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498-0265

Evaluation Report

on

**Project 498-0265 Extension of Small Scale
Agricultural Equipment (IRRI)**

by

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Project Background

Project 498-0265 began in 1975 under Technical Assistance Bureau--TAB (currently S&T)* funding and was transferred to the Asia Bureau in mid-1978. The Asia Bureau extended it to allow time for an evaluation (done in the fall of 1979), redesigned its managerial aspects and in September 1980 signed a Cooperative Agreement with IRRI for outreach operations in four countries over 5 years. Under TAB sponsorship the project conducted small scale farm machinery extension operations in Pakistan and Thailand. The agreement between IRRI and the Asia Bureau provides for a continuation of operations in Thailand and Indonesia (started under USAID/Jakarta sponsorship) and new outreach programs in India and the Philippines. Work in Pakistan was carried on under USAID/Islamabad funding expiring June 30, 1982. For over 10 years prior to its 1980 agreement with the Asia Bureau, IRRI has conducted equipment extension operations in the Philippines as part of its internationally funded core program. Each year AID has funded roughly 25 percent of the core program.

Evaluation Background

The evaluation was conducted in India, Thailand, Indonesia, and the Philippines between November 6 and December 18, 1981 by the project officer. Roughly half of this period was spent on other AID business. Its purpose was to assess progress and IRRI's adherence to AID's requirements as set out in Cooperative Agreement 492-CA-1707, project letters and other communications. For certain matters i.e. operations in Indonesia and Thailand, research/extension link, general management, etc., the evaluation covers the period since the last evaluation in the fall of 1979. For new features designed into the second phase of the project i.e. strategy, work plan, data collection, multidisciplinary, etc., the evaluation covers the period from the signing of the Cooperative Agreement in the summer of 1980.

A draft evaluation was completed in January 1982 and sent to IRRI for comment in February. In addition, IRRI was given the draft trip reports written on each country visited as background for observations made in the evaluation. In April, 1982, IRRI submitted written comments on the draft evaluation some of which have been incorporated as noted in the text. The country visits with IRRI staff and discussion of the draft evaluation allowed a full and frank exchange between AID and IRRI on the progress of the project. We appreciate IRRI's complete cooperation and openness in this evaluation.

*S&T--Bureau for Science and Technology
(formerly DSB Development Support Bureau)

Recommendations

1. Indonesia: Concentrate on developing fabricators in West Sumatra. Management at Los Banos should guard against widening the effort in Indonesia beyond the available means.
2. Thailand: Unless there are major improvements, terminate the program on April 1, 1983, the end of the outreach officer's tour. Improvement in the program over the next year should include:
 - At least one new or improved design put into production.
 - Incorporation into the Thai program of knowledge gained from the AID funded consequences of mechanization study which to date has functioned in isolation from all outreach programs.
 - Support from IRRI agronomic and social scientists, as planned in this project, in putting the baseline data into useable form for operations and in analyzing policy and institutional needs and planning activities in support thereof.
 - Improved counterpart support both in terms of manpower and their productivity in moving through the design, testing prototyping, blueprinting and extension sequence.
 - A much more systematic, conscious and productive two way flow between outreach operations and research at Los Banos.
 - The use of other outreach personnel to review and improve the Thai program. One possibility is for outreach personnel to meet in Bangkok, review the AED, FAO and IRRI programs and recommend ways to improve the return on the AID/IRRI investment.
3. India: Social, agronomic and economic analysis of farmers' needs in the target area before machinery is selected for design, adaptation and extension. A detailed work plan scheduling staffing, facilities establishment, procurement, research and extension targets and rights and duties of the IRRI representative. Given that IRRI will pay almost all the bills, the plan should clarify the IRRI representative's budget authority with respect to his Indian counterpart in Tamil Nadu and CIAE at Bhopal. In general, adherence in the new Indian program to the guidance in the 1979 evaluation, 1980 Project Paper and Agreement and this evaluation.
4. Philippines: Support the outreach officer and key the project wide six monthly report section on the Philippines to targets in the work plan.

5. Strategy: Make sure that each outreach program strategy is clear, achievable within project means and understood by counterparts. The six monthly report should assess country operations against country strategies and work plans.

6. Research: Use the Project Review Committee to clarify research priorities. Make sure that outreach personnel understand priorities and act accordingly in canvassing equipment ideas. For example, a written statement of research priorities and mechanical solutions to be looked for by field officers might help.

7. Analysis: Prepare a list of project wide questions linked to country strategies and work plans which can be reviewed in the six monthly project report and can form the basis of a project management information system.

8. Training via Industrial Secondment: On page 4 of the Cooperative Agreement, IRRI is encouraged to explore the training of counterpart personnel and fabricators by seconding them to agricultural machinery firms. The agreement states:

IRRI may pay the necessary secondment costs of up to two individuals per outreach country per year. Since this is a worthy but untried form of training with costs and secondment period unknown, IRRI should present its ideas to the AID project officer before making commitments.

Nothing has been done on this matter to date. Within the six months following IRRI's receipt of this evaluation report, AID would like IRRI to submit to AID ideas on this subject.

Summary

The Project is going well in Indonesia, poorly in Thailand, beginning well in the Philippines and about to begin, after three years of discussions, in India. Strengths of the project are its purpose which developing countries find attractive, its client and results oriented design which fosters practical results and IRRI's excellent reputation which promotes acceptance of the project and attracts capable staff. A weakness has been IRRI's management with respect to strategy, work planning, support of field staff, data collection and use, multidisciplinary approach and integration of research and extension. Due to these managerial problems, the strengths of the project have been underutilized and opportunities have been missed.

Findings

I. Indonesia

In equipment extension and the development of small fabricators, excellent progress has been made in the target province of West Sumatra since the 1979 evaluation. From a base of virtually nil in the fall of 1979 five fabricators have built and sold a total of 100 threshers, a dealer in the province has sold 50 threshers built by a cooperating fabricator elsewhere in Indonesia and two other West Sumatran fabricators have gone into thresher production. All the West Sumatra fabricators, with the possible exception of P.T. Sutan Kasim in Padang, are small businesses by Indonesian standards and some are no more than individuals with a few hand tools who are getting a start due to the project. In West Sumatra we seem to be replicating the Philippine experience of developing small businesses via the production of IRRI equipment. In the next stage we will see if the fledging producers achieve steady sales and repair work and the stronger producers take on other IRRI designs i.e. the axial pump, the tiller and the reaper.

The following example of the good work in West Sumatra is taken from the Indonesian field trip report.

The Germans gave a workshop to the agricultural service in Bukkit Tinggi. It has a first class building with the best German machine tools. During my visit in 1979, it was largely unused. Now it is used mainly to repair government vehicles which could be done probably more efficiently with more developmental impact in the private sector. However, what might seem another example of distortionary and wasteful donor largesse is having a surprising side effect.

Two of the mechanics at the shop, both government employees, have made and sold eight threshers. We visited the "shop" of each man, Mochtar and Zaimal. Mochtar rents a loft above the courtyard of a building swarming with children and drying laundry along a smelly back alley in Bukkit Tinggi. We entered his room by ladder. In the corner, in a small pile that could fit into a shoe box, was his workshop: a vice, hammer, hacksaw, tin snips and hand powered drill. He cuts and shapes the metal in his room and then takes the pieces to a place where he can borrow a welding machine.

He had seen the thresher at his government workshop. Production technology had been refined by the larger initial fabricators, P.T. Sarasah and Sutan Kasim. Buyer acceptance had been built up by the early sales and by government demonstrations. Working on his own time and selling on order to friends in his village, he took almost no risks. The establishment by outsiders of the technical and market pre-conditions in his immediate environment, the awakening of his personal aspirations and his work in his tiny room: these are the essence of development. This combination of the environmental and the personal, with the absence of risk and the resulting stimulation of imagination and work, is the way development happens.

Thus, it is appropriate to introduce technology to the strongest fabricators (or farmers). Reddy was correct to start with Sarasah and Kasim despite the charge that he was only helping the rich. Once the technology is introduced and the market built up, the second and third stage entrepreneurs will emerge to sustain the program and, with their many improvements in technology and marketing, make it indigenous. Probably the best example of this theory is Asparmin, a natural mechanic who has been out of West Sumatra, has imagination and is ready to seize a good idea in a prepared market. He has made several modifications to the thresher, is using Reddy to acquire financing and may take up other designs.

Asparmin runs a car and motorcycle repair service about four hours from Padang. One day a farmer brought in for repair a thresher made in Padang. Asparmin liked it, learned where he could see one in good condition, sketched it and began making them. It is essential that Reddy have the time to work with potential winners like Asparmin. Asparmin needs help in understanding new designs, production technology, market development, finance for himself and his customers and after sales service and observation. Time spent in thoroughly establishing Asparmin will be much more valuable than time spent giving minor help to entrepreneurs of less potential in other provinces or in working with the Luwu program.

In West Sumatra there has also been progress at the policy and institutional levels. By personal contacts, analysis and demonstrations the IRRI outreach officer has influenced the following:

- a) the thresher rather than land can be used as collateral for a thresher loan
- b) a government program to subsidize the importation and sale of 1000 four wheel Japanese tractors has been cancelled
- c) the agricultural department and the agricultural bank (BRI) are working together to identify crop intensification areas, equipment needs and eligible farmers.

In Jakarta the project offices and workshop, paid for by AID, are appropriate and well utilized and counterpart support is adequate.

At present the operation in Indonesia is the most effective part of the project. The only problems are a tendency toward dispersion of effort beyond the available means. Indonesia presents many opportunities for field demonstrations, equipment design, policy advice, extension and training. In conducting the program, IRRI's representative is exposed to pressure from an energetic USAID Mission, the Mechanization Bureau and other Indonesian agencies, Indonesian businessmen and other IRRI operatives in the country. Given these pressures and the desire to be accomodating, it is difficult for a busy IRRI management far away in Los Banos to keep the meagre program resources marshalled behind a few key targets. A case in point is IRRI's agreement to conduct an equipment testing program in USAID's project Luwu. On the recommendation of IRRI and USAID/Jakarta, this sub-contract was approved by AID/W to sell ten tillers to project Luwu but promises to take the IRRI representative's time in recruiting and supervising personnel in a non-target province in Sulewesi. In commenting on the draft evaluation, IRRI maintains that this work was deliberately accepted according to the country strategy and does not impair efforts in the target province of West Sumatra.

When the AID evaluator arrived in Jakarta, IRRI and USAID insisted he devote the field time of the evaluation to a visit to the equipment testing program in Luwu even though it had not received staff or equipment. Fortunately, this plan was rejected in favor of a trip to West Sumatra where the very favorable results of two years of solid work in the villages could be observed.

In general, IRRI has done a fine job in Indonesia and management in Los Banos and Jakarta should be on guard to keep the main objective clearly defined and stick to it. Activities in Luwu, South Kalimantan, Indramayu and other places should be judged by their contribution to establishing a self sustaining farmer-fabricator complex in one place which will demonstrate that Indonesia can adopt, adapt, manufacture, sell and service small farm equipment in village shops close to farmers. One this is proven to be profitable and self sustaining, it will have the following effects;

- fabricator-farmer interaction will generate indigenous mechanical technology
- fabricators and farmers elsewhere in the country will copy the practices

government will have evidence and a lobby for reforming policies on tariffs, credit, purchases and industrial subsidies which favor foreign and domestic capital intensive producers of large farm equipment.

Only in West Sumatra is there a chance the program will attain the size and integration to produce these effects.

The above comments on the dilutive impact of IRRI's sub-contract to the Luwu project are not criticisms of USAID. USAID launched the outreach program in Indonesia before the regional project picked it up. In a short-handed Mission, an officer has been assigned to monitor the project and USAID has repeatedly asked AID/W to expand IRRI's staff and budget. USAID used some of its bargaining chips to get the GOI to buy ten IRRI tillers with project Luwu funds. USAID understands and supports IRRI's strategy. Nevertheless, IRRI's objectives under this regional project are not necessarily congruent with all Mission objectives and IRRI must decide where its few resources can be used to best advantage.

Honoraria: The evaluation provided an opportunity to make progress on the vexing subject of honoraria. IRRI pays monthly honoraria to government shop and office workers in amounts up to 50 percent of wages at the project office in Pasar Minggu, Jakarta. This started before the regional program adopted the project and is commonly done by other donors in Indonesia. For good reasons it has rarely been done by the Mission in Jakarta or in other AID assisted countries. Recipient governments should at least provide their officials if the project is worth doing. Salary supplements embitter those left out, cannot be sustained when the donor leaves and normally are not linked to performance or even spending a full day on the job. It was agreed the payments will be shifted to the GOI budget and be phased out as civil service salaries increase.

2. Thailand

Although there have been useful accomplishments, the Thai program should be replanned and renegotiated. If it cannot be substantially improved AID and IRRI should consider terminating it.

Useful accomplishments include the following:

- The IRRI representative has helped to projectize work in the Agricultural Engineering Division. New designs are assigned to a staff member to build, test, blueprint, and give to a fabricator. In this way an employee's work can be organized in accountable units and it becomes possible to train, measure productivity and evaluate performance;

The IRRI representative has helped design and test a buffalo drawn plow needing approximately 30 percent less pulling power. He has introduced an American broadcast seeder and worked with the idea of using two tillers to make a four wheel tractor;

- In terms of technical strategy as distinct from program strategy which includes the development of policy, staff and institutions, the program has applied the AID approved strategy: roughly 50 percent of designs, shop time and field demonstrations concern muscle powered equipment suitable for the Northeast. This includes promising equipment for direct seeding;
- The Thai language has been used for training and design standards;
- The program has introduced a lower hitch moment which improves draft and safety and a larger idler pulley for increased belt life.

In broader terms, the influence of this outreach program on policy, institutional development, design, extension and fabricator development has been modest not only since the second phase began in September 1980, but since the AID evaluation in 1979 and since the first phase began in 1975.

Apart from the outreach program, IRRI has significantly influenced small farm equipment in Thailand. The IRRI axial thresher which entered Thailand in the early 1970's, dominates rice threshing in the productive, well irrigated areas, especially the central plain. On the farm this machine has reduced post harvest losses and increased labor productivity and farm income. Its production and repair have created hundreds of industrial jobs.

Under the outreach program other IRRI designs have not been accepted by fabricators or farmers. These include the dryer, pedal pump, two wheel tiller and manual transplanter. At least 50 units of the tiller were produced by a Chingmai fabricator but he has stopped making them. IRRI's tiller has never been competitive with the heavier Thai tiller in the prime marketing area of the central plain. A thorough analysis of its competitive inferiority, using field tests and engineering studies, has never been made. Farmers' unenthusiastic response to the four row manual transplanter has been a big disappointment. They cannot or will not produce a seedling mat suitable for the machine's plucking mechanism. The Agricultural Engineering Division is trying to adapt the mechanism to accept washed seedlings. If the seeding problem is solved, the need for a smooth puddled paddy bed may become another barrier to adoption. The axial pump, except for some important improvements in vanes and propeller angle, is more an example of the transfer of technology from Thailand to IRRI than the reverse. New designs to be tried during the coming year are the tiller mounted reaper and rotary injection planter. Since 1975 this program has always had interesting designs in the offing but not in

At the policy and institutional level, where there are many possibilities for improvement, IRRI has not attempted to devise a strategy or used its non-engineering expertise. Consequently impacts in these areas are negligible.

Counterpart and shop support has been chronically inadequate.

Some useful training has been done but it has not been intergrated with work in other areas.

Baseline data collection has proceeded without any guidance from Los Banos or relation to the overall four-country program.

IRRI non-engineering expertise for social, agricultural, policy, or institutional analysis as recommended in the 1979 evaluation, the Project Paper, the agreement and funded in the project budget, has not been used or even planned.

In late 1980 UNDP/FAO signed an agreement with the Ministry of Agriculture to provide \$1.5 million over four years covering three expatriates, six vehicles and at least \$100,000 in prototypes. The agreement in terms of clarity, strategy, comprehensiveness, targeting, counterpart staff commitments and accountability is superior to IRRI's understanding with the Ministry. Despite the assumption that IRRI is better qualified in this field in Thailand than the UNDP/FAO, the existence of this larger duplicative effort weakens the case for an IRRI program.

Due to its dynamic farm implements industry, effective agriculture, sophisticated market and many capable universities and governmental institutions, Thailand presents a difficult field for assistance in small farm mechanization. Partly in recognition of this difficulty, AID designed into the second phase of the project requirements for strategic planning, work planning, thorough high level negotiations between IRRI and its counterpart and in general improved managerial performance on the part of IRRI.

IRRI has not met these managerial requirements. It has failed to recognize and act on weaknesses in an outreach program that is not effectively using resources. Despite these weaknesses IRRI has made no proposals for change to the RTG or AID. Most disturbing is the impression that IRRI is content to let this ineffective program persist indefinitely.

In commenting on the above paragraph in the draft evaluation, IRRI said it will review the Thai program.

3. India

Discussion between India and IRRI about an IRRI small farm equipment extension program in south India began in mid-1979. The AID 1979 evaluation recommended the addition of India to the regional program. Certain rice areas in India were intensifying cropping and raising yields with a resulting need for mechanization similar to what occurred in wheat in the Punjab in the early 1970s. AID's September 1980 agreement with IRRI allowed one year for an AID approved country strategy and formal agreement between IRRI and India. Given that IRRI had visited India at least twice on this matter, letters had been exchanged and IRRI had a resident representative and other operations in the country, it was expected by AID and IRRI that arrangements would be completed in less than one year, well before the deadline.

The August 31, 1981 deadline could not be met. IRRI requested and AID granted an extension to 1/1/82 which also could not be met and was extended to 3/10/82.

Normally a contractor could be expected to have better judgement about its ability to conclude an agreement. However, in this case the delay seems to lie with the byzantine procedures and overlapping jurisdictions of the Indian bureaucracy. In a similar case, AID waited three years after being told by the GOI that it welcomed a major project in agricultural research.

The 3/10/82 deadline was met and AID authorized IRRI to begin an outreach program in India. IRRI's counterpart, the Central Institute for Agricultural Engineering (CIAE), has clear objectives for the work and is competently staffed. Counterpart support should be adequate. Some budgetary issues remain and establishing office and workshop facilities in Coimbatore may take longer than CIAE and IRRI expect. Before making a commitment to certain machines for design, adoption and extension, non-engineering expertise, with which India is well endowed, should be used to identify farmers' needs.

4. Philippines

The establishment of a program in the Philippines separated from IRRI's Los Banos headquarters and including more than visits to fabricators was recommended in the 1979 evaluation to make the Philippines less dependant on IRRI in this sector. The program has started well during the six months the new outreach officer, Bob Stickney, has been in the country. He has developed solid working relationships with his counterparts in Manila, who are adequate in number, effort and qualifications; formulated

with them a good work plan; has an adequate office; access to a shop, which will be improved; and has begun training and demonstration activities. Through a network of committees he and his counterparts have an influence on national policy in the farm machinery sector. We compliment IRRI for recruiting a representative who has started so well and has such excellent qualifications for this position.

IRRI's counterpart agency, The Bureau of Plant Industry (BPI) operates 25 agricultural research stations in the country's 12 development regions. Sixteen agricultural engineers on these stations receive technical support from BPI's Division of Agriculture and Engineering (DAE) and administrative supervision from the station superintendent who in some cases is an agricultural engineer. The station engineers spend most of their time operating and repairing station equipment: they perform very little research or extension. At its Manila office, BPI has 18 agricultural engineers under the DAE headed by Benito Gonzalo, Stickney's counterpart. One objective of the program is to transfer to these agricultural engineers in Manila and on the stations the extension function up to now performed by IRRI core personnel. This will be done by giving them assistance for equipment testing and demonstration and fabricator development on designs and in regions identified in Stickney's plan. Equipment priorities are the reaper, axial thresher and axial pump, in that order. A broader objective is to move upstream from extension, where it is easiest for BPI to take over from IRRI, to policy, research, testing and training which are more purely governmental functions where a Philippine capability is sorely needed.

The program will concentrate in three regions: II, Cagayan Valley-Northern Luzon; VI, Visayas and X, Cagayan D'aro-Mindanao. This program will operate within two advisory bodies: the National Agricultural Mechanization Council, containing eight ministries, farmers and fabricators with a full time secretariat and the Advisory Board containing IRRI, PPI, fabricators, banks and the dean of agricultural engineering at the University of the Philippines.

These bodies have just the right amount of authority over outreach operations. Additional authority might tie up the program in bureaucratic delays. Although the larger body with its eight ministers and three private sector members seems unwieldy and could threaten the program due to its size and possible bias toward large manufacturers, both bodies allow the IRRI outreach program access to policy and institutional issues far more than is the case in the other three country programs. Insights and recommendations arising in the design and extension process through these bodies should be able to influence policy and organization which are probably the weakest elements in the system and virtually untouched by 17 years of IRRI involvement in agricultural machinery in the Philippines.

It is noteworthy that both bodies have strong private sector participation. Also there are two businessmen serving as consultants to Deputy Minister Lim and working with the IRRI program in BPI. This kind of private sector participation in the government's small scale agricultural machinery programs is strikingly absent in the other outreach countries (Indonesia, Thailand, Pakistan and India) and augurs well for the success of the Philippine program.

Equipment: IRRI's agricultural engineering department is optimistic about the rice reaper, a meter long cutter bar mounted on a tiller adapted from a Chinese design. It was introduced in early 1982 to enthusiastic fabricators. The department hopes it will be the next star performer after the axial thresher. Others at IRRI worry about labor displacement given the cost squeeze in rice farming and the rapid mechanization in sugar farming. It is for this kind of issue that AID has required IRRI, acting as a multidisciplinary institution, to analyze conditions, make country strategies and work plans and monitor results. The introduction of the reaper in several countries and the new outreach programs in the Philippines and India are adding to the pressures on IRRI to link its agricultural/social science capability in a simple, practical way to its engineering capability. This linkage is a weak spot in the project and is returned to later in the evaluation.

The department is also optimistic about the transplanter, despite problems in seedling preparation, a four row direct seeder mainly for rice and a rolling injection seeder mainly for upland crops developed at IITA in Nigeria. These three manually powered devices are good examples of IRRI's simple low cost design philosophy. Within a year we should know if they are appropriately designed for the real world of fabricators and farmers.

Honoraria: The IRRI outreach budget will pay several kinds of honoraria;

- P 500 per individual per meeting of Advisory Board members
- approximately 25 percent of monthly salary for four BPI project related officials and three regional engineers
- P 150/mo each for one secretary and one driver

The yearly amount is estimated at P 59,600 or (÷ 8) \$7,450. This is not a large amount in relation to a Philippine outreach budget of approximately \$150,000/year but the practice, as in Indonesia, is undesirable. Unfortunately, it seems unavoidable, at least initially. The Philippine Council of Agricultural Research has published a list of honoraria rates and honoraria are paid for projects funded entirely with domestic funds although they are most commonly paid from foreign assistance funds.

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During the evaluation visit, officers at BPI, Ben Gonzalo and Ensebio Nicoas, said they would try to link the honoraria paid to field engineers to performance, i.e. number of fabricators developed or designs introduced as opposed to payment for incumbancy. Honoraria used in this way could help introduce flexibility and accountability into rigid civil service personnel procedures.

5. Strategy and Management

AID and IRRI have not easily agreed on what constitutes a country strategy. AID approval of the strategy is required under the project agreement. For three of the four countries AID has sent back strategy statements at least once. Despite numerous discussions and letters, better understanding is needed between AID and IRRI on this matter.

For AID a strategy, as defined in the 1979 evaluation, Project Paper and Agreement, is an essential managerial tool when putting modest resources into the complicated and sensitive sector of small farm mechanization. The implements industry may need assistance in marketing, production, design, extension, research or policy. There are choices between muscle and petrol powered machines in different regions for different crops and farm operations. The dangers of labor displacement, subsidized credit and excessive import substitution must be considered. Achievable goals must be defined with simple ways to measure progress. The process of jointly thinking through these choices is developmental in itself and an excellent way to begin a cooperative working relationship. IRRI is uniquely suited for this kind of joint strategic planning due to its regional knowledge; expertise in engineering, agriculture and economics; and the respect its reputation commands. Once strategy is agreed upon it is possible to make a work plan detailing yearly targets, counterpart commitments, logistical support and the authority over staff, projects, training, policy analysis, etc. of the IRRI representative. In the agreement, AID's approval of the work plan was not required. AID wanted to give IRRI maximum freedom and assumed sound strategic planning would start the country program in the right direction. After the program started, AID expected IRRI would provide responsible management in accordance with the strategy and work plan. All of these assumptions, laid out in the 1979 evaluation and succeeding documents, were based on lessons learned from the first four years of the project.

It is a major conclusion of this evaluation that this system of planning and management has not been put into practice. In Thailand and Indonesia strategies have been rough narrow documents written by busy field officers with little counterpart contribution, and no input from other IRRI departments. In the Philippines the document signed by Director Brady and Minister Tanco reflected IRRI's excellent access to the government and probably missed an opportunity to use this access for a thorough

interchange on the strategic issues mentioned above. In India, it was largely a counterpart effort reflecting regular Indian programs as opposed to the AID-IRRI program criteria and objectives and like the others without any of the social, economic or agricultural contributions from other IRRI departments.

After returning strategy statements for improvements two or three times AID has reluctantly approved what it considered less than desirable work in the belief that further exchanges would only delay the project without improving it.

Work plans, over which AID did not request approval authority, have also been weak in Thailand and Indonesia. The one in the Philippines, made after the arrival of the new IRRI outreach officer, is fine. In India, the CIAE is likely to make a clear, detailed work plan.

The lack of serious collaboration on strategy both within IRRI and between IRRI and its counterparts and the resulting incomplete work plans have weakened management by not providing clear objectives and responsibilities. In addition to this poor start, Los Banos' management of the implementation of country programs has been too decentralized between Los Banos and the outreach offices and too centralized within Los Banos. On most matters where the outreach officer needs guidance or support he is left too much on his own: yearly targets; supply of and authority; over counterpart staff; logistics (for transport, equipment demonstrations, cooperation with other national agencies); role in policy and institutional development, etc. If the field officer happens to fall into a situation where he is supported by the host government and can quickly start some practical activities he is likely to be effective. This happened in Indonesia, partly due to the intercession of the AID Mission, and probably will happen in the Philippines where an effective program is being expanded. However, if the officer is not lucky enough to land in a favorable situation he will probably fail, at least initially. An example of this was during the first phase of the project in Pakistan, where IRRI sent its most experienced design and extension engineer, Amir Khan. This excellent officer floundered for at least two years due to poor planning, negotiation and support. As noted in the 1979 evaluation, we had hoped to improve upon this Pakistan experience during the second phase of the project. Another example is the program in Thailand which under two outreach officers has been failing since its beginning. Without clear choices and strong support, the new program in India may get off to a shaky start. The regional outreach program, an important activity in IRRI's agricultural engineering department, is too far flung, sensitive and complicated to be managed in this fashion.

Within IRRI there is no systematic or required cooperation between engineering and other departments on the planning and operation of the outreach program despite the money in the project budget for engineering

to pay for the services of other departments. The great fund of expertise among the outreach officers has never been pooled on any issue. For example, outreach officers are never called together to discuss or even sent copies of strategy statements for other countries. These are surprising omissions in an institution noted for technical complementarity. The AID/S&T funded study on the social consequences of small farm mechanization proceeds in isolation from IRRI's extension work.*

In the general area of planning, strategy and management, a major finding from the 1979 evaluation remains valid;

The outreach programs have suffered from a weakness in overall planning and management. This has resulted in vague country agreements, the lack of intermediate performance standards, an opportunistic, untargeted approach and the underutilization of IRRI's fund of multidisciplinary expertise. p. 5

At the time of the 1979 evaluation, these weaknesses were partly justified by IRRI's inexperience with this degree of responsibility for field operations in foreign countries and AID's uncertain funding of the project. These mitigating factors do not apply to the second phase of the project begun in September, 1980.

6. Research

Perhaps the central facts of the IRRI agricultural machinery program are that only three machines have been put into significant commercial production in Asia--axial thresher, axial pump, two wheel tiller--and all three were designed before 1973. It is not easy to get a new design into the market and it is difficult to know whether a research program has failed or succeeded. On the plus side, IRRI's R&D expenses in comparison to sales, over which it has less control than a commercial enterprise with a dealer network, are probably not high. Also items designed recently, the reaper, the rolling injection planter and the transplanter, may be ready to take off. On the negative side, even if some "star performers" emerge, it has been a rather long fallow period between 1973 and 1982. During this period other IRRI departments, possibly as a result of larger budgets, have been more innovative.

No further attempt is made in this report to evaluate the output of IRRI's research in farm machinery, a key determinant of project success. However, some observations are made below on the process of research at Los Banos and operations in the outreach countries.

Visits to the outreach countries leave the impression that communications between the field and the center could be clearer, quicker and more authoritative. Generally, the field capacity to make research proposals is underutilized while research capacity is overloaded.

*The lack of planned connection between these two AID funded efforts is partly AID's fault which perhaps more than IRRI's.

Outreach officers having almost daily contact with fabricators and farmers are in an excellent position to know the mechanization possibilities of small farms. This is especially so in Thailand and India where many clever mechanics and farmers are a fertile source of new ideas. The design engineers at Los Banos, with their superb shop and library, global communications and ability to call in experts, are in an excellent position to design and test ideas. Unfortunately, the outreach officers are not instructed by Los Banos to look for anything in particular. This lack of focus also results from weaknesses in strategic and work planning. For example, with the energy shortage, among thousands of villages there may be some good examples of or at least possibilities for fuel saving implements. Field officers might be judged by their suggestions in this category. On the other hand, when the outreach officers send an idea back to Los Banos i.e. Ray Fischer's 35 percent reduced draft buffalo plow from Thailand, there is no procedure for responding. The research idea sent in from the field should be:

- rejected quickly and authoritatively or encouraged for development in the originating country alone, or
- put into the Los Banos design and test schedule, and/or
- sent to other outreach countries.

The outreach officer should be given a clear, quick response so he can:

- develop the idea in his program,
- get on to more important work or
- wait for Los Banos' design and testing work.

In discussing this matter, IRRRI says its design staff is small in relation to ideas and demands spontaneously arising in the field. There are two possibilities for dealing with this situation. First, to correct the imbalance between research demand and supply, Los Banos could (1) instruct the field staff to look for ideas only in certain areas; (2) develop research priorities so clearly, in cooperation with field views, that ideas coming into Los Banos could be quickly screened; and (3) use IRRRI's prestige in negotiation, when there is a surplus of good design possibilities, to shift some of the design work to the national programs. Generally, it is the impression of this evaluation that quicker and better defined communications plus clearer research priorities can make the research-extension system more productive. In this regard the Project Review Committee, a recently reactivated body with representation from several IRRRI departments, will be helpful in setting research priorities and screening proposals. However, improved communications with the outreach officers will remain a responsibility of the agricultural engineering department.

Second, IRRI could balance research demand and supply by adding a core funded research engineer. This project covers a substantial fraction of the costs of IRRI's Agricultural Engineering Department. Project work should not exceed core capabilities. Through 1985 research needs identified under the project are likely to increase and IRRI should consider adding another researcher to the department, either core funded or provided for three years by another donor.

In commenting on the draft evaluation, IRRI agreed there is a problem in matching research supply and demand. IRRI observed that screening down research proposals is desirable but not feasible and did not mention adding researchers.

We repeat the conclusion in the draft evaluation that the excess of design/and testing work over design-testing capability is another chronic problem to which IRRI has not paid sufficient attention.

7. Social Analysis

Social analysis is useful to the project for:

- Strategic planning
- Understanding what the farmers need
- Understanding the consequences of mechanization
- Understanding needed institutional reform
- Understanding needed policy reform

The Asia Bureau continued the small scale farm machinery extension project with IRRI on the assumption that it would use its expertise on agricultural and social conditions in implementing the machinery work as it has with its work in rice research and extension. AID contracted with IRRI, not its Agricultural Engineering Department. In the Project Paper, AID described various possibilities for IRRI assistance to a country's mechanization program in design, production, institutional development, training, policy reform, etc., all requiring some social analysis. In the Agreement AID required that each country program collect baseline data for measuring attainment of project objectives. AID included as a line item in each estimated outreach budget and in the Los Banos budget, funds for the Agricultural Engineering Department to buy the services (travel, per diem, materials, sub-contracting) of other IRRI departments helping with strategy and evaluation.

To date social analysis has been used hardly at all in the project leaving it with a narrow engineering focus and little capability to identify needs or monitor its own progress.

Except for one case during the evaluation, other departments have not been called on for social analysis or evaluation. None of the interdepartmental money has been spent. The most critical need, the design of country programs, has passed. The outreach officers have received no guidance

from Los Banos on what baseline data to collect or how. Consequently there is not even the beginning of a project wide management information system. Apart from the large amount of data collected under the Consequences Project, which functions in isolation from extension work, the questionnaires attached to the cooperating fabricator agreements, a carry over from the first phase of the project, are the main source of project data. These questionnaires are probably a good start but the outreach officers need help in making something useful from this raw data, if such data, which slights equipment buyers and ignores displaced farm workers, is to serve baseline purposes. In general, the project needs a list of simple questions covering the main areas of project performance and impact which can be answered by the outreach officers with some help from other IRRI departments and an occasional subcontract for enumerators and analysis by local social scientists. Where necessary, separate studies on labor displacement, organizational change, subsidized credit, or policy can be funded under the project.