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Cooperating Groups:
BKS (Association of Eastern Island Universities)
WSU (Washington State University)
AID (Agency for International Development)
GOI (Government of Indonesia)

Report to BKS/WSU/USAID
Eastern Islands Agricultural
Educational Project in Indonesia

Robert Hausenbuiller, Soils Advisor
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Final Report on Activities of Robert L. Hausenbuiller
on the USAID-WSU-BKS Project in Indonesia
March 24-May 24, 1984

I Scope of Work

The prime objective of my work in Indonesia was to assist in the completion of a basic soil science text prepared in the Indonesian language for use in Indonesian Universities. I was also requested to assist in two other ways: (1) to attempt to verify a deficiency of the nutrient boron in clove trees near Manado, and (2) to assist in the identification and characterization of some important Indonesian soil types. Of these three functions I felt most comfortable with the first.

II Procedures Used for the Technical Assistance Assignment-Preparation

This assignment was accepted with the understanding that it would make use of my experience gained (1) in teaching introductory soil science over a 23-year period and (2) in the publication of two basic soils texts in English. The status of the Indonesian text was not known in advance. Had I known of the specific needs, I could have brought certain of my more recent writings, which would have been helpful in the work described below.

III Accomplishments

A. Initial Objective - Background

The preparation of a basic text in soil science was one of the major objectives of the WSU program with the BKS institutions in Indonesia. To this end, a textbook committee comprised of soils teachers from several of the BKS universities was established during an earlier phase of the project. Through the efforts of five members of the committee, a preliminary draft of the text had been prepared in advance of my coming. Those doing this work were Ir. Arifin, M.S. Lambung Mangkurat University, Banjarbaru, Dr. Jan Nanere, Pattimura University, Ambon, and Dr. Anna Pairunan, Ir. Tang Kai Sari, and Ir. Sola Samosir, M.S. of Hasanuddin University, Ujung Pandang. During my stay additional contributions to text development were made by Ir. Jeffta Lalopua, M.S., Pattimura University and Ir. Hariadji Asmadi and Ir. Bachrul Ibrahim, M.S. of Hasanuddin University.

B. Accomplishment - Completion of Text Writing

During my tour of duty in Indonesia, the text on basic soils was reviewed and revised in final form. My first days were spent with Dr. Anna Pairunan and Jeff Lalopua, who patiently translated the Indonesian text into English. Certain of the chapters were only partially translated, usually to the point where I felt the material was reasonable and accurate. Two major deficiencies were recognized, however: (1) a need to revise the chapter on soil water and (2) the absence of a chapter on soil classification and survey. The greater part of my time in Ujung Pandang was spent in writing these chapters for subsequent translation into Indonesian. The principal reason for rewriting the chapter on soil water was to eliminate some unnecessary or outdated concepts while introducing the concept of energy relationships in soil water. The modern-day teaching

of soil water explains water retention and flow in energy terms. Whereas my Indonesian counterparts were aware of this concept, they were not wholly familiar with its application. As an aid to translation of the soil water chapter, I gave two short lectures on the meaning and use of the energy concept. Five line drawings were also prepared to illustrate the chapter on soil water.

The new chapter on soil classification and survey was developed through close collaboration with Hariadji Asmadi, who teaches soil classification at Hasanuddin University. Together we decided on the depth to which this very complex subject should be discussed. Hariadji supplied basic information on the system of soil classification used in Indonesia, since I have only limited knowledge of it.

Other changes in the text were made either as editorial modification of the original draft, or by rewriting in English for subsequent translation into Indonesian.

C. Contribution Other than Text Development

Two, somewhat limited tours outside Ujung Pandang provided the opportunity to view first-hand the problem with clove trees in the Manado area, and to assist in the selection, sampling, and photographing of soils considered to be typical of various locations in Indonesia.

The tours also provided me with information on soil use for agriculture in the Eastern Islands. They consisted of a 2-day trip to the Bulakumba, South Sulawesi, area and a 9-day trip to Ambon in the Maluku, and to Manado and Palu in north and west-central Sulawesi. It was on these tours that I gained a better understanding of the specific desires of soil teachers to obtain photographs and analytical data on soils for use in the classroom. A number of profiles (vertical view of the soil, as in roadcuts) were examined, photographed, and sampled for later chemical and physical analysis. A statement regarding this appears later in this report.

While in the Manado area, we visited the site where the growth of clove trees is seriously impaired. Mr. William Scheer, who visited the area previously, considered the problem as possibly due to a deficiency of the plant nutrient boron. His view is strongly supported by chemical analyses of soil and clove leaves. Due to my lack of experience, I can neither confirm nor reject this judgment, but have proposed further study of the problem through plant application of nutrients, especially boron and copper. Whereas the problem with cloves may be largely nutritional, it could also be caused by disease. A fungal infection was clearly evident on the clove leaves.

While in the Palu area, I was taken to the site proposed for an experimental farm on the new campus. Soil in the vicinity of this site showed a high gravel content, and if it is the same everywhere, would not be suitable for growing cultivated crops. I would encourage reconsideration of this proposed use, particularly if such use requires the installation of an expensive irrigation system. Studies conducted on this

land should be limited to those that would apply to similar high-lying terraces skirting the Palu Valley.

IV Communications/Networking

Attempting to increase communications and cooperation among soils personnel was not an assigned goal for my tour. Nor was there an outstanding need for this, since the cooperation and exchange of information among soils teachers already appears to be well established, at least among teachers at several of the BKS institutions. There is apparently a need for greater cooperation at the national level, however. This was most evident in the lack of standardized terminology in the Indonesian language for soil science. I would strongly encourage the formation of a committee, perhaps within the Indonesian Society of Soil Science, with the sole purpose of developing a glossary of soil science terms acceptable to soil scientists and teachers throughout the nation as a whole.

V Future Work Needed in the Specific Area

To be of value the basic text in soil science referred to above must be published and distributed for student use. Every effort should be made to arrange for this prior to termination of the WSU-USAID-BKS project on June 30, 1984. I question whether publication by this date is possible for there are probably too many things to be done before final printing can be done (preparation of illustrations and indexing, for example).

Soils texts in Indonesian for teaching at all levels are sorely needed. To provide them will take many years. There is no better use to be made of funds available for education, in my opinion. Books are essential to the adequate training of soil scientists and teachers needed for the solution of soil and land use problems that will face the nation in the years to come. This, of course, is true for all disciplines, not just soil science.

VI Recommendations and Evaluation

A. For me, the scope of my assignment (to work on a soils text) was most appropriate. In my judgment, all work on the text, save some minor editorial changes and indexing, has been completed. Some deficiencies in the text will be discovered as it is put to use. Based on my experience over the two months in Indonesia, I would have no suggestions for changes in my assignment. I see many areas of need for upgrading soil science research and teaching, however.

B. Among the greatest needs for soils teaching and research in Indonesia is the advanced training of individuals, primarily abroad. I believe there are three areas where the need is most pressing: soil fertility, soil classification and survey, and soil conservation. I am frightened by much of the use (or misuse) of agricultural land, particularly on steep slopes. Very serious erosion is taking place here, which not only destroys the land being farmed, but places that both above and below in peril. I have seen highways in a number of places destroyed or damaged because serious erosion of unprotected farmland below had resulted in the undermining of the highway. The cost to the government for

road repair or replacement under these circumstances must surely far exceed the limited income derived by the farmer who has created the problem.

C. I wish to comment on the project of collecting analytical data and photographs of soils for use in teaching. This is an admirable goal, but it is terribly time-consuming and expensive. I have therefore suggested an alternative - to purchase slide sets such as the one put out by the Soil Science Society of America. The photographs (slides) in these sets are excellent, and they are supported by soil descriptions that have been worked out with care. Soils specifically from Indonesia are not included, but others that are very similar to Indonesian soils are. With the belief that they are quite suitable for use in Indonesia, sets for each of the BKS institutions where soils is taught have been requested.

In conclusion, I wish to thank my Indonesian associates who worked so closely with me and did so much to make my stay both pleasant and worthwhile. These are dedicated people with the interests of their students, their universities, and their nation at heart. I admire each one of them tremendously.

RH:sr
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