

CLASSIFICATION
PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-447

<p>1. PROJECT TITLE</p> <p>The Consequences of Small Farm Mechanization</p>	<p>2. PROJECT NUMBER</p> <p>931-1026</p>	<p>3. MISSION/AID/W OFFICE</p> <p>ST/AGR/EPP</p>							
<p>4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) <u>22-9</u></p> <p style="text-align: right;"><u>3/17/82</u></p> <p><input checked="" type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION</p>									
<p>5. KEY PROJECT IMPLEMENTATION DATES</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">A. First PRO-AG or Equivalent FY <u>77</u></td> <td style="width: 33%;">B. Final Obligation Expected FY <u>78</u></td> <td style="width: 33%;">C. Final Input Delivery FY <u>82</u></td> </tr> </table>	A. First PRO-AG or Equivalent FY <u>77</u>	B. Final Obligation Expected FY <u>78</u>	C. Final Input Delivery FY <u>82</u>	<p>6. ESTIMATED PROJECT FUNDING</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">A. Total</td> <td style="width: 50%;">\$ <u>653,600</u></td> </tr> <tr> <td>B. U.S.</td> <td>\$ <u>653,600</u></td> </tr> </table>	A. Total	\$ <u>653,600</u>	B. U.S.	\$ <u>653,600</u>	<p>7. PERIOD COVERED BY EVALUATION</p> <p>From (month/yr.) <u>October, 1980</u></p> <p>To (month/yr.) <u>October, 1981</u></p> <p>Date of Evaluation Review <u>September, 1981</u></p>
A. First PRO-AG or Equivalent FY <u>77</u>	B. Final Obligation Expected FY <u>78</u>	C. Final Input Delivery FY <u>82</u>							
A. Total	\$ <u>653,600</u>								
B. U.S.	\$ <u>653,600</u>								

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Complete qualitative descriptions of Indonesian and Philippine field sites.	Weeks	June, 82
2. Clean data bases for Indonesian and Philippine Studies.	Weeks	January, 82
3. Complete quantitative analyses for available data.	Weeks	June, 82
4. Initiate field studies in Thailand	Weeks	December, 81
5. Provide technical back-stopping services to Thai researchers until completion of Thai study.	Weeks Weeks	September, 81 September, 82
6. Develop regional models based on data from all field sites.	Weeks	June, 83
7. If the above items have not been accomplished by May 1982 and it appears that additional time is required to complete the scope of work, that the project manager will prepare a PIO/T for an unfunded extension for 12 months.	Appleby	June, 82

BEST AVAILABLE COPY

<p>9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS</p> <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Project Paper</td> <td><input type="checkbox"/> Implementation Plan e.g., CPI Network</td> <td><input type="checkbox"/> Other (Specify) _____</td> </tr> <tr> <td><input type="checkbox"/> Financial Plan</td> <td><input type="checkbox"/> PIO/T</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Logical Framework</td> <td><input type="checkbox"/> PIO/C</td> <td><input type="checkbox"/> Other (Specify) _____</td> </tr> <tr> <td><input type="checkbox"/> Project Agreement</td> <td><input type="checkbox"/> PIO/P</td> <td>_____</td> </tr> </table>	<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	_____	<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____	<p>10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT</p> <p>A. <input checked="" type="checkbox"/> Continue Project Without Change</p> <p>B. <input type="checkbox"/> Change Project Design and/or <input type="checkbox"/> Change Implementation Plan</p> <p>C. <input type="checkbox"/> Discontinue Project</p>
<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify) _____											
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	_____											
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____											
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____											

<p>11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)</p> <p>Gordon Appleby, S&T/AGR/EPP, Project Manager <i>GA</i></p> <p>Clearances:</p> <p>S&T/AGR/EPP, Richard Suttor <i>RES</i></p> <p>S&T/AGR, Mary Mozynski <i>MEM 3/18/82</i></p> <p>S&T/PO, Arthur Silver <i>F. CAMPBELL</i></p>	<p>12. Mission/AID/W Office Director Approval</p> <p>Signature <i>R. J. Jackson</i></p> <p>Typed Name <i>for Donald Fiester, S&T/AGR/D</i></p> <p>Date <u>3/17/82</u></p>
---	---

PROJECT EVALUATION SUMMARY (PES)- PART II

13. SUMMARY

IRRI and its subcontractors have completed survey research in the Philippines and Indonesia, but IRRI has only recently contracted for such work in Thailand, with the result that activities in Thailand are more than a year behind schedule. The data from the completed field surveys is now being cleaned, and computer programs for their analysis are being rewritten. These are both laborious processes, but, once done, quantitative analysis can proceed apace. To date, most analysis has been qualitative, with simple statistics only.

14. EVALUATION METHODOLOGY

This annual management review was conducted by the project officer on the basis of project documents, interviews with the IRRI staff, and field visits to two of the research sites. The project officer also had the opportunity to attend the IRRI "Consequences of Mechanization" workshop, where preliminary results from the field research were presented. (See attached trip report.)

15. EXTERNAL FACTORS

IRRI implemented parts of this grant through subcontracts with national researchers in Indonesia and Thailand. Difficulties with the original Thai researchers necessitated writing a new subcontract with another group, which has delayed the data collection process there. Also, atypically dry weather in both Thailand and parts of Indonesia delayed field work at those sites. (It should perhaps also be noted that variability of the weather from year to year necessitated the change in research design from different field sites in two consecutive years to resurveys at the same site in the second year.)

16. INPUTS

There have been no difficulties with the provision of inputs.

17. OUTPUTS

Data collection has lagged in Thailand for the reasons mentioned above. Also, data analysis has been slowed by the need to clean and verify large data bases, as well as by the need to redesign computer programs for analysis. Consequently, analysis to date has been mostly descriptive, with fundamental statistical analysis. The regional analytic models discussed in the project paper have yet to be begun, and their completion will almost surely require more time than presently planned.

18. PURPOSE

See Sections 13 and 17

19. GOAL

See Sections 13 and 17

PES PART II (Continued)

20. BENEFICIARIES

See Section 13

21. UNPLANNED EFFECTS

As a research project into the consequences of an on-going process -- mechanization -- this project have no unplanned effects.

22. LESSONS LEARNED

See attached trip report.

23. SPECIAL REMARKS

The delays in initiating the Thai research and the difficulties in initiating quantitative modeling will require an unfunded extension.

Attachment: Trip Report

September 7 - October 16, 1981

This trip to the Philippines, Pakistan, and Indonesia accomplished several ends: to ascertain mission interest in the central projects on farming systems research and on marketing; to review progress in data collection for the USAID-funded IRRI "Consequences of Mechanization" project in the Philippines and Indonesia; to attend the "Consequences of Mechanization" workshop, held in Los Banos, the Philippines, September 14-18; and, to participate in the writing of a PID for agricultural research in Pakistan (September 19-October 3).

I. Mission Interest in Central Projects.

A. Farming Systems Research and Extension

IRRI would be interested in implementing parts of the planned information dissemination, training, and possibly technical assistance. These matters can be followed up with Bart Duff, agricultural economist at IRRI, once the development of the project is further along.

3. Indonesia. Like USAID/Philippines, USAID/I has long supported farmer-oriented research and extension through its cropping system program with the IRRI outreach program in Indonesia. In many ways, the central project will benefit from the advantage of the advances made in Indonesia, even as it supports publications, a training program, conferences, or technical assistance there.

IRRI personnel in Indonesia, who have long worked closely with USAID/I, are very much interested in collaborating in this effort. Indeed, Jerry McIntosh, resident cropping

II. IRRI Consequences of Mechanization Workshop and Field Visits

A. Workshop

The Agricultural Economics Division, Agricultural Engineering Department, IRRI, sponsored a workshop under its Consequences of Mechanization grant with S&T/AGR/EPP, September 14 - 18, 1981, in Los Banos, the Philippines.

Assessments of this conference must be tempered by two considerations: first, the papers presented only preliminary analyses because data collection is just ending in three of the four field sites (Thailand has yet to begin); and, second, this project is in many ways an effort in institution building, for all data collection work is subcontracted to nationals in each of the field sites.

Presentation of the research results focused on the consequences of mechanization (i. e., the introduction of tractors or power tillers) on yields, on cropping intensities, and on labor. The investigators found that mechanization had no effect on yields in any of the field sites and little or no effect on cropping intensities. The first finding is rather expected; the second is more surprising, given the belief that mechanized land preparation can significantly shorten the 'turn-around' time necessary between one harvest and the next planting. Evidently, mechanization has little effect in these areas because water availability is the critical variable. In rainfed areas, it hardly matters how quickly land can be plowed if the next rains do not come again for six months; in irrigated areas, the schedule of water provisioning has yet to be changed to allow for quicker replanting. (I found during my site visit that some farmers in Nueva Ecija, Philippines, do have this flexibility in water management: they have installed tubewells. However, the investigators have yet to distinguish between types of irrigation in order to sort out the different effects of mechanization and water availability on cropping intensities.)

The consequences of mechanization on labor vary across field sites with the availability of land and labor, as well as with the type of machine. In West Java, where 50% of the population are landless laborers, tractors appear to have displaced some labor for land preparation. At the same time, however, the infestation of brown stem-hopper has forced the government to implement a policy of simultaneous planting in vast tracts, which might not be possible without power tillers or massive labor migration. In this area, the major questions (1) are why farmers continue buying tractors when they are reportedly economically and financially not sensible and (2) the consequences of other machinery, especially the reaper, which can displace many landless laborers, who depend upon the share of harvest they receive for their work. In Sulawesi, where transmigrants are pioneering new land, tractors have displaced only family labor, presumably freeing women for other tasks and children for school. Here, too, the ownership of tractors has become increasingly less remunerative for farmers, as the number of tractors has increased competition for the custom work that helps pay for the machines. (Of course, in some places tractors may be used more for hauling than for land preparation, a concern that has yet to be incorporated into the analysis.) The introduction of tractors into Nueva Ecija has had little effect on labor, which has long had access to employment in Manila and other cities. Indeed, the endemic labor shortage in this area, along with the availability of water (quicker turnaround times), probably explains why the thresher, which greatly reduces the time for harvest operations, has caught on among farmers there. As in the case with tractors--indeed it is the general case in development economics--the innovators who bought the first threshers made a killing for a few several years, but now they and later innovators find that the margin of profit has fallen significantly, due to increased competition.

B. Field Visits

Excursions to the field sites in Nueva Ecija and West Java provided the opportunity to follow up on some of the findings presented at the conference.

As already noted, the visit to Nueva Ecija clarified the need to compare mechanized farms that have canal water only with those that use tubewell water in order to clarify the relationship between mechanization, water supply, and cropping intensities.

The visit to West Java pointed out the pitfalls of closed-system economic analysis--the strict collaboration of mechanization (the independent variable) on yields or cropping intensity or labor (the dependent variable). To take one example, farmers in one of the towns visited in West Java continue to buy power tillers even though their expected returns on the investment are small or negative. Indeed, the number of power tillers has increased nearly 50 percent in the past year alone, from 56 to about 75. The reasons for this seemingly uneconomic behavior became clear upon inquiry. In this large coastal rice plain, where IRRI seed is planted almost exclusively, there is little reason to graze carabou in the paddies, for the IRRI rice straw is unpalatable to the animals. Consequently, the villagers have banned caribou from the rice paddies, which reduces the incidence of canal damage by bathing animals. Thus those farmers with caribou face a tremendous fodder problem: the nearest fodder is five to ten kilometers away. Under these conditions, a man will buy a power tiller, if he perceives that the purchase will not jeopardize his basic assets, even though he recognizes that the purchase is not really economic, given the reduced possibilities of custom work.

Discussions with farmers in a second village in West Java clarified the shortcomings of another argument current at the workshop: that rising wages are justification for mechanized land preparation and harvesting. Wage rates and harvest shares are reportedly rising in this part of West Java. (Because these were informal interviews, I did not define current wages in rupiahes of constant value in order to control for inflation.) The reason for this apparent increase in workers' salaries, however, indicates that mechanization is not the only solution and may not even be the best solution. Labor is scarce because the government has instituted a policy of simultaneous planting over vast tracts of rice land in an effort to combat the brown stem-borer. This action so exacerbates the usual labor bottlenecks at critical periods in the production cycle that labor now is drawn from as far away as Central Java. This is a common response to high wages in one region by landless laborers and small farmers in neighboring areas. But it is not a necessary argument for mechanization. Development of disease-resistant varieties or of specific insecticides might do as well, with possibly fewer negative consequences for the landless labor force.

C. The Project

The workshop and field visits, helped clarify the directions the analysis should take in the coming year. Clearly, the questions about the consequences of mechanization on yields and on cropping intensities are largely settled. Therefore, further work can focus on the impact of mechanization on labor.

Further, it will be especially important for policy makers, if the IRRI team can determine at least tentatively the consequences of different forms of mechanization under different conditions. This will require some macro-modeling, as specified in the original contract. Also, the team will have to consider machinery in addition to tractors, so that the dynamic process of farm mechanization in the Third World can be better understood and guided. In other words, the exemplary micro analyses performed to date must be complemented with some macro analyses, if policy makers are to be provided general understandings grounded in specific situations.

Research has only recently gotten under way in Thailand due to the difficulties of contracting with a national research group there. Consequently, data analysis from the other field sites will be underway while data collection is taking place in Thailand. For this reason, it will be important that a member of the IRRI Consequences staff, or a person hired specifically for the job, oversee the initiation and conduct of survey research in Thailand in order to alleviate or eliminate many of the difficulties that plagued field workers at the other sites.

Because data collection Thailand will continue up to the new termination date of August 1982 and because the principal investigator for IRRI is now on leave for a year, an additional, unfunded extension through August of 1983 will probably be necessary. IRRI will make a formal request for an extension, if this proves to be the case. IRRI may also request a small grant to underwrite a conference to present and summarize the findings. Alternatively, IRRI may organize a traveling party to inform policy makers in those countries where it has an outreach program of the results of this study. The request for a conference or a traveling party will be made once IRRI decides which means would better disseminate their findings.

In any case, the final report for this project will take shape as a book on mechanization, which should prove useful to development practitioners and policy makers alike.

PEOPLE SEEN

Sept. 11 Jerry Edwards, USAID/Philippines, ARD/D
Martin Billings, USAID/Philippines, ARD
Thomas Hobgood, USAID/Philippines, ARD

Sept. 14-17 IRRI "Consequences of Mechanization" Workshop

Sept. 16 Dennis Greenland, IRRI
Clarence Bockup, IRRI
Bart Duff, IRRI
John Wicks, IRRI

Sept. 18-Oct. 8 Pakistan TDY: Agricultural Research Review

Oct. 10 V. R. Reddi, IRRI Engineer, Indonesia

Oct. 12 Jerry McIntosh, IRRI Cropping Systems
Ritchie Cowan, IRRI Liason Scientist

Oct. 13 Field Trip: West Java

Oct. 14 Walter Tappen, USAID/Indonesia, ARD/D
Ernesto Lucas, USAID/Indonesia, ARD
Douglas Tinslen, USAID/Indonesia, RDO

Oct. 15 William Collier, ADC Representative, Bogor