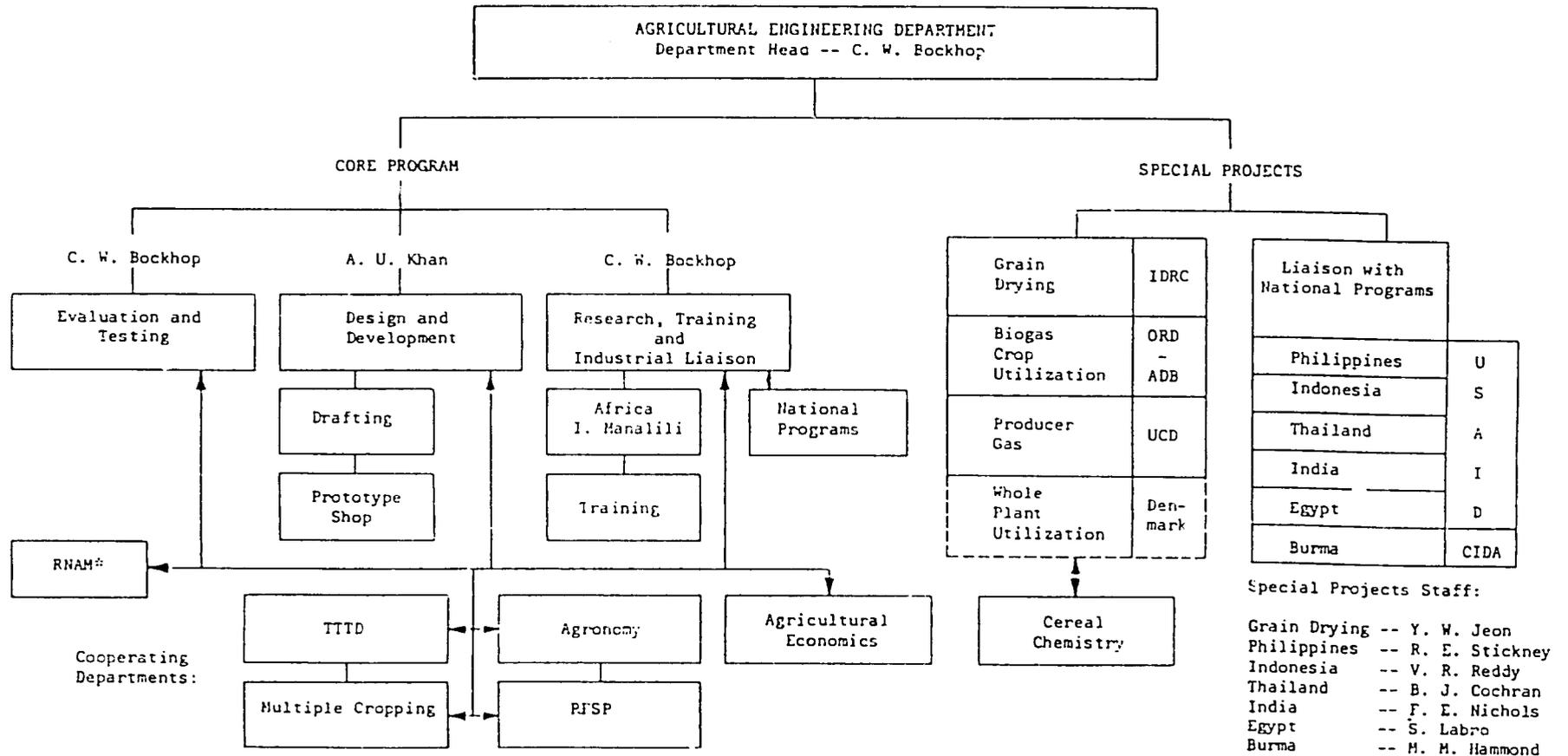
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ORGANIZATION CHART



Special Projects Staff:

- Grain Drying -- Y. W. Jeon
- Philippines -- R. E. Stickney
- Indonesia -- V. R. Reddy
- Thailand -- B. J. Cochran
- India -- F. E. Nichols
- Egypt -- S. Labro
- Burma -- M. M. Hammond

*Regional Network for Agricultural Machinery

AGRICULTURAL ENGINEERING DEPARTMENT
 ORGANIZATION CHART
 (EFFECTIVE APRIL 1, 1985)

Department Head -- C. W. Bockhop
 E. Sunaz, Secretary

C. W. Bockhop

Evaluation and Testing

Instrument Shop
 A. Mazaredo, RA

Laboratory
 I. Barredo, Field Aide

Field Test Personnel

A. Cuballes, SRA
 M. Aban, RA
 M. Marasigan, Field Asst.
 F. de Leon, Field Asst.
 G. Ludra, Field Asst.
 L. Villegas, Field Asst.
 N. Ongkiko, Field Aide
 R. Brill, Field Aide
 C. Dimaranan, Field Aide
 P. Aldemita, Field Aide
 R. Tobias, Lab. Aide
 V. Druga, Laborer
 T. Alvarez, Laborer
 T. Balba, Laborer
 E. Diaz, Laborer

A. U. Khan
 E. Castro, Secr.

Design and Development

L. Kiamco, SRA
 M. Diestro, RA
 E. Calilung, RA
 E. Bautista, RA
 R. Bautista, RA
 A. Vasallo, RA

Drafting

F. Jalotjot, Shop Supr.
 R. Angeo, Draftsman
 R. Cruz, Draftsman
 M. Aquino, Draftsman

Prototype Shop

E. Dunga, Shop Supr.
 A. Dizon, Shop Supr.
 J. Macatangay, Shop Asst.
 Z. Borja, Shop Asst.
 A. Barot, Shop Asst.
 P. de Mesa, Shop Asst.
 M. Salac, Shop Asst.
 A. Smagula, Shop Asst.
 A. Camacho, Shop Asst.
 R. Santos, Shop Asst.
 M. Fabellar, Shop Asst.
 M. Castro, Shop Asst.
 N. Faunlagui, Shop Asst.
 R. Capule, Shop Aide

C. W. Bockhop

Research and Industrial Liaison

Philippines
 R. E. Stickney
 S. Mamit, Secr.
 G. Salazar, SRA
 H. Manaligod, RA
 J. Damian, Driver

Indonesia
 V. R. Reddy

Thailand
 B. J. Cochran

India
 F. E. Nichols

Burma
 M. M. Hammond

Egypt
 S. Labro

Africa
 I. Manalili

Training
 I. Manalili

Y. W. Jeon
 M. F. Sunga, Clk-Typ

Grain Drying and Crop Utilization

L. Halos, RA
 A. Belonio, RA
 A. Elepano, RAide
 -----, RA

Supplies and Purchasing

N. Rivera, Office Asst.
 A. Armia, Office Aide

AGRICULTURAL ECONOMICS DEPARTMENT

J. Bart Duff
 H. Rada, Secr.
 L. Banez, Secr.

Economic Analyses

-----, SRA
 M. J. Lim, RA
 C. Maranan, RA
 F. Juarez, RA
 L. Ebrer, RA
 A. Sal. ia, RA

REPORT OF
CIAE-IRRI INDUSTRIAL EXTENSION PROJECT

For presentation at

SECOND ADVISORY COMMITTEE MEETING

(5th March, 1985)

at

INDIAN AGRICULTURAL RESEARCH INSTITUTE

PUSA, NEW DELHI - 12

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GENERAL INFORMATION

1. Name of the Project : CIAE-IRRI Industrial Extension Project on Small Farm Machinery
2. Location of the Project : Tamil Nadu Agricultural University Campus, Coimbatore, India.
3. Sanction Document : No. 9-5/79-AE dated 6-6-1983 of Indian Council of Agricultural Research, New Delhi.
4. Duration
 - a) Year of start : 1983
 - b) Year of completion : 1985
5. Staff position : As on 28-2-1985

| S. No. | Designation | Scale of pay | No. of posts | Present incumbent | Date of joining the Project |
|--------|---|--------------|--------------|-------------------|-----------------------------|
| | | B. | S/Shri/Smt. | | |
| 1. | Project Engineer (S-3) (Project Leader) | 1500-2000 | 1 | P. Datt* | 31-10-1983 |
| 2. | Agro Industrial Engineer (T-7) | 1100-1600 | 1 | Vacant | - |
| 3. | Design & Test Engineer (S-2) | 1100-1600 | 1 | Vacant | - |
| 4. | Economist (S-2) | 1100-1600 | 1 | Vacant | - |
| 5. | Draftsman (T-II-3) | 425-700 | 1 | Vacant | - |
| 6. | Technician (T-1) | 260-430 | 3 | Vacant | - |
| 7. | Driver (T-1) | 260-430 | 1 | S.K.Gurusamy | 2-7-1984 |
| 8. | Accountant | 425-700 | 1 | M.Velu | 15-12-1983 |
| 9. | Stenographer | 425-700 | 1 | V.S.Santha | 1-12-1983 |
| 10. | Clerk-cum-Typist | 260-400 | 1 | Vacant | - |
| 11. | Messenger | 196-232 | 1 | Vacant | - |
| 12. | Security Guard | 196-232 | 2 | Vacant | - |

Unaudited approximate expenditure upto 28.2.1985:

| | 1983-84 Rs. | 1984-85 (upto 28.2.85) Rs. | Total Rs. |
|---|----------------|----------------------------------|--------------|
| I. Establishment Charges | | | |
| 1) Salary of Establishment (Nett) | 10,142.45 | 67,264.95 | 77,407.40 |
| 1i) Allowances | | | |
| a) Medical charges | | 752.80 | 752.80 |
| b) Travelling allowances | 689.50 | 1,458.80 | 2,148.30 |
| 1ii) Bonus | | 871.00 | 871.00 |
| II. Other Charges. | | | |
| 1. Assets acquired | 2,09,973.34 | 31,228.84 | 2,41,202.18 |
| 2. Expenditure on Stationery | 510.37 | 927.55 | 1,437.92 |
| 3. Expenditure on Postage | 296.50 | 495.00 | 791.50 |
| 4. Other office expenditure | 307.20 | 391.55 | 698.75 |
| 5. Expenditure on Casual labour | 1,100.00 | 1,463.00 | 2,563.00 |
| 6. Other contingencies | 1,315.57 | 11,697.61 | 12,913.18 |
| 7. Expenditure on non-consumable stores | 240.00 | 3,028.02 | 3,268.02 |
| | | | 3,44,066.05 |

* Transferred temporarily from Central Institute of Agricultural Engineering, Bhopal, to organise the activities of the Project.

The Expatriate consultant, Mr. Fred E. Nichols, joined the Project with effect from 6.8.1984.

Best Available Document

PLAN AND PROGRESS - FIRST YEAR

The strategy statement for the Industrial Extension Project stipulates following work plan for the first year of the Project.

- (a) The unit will be established and located.
- (b) Needed personnel will be recruited/hired. The Project Engineer and IIRI consultant will be appointed. Other engineers and technicians and other personnel will be recruited/hired.
- (c) Needed facilities will be developed.
 1. Offices established.
 2. Shop facilities located.
 3. Equipment and transport procured.
- (d) Liaison will be established with manufacturers in the Coimbatore area.
- (e) Bench mark survey will be carried out on the farm machinery industry in the area.
- (f) Depending on the priority needs for equipment, designs from the International Rice Research Institute, from Central Institute of Agricultural Engineering and other institutions will be introduced to local manufacturers. Assistance will be given in fabrications, testing and demonstration of the first models.
- (g) Project Leader and Engineers appointed to the Project will be sent to International Rice Research Institute for industrial extension training.
- (h) Designs from IIRI and other locations will be tested under local conditions and modified as needed.

The Progress made during first year of the Project has been reported in the Interim consolidated Report which is attached herewith.

WORK PLAN FOR SECOND YEAR

The strategy statement for the Industrial Extension Project sets following targets for the second year of the Project.

- (a) The activities initiated in the first year will be continued.
- (b) The contact with manufacturers will be expanded to include other areas of the Coimbatore region.
- (c) Training programmes will be established for manufacturers to be conducted by the Industrial Extension Project personnel.
- (d) Demonstrations will be conducted to introduce needed machinery to farmers and to assist manufacturers in establishing their markets.
- (e) Project Engineer and Consultant will participate in the Annual Workshop of the ICAR Coordinated Scheme on Farm Implements and Machinery.

PRODUCT DEVELOPMENT ACTIVITY

The project is at present working in collaboration with manufacturers for development of a reaper, a thresher and a rice transplanter as commercial products available to the rice farmers. The product development activity includes supply of drawings, critical parts and prototypes as models for understanding drawings. It also includes training, guidance and provision of workshop facility.

The project is working with following manufacturers.

1. Ms. National Engineering co,
Angappa Naick Street,
Madras - 600 001.
2. Ms. Elseetee Industries,
PO Box No. 1808
Singanailur,
Coimbatore - 641 005.
3. Ms. Swathi Industries,
262, Maruthamalai Road,
P.N. Pudur,
Coimbatore - 641 041.
4. Ms. Valampuri Industries,
1-B, Thiyagi Kumaran Street,
P.N.Pudur,
Coimbatore - 641 041.
5. Ms. Karthic Industries,
3/9, Natesamudaliar Street,
Vadavalli, Coimbatore - 641 041.
6. Ms. Grants Agro Engineering & Industries
38, Damodara Reddy Street,
T.Nagar, Madras.
7. Ms. Marudamalai Andavar Industries,
P.N.Pudur, Coimbatore - 641 041.
8. Ms. Em. Em. Castings,
Private Industrial Estate,
Kuruchi, Coimbatore - 641 021.

Apart from above there are some-outstation industries who have been provided drawings only.

The progress of product development activity is given in table 1.

Table 1. Progress of Product Development.

| S.No. | Machine | Cooperating Manufacturers (No.) | Total Production (No.) |
|-------|--|---------------------------------------|------------------------------|
| 1. | 1.0 m Vertical Conveyer Reaper (RE-2) on Power Tiller (PT-5) | 5 | 10 |
| 2. | 6- row Rice Transplanter (TR - 4) | 3 | 3 |
| 3. | Axial Flow Thresher (TH - 8) | 2 | 2 |

MARKET DEVELOPMENT ACTIVITY

For assisting the manufacturers in creating demand for the machines, demonstrations were organised in various areas in collaboration with manufacturers, Agriculture Department and Agro Industries Corporation. The demonstrations were attended by a large number of farmers, govt. officials, bankers and press. The progress of this activity is shown in Table -2 for the reaper and the thresher. A system for continuous demonstration of the transplanter in workshop has been developed by using nursery grown ⁱⁿ steel frames on hard surface. In the next transplanting season the transplanter will be demonstrated in the farmers fields who ^{have} already been contacted during demonstrations of reaper and thresher.

The observations made during the demonstration, farmers comments and special conditions encountered are given below:

1. In vast area in Thanjavur district farmers grow pulses as relay crops with paddy to utilise the residual moisture. At the time of harvesting the pulses seeds germinate and use of reaper damages the pulse plants.
2. Some farmers expressed that the chopped straw produced by TH-8 thresher is not good for storage and handling. Other farmers informed that this size of straw is liked by the cows.
3. The output of the thresher depends on the quantity and quality of straw in the crop. Maximum grain output of 12q/hr was observed at one location while 6 to 8 q/hr was the output at most of the locations.
4. Most of the farmers appreciated that no grain was lost with the straw and chaff coming out of the TH-8 thresher.
5. At one location the reaper was used for harvesting water grass.

The performance of the reaper was appreciated.

6. In heavy clay soils from which water could not be drained before harvesting and in which puddling was done by tractors the reaper had to be removed part by part after it sank down. But at most of the locations no traction problem was encountered. Wheels may have to ^{be} redesigned for making the reaper suitable for the worst condition
7. The manufacturers are receiving several enquiries for the thresher and the reaper from the areas in which they were demons

Table 2. Progress of Market Development Activity-Demonstrations

| Date | Place | Distance from Coimbatore | Name of the contacted farmer | Demonstration Hours | |
|----------------------|--|--------------------------|------------------------------|---------------------|-----------------|
| | | | | Reaper (RE-2) | Thresher (TH-2) |
| 28.9.84 29.9.84 | Kottur Malayandi Pattinam, Dt. Coimbatore. | (70) | Mr. Ramakrishnan | 2.0 2.0 | - |
| 29.12.84 29.12.84 | Alandurai, Coimbatore. | (35) | Mr. Aruchamy | 3.5 | - |
| 1.1.85 | -do- | (35) | -do- | - | 3.0 |
| 7.1.85 | Chande Goundampalayam Thondamuthur Coimbatore. | (30) | --- | 3.0 | 5.0 |
| 10.1.85 | Vadavalli, Coimbatore. | (5) | --- | 1.5 | --- |
| 18.1.85 | -do- | (5) | --- | 3.0 | --- |
| 23.1.85 | Tamil Nadu Sugar Farm Corporation, Thanjavur | (280) | --- | 2.0 | 2.0 |
| 5.2.85 | Kattu Thottan Thanjavur | (250) | Mr. Magglasamy | 2.0 | 2.0 |
| 6.2.85 | Govindapuram Thiruvaidaimaruthur Thanjavur | (280) | Mr. Radhakrishnan | - | 1.0 |
| 7.2.85 | Pandaravadai Mayiladuthurai Thanjavur | (320) | Mr. Santhanakrishnan | 0.5 | 1.0 |
| 7.2.85 | Keelavali Attakulam, Sirkali Thanjavur. | (350) | Mr. Natarajan | 1.5 | 2.5 |
| 8.2.85 | Chidambaram South Arcot. | (330) | Mr. Pannirselvam Professor. | 2.0 | --- |
| 16.2.85 | Nagavalli, Chamraj-Nagar, Karnataka. | (180) | Mr. N.M.P. Pattusami Patel | 1.0 | 1.5 |
| 22.2.85 | Thiruvallathur Palghat, Kerala. | (60) | Mr. P. Chidambaram | 3.0 | 3.0 |
| 23.2.85 | -do- | (60) | -do- | 1.0 | 3.0 |
| | | | | 34.0 | 24.0 |

THAI-IRRI INDUSTRIAL EXTENSION AND
SMALL FARM MECHANIZATION

Semi-Annual Report
October 1, 1984 - March 31, 1985

Prepared by

Chak Chakkaphak
DOA-AED Co-Leader

Bill Cochran
IRRI Co-Leader

Date: April 8, 1985

Semi-Annual Progress Report

The IRRI-THAI Industrial Extension and Small Farm Mechanization Project continued activities of Demonstrations, Exhibition, Training and Cooperation with various government agencies. The amount of involvement in each category has increased significantly during the past 6 months. A brief description of these activities are as follows.

DEMONSTRATIONS:

A number of demonstrations were conducted by the project staff to farmer groups, training programs and in conjunction with national exhibitions. All rice production equipment were not demonstrated each time but selected machines were used based on the interest of the groups. An increased number of request came from extension officers and project leaders.

EXHIBITIONS:

The project participated in three major exhibitions since October 1984. The exhibits included arranging for literature distribution and demonstration of machines.

1) Northern Agricultural Mechanization Exhibition at Pitsanuloke. The exhibition included 3 days with field demonstrations of all IRRI developed machines.

2) National Agricultural Week - at Kampang Saen for 6 days with field demonstrations of plowing, transplanting and direct

seeding. Soil boxes were located at the exhibition sites to demonstrate hand seeders and weeders by interested observers.

3) Workshop on Technology and Technology Transfer for Rural Women at the Asian Institute of Technology for 3 days. There were no field demonstrations although the machines were discussed in detail during the workshop.

TRAINING:

Training continues to be a major part of the project. There is a continuous need to train AED staff, government agency staff, manufacturers and farmers. Each of these groups have received some training during the semi-annual reporting period. These training programs are summarized as follows.

1) Agricultural Engineering Division Staff: Training for the AED staff included seminars held each month beginning January 1985. The seminar programs are selected by an AED-IRRI staff committee and is normally scheduled for 2 hours duration. A list of proposed future seminar topics are as follows:

ORGANIZATION OF AED SEMINAR

1. Frequency: 1 per month
2. Time: First Monday 9.00-10.00 A.M.
3. Suggested Topics:
 - a) Agricultural Efficiencies
 1. field
 2. machine
 3. machine capacity

- b) Mechanical Drives
 - 1. V-Belt 2) Universal joints 3) Gears
 - 4) Chain & sprocket 5) Hydraulic
- c) Dimensions & Dimensional Analysis
- d) Development of Pi terms
- e) Models and Similitude
- f) Design of Transport Systems
- g) Alternate Fuels
- h) Research Methodology
- i) Post Harvest Technology
- j) Development of Experimental Machinery Prototypes
 - a) Fertilizer applicators b) Improved moldboard plow
 - c) Soybean thresher d) Groundnut Digger
- k) Potentials for Advanced Degree Training
- l) Automatic Sensing-Controls
- m) Computer Applications
- n) Field Testing Designs for Statistical Analysis
- o) Government Policy and Marketing and its Effect on Mechanization.
- p) Agricultural Extension Program in Thailand
- q) Graphical Methods
 - a) Curve plotting b) Histograms c) 3 dimensional plots
 - d) Nomographs
- r) Other:
 - 1) Writing Project Proposals
 - 2) Ideas from AED Seminar Committee

The first seminar was entitled "Introduction to Computers". An outside resource person was invited to participate in addition to the IRRI staff. The second seminar was entitled "Research Methodology" presented by a resource person from Chulalongkorn University. The objective of these seminars are to provide the professional AED staff with appropriate topics to improve their capability.

2) Government Agency Staff: In order for the project to effectively cooperate with projects and government agencies, appropriate individuals must have some training in mechanization. Training not only assures the machines will be used properly by the agency staff but they are also capable of including some training of farmers in their programs. The following training programs were conducted for government agency staff.

| <u>Participants</u> | <u>Location</u> | <u>Duration</u> | <u>No. of participants</u> |
|----------------------------|-----------------|-----------------|----------------------------|
| a) District Agri. Officers | Lampang | 3 days | 26 |
| b) Agricultural officers | Chiangmai | 3 days | 50 |
| c) Extension-Specialists | Prae | 4 days | 15 |
| BAAC staff | | | 16 |

SMALL FARM MACHINERY TRAINING COURSE

At

Prae Rice Research Center

February 19-21, 1985

SUMMARY OF COURSE EVALUATION

1. Thirty-one persons were attending the training course. Fifteen participants were government officers and the rest were BAAC officials. Three government officers and four BAAC officers had participated in a similar course before.

2. The participants already knew or were familiar with the following equipment before attending the course.

| Equipment ----- | No. of Government Officers ----- | No. of BAAC Officers ----- |
|----------------------------|--|----------------------------------|
| 1) Buffalo plow | 10 | 13 |
| 2) PT with mclldboard plow | 7 | 12 |
| 3) PT with disk plow | 5 | 11 |
| 4) Ridger | 5 | 5 |
| 5) Jab Planter | 9 | 2 |
| 6) Inclined Plate Planter | 7 | 8 |
| 7) Star Wheel Weeder | 8 | 1 |
| 8) Sprayer | 12 | 12 |
| 9) Rice Thresher | 7 | 11 |
| 10) Soybean Thresher | 5 | 2 |

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3. After completion of the course, the participants obtained the most information and/or got the most understanding of the following equipment.

| Equipment | No. of Government Officers | No. of BAAC Officers | Total Votes |
|---------------------------|----------------------------|----------------------|-------------|
| 1. PT with moldboard plow | 1 | 3 | 4 |
| 2. PT with disk plow | 4 | 5 | 9 |
| 3. Jab Planter | 4 | 6 | 10 |
| 4. 2-row RIP | 4 | 12 | 16 |
| 5. Inclined Plate Planter | 10 | 11 | 21 |
| 6. PP Weeder | 5 | 4 | 9 |
| 7. Star Wheel Weeder | 8 | 7 | 15 |
| 8. Sprayer | 7 | 5 | 12 |
| 9. Rice Thresher | 3 | 5 | 8 |
| 10. Soybean Thresher | 8 | 11 | 19 |
| 11. Groundnut Digger | 7 | 10 | 17 |
| 12. Groundnut Stripper | 8 | 12 | 20 |
| 13. Groundnut Sheller | 11 | 11 | 22 |

(Note: The participants could select up to six machines)

4. The most promising equipment for respective areas of the participants are as follows:-

| Equipment | No. of Government Officers | No. of BAAC Officers | Total Votes |
|---------------------------|----------------------------|----------------------|-------------|
| 1) PT with disk plow | 1 | 6 | 7 |
| 2) Jab Planter | 9 | 7 | 16 |
| 3) 2-row RIP | 7 | 12 | 19 |
| 4) Inclined Plate Planter | 6 | 10 | 16 |
| 5) PP Weeder | 4 | 6 | 10 |
| 6) Star Wheel Weeder | 8 | 4 | 12 |
| 7) Sprayer | 2 | 5 | 7 |
| 8) Rice Thresher | 5 | 7 | 12 |
| 9) Soybean Thresher | 7 | 9 | 16 |
| 10) Groundnut Digger | 5 | 5 | 10 |
| 11) Groundnut Stripper | 7 | 11 | 18 |
| 12) Groundnut Sheller | 7 | 9 | 16 |

Note: The participants could select up to six machines.

5. In order to promote the use of small farm machinery to farmers, the participants suggested the following approaches.

- Set up pilot plots in farmer's fields in collaboration with village leaders and BAAC officers. Close monitoring must be done. The machines to be promoted should be available for farmers to buy. However, they must be suitable for local conditions.
- Demonstration and exhibition program for farmers and training program for progressive farmers.
- AED should distribute the promising machines to related organizations more widely.

6. Twenty-three participants indicated the topics for training were suitable, while no answer was received from the rest of the participants. However, some participants would like to have more information on the following topics.

- Sprayer
- Chemicals and chemical residue
- Rice transplanter
- Weeder
- Land preparation for different types of soil
- Water pump
- Power tiller

7. Twenty-six participants indicated the handouts were suitable and useful, three participants indicated a fair amount of usefulness. However, two participants suggested more details and pictures should be included in some of the handouts.

8. The participants suggested the following changes and/or improvement in the training course.

- More time should be allocated for sprayer and more information should be included in the handouts.
- There should be more information on power tillers and attachments
- There should be more information on the use and maintenance of the equipment
- There should be more demonstration plots so the participants can see the results of the use of different equipment.

9. Twelve participants indicated the laboratory practice was suitable, another ten participants also agreed but suggested more time and for the laboratories.

10. Fifteen participants indicated the duration of training was suitable. But twelve indicated the training was too short compared with the course contents. A more suitable duration should be 4-5 days.

11. General comments from the participants are as follows:-

- There should be posters of each machine during the display. Sources of availability should also be indicated.
- Drawings of simple equipment should be distributed to farmers during demonstrations so some interested farmers could build the equipment themselves.
- Problems, cause, and remedy for each machine should be emphasized.
- Movies and/or video should be shown in the training course (if possible)

2,2

- More equipment should be distributed to BAAC
- There should be more training for BAAC officers, especially for each province or region.
- Achievement of participants should be evaluated.
- All lecturers were friendly.

3) Manufacturers: A course to train manufacturers in machinery production technology was held in cooperation with the Industrial Services Division in Bangkok. IRRI cooperating manufacturers were selected to attend the 12 day training program. The ISD provided classroom and laboratory facilities which were very effective for the course objectives. All lectures and handout materials were in the Thai language.

CURRICULUM

for

MANUFACTURERS TRAINING PROGRAMME

12-23 November, 1984

Monday, 12 November

| | |
|-----------|--|
| 0900 | Welcome Address |
| 1000 | General Introduction to Metal Working Industry |
| 1330-1630 | Farm Machinery Industry |

Tuesday, 13 November

0900-1200
1330-1630

Principle of Engineering Drawing

Wednesday, 14 November

0900-1200
1330-1630

Engineering Drawing

Thursday, 15 November

0900-1200

Heat Treatment of Steel (Demonstrate & Practice)

Friday, 16 November

0900-1200
1330-1630

Foundry Technology (Demonstration using Aluminium)

Monday, 19 November

0900-1200
1330-1630

Oxyacetylene:
Welding Technology - Electric - : Démonstration
TIG : tration

Tuesday, 20 November

0900-1200
1330-1630

Jigs & Fixtures for Welding

Wednesday, 21 November

0900-1200
1330-1630

Plant Layout and Material Handling

Thursday, 22 November

0900-1200
1330-1630

Safety
Factory visit (The Siam Kubota Diesel Co., Ltd.)

Friday, 23 November

0900-1200
1330-1630

Practice on Plant Layout & Material Handling
Discussion & Conclusion (AED director)

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MANUFACTURERS TRAINING COURSE

SUMMARY OF EVALUATION

Evaluation of the training course was done in four parts; participants, curriculum, lecturers, and general. The results are summarized below:

Part I: Participants

Twelve out of eighteen participants had never participated in any training course before. The course was moderately useful to ten participants and highly useful for the rest. All of the participants agreed the arrangements provided were good.

Part II: Curriculum

- 1) Most important topics
 - Heat treatment (5)
 - Drawing (5)
 - All topics (2)
 - Welding (2)
 - Jigs and Fixtures (2)
 - Foundry (2)
- 2) Least important topics
 - None
- 3) Most interesting topics
 - All topics (5)
 - Heat treatment (2)
 - Drawing (2)
 - Jigs and Fixtures (2)

- 4) Least interesting topics
 - None
- 5) Topics that should be expanded
 - Heat treatment (6)
 - Foundry (4)
 - Drawing (2)
 - Welding (2)
- 6) Topics that should be included in the next training
 - Die and cast
 - Forging
 - Machining
 - Cost analysis
 - Safety
 - Extension and marketing
- 7) Topic that should be deleted.
 - None
- 8) Suggestions/comments
 - There should be more time for factory visits
 - There should be more practice time for the participants
 - High technology which is not applicable to the manufacturer such as TIG and MIG welding should not be emphasized.

Part III Lecturers

All participants indicated the number of lecturers, lecture notes, and content covered during the lecture were suitable. However, eleven participants suggested there should be more practice and utilization of laboratory equipment.

Part IV: General

The training duration of 2 weeks was desirable for most participants (14). Three participants suggested one week training because of their lack of free time. Only one participant would like to have 4 weeks training. The number of

participants for the training course should be 15-20 (10 choices). The training environment at ISD was perfect (all participants).

4) Farmer Training: The farmer training programs were not as formal as those for manufacturers and agency staff. The training normally consisted of one day lectures and laboratory exercises on selected machines. Each program was organized by a cooperating agency or a manufacturer. A summary of the major programs presented to farmers are as follows.

| Cooperator ----- | Date ---- | No. of participants ----- | Location ----- |
|--|--------------|---------------------------------|-------------------|
| 1) Prae Rice Research Center | Sept. 19 | 48 | Prae |
| 2) Prae Rice Research Center | Sept. 27 | 52 | Prae |
| 3) Jakpeth Tractor Co. | Jan. 7 | 550 | Muang |
| 4) Jakpeth Tractor Co. | Jan. 8 | 400 | Lamsak |
| 5) Jakpeth Tractor Co. | Jan. 9 | 200 | Lamkoo |
| 6) Jakpeth Tractor Co. | Jan. 10 | 350 | Chandam |
| 7) Appropriate Technology Association | Jan. 27 | 52 | Chiangmai |

The project staff assisted Jakpeth Tractor Co. in extending the inclined plate planter to farmers. An individual from the tractor company was assigned to assist in the lectures and demonstrations so he could be trained and could continue with

their program without the project involvement. This company is manufacturing the inclined plate planter and is working with the Bank of Agriculture and Agricultural Cooperatives to properly introduce the machine to farmers.

PUBLICATIONS:

The following publications were written and presented during the period of October 1 through March 31.

1. "Implementation of Mechanization to Small Rice Farms in Thailand" by Dr. B.J. Cochran, paper presented at the Industrial Extension Workshop, Peoples Republic of China. October 9-24, 1984.
2. "Small Farm Mechanization in Thailand Present and Future" by Dr. B.J. Cochran and Mr. Chak Chakkaphak, paper presented at the Farm Machinery and Rural Industry in SE Asia and the Pacific Conference, Pattaya, Thailand. November 26-28, 1984.
3. "THAI-IRRI Industrial Extension Program for Small Farm Mechanization" Industrial Extension Conference, Agri. Engr. Dept., IRRI, Los Banos, Philippines, Oct. 10-13, 1984.
4. "Implementation of Mechanization to Small Rice Farms in Thailand" by B.J. Cochran, Paper presented at American Society of Agri. Engr., New Orleans, La., Dec. 11-14 1984.
5. "Methodology for Technology Extension of Small Farm Mechanization", by B.J. Cochran, paper presented to workshop on Identification of Appropriate Technologies and Methods of Technology Transfer for rural Women", Asian Institute of Technology, Bangkok, Thailand, Feb. 25 - Mar. 8, 1985.
6. "Annual Report-IRRI-THAI Industrial Extension Program for Small Farm Mechanization" by B.J. Cochran and Chak Chakkaphak.

STATUS OF MACHINE ACCEPTABILITY:

An important part of the extension program has been to survey the farming areas, introduce appropriate machines for the farming conditions and extend machines indicated to have potential acceptability by farmers. As of now there are five machines not previously accepted by farmers which are now commercially available.

1) Inclined Plate Planter - This machine is having the greatest success in that there are three quality manufacturers selling to farmers. The BAAC has accepted this machine as a product they will purchase for farmers. The three manufacturers have produced in excess of 300 units during the past 6 months and they estimate more than 1000 units will be sold during 1985.

The Inclined Plate Planter was designed by the IRRI Agricultural Engineering Department and was introduced through the project loan program to national projects. The planter is capable of planting rice, soybeans, mungbeans, sorghum, corn or peanuts plus can be used to apply fertilizer to upland crops. An operators manual has been developed by the project in both English and Thai languages. The retail value now ranges from 2,900 Baht (\$110.00) to 5,000 Baht (\$185.00) depending on the manufacturers. The price should reach a more constant level as free marketing competition continues.

2) Rolling Injection Planter - The Agricultural Engineering Division and a Small Farm Machinery FAO project has modified and developed a 2-row Rolling Injection Planter. It has been used in the projects exhibitions, demonstrations, and training programs. More than 2000 rai (300 ha) has been planted by farmers in the rainfed areas of the north. A manufacturer can now produce the machine and sells to farmers for approximately 2,200 Baht.(\$82.-)

3) Cyclone Seeder - Previous work has been done by the project in extending the cyclone seeder but during the past year it has become a machine being accepted by small farmers. A manufacturer has been trained to produce the seeder commercially for 500 Baht (\$20.00). Approximately 100 units have been distributed among farmers, projects and government agencies. The seeder is capable of broadcast seeding rice in paddy and upland, plus any free flowing granular material, including fertilizer. The versatility of the machine increases the acceptability potential.

4) Push-Pull Weeder: The push-pull weeder may be referred to by several names but it is a tool that originated in Europe. It was introduced into Thailand by an FAO Farm Machinery project and is being accepted as a light, inexpensive tool to reduce the drudgery of weeding upland crops. The weeder is most effective when weeds are 10 cm high or less in light soils.

4/1

Observations comparing the push-pull weeder with the standard hoe indicates the standard hoe is out of the soil and producing no effective work 85 percent of the time. The push-pull weeder is in the soil producing effective work 85 percent of the time. A manufacturer produces this machine and sells for 80 Baht (\$3.00). More than 200 units have been produced during the past 6 months.

5) Improved Buffalo Plow: The Thai-IRRI project improved the design of the conventional buffalo plow more than 2 years ago. Test results showed the improved plow to be more efficient with a higher field capacity compared to the conventional plow. The plow has not been widely accepted but farmers who use it agree it is an improvement but more expensive. The project worked with the manufacturer to develop a mold so the plow could be cast which reduced the purchase price. Farmers in the northeast are most interested and approximately 100 new models have been produced by a manufacturer in Khon Kaen.

VI. MECHANIZATION-ECONOMIC STUDY

A special study was implemented to determine the mechanization and economic status of the farmers in the northeast.

Three hundred and thirty three farmer households from 17 villages in 5 provinces were sampled. A questionnaire for each village leader was used to provide village level statistics. The

survey also included a questionnaire for 18 manufacturers to determine the size, type and amount of equipment produced. It was conducted by a staff of one study leader and 6 enumerators. All data has been collected, edited and entered on PC computer diskettes. A complete set of data will be given to the IRRI Agricultural Engineering Department and shared with the Department of Economics as a source for more detailed Socio-Economic Analysis.

Results of the study presented as Figure 1, shows more than 50 percent of the farmers in all provinces want to invest in mechanization. Most of the farmers indicated they would need loans to purchase equipment.

Tables 1 and 2 summarizes the reasons farmers gave for wanting to buy machines or not buying machines respectively. The farmers who wants to buy machines listed the constraints presented in Table 3. Table 4 presents the farmers attitudes toward mechanization.

These preliminary results indicate mechanization would be accepted by farmers in the northeast. Additional analysis of the survey results should indicate the level of mechanization that would be most acceptable.

A full report of the Mechanization Economic study will be made and published as a separate publication.

Percentage of Farmers Who Want to Buy New Machines

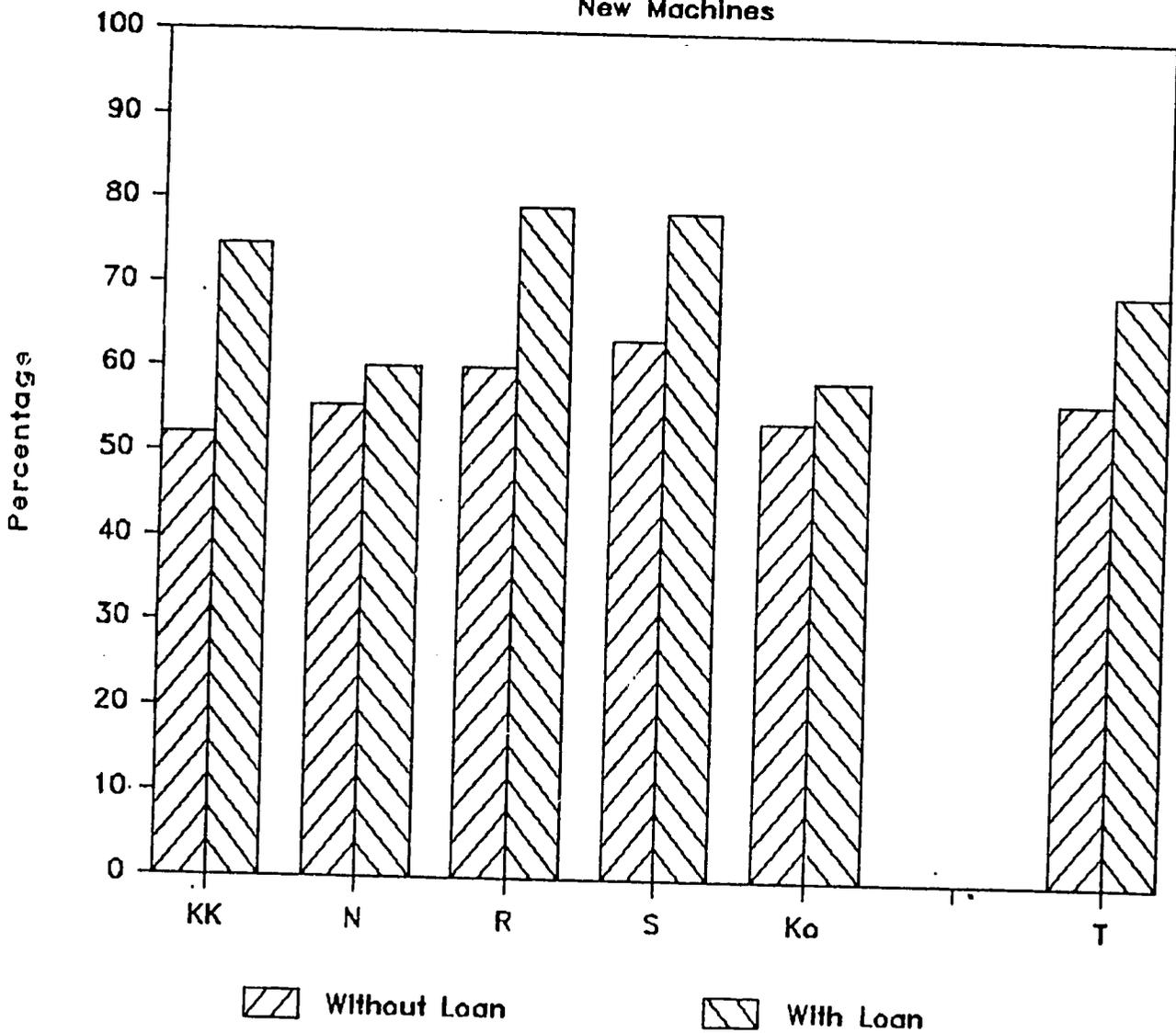


Figure 1

TABLE 1. Main Reasons of Farmers (by percentage) for Buying New Machines.

| Reasons | PROVINCE | | | | | Overall |
|-----------------|-----------|------------------|--------|----------|-------|---------|
| | Khon Kaen | Nakorn- panom | Roi Et | Srisaket | Korat | |
| Plant on time | 14.0 | 26.3 | 42.6 | 28.8 | 2.0 | 23.0 |
| Do better job | 8.0 | 21.1 | 9.3 | 19.2 | 8.2 | 12.8 |
| Easier | 22.0 | 18.4 | 9.3 | 19.2 | 16.3 | 16.9 |
| Save time | 20.0 | 5.3 | 7.4 | 7.7 | 6.1 | 9.5 |
| Increase income | 8.0 | 10.5 | 14.8 | - | 24.5 | 11.5 |
| Versatile | 10.0 | 7.9 | 7.4 | 3.8 | 34.7 | 12.8 |

TABLE 2. Reasons Farmers Not Buying New Machines.

| Reasons | PROVINCE | | | | | Overall |
|--------------------------|-----------|------------------|--------|----------|-------|---------|
| | Khon Kaen | Nakorn- panom | Rot-Et | Srisaket | Korat | |
| Too expensive | 50.0 | 57.1 | 85.2 | 66.7 | 39.5 | 57.7 |
| Less use | - | 10.7 | - | 4.2 | - | 2.7 |
| High cost for fuel & oil | 12.5 | 7.1 | - | 8.3 | 5.3 | 6.7 |
| Not suitable for areas | 3.1 | 10.1 | - | 16.7 | 7.9 | 7.4 |
| Small land | 18.8 | 7.1 | 11.1 | 4.2 | 7.9 | 10.1 |
| Hard to operate | - | - | - | - | 7.9 | 2.0 |
| Many reasons | 12.5 | 3.6 | - | - | 31.6 | 11.4 |

TABLE 3. Constraints of Farmers Who Want to Buy Machinery

| Reasons | Khon Kaen | Nakorn- panom | Roi-Et | Srisaket | Korat | Overall |
|----------------------|-----------|------------------|--------|----------|-------|---------|
| No money | 77.8 | 87.3 | 77.9 | 78.8 | 71.1 | 77.8 |
| No operator | 23.9 | 33.3 | 20.6 | 21.2 | 13.3 | 21.9 |
| Land limita- tion | 20.9 | 49.2 | 30.9 | 34.8 | 14.5 | 29.1 |
| Hard to operate | 13.4 | 47.6 | 32.4 | 31.8 | 34.9 | 32.0 |
| Expensive | 80.6 | 71.4 | 73.5 | 74.2 | 73.5 | 74.6 |
| Hard to repair | 67.2 | 76.2 | 73.5 | 81.8 | 77.1 | 75.2 |

TABLE 4. Attitude Toward Mechanization of Farmers Who Want to Buy Machinery With Loans Provided.

| Reason | Khon Kaen | Nakorn- panom | Roi-Et | Srisaket | Korat | Overall |
|--------------------|-----------|------------------|--------|----------|-------|---------|
| Save time | 94.0 | 81.0 | 83.8 | 89.4 | 79.5 | 85.3 |
| Plant on time | 88.1 | 76.2 | 75.0 | 89.4 | 66.3 | 78.4 |
| Easier activity | 80.6 | 61.9 | 73.5 | 81.8 | 68.7 | 73.2 |
| Increase yield | 64.2 | 68.3 | 70.6 | 80.3 | 63.9 | 69.2 |
| Increase income | 73.1 | 77.8 | 69.1 | 75.8 | 68.7 | 72.6 |
| Do better job | 80.6 | 74.6 | 69.1 | 77.3 | 73.5 | 74.9 |

FUTURE PLANS:

Six months remain before the project terminates. During this time the following activities will be initiated and/or completed.

- a) A manufacturers training course will be held in Khon Kaen in the northeast during July. The training will be conducted in cooperation with Khon Kaen University Industrial Engineering Department, Industrial Services Institute (Khon Kaen) and Industrial Services Division (Bangkok).
- b) The Agricultural Engineering Division seminar will be continued and will include topics selected from the proposed attached list.
- c) A Farmer Training Course will be conducted in cooperation with the Northeast Region Agricultural Office Irrigation Project.
- d) During the 1985 rainfed rice crop planting season, demonstrations will be made to farmers in cooperation with provincial extension officials. The Cyclone Seeder will be emphasized along with the RIP and inclined plate planters.
- e) Follow up with the Prae training course to assist with activities the extension officers and BAAC staff initiated in the northern provinces.
- f) Terminate the project and produce the final project report.

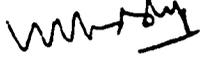


IRRI - DITPROD INDUSTRIAL EXTENSION PROJECT

P.O. BOX 18/KBYPM. PASAR MINGGU, JAKARTA SELATAN INDONESIA TELEPHONE : 7 8 2 5-5.7

December 18, 1984.

To : Mr. Walter C. Tappan
IRRI Liaison Scientist

From : V.R. Reddy 
Agricultural Engineering Consultant

Subject : Quarterly Report
October through December 1984

T r i p s :

- * October 8th - October 24th : To Los Banos and to China with IRRI Agriculture Engineers.
- * November 13rd - November 15th : To West Sumatera - Accompany Mr. R.D. Bell of NIAE for the impact study of CGIAR.
- * December 13rd - December 14th : To Klaten and Yogyakarta - R. Dadang Tarmana accompanied to test Agro 'U'Till tractor and visit cooperative manufacturer.

At Los Banos we had annual Industrial Extention Project coordination meeting from October 9th to 12th. Annual reports of each project from Thailand, Phillipines, Indonesia and India were presented, Research priorities and assistance required from our research group at Los Banos were indicated.

We left for Beijing on October 13 from Manila. Visited facilities of CAAMS and had useful discussions with the Chinese Academy's research scientist.

Visited a power tiller factory and a farm commune in Beijing. Travelled by train through Nanjing, Huanzhou, Shianzi and Guanzhou research stations. It was a wonderful opportunity to be able to see the progress made by the chinese research stations in the field of farm machinery and to interact with them professionally.

During this quarter two new transplanters were built with the latest modifications incorporated. Field tested one hand tractor in farmer's field at Bekasi with the new plough and Yanmar air-cooled diesel engine. Since the merger of the two workshops, the tempo of prototype building and modification work has slowed down due to the lack of space and staff available for the project work.

Our field extention work in West Sumatera however, continues to show progress. In addition to the increasing production of threshers, the hand tractor's production and demand seems to be encouraging. The field report of four locally produced and sold hand tractors is quite good. However, the need for credit for the purchasers continues to be the majour constraint. Our follow up with the Bank Pembangunan Daerah seems to show some progress, in the sense that they have agreed in principle to offer credit through the local approved fabricators.

Prepared detail plans for the training programme of fabricators to be conducted in January 1985 at Bukittinggi. A copy of 'Panduan' is enclosed herewith.

IRRI-DITPROD

Final copy of ILO funded survey report on 'Diffusion and Commercialization of Rice Postharvest Equipment in West Sumatera' with regression analysis and 't' tables has been completed. These will be distributed by ILO as part of their 'working paper' series which have wide professional circulation. A copy of the same is enclosed with this report.

Assisted Mr. R.D. Bell of N.I.A.E. for this impact study of CGIAR with all the information he needed and taking him to meet concerned Government officials in Jakarta and accompanied him through West-Sumatera to see the impact of the project work in the province.

Purchased IBM PC-XT micro computer with printer for the project. Project staff is now in the process of getting familiarised and necessary practise to use for the project work. Feasibility data sheets for the IRRI-small farm equipment are being programmed to arrive at the profitability of the equipment with severable variables such as the local wage, price, interest rate..etc ; Bart Duff's suggestions and advise in this regard were very timely and useful to us.

During Bart Duff's visit in November we had a useful meeting with AARD officials, attended by Dr. Manwan, Dr. Siwi, Dr. Faji from Sukamandi, Dr. Bambang from Maros and other engineers along with Mr. Walter C. Tappan, Bart Duff and myself. They have expressed their anxiousness to receive a proposal from IRRI for their Farm Equipment Research and development work. It was decided to send sets of equipment being promoted by our project to their research stations at Sukamandi, Maros, Sukarami and Banjarmasin. A preliminary note prepared by me in this regard after this meeting is enclosed.

DEPARTEMEN PERTANIAN
DIREKTORAT JENDERAL PERTANIAN TANAMAN PANGAN

PANDUAN
LATIHAN PEMBUATAN TRAKTOR TANGAN DAN REAPER SECARA LOKAL
DI SUMATERA BARAT

KERJASAMA ANTARA :
DIREKTORAT BINA PRODUKSI SUB DIREKTORAT PENGEMBANGAN ALSINTAN
DINAS PERTANIAN TANAMAN PANGAN SUMATERA BARAT
BALAI BESAR PENGEMBANGAN INDUSTRI LOGAM DAN MESIN
INTERNATIONAL RICE RESEARCH INSTITUTE.

1984

PANDUAN
LATIHAN PEMBUATAN TRAKTOR TANGAN DAN REAPER SECARA LOKAL
DI SUMATERA BARAT

I. PENDAHULUAN :

Latihan pembuatan traktor tangan dan reaper secara lokal di Sumatera Barat adalah merupakan latihan lanjutan bagi para pengrajin pembuat traktor tangan di Bukittinggi pada tanggal 9 s/d 21 Januari 1984 yang lalu.

Pada latihan yang lalu, titik berat latihan adalah pada pembuatan traktor tangan, sedangkan dalam latihan ini, disamping pembuatan traktor tangan 4 - 5 HP juga dilaksanakan latihan pembuatan reaper 1,0 m atau alat pemotong padi.

Latihan ini dilaksanakan sesuai dengan program pengembangan alsin di Sumatera Barat, dimana pembuatan dan penggunaan power thresher telah berkembang dengan baik.

Dengan demikian, pembuatan alat pemotong padi ini sejalan dengan pembuatan alat perontok yang dibuat secara lokal oleh pengrajin Sumatera Barat.

II. TUJUAN

Tujuan latihan adalah untuk meningkatkan pengetahuan dan ketrampilan para pengrajin, sehingga akan mampu untuk :

1. Membuat traktor tangan dan reaper atau alat pemotong, menghitung kebutuhan bahan dan analisa ekonomi pembuatan alat.
2. Melakukan pengujian terhadap alat yang telah dibuat.

III. TEMPAT DAN WAKTU

Tempat.

Latihan dilaksanakan pada UPT Perbengkelan Dinas Pertanian di Bukittinggi.

2. Waktu

- Pelaksanaan latihan pada tanggal 14 - 27 Januari 1985
- Latihan akan dilaksanakan selama 15 hari

IV. ORGANISASI

1. Penanggung Jawab : Kepala Dinas Pertanian Sumatera Barat
2. Panitia pengarah : a. Diperta Sumbar
b. Subdit Pengembangan Alsin Pertanian
3. Panitia pengarah berfungsi menetapkan kebijaksanaan, kurikulum latihan dan memberi pengarah pada panitia pelaksana.
4. Panitia pelaksana : Diperta Sumatera Barat, bertugas sebagai pelaksana harian latihan.

V. PESERTA

1. Peserta terdiri dari para pengrajin yang telah mengikuti latihan pembuatan traktor tangan tahun 1984
2. Jumlah peserta 12 orang
3. Syarat peserta :
 - Mekanik dari para pengrajin yang akan menangani pembuatan traktor tangan, sekurang-kurangnya berpendidikan sekolah tehnik.
 - Atau manager/pimpinan pengrajin yang bersangkutan

VI. STAF PENGAJAR/INSTRUKTUR

- a. 1 orang dari Subdit alsin Jakarta
- b. 1 orang dari BBLPM Bandung
- c. 2 orang dari Diperta Sumbar
- d. 1 orang dari Kanwil Perindustrian Sumbar.

VII. BIAYA

Pembiayaan akan disediakan oleh Pusat melalui Proyek ATA 220/IRRI dengan komponen biaya sebagai berikut :

1. Persiapan :
 - a. Perbanyakkan bahan pelajaran berupa :
 - Gambar kerja 10 orang X 1 set dipersiapkan Pusat.
 - Foto copy materi pelajaran

b. Dekumentasi

- 1 roll slide film =Rp. 5.000,-
- 1 roll film biasa =Rp. 3.000,-

Rp 8.000,-

2. Transportasi

- a. Peserta p.p. 10 orang x Rp. 4.000 =Rp.40.000
- b. Instruktur
 - Pusat 2 org p.p, 2org X Rp200.000 =Rp.400.000
 - MIDC 1 orang
 - + Bandung-Jkt p.p. 1 orgXRp.16.000 =Rp. 16.000
 - + Jkt -Pdg p.p. 1 org X Rp.200.000 =Rp.200.000
- c. Bahan Bakar
 - Pdg - Bkt 300 Km, bensin 60L XRp350=Rp. 21.000
 - Olie 5 Lt X Rp. 1.800,- =Rp. 9.000
 - Solar traktor tangan 10Lt X Rp250,- =Rp. 2.500

Rp.688.500,-

3. Lumpsum :

a. Pengajar :

- Pusat, gol. III, 2 orgX 14 hr X Rp.21.000 =Rp. 588.000
- MIDC, Gol III, 1orgX 14hr X Rp. 21.000 =Rp. 294.000

b. Peserta 10 org X 14 hr X Rp.4.500 =Rp 630.000

c. Petugas bengkel 4 org X 14 hr XRP.4.500 =Rp. 252.000

Rp.1.764.000

4. Bahan material pembuatan traktor tangan dan reaper Rp. 800.000,-
(macam-macam)

T O T A L Rp.3.260.500,-

=====

VIII. KURIKULUM LATIHAN

| No. Mata latihan | Jam pelajaran | | |
|--|---------------|----|----|
| | T | P | J |
| A. Kelompok Tani | | | |
| 1. Kebijakan dan langkah-langkah operasional pengembangan engineering pertanian di Indonesia | 2 | - | 2 |
| 2. Kebijakan pengembangan industri alsin pertanian di Sumatera Barat | 2 | - | 2 |
| 3. Manajemen perbengkelan pertanian | 2 | - | 2 |
| B. Kelompok Industri | | | |
| 1. Teknik membaca gambar kerja traktor dan reaper | 2 | 1 | 3 |
| 2. Teknik menghitung kebutuhan bahan bakar pembuatan traktor tangan dan reaper | 2 | 2 | 4 |
| 3. Analisa ekonomi pembuatan traktor tangan dan reaper | 2 | 1 | 3 |
| 4. Praktek pembuatan traktor tangan 4-5HP | - | 54 | 54 |
| 5. Praktek pembuatan reaper 1,0 m | - | 54 | 54 |
| 6. Prosedur pengujian alat dan instrumen uji | 3 | - | 3 |
| 7. Praktek pengujian | - | 20 | 20 |
| C. Kelompok Penunjang | | | |
| 1. Analisa ekonomi penggunaan traktor dan reaper | 3 | 1 | 4 |
| 2. Masalah pemasaran alsin pertanian di Sumbar | 2 | - | 2 |
| J U M L A H | | | |

Catatan :

T = Teori

P = Praktek

J = Jumlah

IX MATERI DAN JADWAL PELAJARAN

14 - 01 - 1985 (SENEN)

| | | |
|---------------|---|---------------------|
| 07.00 - 07.15 | Selamat datang/Pembukaan | Ka. Diperta Sumbar |
| 07.15 - 08.00 | Kebijaksanaan dan langkah-langkah operasional pengembangan engineering pertanian di Indonesia | Pusat/Daerah |
| 08.00 - 08.45 | Pemutaran film & slide pengembangan alat mesin pertanian di Indonesia | Daerah |
| 08.15 - 09.15 | Perkenalan peserta dan staf pengajar | Daerah |
| 09.15 - 09.30 | Istirahat, coffe break | |
| 09.30 - 11.00 | Kebijaksanaan pengembangan industri alsin pertanian di Sumatera Barat | Perindustrian |
| 11.00 - 11.45 | Tehnik membaca gambar kerja traktor tangan dan reaper | Daerah/Pusat |
| 11.45 - 13.00 | Istirahat, makan siang | |
| 13.00 - 13.45 | Tehnik membaca gambar kerja traktor tangan dan reaper (lanjutan) | Daerah/Pusat |
| 13.45 - 15.15 | Tehnik menghitung kebutuhan bahan pembuatan traktor tangan dan reaper | Daerah/Pusat |
| 15.15 - 16.00 | Latihan tehnik membaca gambar kerja | Daerah/Pusat |
| 16.00 - 19.00 | Istirahat | |
| 19.00 - 20.30 | Latihan dan diskusi tehnik menghitung kebutuhan bahan pembuatan alat | Team Pusat & Daerah |

15 - 01 - 1985 (SELASA)

| | | |
|---------------|--|---------------------|
| 07.00 - 09.30 | Analisa ekonomi pembuatan traktor tangan dan reaper | Pusat/Daerah |
| 09.30 - 10.00 | Istirahat, coffe break | |
| 10.00 - 11.30 | Masalah pemasaran alsin pertanian di Sumatera Barat | Daerah/Bank |
| 11.30 - 13.00 | Istirahat, makan siang | |
| 13.00 - 15.15 | Analisa ekonomi penggunaan traktor tangan dan reaper | Daerah |
| 15.15 - 16.00 | Latihan dan diskusi analisa ekonomi pembuatan traktor tangan dan reaper | Team Pusat & Daerah |
| 16.00 - 19.00 | Istirahat | |
| 19.00 - 19.45 | Latihan dan diskusi analisa ekonomi penggunaan traktor tangan dan reaper | Team Pusat/Daerah |

16 - 01 - 1985 (RABU)

| | | |
|---------------|---|--------------|
| 07.00 - 08.00 | Management Perbengkelan Pertanian | |
| 08.00 - 10.00 | Management Perbengkelan Pertanian | Pusat/Daerah |
| 10.00 - 10.30 | Istirahat | |
| 10.30 - 12.00 | Persiapan pembuatan traktor tangan 3 HP | Pusat/Daerah |
| 12.00 - 13.00 | Istirahat, makan siang | |
| 13.00 - 15.00 | Praktek pembuatan traktor tangan 3 HP | Pusat/Daerah |
| 15.00 - 17.00 | Praktek pembuatan traktor tangan 3 HP | Pusat/Daerah |
| 17.00 - 19.00 | Istirahat | |
| 19.00 - 20.00 | Praktek dan diskusi pembuatan traktor tangan 3 HP | Pusat/Daerah |
| 20.00 - 21.00 | Praktek dan diskusi (lanjutan) | Pusat/Daerah |

17 - 01 - 1985 (KAMIS)

| | | |
|---------------|-----------------------------|------|
| 07.00 - 08.00 | Praktek (lanjutan) | Team |
| 08.00 - 10.00 | Praktek (lanjutan) | Team |
| 10.00 - 10.30 | Istirahat, coffe break | |
| 10.30 - 12.00 | Praktek (lanjutan) | Team |
| 12.00 - 13.00 | Istirahat, makan siang | |
| 13.00 - 17.00 | Praktek, diskusi (lanjutan) | Team |
| 17.00 - | Istirahat | |

18 - 01 - 1985 (JUM'AT)

| | | |
|---------------|--|------|
| 07.00 - 08.00 | Praktek (lanjutan) | Team |
| 08.00 - 10.00 | Praktek (lanjutan) | Team |
| 10.00 - 10.30 | Istirahat | |
| 10.30 - 11.30 | Praktek (lanjutan) | Team |
| 11.30 - 13.20 | Istirahat, Shalat Jum'at & makan siang | |
| 13.20 - 17.00 | Praktek dan diskusi (lanjutan) | Team |
| 17.00 | Istirahat | |

19 - 01 - 1984 (SABTU)

| | |
|---------------|------------------------|
| 07.00 - 10.00 | Praktek (lanjutan) |
| 10.00 - 10.30 | Istirahat, coffe break |
| 10.30 - 12.00 | Praktek (lanjutan) |
| 12.00 - 13.00 | Istirahat, makan siang |
| 13.00 - 17.00 | Praktek (lanjutan) |
| 17.00 | Istirahat |

| | | |
|---------------|-------------------|-------------------|
| 13.00 - 15.00 | Penutupan latihan | Team |
| 15.00 - 16.00 | Penutupan latihan | Kasubdin Produksi |
| 16.00 - | Sayonara/Merienda | |

27 - 01 - 1985 (MINGGU)

Peserta pulang ketempat asal

X. PERALATAN LATIHAN

1. Peralatan UPT Perbengkelan Diperta Bukittinggi
2. Pola cetak atau alat bantu pembuatan traktor tangan
3. Peralatan uji dan bahan material yang diperlukan untuk pembuatan traktor tangan.

XI. METODA LATIHAN

Metoda pengajaran yang digunakan dalam latihan ini meliputi :

1. Praktek
2. Teori
3. Diskusi

XII. TATA TERTIP LATIHAN

1. Setiap peserta wajib mengikuti seluruh acara latihan dan mengisi daftar hadir
2. Para peserta harus sudah hadir di kelas lima menit sebelum acara dimulai
3. Peserta yang berhalangan hadir/tidak dapat mengikuti pelajaran harus menghubungi Panitia Pelaksana
4. Para peserta harus menjaga kebersihan tempat praktek dan kuliah
5. Setiap selesai praktek, para peserta harus mengembalikan barang, perkakas dan instrumen yang dipinjam dari Bengkel Dinas Bukittinggi
6. Para peserta harus tinggal di asrama yang disediakan oleh Panitia Pelaksana
7. Para peserta wajib menjaga ketertiban asrama dan menjaga kesehatan diri sendiri
8. Para peserta latihan harus menunjuk seorang ketua kelas dan wakilnya.

Jakarta , Nopember 1984



*SUGGESTIONS FOR STRENGTHENING R & D CAPABILITIES OF 'AARD'
IN THE FIELD OF SMALL FARM MACHINERY AND EQUIPMENT.*

Introduction :

We have been witnessing the phenomenal growth of food crop production in Indonesia in the recent years and that has been possible due to the successful introduction of H.Y.V. and having laid a strong foundation for the national agency of agricultural research and development (AARD).

So far the major strengthening of R & D capabilities within 'AARD' has been taking place mainly in the fields of biological sciences such as breeding, Agronomy, Entomology and farming systemetc.

With the increasing trend of industrialisation in the country and migration of population from rural to urban areas the scarcity of labour for the agricultural operations is being increasingly felt particularly in the outer islands with less density of population and larger areas being brought under cultivation.

Therefore the need to develop and promote appropriate farm equipment technology within the country is becoming more important and AARD is very rightly assigning the priority it deserves.

It may be noted that since '78, IRRI has been funded by USAID to work with DITPROD on industrial extension project mainly to extend the IRRI developed small farm equipment technology and has provided the services of an Agriculture engineer. The work carried out by this project is briefly described in their "Report on IRRI Industrial Extension Project in Indonesia from March 1978 to August 1984" a copy of it is enclosed (appendix # 1).

The Present Position :

AARD has allotted some budget and staff at Balitan² Sukamandi and Maros to undertake the R & D work of farm equipment.

*) By V.R. Reddy, IRRI - Agricultural Engineer

Qualifications and experience of the engineering staff attached to the above research stations and the nature of work they have so far undertaken along with the facilities available is noted in the enclosed * (appendix # 2).

Long term proposal to be funded by possible donor agencies.

IRRI has agreed to provide AARD the services of its two experienced engineers to visit the above research stations and after discussing with their senior staff will submit its report in the form of a project proposal with budget estimates for the consideration of the possible donor agencies.

Short term recommendations :

Since a long term project proposal of this nature is likely to take a year or two to mature , following short term measures are suggested for the consideration of AARD.

To start with it will be desirable to acquire few sets of appropriate farm equipment locally available such as, hand tractors, water pumps, threshers, harvestors, dryers, maize shellers, weeders, planters, ...etc. for field testing, modifying and incorporating improved features suitable for the local condition.

The guidance needed to undertake this task can perhaps be got ^{initially} from the qualified and selected young overseas volunteers who can be requested through V.S.O. from U.K. or peace corpse volunteers from U.S.A. at a very nominal cost. About two volunteers for each research station should suffice to start with.

This exercise in itself should provide good training on the job for the staff involved in each research station. In addition to it the above staff's technical skills/knowledge can be upgraded by sending them to several short term training programme/courses being offered by the institutes such as IRRI, RNAM, FAO, NAEI...etc.

*Information is to be received from Sukamandi and Maros research station.

Minimum workshop equipment and testing instruments needed during this initial phase at each of the above research stations to enable them to undertake the above mentioned field testing, modification and building simple prototypes is listed in the enclosed (appendix # 3).

One set of IRR1 (designed) equipment now locally being fabricated is being made available (by March '85 or so) to the above research stations from the IRR1-DITPROD project funds as per the recent decision. This project will further be able to offer initial guidance during its remaining tenure i.e. up to Sept 1985.

VRR/ Dec. 1984.



IRRI-DITPROD INDUSTRIAL EXTENSION PROJECT

P.O. BOX 18/KBYPM. PASAR MINGGU, JAKARTA SELATAN INDONESIA TELEPHONE : 782557

April 13, 1985

To : Mr. Walter C. Tappan

From : V.R. Reddy

Subject : Quarterly report
January through March 1985.

T r i p s :

- * January 20th - January 26th : To visit Aceh and West Sumatera accompany evaluation team.
- * January 30th - February 3rd : To visit South Sulawesi accompany evaluation team
- ~~* February 11st - February 12th : To visit Sukamandi - accompany Amir U Khan for submitting - recommendations to AARD~~
- * February 13rd - February 14th : To visit South Sulawesi - accompany Amir U Khan for submitting recommendation to AARD.
- * February 26th - February 28th : To visit fabricators with representative of regional Banks in West Sumatera.
- * March 13rd - March 15th : To attend Junior Minister of Agriculture visit to West Sumatera.
- * March 18th - March 21st : To attend 'International' gasifier conference along with USAID team in Bandung.

IRRI-DITPROD

Visited West Sumatera, Aceh and South Sulawesi with the evaluation team and assisted them in meeting the concerned G.O.I. officials in Jakarta and with all the information they needed for preparing their report on the project's performance. Their final report does state that the project has achieved its goals inspite of the institutional constraints.

Accompanied Amir U Khan to Sukamandi, Bogor and Maros to meet the staff of CRIFIC at the above research stations. Our report with recomendations to strengthen their R&D capabilities in the field of small farm machinery and equipment has been submitted for the consideration of AARD. Meanwhile a set of IRRI designed equipment consisting of hand tractor with trailer, paddy thresher, paddy transplanter, axial flow pump, pedal thresher and pedal winnower, were fabricated in the project's workshop. They will be despatched shortly one set each to their four research stations at Sukamandi, Maros, Sukarami and Bogor.

We have just received, turtle tiller, disc plough and Kapak Kapak pump from IRRI, Los Banos. We will be shortly testing them in the field in West Java first and if found suitable after making certain modifications, will be despatching to West Sumatera for the field extention work.

IRRI-DITPROD

In addition to the continuous growth of paddy threshers production (around 1800 threshers as per the latest figures collected by the DIPERTA in West Sumatera), PD5 hand tractors production and sales demand shows very encouraging trend. More than 10 units made by one of the IRRI cooperative fabricators have been working in - Payakumbuh area very successfully since last two seasons. With the increasing interest by the farmers for such light and inexpensive hand-tractors, now three more fabricators have taken up the production of them. The project is assisting them both in field testing them initially and also in procuring sprockets, chains etc. from Jakarta, since they are not available in West Sumatera.

During the visit of Junior Minister of Agriculture (from March 14 to 16th), an exhibition of locally produced farm equipment, assisted by the project was organised. Later the minister visited project assisted workshop facilities at Bukittinggi and one of the cooperative fabricators at Sijunjung. He seemed very impressed with the progress made by West Sumatera particularly in the field of small farm mechanisation. This was well publicised in the local and national news papers.

Mr. Van Ruiten's tour report (Indonesia - HVR - III - No.42) has pointed out that the IRRI type paddy threshers are being fabricated in Aceh province, and that they need to improve the quality of their equipment before the farmers are disillusioned with this badly needed equipment in the province. He has recommended that IRRI should assist in this regard .

IRRI-DITPROD

Since FAO had earlier ('82/'83) funded a project in Aceh to decrease post harvest losses (by placing a consultant for one year, who had assisted in introducing IRRI type paddy threshers, bringing the first pieces from West Sumatera), we have approached their regional office here for funding a follow-up training programme aimed at improving the quality of threshers locally produced with the assistance of our project. This has been agreed to and we are now working out the details of the training programme in consultation with the provincial agricultural departments. A brief note prepared in this regard is enclosed herewith. We are hopeful it will be implemented before this project is terminated.

VVR/H/April '85.

PROPOSED TRAINING PROGRAMME FOR THRESHER MANUFACTURERS IN ACEH.

Background information:

IRRI industrial extension project in Indonesia has assisted local fabricators to produce small rice farm equipment such as hand tractors, paddy threshers, water pumps, weeders, dryers etc. in the provinces of West Sumatera, South Sulawesi, South Kalimantan and West Java.

Paddy threshers produced in West Sumatera found their way into the neighboring provinces including Aceh.

Mr. Von Ruiten in his survey report 'Ref. Indonesia-HVR-III-No.42' has confirmed that IRRI type paddy threshers are now being produced by several local workshops in Aceh. With the introduction of these threshers Mr. Von Ruiten has stated that farmers are able to thresh paddy 1 to 2 weeks earlier than before which is resulting in the decrease of post harvest losses. However, he has commented that the workmanship of such locally produced threshers in Aceh is far from satisfactory.

Mr. Von Ruiten has advocated early measures to be taken to improve the quality of such locally produced threshers before the growing market of threshers is adversely affected.

On the advice of IRRI-DITPROD, FAO. has agreed to fund (upto \$5000) for conducting a training program for the local producers of threshers in the province of Aceh as the first step to improve their workmanship.

Proposed Training Programme :

IRRI-DITPROD has conducted several training programmes as part of the project work in the provinces including west Sumatera, specially emphasising the fabrication methods (practically) with the help of simple fixtures and templates to make them interchangeable, and test them for optimum field performance. Our experience is that these training programmes have proved very effective.

A similar training programme for a week in Aceh would involve costs approprimately as following :

| | |
|---|------------|
| Cost of raw materials for building two threshers | \$ 800/- |
| Cost of one set of fixtures and templates | \$ 700/- |
| <u>Travel expenses</u> for four Instructors from Padang and from and Jakarta 2 persons to Aceh and back | \$ 700/- |
| Estimated per diem cost (one week) for the instructors | } \$ 500/- |
| DIPERTA Aceh staff (4 persons) local threshers producers (12 persons) for six days | |
| Field testing expenses | |
| Miscellaneous expenses for photo copying, local transportation, arranging function noon meals etc. | } \$ 500/- |
| Cost of the visit of local producers (12) of Aceh to West Sumatera to study the manufacturers and users. | |
| <hr/> | |
| T o t a l | \$5000/- |

However, this proposal needs to be discussed in detail with the staff of
DIPERTAS of Aceh and West Sumatera and agreed upon. We suggest a repre-
sentative from IRR1-DITPROD and FAO to visit Padang dan Banda Aceh during
the month of April and conduct the above training preferably either a week
before Ramadhan in May or after Ramadhan in June.

----- ***** -----

April 1985
VRR/H.

W. Sumatra strives for modern rice cultivation

Mr Walter Tappan

West Sumatra has gradually broken with its age-old tradition in rice culture and is well on its way to mechanization in keeping with modern technology.

It began in the 1970s with the introduction of motor-driven paddy hullers followed with threshing machines and later the employment of hand-tractors for plowing and weeding.

About 5,000 traditional watermills have been turned idle. The mountainous area of the Bukit Barisan range traversing Sumatra from northwest to southeast turn out numerous streams which man gratefully employed for the running of watermills. It is this semi-mechanical device that made it easy for the people to free the paddy from its hulls and bran, leaving white rice ready for cooking. In other areas the milling takes place by means of pounding by hands or foot-driven wooden hammers.

The invention and production of motor-driven hullers led the farmers to abandon their traditional watermills and send their paddy to hulling centers for processing. The mechanized hulling has proved to turn out better quality rice. Authorities say that in 1984 only 17 percent of the rice delivered to the village unit cooperatives (KUD) were regarded qualitatively below standard.

In 1980 already 3,151 hulling units were in operation in many parts of West Sumatra. Four years later the number went up to 3,531 signifying a 12.06 percent increase.

Nurmawan, chief of the provincial agricultural service, said the total milling capacity of the hullers was 827,098 tons, while rice production in 1984 amounted to 820,522 tons, showing a surplus capacity of 6,576 tons.

The surplus capacity on district level included 13,063 tons in Pasaman, 2,321 tons in Lima Puluh Kota, 10,409 tons in Tanah Datar, 21,736 tons in Pesisir Selatan, 5,241 tons in Kodya Payakumbuh, 205 tons in Padangpanjang, and 1,882 tons in Kodya Padang.

The areas with capacity shortage are Agam (10,397 tons), Padang/Pariaman

(25,229 tons), Solok (14,007 tons), Sawahlunto/Sijunjung (2,878 tons), Bukittinggi (665 tons), and Kodya Solok (327 tons). The milling capacity is set for workday/year.

Considering this surplus, all watermills through West Sumatra should have been idle. However those still in use may be due to their remote location from the paddy milling centers.

The mechanized milling has encouraged the farmers to modernize their method of threshing, which used to be done by manual beating or trampling.

Imported

The hullers are imported, particularly from Japan, but the threshers are made locally.

Ever since early Repelita III (1979-1983) the ministry of agriculture has encouraged the manufacture of agricultural machines adapted to the one designed by the International Rice Research Institute (IRRI) at Los Baños, the Phillipines, and made to suit the soils in various parts of the country.

In West Sumatra the making of these machines is being done under the guidance of the agricultural mechanization agency of the provincial agricultural office. Workshop owners are given theoretical and practical education in handling the devices.

At present 20 machine shops scattered over six districts in the province are turning out agricultural devices. Only 5 to 7 H.P. motors are imported.

Besides, several of the shops have started manufacturing hand tractors for plowing and weeding.

Popular

Of all these devices only the threshers have become popular and marketed in Aceh, Medan, South Sumatra, West Sumatra, Kerinci, and Lampung.

W. Reddy, Indian consultant of IRRI assigned to the directorate for food production, who visited West Sumatra some time ago, has noted that in the whole of West Sumatra 1,500 threshers of an average capacity of 0.5 tons of

paddy/hour/unit are being used.

These threshers are available at a price ranging from Rp600,000 to Rp700,000 a piece. However the farmers need credits in order to be able to acquire such a machine, he said.

"If rice hullers require more than 10 years to cope with the paddy production in West Sumatra, the threshers may only need seven years," he said when inspecting the thresher making shops some time ago.

Based on an average capacity of 0.5 tons of paddy/hour/unit, 13,500 more threshers are required to handle the over one million tons of paddy production a year.

Hand-tractors

The application of locally made hand tractors for plowing and weeding has already taken place in a number of places, among others in Payakumbuh area. Twelve of them, produced by DMS at Bukittinggi, are available at a price of Rp1.2 million each.

With the introduction of partial mechanization, particularly the employment of ricemills and threshers, West Sumatra is expected to be able to save 110,770 tons of rice a year which would have been lost by the traditional technology.

According to Nurmawan, the agricultural officer, with the application of machines the milling conversion rate has now reached 62.05 percent against 60 percent by the traditional watermills.

W. Reddy, for his part, commented that the threshing machine could prevent a loss of up to two percent of rice compared with the traditional beating and foot trampling system. This means that each year 13.5 percent or 110,770 tons of rice could be saved from losses, based on the annual production of 820,522 tons in 1984. Assuming a rice price of Rp350 per kg, the quantity saved would be worth Rp38.7 billion or Rp2.8 billion bigger, compared with West Sumatra regional budget (APBD) for the 1985/1986 financial year amounting to Rp36.1 billion.

— JP/Antara

MAF-IRRI INDUSTRIAL EXTENSION PROGRAM (Philippines)

SEMI-ANNUAL REPORT

OCTOBER 1, 1984 - MARCH 31, 1985

At our request, USAID/Manila evaluated the MAF-IRRI Industrial Extension Program in October 1984. The main recommendation was that the MAF-IRRI Program should be continued for an additional two years in order to benefit from the recently attained momentum and to ensure institutionalization during the present period of economic crisis. A copy of the recommendations is included as Annex A. Possibilities for funding an extension of the Program have been discussed with the Program's Advisory Committee, the Agricultural Research Office of the Ministry of Agriculture and Food, and USAID/Manila. A proposal was submitted to the Agricultural Research Office for possible funding by the Rainfed Resources Development Program (a USAID loan to the Philippines). A copy of this proposal is included as Annex B.

The major extension activity during this period has been to promote the tapak-tapak pump (see Annex C) in Regions 1, 3, and 4, with moderate efforts in Regions 5, 6, 7, 8, 9, 10, 11, and 12. This effort involved direct collaboration with the MAF regional offices, with field demonstrations being organized by provincial and municipal agricultural officers. The effort will be evaluated in April 1985, and results will serve as the basis for planning the next extension effort during the dry season of 1985-86.

Extension of the manually-operated rice seedling transplanter has continued. Training courses for farmers and technicians were held in Regions 2, 6, 11, and 12. Cooperating manufacturers are now producing the transplanter in six regions.

The thresher/sheller developed by the MAF-IRRI Program was awarded a first prize in the Creative Research Category of the 1985 Inventor's Contest. (see Annex D.) Over ten manufacturers have been assisted to modify their thresher so that it may also serve as a corn sheller. We have worked to develop a smaller (TH7) thresher/sheller which will be promoted in areas where the lower price and smaller size of the unit is expected to be more acceptable to farmers than the TH8 thresher/sheller. A course was held at BPI Manila to train the MAF-IRRI regional engineers to operate and maintain thresher/shellers which were purchased by the Ministry for use at the regional level.

We also continued to test and improve the sweet potato chipping machine, paddy dryer, and reaper. Our efforts to promote the seed and fertilizer applicator (SFA) have been only marginally successful and are now being evaluated. Field trials of the rolling injection planter (RIP) have continued in Region 6 by the KABSAKA project of the Ministry of Agriculture and Food, and we plan to evaluate these results and formulate plans for further testing or preliminary extension.

The axial flow pump has not been readily accepted by farmers because of its relatively high price. This has led us to undertake the development of a lower cost pump which combines the best features of the axial flow pump and the "sipa" pump which is popular in the Bicol region. Prototypes have been fabricated, tested, and demonstrated in Regions 5 and 6. We are now preparing promotional material and technical drawings which will be used in an intensive extension effort beginning in May of this year. Our initial demonstrations indicate that farmers are enthusiastic about the pump because of its low cost (about ₱1,000 or US \$50) and high efficiency.

11

We have continued to collaborate with the Small Business Advisory Center (Ministry of Trade and Industry) in helping cooperating manufacturers in Region 12 to form an association. A training course on financial management and organizational development was offered to these manufacturers during March 1985.

The activities of the MAF-IRRI Program were discussed with MAF regional directors and research coordinators and managers during the MAF-IRRI Technology Transfer Workshop held in Nueva Ecija during March 1985. (A copy of our presentation is included as Annex E.) We brought up the problem that our regional engineers are hampered by insufficient funds for fuel and per diem, as well as by the limited availability of suitable vehicles and drivers. This problem was discussed in more detail at a MAF meeting in Ilagan, and the regional directors have agreed to provide part of the necessary funds from their budgets, - at least until the Ministry's budget to BPI for the MAF-IRRI Program has been increased.

The priorities for the next six months are to: (a) complete training activities for MAF-IRRI staff members, - including both on-the-job training and the three-week course at IRRI; (b) continue development and promotion of the equipment described in the preceding paragraphs; (c) finish equipping the BPI machine shop with necessary tools and machinery; (d) help select and train a person who will take over the responsibilities of the present IRRI liaison engineer; (e) work towards ensuring that the Program will have an adequate budget in order to sustain its present level of activities; (f) prepare the final report with a work plan for the future.

RECOMMENDATIONS FOR IMPROVING THE CURRENT IRRI-MA PROGRAM*

Recommendations for AID

1. The evaluation team's main recommendation is that the AID Asia Bureau grant a two-year extension to the current IRRI Project without adding additional funds. This would enable BPI to gain needed additional institutional capability and to maintain its recently acquired momentum during the current GOP budget crisis.
2. The AID ASEAN Program and AID Science and Technology Bureau should consider initiating a regional industrial extension project for small-scale fabricators of farm machinery.
3. The USAID/Manila Mission in collaboration with its GOP counterparts should investigate further the possibilities of assisting the BPI (MAF-IRRI) Program under one of its larger projects, either Small and Medium Enterprise Development (SMED), Rainfed Resources Development (RRD), or Accelerated Agricultural Production (AAP).
4. The USAID/Manila should encourage testing BPI (MAF-IRRI) types of farm machinery under USAID assisted, MAF farming systems projects (RRD and Farming Systems Development - Eastern (Visayas)).

Recommendations for the GOP

1. BPI should pursue efforts to obtain continued external funding either from private sources (such as AMMDA or regional industry associations), from AID, or from another donor. This last possibility can be explored with the NEDA External Assistance Staff.
2. Though the Government budget is extremely tight, efforts should be made to obtain some additional Government budget allocations to sustain the Program after September 1985. Roughly P300,000 to P500,000 per year is needed for: a) travel, training, and other extension expenses; b) costs related to equipment development and testing; and c) a full time coordinator with extensive field experience and proven leadership ability as well as two or three engineers to replace those currently supported by the AID-IRRI grant.
3. The BPI and IRRI Program co-leaders should work together to utilize wisely the remaining AID-IRRI grant funds before September 1985.
4. MAF should integrate the farm machinery development work of BPI into MAF farming systems, research and development efforts (particularly through the RIARS network) and into the regular MAF extension activities.

*Section D of the USAID Evaluation of the MA-IRRI Industrial Extension Program for Small Farm Equipment (Second Draft, October 1984).

5. BPI should strengthen linkage and coordination with technology resource institutes (such as AMDP) and with other government and non-government agencies involved in industry extension activities (such as SBACs, NACIDA, private university small business institutes, and UPISSI). These agencies may be able to assist farm implements manufacturers in their business consultancy needs.

6. The evaluation team strongly recommends that Government policy makers give increased attention to the farm mechanization requirements of their current shift toward accelerated agricultural production and their focus on five priority crops: corn, azolla, rootcrops, ipil-ipil, and soya beans.

7. Government agencies and credit programs should favor the purchase of locally manufactured farm equipment.

8. The Permanent Inter-Agency Committee for Agricultural Mechanization (PICAM) should be constituted officially and formulate policies on the industry's tariff and incentive structure, research and extension jurisdictions, credit schemes, standardization, and the impact of mechanization on small farms, landless labor, and rural industrial growth.

Recommendations for IRRI

1. Because the BPI Program provides IRRI with a very valuable communication channel with farmers and valuable feedback on IRRI-type equipment, IRRI should continue to support the BPI extension program with technical assistance, testing, and perhaps funding from the IRRI core budget.

2. The IRRI small farm equipment program should be coordinated closely with the IRRI cropping systems program with a goal of more fully utilizing the vast multidisciplinary expertise available at IRRI.

DRAFT

17 January 1985

PROPOSAL

for

MAF-IRRI PROGRAM FOR SMALL FARM EQUIPMENT

Summary

A continuation of the MAF-IRRI Program for Small Farm Equipment is proposed for two years, 1 October 1985 through 30 September 1987. The objective is to establish MAF's capability for the development and extension of agricultural equipment suitable for: (a) improving the income of disadvantaged farmers (e.g., those with small rainfed farms); and/or (b) increasing production of priority crops, such as yellow corn, sweet potato, soybean, and rice. The effectiveness of the present collaborative effort of MAF and IRRI is described, and it is proposed that the same relationship be maintained for the proposed continuation. The estimated total budget is US \$457,200 for the two-year period.

1. INTRODUCTION

In 1981 the Ministry of Agriculture and Food (MAF) and the International Rice Research Institute (IRRI) initiated a collaborative project entitled "MAF-IRRI Industrial Extension Program for Small Farm Equipment". The project was financed by a grant to IRRI from the US Agency for International Development (USAID) for the purpose of assisting national institutions in developing countries to strengthen their capabilities for the development and extension of locally-made agricultural equipment suitable for small farms.

Annex A provides a detailed description of the MAF-IRRI Program's activities and accomplishments up to September 1984. The principal achievements are:

- a. A central office for the Program has been established at the Bureau of Plant Industry (BPI), where 8 engineers are participating on a part-time basis. The Program also has part-time participation of engineers located in each of the twelve agricultural regions. These engineers have received training at IRRI, BPI, and in the field, and are now responsible for demonstration and promotion of MAF-IRRI equipment in their regions, together with providing technical assistance to cooperating manufacturers.
- b. Over 250 cooperating manufacturers have joined the Program. These manufacturers are located in all of the major agricultural areas of the country, as well as in the principal cities.
- c. The Program is actively promoting nine types of small-scale agricultural equipment, and it is currently developing three other promising types of equipment. Cooperating manufacturers have responded by requesting over 500 sets of technical drawings for these equipment, and over 100 prototype units have been loaned by the Program to manufacturers to facilitate fabrication of their first units.

Since the USAID grant terminates September 30, 1985, USAID/Manila was requested to carry out an evaluation of the Program in 1984. The main recommendation of the evaluation team was that the Program should be continued for at least two more years in order to "enable BPI to gain needed additional institutional capability and to maintain its recently acquired momentum". The purpose of the present proposal is to suggest the objectives, institutional collaboration, and budget for the continuation.

2. OBJECTIVES

The purpose of the proposed project is to establish MAF's capability for the development and extension of locally-manufactured agricultural equipment which will benefit farmers who are among the principal target groups of current government programs, such as:

- a. Farmers whose economic status is below average because of the lack of irrigation (i.e., areas which are totally rainfed or have irrigation only during part of the year), poor soils and/or water control (e.g., eroded or flooded areas), and/or inadequate infrastructure (e.g., inadequate roads, equipment sales and repair services, postharvest facilities and marketing systems).
- b. Farmers who are potential producers of priority crops, such as yellow corn, sweet potato, soybeans, and rice.

At first, the MAF-IRRI Program promoted existing IRRI-designed equipment that generally are most appropriate for irrigated rice farms. However, during the last two years the Program has begun to direct its efforts towards rainfed areas and upland crops. The Tapak-tapak pump, sweet potato chipping machine, thresher/sheller, and seed and fertilizer applicator are concrete examples of this effort (see Annex A for details).

It is proposed that the Program be continued for an additional two years (October 1, 1985 through September 30, 1987) with the following specific objectives:

- a. Develop and promote equipment suitable for farmers lacking irrigation during part or all of the year. Examples: (1) pumps; (2) minimum tillage and planting devices to conserve residual moisture and/or reduce the time and risk of crop establishment, such as the rolling injection planter promoted by the Program and now undergoing on-farm trials by KABSACA and several RIARS; (3) manually-operated rice seedling transplanter to speed up the establishment of a second rice crop in a rainfed cropping pattern; (4) manually-operated row seeder to replace direct seeding by broadcasting, - a practice which pushes farmers to use herbicides, whereas the row seeder enables them to use the manually-operated push weeder.

- b. Develop and promote low-cost postharvest equipment (e.g., chipping machine, threshers, shellers, and dryers) that will reduce losses due to deterioration and will increase the prices received by farmers for their products.
- c. Develop and promote equipment that will help farmers to increase the production of priority crops such as yellow corn, sweet potato, and soybean. Examples: (1) seed and fertilizer applicator which economizes on fertilizer by proper placement; (2) animal-drawn weeder suitable for weeding corn earlier than the present farmers' practice of using the traditional plow (weeds are often the major problem of upland crops); (3) postharvest equipment (as described above).
- d. Strengthen collaborative work with the ARO and RIARS system, as well as with agricultural colleges and universities. (The Program has collaborated with: UPLB on corn shellers and rice transplanters; VISCA on chipping machines and seed and fertilizer applicators; CLSU on the Tapak-tapak pump).
- e. Strengthen manufacturers of agricultural equipment suitable for small farms. This involves continuation of training, technical assistance, and prototype testing, and described in Annex A.

3. PROPOSED MAF-IRRI COLLABORATION

The experience of the past four years indicates that the primary strength of the MAF-IRRI Program is that it combines the unique capabilities of the two institutions, MAF and IRRI, in an effective manner to achieve the desired objectives. The capabilities of MAF and IRRI are complementary, and both are essential to the Program's success. For example, through its direct contact with farmers in all regions of the country, MAF is capable of carrying out demonstrations and trials to determine which types of equipment are most suitable, - and then follow up with extension activities to promote these equipment and, when necessary, adaptation of the equipment to varying local conditions. On the other hand, IRRI is capable of R&D on equipment requiring advanced scientific and technological knowledge and facilities, including inputs from economists, farming systems specialists, irrigation engineers, soil and plant scientists, and other disciplines available at IRRI.

The principal responsibility of the IRRI Liaison Engineer is to ensure that these comparative advantages of MAF and IRRI are utilized in an effective manner to achieve the main objective of the Program, - which is to increase the availability of agricultural equipment suitable for small farmers. This role may be illustrated by the following cases:

1. Transplanter. IRRI first introduced the transplanter in the Philippines in 1980, but it was not accepted by farmers because of the costly seedling production method, plus several technical problems with the machine (e.g., missing hills and difficulty to pull). The Liaison Engineer coordinated a collaborative effort of IRRI and the MAF-IRRI Program to carry out an intensive on-farm effort to evaluate and improve the transplanter. A cooperating farm in Bukidnon came up with a greatly simplified method for seedling production and handling, as well as suggesting mechanical improvements of the transplanter which were then developed by an IRRI engineer who also added his own innovations. Feedback from farmers in Camarines Sur provided another appropriate method for seedling production. The transplanter is now being promoted by the Program in four regions, - and many farmers have indicated their acceptance by buying units. MAF engineers have been trained at IRRI and in the field (e.g., Camarines Sur) on seedling preparation and on fabrication, assembly, adjustment, and operation of the transplanter. Consequently, the MAF engineers are now capable of assuming most of the responsibilities of the transplanter extension project. We believe that the MAF-IRRI collaboration was the essential factor in improving the transplanter to the level that it is now acceptable to farmers. Consequently, IRRI has also benefitted from the collaboration and is passing the benefit on to other countries.

2. Tapak-tapak pump. The Liaison Engineer and the BPI Engineering Chief organized a workshop to be held in Nueva Ecija for the purpose of bringing together farmers, manufacturers, and technicians to determine priorities for equipment R&D. They invited the current head of IRRI's Agricultural Economics Division to present a paper proposing equipment priorities on the basis of results of an on-going IRRI study of the principal constraints to increasing

rice production in the Philippines. One of his proposed priorities was low-cost irrigation pumps, and the Liaison Engineer began to search for appropriate designs. The most promising design that he found was the twin treadle ("Tapak-tapak") pump developed by the Rangpur Dinajpur Rehabilitation Service (RDRS) in North Bangladesh. He was able to visit the pump project in Bangladesh and arrange for an experienced RDRS engineer to stop over in the Philippines to give a 7-day training course to MAF-IRRI engineers. The resulting "Tapak-tapak pump" has been tested and modified by these engineers, and it is now being promoted with good acceptance by farmers. It is particularly appropriate in rainfed areas where farmers grow vegetables during the dry season after harvesting the wet-season rice crop.

3. Thresher/sheller. Government officials informed us that the national program for increasing production of yellow corn was being hindered by insufficient availability of corn shellers. Consequently, the Liaison Engineer suggested that the MAF-IRRI Program try to modify the IRRI-designed axial-flow paddy thresher so that it could also be used to shell corn. The axial-flow thresher is popular in many areas of the Philippines where it is fabricated by local manufacturers, many of whom are cooperating members in the MAF-IRRI Program. The modification was developed by MAF engineers and the Liaison Engineer, with the collaboration of a cooperating manufacturer who is an experienced fabricator of axial-flow threshers. The resulting modification is outstanding due to its low cost (about ₱1000 additional cost), high capacity (up to 5 tons/hour), and grain purity (99+%). The design has been disseminated to the Program's cooperating manufacturers, and over six have fabricated prototypes, with two already initiating commercial production.

These three cases illustrate different ways in which MAF and IRRI have worked together to achieve practical results which most likely would not have been attained by either institution without the collaboration of the other. In the first case, the MAF-IRRI Program served as the channel for communicating essential information from farmers to IRRI regarding needed improvements of the transplanter. These improvements required the technical

capability of IRRI, and subsequent trials and training required the collaboration of both MAF and IRRI. In the second case, the MAF-IRRI staff was capable of carrying out most of the engineering and extension of the Tapak-tapak pump, while IRRI's role was to stimulate the Program's initial efforts to find a suitable low-cost pump and then, through the Liaison Engineer, enable the transfer of technology from RDRS/Bangladesh. In the third case, the MAF-IRRI staff and Liaison Engineer identified and developed the thresher/sheller modification, without additional assistance from IRRI, but the original thresher was an IRRI design.

The Philippines is fortunate to have the unique opportunity for MAF and IRRI to collaborate in the development and extension of small farm equipment, and it is proposed that the current relationship be continued in order to provide small farmers with additional equipment, such as the types indicated in Section 2.

4. PROPOSED IMPLEMENTATION AND FUNDING

At present, the MAF-IRRI Program is supported in part by the funds of a grant to IRRI from USAID/Washington. These funds have not only supported the IRRI Liaison Engineer and his staff (secretary and driver) at BPI, but have also been used for purchases and operating expenses that cannot be covered by BPI either because of the lack of funds (especially near the year's end) or because MAF regulations do not allow funds to be used for certain purposes (e.g., new equipment, additional personnel, incentives) or cannot be obtained on short notice (e.g., travel advances and materials purchases). An innovative "learning-by-doing" development project like the MAF-IRRI Program could not function effectively without a flexible budget which can respond immediately to sudden needs, such as materials or parts to repair or modify prototype equipment or urgent requests from regional offices for equipment demonstrations or technical assistance. In order to sustain the Program after the proposed two-year period, BPI will need to increase both the amount and the flexibility of the budget provided to the Program.

Since the present arrangement has proven to be effective, it is proposed that approximately the same amount of funds be channeled through IRRI for the MAF-IRRI Program (see "Proposed Budget for IRRI Liaison Office at BPI/Manila"). These funds would be managed in the same manner as at present, which is consistent with USAID regulations, but with joint approval of expenditures by both the IRRI Liaison Engineer and the BPI Engineering Chief.

A detailed accounting of expenditures would be provided to MAF on a quarterly basis, and any changes from the proposed budget would be submitted in advance for MAF approval.

BPI will continue to provide partial support to the Program from its regular budget. The current level of this support is estimated to be ₱300,000 which corresponds to approximately 25% of the total annual budget of BPI's Agricultural Engineering Division for 1984. This includes the transfer of BPI funds to MAF Regional Offices for travel and miscellaneous expenses of regional engineers while participating in activities of the Program. Due to inflation plus reductions in the BPI budget, it is no longer possible for BPI to transfer the necessary funds (₱2,000 per month for each of the 12 regions). Consequently, the proposed budget includes an appropriate amount for this purpose. (See "Proposed Supplementary Budget for BPI".) By the end of the proposed two-year continuation project, BPI's regular budget should be increased to cover these expenses.

The proposed budget also includes funds for purchasing tools and equipment needed to improve the BPI shop so that it will be more suitable for fabricating equipment prototypes.

The Program's progress is currently hindered by the lack of a BPI engineer capable of coordinating the diverse activities (e.g., equipment development and promotion, training, technical assistance to manufacturers, activities of regional engineers) under the direction of the BPI Engineering Chief with the assistance of the IRRI Liaison Engineer. The latter two persons have had to assume these duties but the situation needs to be improved because the BPI Engineering Chief cannot devote full-time to the Program and the IRRI Liaison Engineer should not coordinate the daily activities of BPI and MAF employees. The coordinator should be an experienced BPI/MAF engineer who has a demonstrated ability with respect to the practical development and extension of small farm equipment, as well as effective management of technical activities and personnel. Although engineers of this calibre are scarce, several potential candidates have been tentatively identified. The person should be appointed and trained during the two-year period so as to have a capable coordinator available to sustain the Program after the proposed project is completed. The Advisory Committee has been informed of the need, but no definite action has been taken.

IRRI has partially supported the Program from its regular budget by providing personnel and facilities for training of MAF engineers at IRRI, as well as collaboration on equipment development, testing, and promotion (e.g., transplanter, reaper, and rolling injection planter). This support is estimated to amount to approximately US \$79,000 per year (10% of the total annual budget of IRRI Engineering, including senior staff engineers). It is proposed that IRRI continue to provide this level of support to the Program, - even after the two-year period of the proposed extension.

The Program is guided by an Advisory Committee having the following members: MAF Assistant Secretary, Head of IRRI Engineering, Dean of UPLB Engineering, Director of the Agricultural Machinery Testing Center (AMTEC), President of the Agricultural Machinery Manufacturers and Distributors Association (AMMDA), and representatives from the Central Bank and Ministry of Industry and Trade. It is proposed that the same Committee continue to guide the Program, but with the addition of a representative of ARO.

PROPOSED BUDGET FOR IRRI LIAISON OFFICE AT BPI/MANILA

| | <u>FIRST YEAR</u> 10/01/85-09/30/86 | <u>SECOND YEAR</u> 10/01/86-09/30/87 | <u>TOTALS</u> |
|---|--|---|---------------------|
| 1. Salaries and Wages ^{a/} | \$ 68,000.00 | \$ 74,800.00 | \$142,800.00 |
| 2. Overhead | \$ 10,000.00 | \$ 11,000.00 | \$ 21,000.00 |
| 3. Fringe Benefits and Allowances | \$ 41,800.00 | \$ 46,000.00 | \$ 87,800.00 |
| 4. Travel and Transportation | | | |
| a. Local Travel | \$ 10,000.00 | \$ 11,000.00 | \$ 21,000.00 |
| b. South and Southeast Asia Travel | 4,000.00 | 4,400.00 | 8,400.00 |
| c. ASAE Meeting | 4,100.00 | 4,500.00 | 8,600.00 |
| d. Home Leave | 13,100.00 | - | 13,100.00 |
| | <u>\$ 31,200.00</u> | <u>\$ 19,900.00</u> | <u>\$ 51,100.00</u> |
| 5. Equipment, Materials and Supplies | \$ 15,200.00 | \$ 14,600.00 | \$ 27,800.00 |
| 6. Training, Meetings and Workshops | \$ 5,600.00 | \$ 4,000.00 | \$ 7,600.00 |
| 7. Incentives and Travel of MAF Personnel ^{b/} | \$ 10,800.00 | \$ 12,000.00 | \$ 22,800.00 |
| 8. Miscellaneous and Contingency (15%) | \$ 26,800.00 | \$ 27,500.00 | \$ 54,100.00 |
| TOTAL ANNUAL BUDGET | <u>\$ 205,400.00</u> | <u>\$ 203,600.00</u> | <u>\$415,000.00</u> |

Footnotes:

mpr
1.16.85

^{a/}IRRI staff at BPI (liaison engineer, secretary, and driver) plus temporary local-hire employees at BPI

^{b/}Monthly incentive payments are provided to engineers who have contributed significantly to Program activities by working beyond the normal responsibilities of their positions with the Ministry.

PROPOSED SUPPLEMENTARY BUDGET FOR BPI

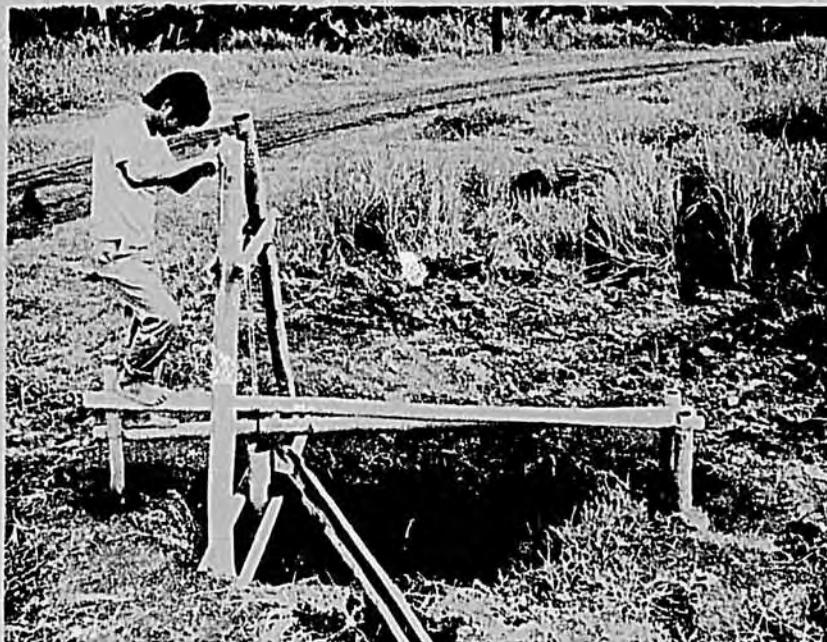
Note: All items can be provided in Pesos

| | FIRST YEAR 10/01/85-09/30/86 | SECOND YEAR 10/01/86-09/30/87 | TOTALS |
|--|---------------------------------|----------------------------------|------------------|
| Travel and Operational Expenses for Regional Engineers | | | |
| Average of US\$100 per month for each region, multiplied by 12 regions. with 10% increase in second year | \$ 14,400 | \$ 15,800 | \$ 30,200 |
| Tools and Equipment for Improving BPI Shop | | | |
| Welding machine, lathe machine, power saw, portable power tools, and hand tools | <u>10,000</u> | <u>2,000</u> | <u>12,000</u> |
| TOTAL ANNUAL BUDGETS | <u>\$ 24,400</u> | <u>\$ 17,800</u> | <u>\$ 42,200</u> |

SUMMARY OF TOTAL PROPOSED BUDGET

| | FIRST YEAR 10/01/85-09/30/86 | SECOND YEAR 10/01/86-09/30/87 | TOTALS |
|------------------------------|---------------------------------|----------------------------------|------------------|
| IRRI Liaison Office at BPI | \$205,400 | \$209,600 | \$415,000 |
| Supplementary Budget for BPI | <u>24,400</u> | <u>17,800</u> | <u>42,200</u> |
| TOTAL ANNUAL BUDGETS | <u>\$229,800</u> | <u>\$227,400</u> | <u>\$457,200</u> |

MA-IRRI INDUSTRIAL EXTENSION PROGRAM FOR SMALL FARM EQUIPMENT



MA-IRRI "TAPAK-TAPAK" PUMP

Ideal for small-farm irrigation where engine-driven pumps are generally too expensive and bucket-lifting by hand is limited to very small areas because of its high labor requirement.

ADVANTAGES

EASY TO OPERATE: Uses the body weight and leg muscles; less tiring than conventional pumps which use arm and back muscles.

LOW COST: About ₱400.00 (US \$20) for all materials and labor for complete pump, including bamboo framework (but excluding cost of digging or drilling the well).

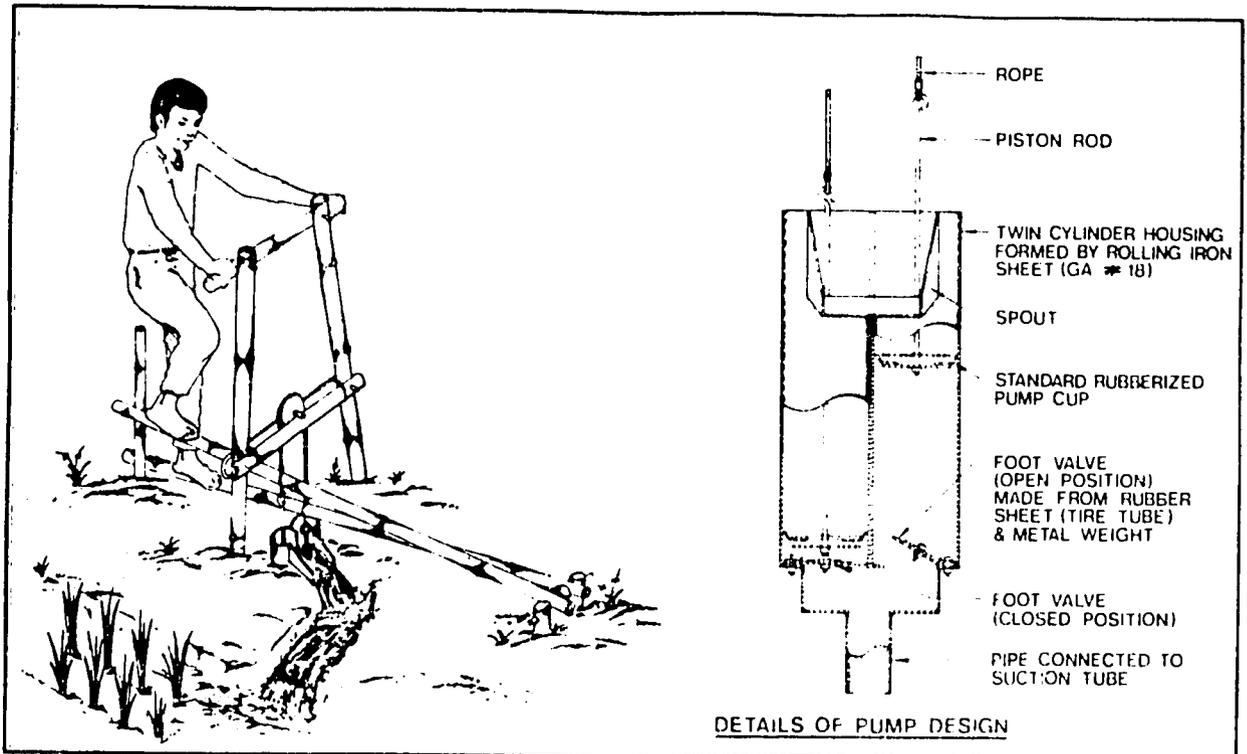
SIMPLE CONSTRUCTION: Can be fabricated from locally available materials using **common shop tools**, thereby reducing cost and simplifying maintenance and repair.

ADAPTABLE: Can be portable or stationary; suitable for open-pit wells, tube wells, canals, lakes, and rivers; no priming required for depths as great as 5 meters (16 feet).

HIGH CAPACITY: Due to the effective use of the body weight and the twin pump cylinders, the capacity is higher than for most low-cost manual pumps. Approximate capacities are:

- 3 liters/second (48 gallons/minute) for a 2 meter lift.
- 2 liter/second (32 gallons/minute) for a 4 meter lift.

MA-IRRI "TAPAK-TAPAK" PUMP*



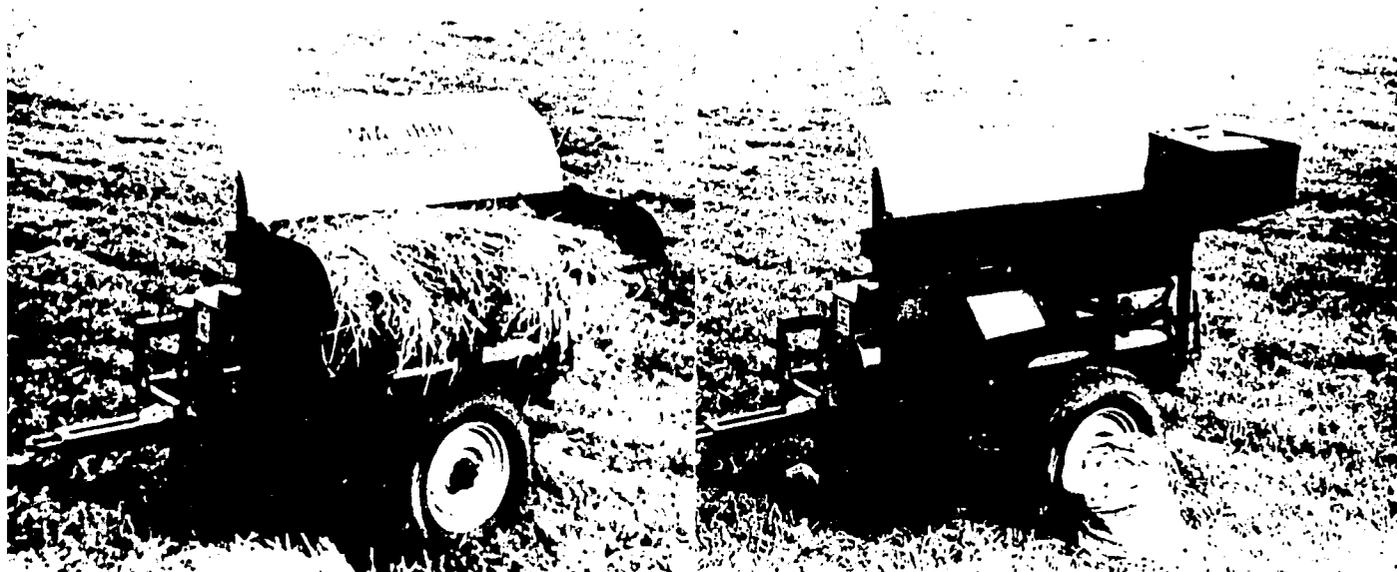
Technical information and blueprints may be obtained from:

MA-IRRI INDUSTRIAL EXTENSION PROGRAM
FOR SMALL FARM EQUIPMENT

Agricultural Engineering Division
Bureau of Plant Industry
San Andres Street, Malate
Metro Manila
Philippines

Telephone: 59-81-14

*Note: The Tapak-Tapak Pump is based on a design developed in Bangladesh by the Rangpur Dinajpur Rehabilitation Service.



RICE THRESHER — converts in 15 minutes to — CORN SHELLER

MA-IRRI THRESHER/SHELLER

The popular axial-flow thresher* has been modified so that the same machine may be used both as a corn sheller and as a rice thresher.

ADVANTAGES

- o Economical: - The cost of the thresher/sheller is only about 5% higher than the cost of a conventional axial-flow thresher.
- o Convenient: - Easy to change from threshing to shelling in less than 15 minutes; only five components are modified (see details on reverse side).
- o Versatile: - Even existing (used) threshers may be modified at low cost. Capable of shelling all sizes and varieties of corn.
- o High Performance: - Comparable to single-purpose corn shellers:

| | | | |
|---------------|-----------------------|-------|------------------------------------|
| <u>Corn</u> : | Capacity** | | Up to 5 tons per hour |
| | Shelling Efficiency** | | over 99% |
| | Total Shelling Loss** | | less than 0.3% |
| | Kernel Breakage** | | less than 2.5% |
| | Cleaning Efficiency** | | over 99% purity |
| <u>Rice</u> : | Capacity | | 20-30 cavans (1-1.5 tons) per hour |
| | Separation Recovery | | 98% (weight basis) |

*Originally designed by IRRI (Phil. Patent No. 12001; U.S. Patent No. 3776242).

**Performance data of AMTEC for modified TH8 thresher with 16 hp gasoline engine or 11 hp diesel engine and built-in grain cleaner (oscillating screen with blower).

MA-IRRI THRESHER/SHELLER



ONLY 5 COMPONENTS ARE MODIFIED TO CONVERT THRESHER TO SHELLER:

- ① Concave grill is strengthened by using heavier bars and/or extra lateral reinforcing bars.
- ② Hopper: to facilitate feeding corn into the machine is installed in place of the horizontal tray used for feeding paddy.
- ③ Baffle is installed in discharge tube to prevent passage of corn cobs and kernels.
- ④ Door in side-wall of discharge tube is opened to allow cobs and kernels to pass to oscillating screen.
- ⑤ Oscillating screen for paddy is replaced with one having larger holes for corn kernels.

Detailed information may be obtained from:

MA-IRRI INDUSTRIAL EXTENSION PROGRAM
FOR SMALL FARM EQUIPMENT

Agricultural Engineering Division
Bureau of Plant Industry
San Andres Street, Malate
Metro Manila
Philippines

Telephone: 59-81-14



**MA-IRRI INDUSTRIAL EXTENSION PROGRAM
FOR SMALL FARM EQUIPMENT**
BUREAU OF PLANT INDUSTRY
AGRICULTURAL ENGINEERING DIVISION
SAN ANDRES ST., MALATE, MANILA
TELS. 50-81-14 OR 50-08 01

A N N O U N C E M E N T

**MAF-IRRI PROGRAM AWARDED PRESIDENTIAL MEDAL
FOR DEVELOPING THE THRESHER/SHELLER**



We are pleased to inform you that the thresher/sheller developed by the MAF-IRRI Program was awarded first prize in the Creative Research Category of the 1985 Inventors' Contest sponsored by the Philippine Invention Development Institute. There were over 300 entries in the 1985 Contest which was held at Philtrade on February 21-28. The award was presented by Minister of Labor Blas F. Ople.

MAF-IRRI INDUSTRIAL EXTENSION PROGRAM FOR SMALL FARM EQUIPMENT

Summary of Regional Activities

B. C. Gonzalo and R. E. Stickney
March 1985

1. Regional Project Engineers have been appointed in each Region (see list below) to serve as coordinators of Program activities. All but the newest engineers have received training at IRRI and BPI. Some are located at Experiment Stations, while others are in the Regional Offices.

| <u>Region</u> | <u>Engineer</u> | <u>Location</u> |
|---------------|-------------------|---|
| 1 | Clemente Abrina | Regional Office San Fernando, La Union |
| 2 | Rodolfo Bayucan | Ilagan Experiment Station Ilagan, Isabela |
| 3 | Leonardo Gappi | Regional Office San Fernando, Pampanga |
| 4 | Carlito Fernandez | BPI Central Office San Andres, Malate, Manila |
| 5 | Prisco Salcedo | Bicol Experiment Station Pili, Camarines Sur |
| 6 | Ruperto Deysolong | Visayas Experiment Station Jaro, Iloilo City |
| 7 | Bonifacio Cabahug | Regional Office Cebu City |
| 8 | Carlos Macabenta | Gandara Experiment Station Gandara, Samar |
| 9 | Florencio Vivas | Ipil Experiment Station Ipil, Zamboanga del Sur |
| 10 | Rolando Ansale | Regional Office Cagayan de Oro City |
| 11 | Angel Platon | Davao Experiment Station Bago Oshiro, Davao City |
| 12 | Arturo Neyra | Mindanao Experiment Station Midsayap, North Cotabato |

2. Principal Responsibilities of Regional Engineers are:

- Determine equipment practices and needs of farmers in the Region
- Field test equipment prototypes developed by the Program

- Demonstrate the Program's equipment to farmers to determine potential acceptability and/or necessary modifications
 - Provide technical assistance to local manufacturers of equipment promoted by the Program
 - Train farmers on the operation and maintenance of equipment
3. Equipment now being promoted in the regions are summarized in Table 1. Promotion of the 1.0 m reaper has been temporarily suspended. The rootcrop chipping machine will be promoted later this year, and the rolling injection planter (RIP) is being evaluated in Region VI. Efforts to develop a suitable dryer and lower-cost axial-flow pump are continuing.
4. Principal Problems that are limiting the effectiveness of Regional Engineers:
- a. Insufficient funds for fuel and per diem (100%)
 - b. Unavailability of suitable vehicle and driver (75%)

Table 1: STATUS OF EQUIPMENT PROMOTED BY THE MAF-IRRI PROGRAM

| EQUIPMENT | R E G I O N | | | | | | | | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Seed and Fertilizer Applicator (SFA) | - | D,M,S | D,M,S | D,M,S | D,S | D,M,S | D,M,S | D,S | - | D,S | D,M,S | D,M |
| Transplanter | D | D,M,S | D,M,S | D,M,S | D,M,S | D,M,S | - | D | D | - | D,M,S | D,M,S |
| Tapak-Tapak Pump | D,M,S | - | D,S | D,M,S | D,S | D,M,S | D,M,S | D,S | D | D | D | D |
| Thresher/Sheller | - | D,S | D,M,S | D,M,S | - | D,M,S | - | - | D,M | D | D | D,M,S |

Note: D = Equipment has been demonstrated to farmers in the region

M = Equipment is being manufactured in the region

S = Equipment has been sold in the region