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File
Soil Mgmt CRSP

TRIP REPORT

Date submitted 3/20/80

NAME John L. Malcolm **TITLE** Soil & Fertilizer Spec. **DIV./UNIT** TSWM

PERIOD OF TRAVEL (inclusive dates) February 18-March 7, 1980

ITINERARY Washington - Indonesia - Washington
(Use attachment for details, including time schedule)

PURPOSE To arrange primary site for Soil Management CRSP research in humid tropics and evaluate IFDC cooperation with Indonesian Fertilizer Industry.

ORGANIZATIONS AND PERSONS CONTACTED:
(Use attachment for details.)
Soil Research Institute, Faculty of Agriculture, CRIA and Pusri

RESULTS/ACCOMPLISHMENTS:
1. Field research site selected
2. Letter of Intent signed with SRI, CRIA and U. of Bogor
3. Found PUSRI/IFDC cooperation excellent and highly productive
Etc.

FOLLOW-UP ACTION REQUIRED:
(Indicate what, by whom, when.)
University cooperators to be selected for CRSP - NCSU Sept. 1980
CRSP funding DS/AGR January 1981.

OTHER REMARKS:
(May include other information, observations, and impressions of general interest.)
See attached report

Attachments:
(List)
PUSRI Annual Report (original only)

Distribution:
(List) DS/AGR, ASIA/TR, FIFAD, E. Kiehl, JRC, F. Hutchinson, USAID/Jakarta, W. Tappan/E. Lucas, IFDC: D. McCune, P. Stangel, R. Diamond; TVA: C. Kresge; NCSU: P. Sanchez, J. Malcolm.

GF Form No. 2

Trip Report - Malcolm - Indonesia
February 18 - March 7, 1980

The trip to Indonesia had two basic purposes. The first to arrange the basis of a collaborative research program in soil management with the technical officers of the government of Indonesia and North Carolina State University, the planning agent for the CRSP. The second was to assess the impact of IFDC and TVA on the Indonesian fertilizer industry led by PUSRI the government production and marketing corporation.

The prospects for meaningful collaborative research in soil management are excellent. The Soil Research Institute, SRI the Central Research Institute for Agriculture, CRIA and the Faculty of Agriculture, University of Bogor signed a joint letter of intent with NCSU to undertake the research in West Sumatra and or Jambi. The sites visited have no marked dry season and the soils are highly acid, low in bases and dominated by aluminum. Within this general description a variety of soils are represented. They are mostly well drained soils of loam and clay loam texture. They contain few weatherable minerals to supply essential plant nutrients once the available fraction is removed by crops, leaching or physical transport of the soil.

The longtime residents of the area have succeeded by following shifting cultivation. This practice will be abandoned as a result of growing population and immigration of farmers from Java. Farmers in the government sponsored transmigration settlements are allotted only two hectares of land, including the house site. A permanent farming system must be found to replace shifting cultivation.

The urgency of the problems facing farmers in this area is alarming. Farmers reported that land cleared only three years ago will no longer yield casava tubers. Analyses by SRI show a very high active aluminum concentration in most of the soils from the area. Phosphate fixation is high and available potassium is very low in most cases. Plants showing symptoms of magnesium and boron deficiency were seen. The importance of ash from clearing was dramatically demonstrated at one site. Where the ground was black from the burn pile upland rice was two feet tall, had green leaves and was well tillered. Where no evidence of ash could be seen, less than one foot away, the rice was less than one foot tall, yellow and had failed to tiller.

Both lime and fertilizer are essential if the farms are to succeed. Limestone is available within 50 km of the probable experimental sites. Although quarries were opened to provide aggregate for the TransSumatra Highway, none is being crushed now. The crushers have been moved closer to current construction. A rock crushing and grinding plant could be installed easily to make ground limestone available at low cost. Dr. Shepard of U. Bogor reported that the magnesium content of the limestone was in the range of 5-10 percent and that he had had excellent results with dust from the crushers. The benefits from liming did not show immediately in his work but became dramatic after several crops.

Phosphorus is clearly needed but economical rates must be established. Soil tests should be sufficient to pinpoint areas deficient in potash or soils that are becoming depleted. Magnesium will be no problem if the local limestone deposits are developed but may be a problem if dependence is placed on limestone or hydrated lime imported from Java. The right sulfur and micronutrient levels must be determined to sustain-yield.

With the threat of imminent crop failures a general extension program stressing lime and complete fertilizer must be started concurrently with the research program under the CRSP. The results of the test a priori recommendations must be followed up as part of the research and new recommendations made until a stable balance between plant nutrient drawdown and fertilizer inputs is achieved. The research on the Bench Mark project in South Sumatra should provide useful data for the initial recommendations even though the soils do not belong to the same family.

The joint proposal from the three units of the Indonesian government and NCSU was well received by Mr. Tappan at USAID. He warned us that the Indonesian staff was already heavily committed and that new efforts must include systematic training of the Indonesian staff. He also made it clear that the research must be directed at soil problems confronting all farmers on the acid soils of Sumatra and not be specifically targeted at the transmigration areas.

There is adequate guest house at Sitiung II roughly 200 km from Padang and centrally located in the area proposed for the field research. There is no residential housing for resident research staff. The SRI is taking over a laboratory in Bukittingi which has just been vacated by a German soil

survey team. This would make a suitable, although not ideal, headquarters for the project. Bukittingi is approximately 150 km from the field site area. The town has both water and electricity. The climate is pleasant, elevation roughly 1000 meters. The hotel was very good and not excessively expensive. Housing was reported to be available for rents under $200 per month. There is a hospital but no English/American style schools. A good supply and variety of food was available in the local market. The hotel and restaurant we patronized served food which would please any experienced traveler.

A visit to the Industrial Crops Research Experiment Station outside Solok provided a bit of variety. The principal research in progress here was on the identification and control of an epidemic disease of clove trees. The disease is devastating. Forty and fifty year old trees will die three months after the first appearance of symptoms. Such mature trees can be expected to return over $100 per tree per year. Normally they are planted around the household compound and most farmers would have 10 - 20 trees. Losses are already estimated to be in the range of 10,000 - 15,000 ha. The English pathologist, Peter Hunt, assigned to the station believes that they have isolated the bacterium causing the disease from the xylem of diseased trees and said that it resembles the agent causing Pierce's disease of grapes, if my hearing and memory serve me well.

The visit with PUSRI was rewarding. This is a very business like organization running current facilities well and making adequate plans for the future. Current urea production is about 1,600,000 metric tons per year from four units all located at Palembang, Sumatra, close to the gas wells. Currently Indonesia is exporting about 250,000 tons of urea per year but will be approaching balance by the time a new plant at Acheh comes into production in 1982-83. PUSRI produces only urea. Superphosphate is produced by P.T. Petrokimia Gresik but it is marketed through the same channels. All potash must be imported. There is no significant production of mixed fertilizers, although there is a substantial need for them.

IFDC and TVA have had a major impact on PUSRI. The new pan granulator being installed at Palembang was selected on IFDC's recommendation. The engineers who will be responsible for its operation were trained at IFDC's pilot plant. A major reason for adopting the pan granulator was to permit the manufacture of large urea granules, demonstrated to be more effi-

cient by IFDC. Further, large granules will permit efficient sulfur coating of urea, an option which would not have been available if a conventional prill tower had been built to replace the one which had become obsolete.

IFDC worked with PUSRI and SRI agronomists on the design of fertilizer research strategy and program over the last year. A final meeting in April will approve the design of the individual field research activities. Again IFDC will be a full partner in this meeting.

PUSRI has just recruited one of the top engineers from TVA as senior production advisor at Palembang. He will be replacing a TVA engineer who has worked with PUSRI for the past seven years. Although both men resigned from TVA to accept direct employment in Indonesia, they were chosen because of the skill and background developed at TVA and the international program sponsored by AID. Dr. Paul Stangel of IFDC served as marketing advisor to PUSRI for two and a half years.

PUSRI is now operating four bulk carriers of 7500 ton capacity for shipment of urea in Indonesia. The carriers were built on the basis of IFDC recommendations and designed according to specifications drawn up by IFDC. Two additional carriers of similar design are on order and two ammonia tankers are also to be added to the fleet.

Contacts - Malcolm, TDY - Indonesia February 18 - March 7, 1980

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Soil Research Institute
Dr. I. Muljadi, Director
Dr. M. Sudhadi, Chief Soil Fertility Research
Mr. Subagjo, Soil Chemist
Mr. Abdul Rahman, Soil Physicist

CRIA
Dr. Rusli Hakim, Director
Dr. Sjarifuddin Baharsjah, Manager

PUSRI
Mr. Dalil Hasan, Commercial Director
Dr. Entol Soeparman, Head Research and Development
Mr. Sudharyono Mustafa, Deputy Head, R & D.
Ir. Wardiyosa, General Manager - Palembang
Ir. Nur Midayat - Operations Manager
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Ir. Darujat Mufti - Director of Training
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Pertamina
Mr. Tranggono, Deputy Manger, Bulk Receiving and Bagging Unit, Jakarta
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JLMalcolm:3/20/80