13

A Plant Breeder's View of Social Sciences in the CRSPs

Matt J. Silbernagel

As a plant breeder on the Bean/Cowpea CRSP, I have worked closely with agricultural economists on the program and have interacted with anthropologists and sociologists on this CRSP as well as others. As a result of these experiences, I am more firmly convinced than ever that not only should the social sciences be involved in international agricultural development programs, but also that chances for the successful completion of most biologically based technical interventions under DC conditions are greatly reduced without the essential information provided by these disciplines.

The CRSP mandate calls for special research attention to smallholder farm families and to the role of women in development. Smallholders produce most of the food in DCs. And, certainly for beans and cowpeas, women do most of the production, harvesting, storage, marketing, and preparation for consumption. These are therefore very valid mandates and ones that should not be neglected, especially in times of budget reductions.

CRSP OBJECTIVES AND SOCIAL SCIENCE ROLES

To fulfill CRSP mandates, high levels of social science inputs are required, and research goals must be carefully defined in terms of both their biological and social soundness. The USAID log frame is a useful tool in helping program participants (as well as reviewers, administrators, and others) to see their individual roles holistically. The log frame sets timelines, input and output requirements, and the social, economic, and political conditions necessary to reach concrete objectives. Any modifications to the original framework must be carefully reviewed by the CRSP MEs, technical committees, boards of directors, and USAID before approval.

Ultimately, external evaluation panels rate CRSP projects and programs according to their accomplishment of the objectives set forth in the log

frame. Evaluators also must consider how well and to what degree biological intervention packages relate to the needs of smallholders and women. However, this is very hard to do without on-farm testing of potential production packages. And imperative to such testing is social science analysis of the acceptance or rejection of production packages, their spread to other smallholders, and their positive or negative impacts on family income and nutrition and on regional marketing and food systems.

From the perspective of USAID and its need to justify its programs to Congress, this kind of social science documentation of pre- and postintervention conditions is usually the best way to quantify the biological, agronomic, economic, and social effects (and effectiveness) of development efforts. Such documentation is often the critical factor in decisions to continue or cancel donor funding. Agricultural development endeavors must compete for scarce funds against programs in health, education, road systems, and other fields—all equally important in DCs. Administrators therefore examine the relative cost/benefit ratios of various programs to calculate which ones will obtain the most "bang for the buck." Biological research alone does not generate that kind of assessment information.

Within DCs, host country scientists must compete even more fiercely for scarce governmental support of their agricultural programs. They, too, need success stories and good cost/benefit assessments of their contributions, both actual and potential, in order to convince their own governments that money spent on plant breeding will pay off economically, socially, and politically. Here again, biological research needs proper social science input.

In assessing the value and importance of social science research in production agriculture, a key question is: how do we measure the contributions of such research? This is not an easy question to answer, since presumably social science achievements cannot be directly calculated in bushels per acre. Biological scientists can measure their success by the productivity of new disease-, insect-, or drought-resistant cultivars. But social research may have greatly contributed to such biological achievements by discovering which plant, seed, or cooking characteristics are most desired by producers, consumers, and marketers in a disease-, insect-, or drought-resistant context.

Likewise, evaluation of new cultivar acceptability, area production figures, marketing volumes, changes in prices and/or per capita consumption, and so forth, are beyond the capability of the biological scientists. Usually, anthropologists, sociologists, and economists compile this kind of information.

Careful impact documentation should lead to continued funding of existing projects and/or the expansion of successful R&D models to other crops. Perhaps one way to determine how much social scientists have contributed to CRSPs will be to see how long and well the CRSP model is

used by development entities such as USAID and how long it takes other agencies to adopt the use of more interdisciplinary research teams. In other words, CRSP achievements will be measured against those of agricultural development projects staffed solely by biological scientists. Once that comparison is made, the only question remaining will be: "why did it take us so long to see the advantages of this approach?"

TENSIONS AND CHALLENGES IN CRSP RESEARCH

Part of the answer to the above question lies in the special tensions and challenges of conducting research under the CRSP model. The chapters in this volume present some fine examples of how cross-disciplinary teams can evaluate, formulate, and execute successful research programs. However, they also note that the process is not easy; it requires considerable effort and compromise for all involved.

One problem in such cross-disciplinary endeavors is that all of us have for so long been compartmentalized by our respective academic and administrative experiences. Thus, we find we are often woefully ignorant of other fields and their professional terminology, research methods, publication styles and audiences, etc. This is equally true for biological and social sciences. The more we interact on many different levels, thought, the more we understand each other and the more we appreciate the value of, and develop genuine respect for, the different disciplines that are needed to ensure the success of a specific goal-oriented project. In this regard, the CRSPs have made some significant strides, as this book attests.

To reach this point, however, some strong biases have to be overcome. First and foremost is the territorial instinct. For the biological scientist, this translates as, "I know what I need to do, so why should scarce resources be diverted to social science studies?" Social scientists, on the other hand, may feel that this same biological scientist is in great need of precisely the kinds of insight and research guidance that only they can provide. This situation represents a kind of intellectual snobbery on both sides. Only after we all realize how much we need one another in order to reach the greater common goal do we begin to appreciate the wisdom of the people in USAID who designed the CRSP approach to solving world food and hunger problems.

This brings up another important point: the tensions between conducting applied research versus "hard science." CRSPs are by definition and necessity goal-oriented *service* projects. Therefore, participants should expect to serve. While this role may call for some real ingenuity and innovative approaches, ultimately it boils down to technology transfer. U.S. scientists involved in CRSPs should be well established in their respective fields, because under present university systems this kind of work will not lead to promotions in

the academic world. Likewise, both biological and social scientists should realize before they get involved that neither group is merely providing a service to the other. Instead, all inputs should address a common program goal. There is no room for the independent operator.

A further challenge is that of addressing long-term research objectives on short-term and sometimes unstable budgets. Sadly, this appears to be a fact of life when it comes to USAID-funded activities, and it applies equally to all disciplines. Recent budget cuts under the Gramm-Rudman act curtailed some CRSP activities. Many CRSP social scientists have felt that they and their projects were disproportionately cut relative to biological scientists. However, a number of CRSP biological activities have also been cut or revised. In the opinion of some biologists, these activities may have been more relevant to project goals at this point than was continued social research—especially if the latter would provide only an ever-broadening view of a dynamic flux of people, environments, economics, politics, crops, donor agencies, expatriate specialists, problem diagnosis, recommended solutions, and so on and on. The fact remains that most agricultural production projects depend primarily on biological inputs to generate new advances in agricultural technology.

At least in the realm of plant breeding, what is needed now is much more focused biological information that breeders can use to develop improved cultivars. Furthermore, once a long-term breeding program is launched, at least 10 years of concentrated effort from biological scientists is required to achieve any concrete results in the form of improved cultivars. In short, goals cannot be redefined indefinitely, because each time a new objective is added, it takes longer to reach the ultimate goal.

This is not to say that CRSP priorities cannot or should not change. Rather, it is simply to recognize the hand that feeds us. USAID objectives for the CRSPs are to increase the production and utilization of specific basic food crops in DC's. It is not our job to decide whether wheat needs more research attention than do beans. Nor is it our place to question whether CRSP research should be directed at small (poor) farmers, or whether host country food needs might best be met by a few large mechanized farms. Likewise, our research and training activities include a mandate to consider the role of women in development. In other words, the primary task at this point is to complete the objectives at hand, not to develop new ones.

THE FUTURE

Continuation of USAID funding for CRSPs will depend to a considerable degree on these programs' contributions not only to DCs but also to our domestic U.S. economy—contributions that derive from increased scientific

knowledge and new agricultural advances gained through CRSP research. Documentation of quality research in refereed international journals is the foremost criterion on which we will be judged. Trip reports and workshop reports are also important. All such documents should make explicit how CRSP activities help domestic programs. Moreover, these documents should be systematically distributed to U.S. administrators. In every way possible, we should also inform the general public (grower groups, service clubs, etc.) of benefits to domestic programs.

Each CRSP and CRSP project should use videotapes, printed information, and other materials and media to stress that these programs are aimed at *famine prevention* in DCs and that they promote the development of scientific knowledge and U.S. agriculture. For example, we should emphasize that the CRSPs create "centers of expertise" that put participants in the forefront of their scientific fields by pulling together, from around the world, leading scientists in government and university research, including key IARC scientists.

Despite its tensions and challenges, the CRSP concept of interdisciplinary goal-oriented research within the framework of a global plan is an excellent new model. It affords all participants unique opportunities to accomplish objectives not attainable within the normal limitations of conventional narrow-spectrum, unidisciplinary research. This model is so sound that I believe it can and will become the norm within domestic research programs. To make it work most effectively, however, more directed, cross-departmental graduate student training will be required, along with academic reward systems that give greater recognition and promotional consideration to scientists engaging in such interdisciplinary team research.

14

The Interdependence of Social Science and Food Science

Tommy Nakayama

The social consequences of technology development have created an active arena of litigation, with subsequent limitations on the scope of applied technology. Recourse to such terms as "size neutral" constitutes an attempt by agricultural research entities to divorce technology development from its social consequences for both small "family" farmers and large corporate enterprises; likewise for projects that focus on research (the CRSPs' mandate) rather than research plus extension—the latter is left to national programs. Again, this represents an attempt to sidestep the potential social impacts of technology development.

In the ultimate analysis, however, such rhetorical postures cannot shield either biological or social scientists from the actual consequences of technology development. Some of the chapters in this volume leave the impression that biological scientists have been antagonistic toward, or at best benignly neglectful of, social scientists. Wherever the truth may lie in such perceptions, the fact is that social impacts cannot be ignored. Perhaps an illustration from one natural scientist's perspective of where social scientists can make important contributions in agricultural development may be helpful.

A PLANT/PEOPLE MODEL OF FOOD DELIVERY SYSTEMS

An early contribution to international agricultural research came from economics, by way of what was basically an application of the second law of thermodynamics (Table 14.1) This law states that the energy available to a system equals the total energy in the system minus the unavailable energy. This simple statement has had numerous interpretations, but its essence has guided many technology development efforts. An example is the steam engine: as with many scientific innovations, the impetus to find the theoretical limits to the efficiency of this invention was primarily economic.