

Social Science and Soil Management:

An Anthropologists Role in the Tropsoils Project¹

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Six months have elapsed since I left Sitiung, West Sumatra, a village, where I had lived and worked for three years, most recently as Team Leader, and previously as Farming Systems Researcher on the Tropsoils Project. I am prompted to write about my role in the project for two reasons: 1) the sense that we were able to work unusually effectively as a team, and 2) the recognition that "farming systems research" is implemented in very different ways on different projects.

I was originally hired to try to ensure that we made the match between soil management technology and people in a generally beneficial manner. Looking back at my role over the years, I believe I have made five basic kinds of contributions.³ These are:

I. Responsibility for Making the "Soil-People Match".

Although there may be general agreement that human factors are important, when a team is composed purely of agricultural scientists, there is a tendency

to neglect this aspect. Scientists, almost by definition, have their particular bailiwicks about which they are interested and in which they are trained. They have plenty of their own work to do: and paying attention to human factors, though desirable, is time consuming. They consider such work outside their realm of expertise, and therefore—frequently—just don't do it. The simple fact that I was part of the team, with the specific responsibility to attend to such matters, contributed to various research decisions which were responsive to human needs.

For instance, our work on home gardens (Agus et al. 1986; Colfer et al. 1985; Dudley and Hidayat 1986) is unlikely to have been undertaken in my absence. Despite the different opportunities and constraints affecting home gardens vis-a-vis upland fields, there is often a perception within agriculture that the former are of marginal importance. The economic and nutritional significance of home gardens, as well as the opportunity to work more effectively there with women farmers (whome we have found to be very

¹ Tropsoils is another name for the USAID, centrally funded Soil Management CRSP (Collaborative Research Support Program), operating in several countries. The following discussion applies only to the project in Indonesia, which involves the University of Hawaii, the Centre for Soils Research (Bogor), and North Carolina State University in Raleigh. Project papers mentioned in this paper are available from Tropsoils Project, Sitiung I, Blok B, PO Box 2, West Sumatra, Indonesia.

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³ The following account is not intended to imply that I was solely responsible for the experiments done on these various topics. I had an influence in the direction of the research; but the enthusiasm, receptivity and knowledge of other team members were equally essential. Mike Wade, Fahmuddin Agus, Carl and Stacy Evensen, Dan Gill, Stephenie Kan, Djoko Santoso were all extremely active participants; and many others contributed meaningfully as well.

involved in agriculture), came to our attention because of our surveys and work with farmers.

Similarly the important differences in indigenous farming systems vis-a-vis transmigrant⁴ farming systems would likely have escaped notice (as they have in every other agricultural project with which I am familiar in Indonesia). There is a strong government interest in transmigrants and considerable pressure to attend to their agricultural needs. However, from an equity point of view, as well as a potential source of knowledge and experience about the local environment, research on matters of concern to the indigenous population is warranted.

The observation that different management practices characterized the different ethnic groups contributed to our interest in different tillage practices (Field Research Briefs No. 3, 4, 7, 14, 18, and 24; Wade et al. 1985; Colfer et al. 1984a), and a strong recommendation for the initiation of research on tree crops (especially with a marketable product) in this environment (Naim and Agus 1985; Colfer and Gill 1986).

Other team members, following up on our observation of farmer practices, noted differing patterns of residue management among different farmers, and designed experiments to look at this (e.g., Gill et al. 1986). Similarly initial researcher interest in green manures was reinforced by observation of farmer practices and interest (Field Research Briefs No. 2, 8, 13, 16, 19, 20, and 29). This gave added impetus to the work on pasture grasses and leguminous trees as sources of organic matter for use as a soil amendment (Field Research Briefs No. 19, 20).

II. Experience Dealing with Communities

The reticence of agricultural scientists to work with people is only partly due to overwork. Another important factor is their lack of experience and training in how to do it (reasonably enough!). One of my contributions has been to provide guidance in ways to deal with farmers in a constructive manner.

One of our most valuable activities, for making the "match" between technology and people, has been our collaborative work with farmers. In this work, we developed tentative research designs, submitted them to the farmers, and revised them so they were consistent with the goals of both farmers and researchers. We then monitored farmers implementation of our joint plans (Colfer et al 1984a; Wade et al 1985; Agus et al. 1986).

Agricultural scientists are frequently trained to look at their activities as quite uni-directional. That is, they

are familiar with the usual extension systems where the researcher does science, and then passes the product on to the extension agent, who in turn passes it on to the farmer.

We were trying to operate under a different model: one where both the farmers and the researchers brought knowledge and experience of value to the joint endeavor. We were trying to collaborate, joining their experience with our science. However, understanding unfamiliar systems is not always easy. Farmers may fear researchers; or they may be unduly respectful of educated people, and thus unwilling to share their views; or they may simply delight in misleading outsiders.

Anthropologists are trained to understand alien systems. We know simple techniques for learning about people's views and behavior. The most important techniques are extremely simple, but they do have to be known. For example, I briefed my coworkers, on our first sortie into the communities of Sitiung:

- to listen and look, to record their observations,
- to adopt a nonjudgmental attitude, to refrain from correcting or arguing with misinformation; rather to note it down for later reference.
- to treat farmers as equal, recognizing and respecting their different kinds of knowledge/experience.
- to notice as much as possible about their way of life (e.g., division of labor, decision-making, health status, food consumption patterns, family composition, anything that might bear on agricultural activity).

And as we worked with the farmers, I sometimes gave guidance, as needed or requested. For instance, in meetings with farmers of three ethnic groups, I noted that one Indonesian coworker tended to address his remarks only to farmers of his own ethnic group; whereas we actually wanted input from all. The "slight" was unintentional, and he was happy to make eye contact all around. I sometimes reminded my coworkers of the necessity to check farmers' statements, by asking others or by observing what they actually did. Despite women's observable involvement in agriculture, coworkers sometimes forgot—prompting a comment from me.

My ability to make this kind of contribution effectively was greatly enhanced by the kind of working relationship my coworkers and I developed; they appeared genuinely to want such advice. I also think the willingness of farmers to express their points of view (which we very much needed to know) was greatly enhanced by the sympathetic atmosphere we were able to create by use of such simple techniques as listening attentively, behaving respectfully, and trying to comply with local custom to some degree.

III. Taking a Holistic View.

Although agriculture is important to farmers, they (like us) are enmeshed in a cultural system which

⁴"Transmigration" is a long standing Indonesian program to resettle people from densely populated Java and Bali to the sparsely populated "Outer Islands" (mainly Kalimantan, Sumatra, Sulawesi, and Irian Jaya). The 100,000 ha area known as Sitiung, includes over 10,000 transmigrant families as well as a comparable number of indigenous people (Minangkabau), living in scattered villages of 100-300 families.

includes such diverse components as kinship, religion, politics, education, health, and so on. Even within agriculture, there are a variety of components of importance.

Agricultural scientists are trained in experimental research designs. They think in terms of plots, fertilizer rates, ECEC, and ANOVAS. That is their work. By looking at the Sitiung context in a holistic manner, I was able to balance this (necessary) preoccupation with the specifics of soil science, with a grounding of sorts in the complexities of the real world.

Unlike some farming systems projects, our goal was not to study or work with the whole farming system. Rather it was to keep in mind the whole farming system, while determining our soil management priorities. We used soil management practices as the focus of Tropsoils activity, and investigated other human spheres insofar as they appeared to have a link to, or effect on, soil management⁵ (cf. Vayda, Colfer and Brotokusumo 1980, for a parallel approach).

Examples of the ways in which I made this kind of input follow:

- The team is trying to decide whether it makes sense to do an experiment on pasture grasses and legumes. I point out the number of cattle and goats that are stall fed in Sitiung I, and the amount of time people spend finding fodder for their animals, in support of such an experiment.
- During a team discussion of fertilizer rates on a new experiment, someone suggests including a treatment with 6 tons of lime/ha. I remind them that farmers cannot afford that (though we may still decide it's worthwhile for other reasons).
- Due to team labor shortage, we are considering abandoning our "tree systems" trial. I remind them of the reduced labor requirement for farmers of tree crops, as well as the higher cash incomes, erosion control, source of organic matter, and lower risk, as compared to food crops.
- A team member suggests a new trial using cowpeas as a crop because they are so aluminum tolerant. I remind them that people don't really eat many cowpeas, and can't get a very good price for them.
- One of our surveys has shown that nutritional status in the area is marginal. Stacy Evensen (our nutritionist) and I suggest we initiate some experiments using vegetable crops, to enhance nutrition while doing soil science. The suggestion is taken, and a farmer-managed experiment comparing barnyard manure, composting, and inorganic fertilizers is initiated (Fahmuddin et al. 1986).

⁵ Building on this holistic approach to data collection (systemic, yet tied to soil management), I have done some work on integrating our information on farmers into an "expert system". My interest in this possibility derives from the apparent ability of expert systems to utilize very complex kinds of information to provide non-"experts" with help in problem-solving. It may be a helpful tool for policymakers and scientists, facilitating more informed decisionmaking.

IV. Provision of Specific Information.

Anthropologists are also trained in various research methods for getting at specific kinds of information about people. A number of "special studies" were designed on site in response to information needs perceived by team members.

- The agricultural scientists jumped right into experiments on fertilizer and lime use, but they soon realized they wanted to know how much cash farmers had available for the purchase of such inputs. We were also concerned that our project not have deleterious effects on community nutrition. But to determine that, we needed a measure of nutritional status in Sitiung. We interviewed 80 families for two days and recorded their food consumption during that time as well as income information (Chapman 1984; Colfer et al. 1985).
- We began to suspect that the local farming system (Minang) might have some important pointers for us if only we understood it better. We arranged for a four month study by an Andalas University student (Herman Agus) in a nearby Minang village, focusing on its tree farming practices (Naim and Agus 1985). These results were of such interest that I began working in Pulai, another Minang village, doing participant observation, and a variety of other studies to expand our understanding of this very different farming system.
- Team members began to wonder what farmers saw as the primary constraints to their production. So again we planned and implemented a small, in-depth survey to find out (Evensen et al. 1985).

V. Research of Anthropological Interest.

Although I have seen my role in Tropsoils as supportive, by and large, I also felt some commitment to do some research of a more scientific nature—research on global concerns in social science. One of the first studies I initiated on coming to Sitiung, besides the collaborative research with farmers, was a time allocation study. I knew we'd want to know what people were doing, who was doing what, and how much time was spent on which activities. The time allocation study mentioned above has done double duty in this regard. Since I have used the same method in four communities and among four ethnic groups, useful comparisons and generalizations are possible (Colfer 1983; Colfer et al. 1984b).

A Galileo study, which provided use with "cognitive maps" of people's perceptions of and values relating to soil, was not dictated by specific team needs so much as by the scarcity of information on people's views of soil. Such a study seemed a legitimate contribution to soil management in and of itself, since people's behavior toward the soil is influenced by their perceptions of it. It also has significant possibilities for use in extension (Colfer et al. 1986).

The related "Indigenous Knowledge Study" aims to compare the "soil science" of the Minang with that of the soil scientists (Colfer and Gill 1986). Do the Minang, thoroughly familiar with this environment, recognize important differentiations that have escaped our notice? Do their methods of choosing good land mesh with our own? Do they alter their soil management practices by land type, and if so, how?

Let me close with a brief comment on the nature of intra-team collaboration on the Tropsoils project, prompted by the recent article by Rhoades, Horton and Booth (1986) on the same topic. After independently written sections on their respective roles in interdisciplinary research at CIP, they emphasize the constructive role of conflict in interdisciplinary research, seeing the alternatives as "drifting into disciplinary isolation."

I have worked on teams which functioned within the "constructive (and sometimes not so constructive) conflict" mode, but I far prefer working in the more cooperative kind of atmosphere we were fortunate enough to develop in Sitiung. Although, like Rhoades et al., we were not completely satisfied with the intensity of our collaboration; we did a comparatively good job, overall, in that sphere (going regularly to

farmers' fields and research plots, planning, solving crises, and writing papers together).

Several factors may have contributed to the particular operating style we developed. First, we had a "team building" period in Honolulu before we went to the field which emphasized the existence of differences in approach between disciplines and the importance of our coming to understand each others' research styles. The notion that each team member brings strengths and weaknesses to the team effort was emphasized (we all took the Meyers-Briggs, which prompted discussion of our respective roles). I think this experience was extremely helpful in creating a receptive atmosphere for anthropological input. I only had to defend my presence to outsiders. My substantive input seemed to be reviewed by colleagues with the same combination of interest and critique as they reviewed each other's suggestions.

Second, the norms of social interaction in Indonesia, unlike South America, do not permit open conflict. Any attempt to engage in the kind of "constructive conflict" so common in the eastern US would have precluded meaningful Indonesian input.

Lastly (and this is the interpretation of Mike Wade, my most consistent collaborator), we could have just had a lucky mix of personalities. ■

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