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SPECIAL REPORT

An
Evaluation
of
Participant Training
Under
the University of Tennessee
India Agricultural Program

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University of Tennessee India Agricultural Program

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The differences between the United States and the less-developed nations with respect to agricultural production and rural living are becoming more striking every day. As a means of bridging this gap, the United States is sharing its agricultural knowledge with these nations by training their agricultural specialists in this country. The University of Tennessee is assisting in this training. Working with the Agency for International Development (A.I.D.), the University of Tennessee entered into a contract with the Government of the United States, as represented by A.I.D., to render technical advice and assistance requested by the Government of India under agreement between the Government of India and the Government of the United States of America.¹ Under the present arrangement, the University of Tennessee² is rendering technical advice and assistance for the purpose

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¹The original contract was dated March 23, 1956, subsequently amended through December 24, 1958, and later superseded by a new contract dated October 19, 1959, as amended, and continuing through October 31, 1966, unless previously terminated in accordance with the provisions of the contract.

²Under the terms of the contract through October 31, 1964, the University of Tennessee was responsible for the program in Region V of India comprising Madras, Kerala, and Mysore states. In Region V, the cooperating institutions consisted of five colleges of agriculture, three colleges of veterinary science, and one home science college. Four of these institutions are in Madras State: (1) Agricultural College and Research Institute, Coimbatore, (2) Department of Agriculture, Annamalai University, Annamalainager, (3) Madras Veterinary College, Madras and (4) Sri Avinashilingam Home Science College, Coimbatore; two in Kerala State: (1) Agricultural College and Research Institute, Vellayani (Trivandrum) and (2) Kerala Veterinary College, Trichur; and three in Mysore State: (1) Agricultural College and Research Institute, Hebbal, (2) Agricultural College, Dharwar, and (3) Mysore Veterinary College, Hebbal.

of improving the economic development and general welfare of India by assistance to the University of Agricultural Sciences, Hebbal, Bangalore.³

This summary is an evaluation of the participant training program authorized by the contract. It is both a report of accomplishments and a challenge for renewed efforts to do a better teaching job. Data for the report were obtained during July and August of 1964 by personal interview and from questionnaires completed by 90 participants⁴ who have finished their training and are presently employed in India.

The Training Program

Ninety-seven participants have completed their training and have returned to India since a program began March 23, 1956. Of these, 86 earned a Master's degree, one the degree of Doctor of Philosophy, and 10 finished non-degree

³The Mysore State Government passed the University of Agricultural Sciences Act, 1963, in April of 1963. The Act received the assent of the President of India on May 25, 1963. The Act provided for the establishment and incorporation of a university for the development of agriculture, animal husbandry, and allied sciences. The new university, located at Hebbal, was inaugurated August 21, 1964. The three colleges that became a constituent part of the new university are the: (1) Agricultural College and Research Institute, Hebbal, (2) Agricultural College, Dharwar, and (3) the Mysore Veterinary College, Hebbal.

⁴The individual agriculturist, when he arrives at the University of Tennessee under sponsorship of A.I.D., is called a "participant." This term is used because he participates in the educational program which has been planned for him. The University of Tennessee makes available to him training opportunities. The success or failure of the program depends on his participation. The term "participant" is used also because these individuals already are professionals. For the most part, they have had considerable academic training, at least the equivalent of a Bachelor of Science degree, and numerous years of experience in their fields of specialization. They are among the most talented agriculturists and veterinary scientists in their country.

programs. Twelve participants are currently receiving training in the United States of whom five are enrolled in Ph. D. programs.

Orientation

Orientation of the participant before he leaves India has been an important part of the orientation program. It is, however, little more than a small beginning in understanding the United States. But it is a vital beginning. Each participant discusses thoroughly with the Group Leader the purpose of his program and the importance of following the program arranged for him at the request of his government and the University of Tennessee. They also are told what standards of behavior are expected of them in American society.

Most of the participants also receive a week's orientation in Washington on American government, customs and habits, and university life prior to arriving on the university campus.

The above, however, is no substitute for the personal discussions and orientation between the individual participant and his administrative and academic advisors on campus. Here is where the participant must make the transition from his work environment in India to that at the University of Tennessee. Both formal and informal meetings are held with the participants to make them feel at home and to get them to understand what is expected of them during their stay at the university.

The participants' reaction to the orientation provided is recorded in Table I. Roughly three-fourths of the participants thought the orientation given was adequate. Indications are that improvement can be made in explaining American customs and habits, university life, and campus procedures.

Table I. Participants' reaction to the orientation received relative to their training program

Item	Percent indicating orientation adequate
Orientation to American customs and habits	78
Orientation to American university life	75
Knowledge of campus procedures	76
Answers to problems relating to training program given promptly and clearly	90

Counseling

Providing training programs of ever increasing value to participants as they come to the University of Tennessee and other institutions where they undergo their training required consideration of many new training concepts and implementation of the best. Guidance and counseling, taking into account the importance of personal factors, is extremely important and have been given strong emphasis by the administrative and academic staffs of the universities. Ninety-four percent of the participants felt that their faculty advisors were eager and enthusiastic about assisting them with their training programs, five percent that their faculty advisors were only moderately interested, and only one percent that their advisors were not interested in them or their program. This suggests that most of the faculty advisors have developed such key qualities as rapport, understanding, empathy, and acceptance of the participants. Continuous counseling by the campus administrator, foreign student advisor, or faculty member with whom the participant has close contact is the key to an effective college program. Such counseling, especially in the early period of his stay at the university, helps the participant overcome the cultural shock and make most of the adjustments every participant faces in our country.

When the alert faculty advisor gets a really close look at participants' needs, he realizes the important role of field experience, rural observations, in-service training opportunities, and a first-hand look at private-enterprise agriculture to supplement his academic training. And in the academic program, the faculty advisor must realize what courses should be taken, their sequence, the class load, and a thesis project geared to the participants' needs. The participants' reaction to guidance given on academic matters and the practical aspects of the training programs indicate that, in general, faculty advisors at the University of Tennessee and cooperating institutions did a good job (Table 2). Additional attention, however, should be given to the class load assigned. Thirty percent of the participants thought the number of credit hours of course work assigned during the first quarter or semester was too great.

Table 2. Participants' reaction to the guidance given on academic matters and practical training aspects of their programs

Item	Percent indicating guidance adequate
Class load the first quarter (semester)	70
Was adequately advised by faculty advisor on:	
Tour program	93
Social life	93
Practical training	95
Courses to be taken	97
Order in which courses were taken	97
Thesis research	97

Training

Many things affect the success or failure of a training program. Some have to do with the participant himself such as his initiative and attitude. Some, of course, stem from the program which has been planned. Others relate

to timing, length and location of programs, and orientation and counseling before and during the training. Some factors affect groups more than individuals. Some things may improve practical training yet hinder academic progress.

In my judgment, the staffs of the departments responsible for training should be asking themselves if they understand the goals and desires of the Indian people the participants represent, their culture and traditional background, and the problems they face in making the transition from traditional to a commercial agriculture in India. It is easy to underestimate the extent and nature of the problems of transition of an agriculture that has been rather static for hundreds of years. To a substantial degree, tradition, stability, and resistance to change have been the basis of security and continued existence. Furthermore, it is difficult to comprehend the magnitude of the number of cultivators or farmers in India, which has 62 million cultivators, and 50 million landless laborers in rural areas. Three-fourths of the population cannot communicate by the printed word, and a majority of the 560,000 villages are without electricity, motorable roads, or sanitary water supply. When we comprehend the sincerity of these people to achieve change, we begin to realize the responsibility we have to train leaders for these tasks. We should be profoundly concerned about giving them training that meets their needs, and not simply a stereotyped program that has a standard content dictated by our advanced, specialized, highly commercial agriculture.

Thus, a continuous challenge in training participants is to help them sift out ideas and principles which will be useful in India. Our concern should be to provide needed training, experience, motivation, imaginative

and creative application of techniques, and a spirit of dedication to enable them to identify the important tasks and to provide the needed information when they return to their home institutions. Emphasis should be on ideas that can be "adapted," not on programs that should be "adopted." Studies of average situations, problem cases, and some outstanding successes should be included.

Training programs for fulfilling the above criteria is much more difficult and requires more funds and time than developing imitators. Imitators may have superior command of modern techniques and advanced procedures but may lack the dedication required to do good research with limited means. When measured against these criteria, our training programs have weaknesses both in the research experience gained from the thesis and in the applied courses. Probably the only apology is that "we are doing the same as other institutions" or in the axiom that "no program is perfect."⁵

It is natural and perhaps convenient to include in the participants' program the same courses that are required of United States graduate students. An example of a course of this type is Agricultural Policy. A typical course in this area of study, oriented to price and income policy under conditions of surplus production, makes a small contribution to the training of the Indian student where the urgent problems center on increasing output of food. More flexibility is required. Appropriate areas of study might be seminars or assigned reading on the relation of government to agriculture, dealing with

⁵Montgomery, George, "Farm Management Research and Agricultural Development in India," Illinois Agricultural Economics, Vol. 4, No. 3, December, 1964, page 45.

such topics as education, administrative procedures, land policy, incentives, and the role of agriculture in economic development.

From the standpoint of the training received in research, the participants indicated that learning how to recognize a research problem and how to draw up a project to seek its solution was the most useful part of their training (Table 3). Learning how to use experimental techniques effectively was also rated high. The thesis research experience that has proved the least useful in their present employment relates to the use of scientific literature in their discipline, organization and interpretation of research data, and the composition of the text.

Classroom experiences useful to the participants in their present employment were in their judgment good to excellent. Of the 11 factors rated, the individual professor's evaluation of student performance through internal examinations, class reports, term papers, and problem exercises

Table 3. Rating given by the participants to factors associated with their research training that were considered by them to be the most useful in their present employment

Factors	Mean index rating*
Learned how to recognize problems and how to draw up a project to seek its solution	134
Learned how to use experimental techniques effectively	105
Learned how to analyze data to determine their significance by using the latest graphic and statistical methods	96
Learned how to organize studies and design experiments, such as layout of field plots, feeding experiments in animal nutrition, and studies in the social sciences	91

(Continued)

Table 3. (Continued)

Factors	Mean index rating*
Learned how to organize research data, arrange tables, design illustrations, and compose the text of the thesis	89
Learned how to use scientific literature in their discipline	86

*Each participant was asked to rank the 6 factors listed in order of their importance to his present employment. The value of 6 was assigned to the factor ranked most important with the value of 1 assigned to the factor considered least important. The number of responses in each category was then multiplied by the assigned weight. The values were summed and divided by 6 to give the average mean index rating. The average mean index rating was then divided into the sum for each factor evaluated and multiplied by 100 to give the mean index rating.

and the fact that the instructors met their classes promptly were rated as the most useful. The use of visual aids was indicated as the least useful (Table 4). This is probably due to the lack of visual aids at their institutions for classroom use or because visual aids were not used to any great extent in some of the courses taken during their training.

Provisions for practical experience in the participants' training program is extremely important. Such experience may be limited and restricted to serve particular needs, or general and diverse to serve an assortment of requirements. In evaluating practical experience received outside of the classroom, participants were asked to check from a list of 13 experiences those that were considered to be useful to them in their present employment. The most valuable experience was the examining of good books in their discipline and making a list of them for future reference.

Table 4. Rating given by the participants to selected factors from their classroom experiences that were considered by them to be the most useful in their present employment

Factors	Mean index rating*
Professors always prompt in meeting classes and systematic	106
Individual professor's evaluation of student performance through internal examinations, class reports, term papers, and problem exercises, etc.	106
Course grades reported promptly	103
Assignments are definite and reasonable	102
Professors invite questions and/or discussions during lecture	102
Adequate opportunity to learn by doing	102
Subject matter presented in clear, concise, intelligible manner	101
Lectures well-organized	101
Examinations, oral and written were adequate to evaluate student performance	98
Laboratory classes well-organized with equipment functioning properly, objective of practical explained clearly and adequate time allowed for satisfactory completion	94
Use of visual aids	85

*Each participant was asked to score each factor on the basis of excellent, good, fair, or poor. The number of responses in each category was then multiplied by an assigned weight: 4 for excellent, 3 for good, 2 for fair, and 1 for poor. These values were summed for each factor and divided by the number of responses for that factor giving a weighted mean rating. The sum of the weighted mean ratings for each of the factors was then divided by the number of factors. This average was divided into the weighted mean rating for each factor and multiplied by 100 to give the mean index rating.

Eighty-three percent of the participants checked this experience (Table 5). Another rich experience was attending meetings of their professional societies. Also extremely important was the visiting of agricultural experiment stations to observe research in progress in the laboratory and field.

Tour programs in general were good. Ninety-five percent of the participants attested that the tours arranged were consistent with the objectives of their training. Ninety percent felt that the tours were helpful in providing new ideas for India. More attention, however, should be given to proper timing of the tours. Only 65 percent of the participants felt that the timing was satisfactorily related to training. Only five percent felt that the tours were too long.

An objective in each of the participants' training programs was to gain a clear understanding of the relationship between resident teaching, research, and extension education. This objective appeared to be met satisfactorily since 92 percent of the participants thought the opportunity provided for this purpose was adequate.

To train participants to be better teachers, research workers, and to be extension oriented, the training program for most of the participants included a required course in research methods, teaching methods, agricultural extension, and rural sociology. When the participants were questioned as to whether they thought these courses should be required, all agreed that the research methods course should be compulsory; 93 percent thought the teaching methods course should be required; 77 percent the agricultural extension course; and 53 percent the course in rural sociology.

Table 5. Practical experience outside the classroom that the participants considered to be useful to them in their present employment

Experience	Percent of participants that checked these items
Examined and made list of good books which could be used effectively in their work	83
Attended meeting (s) of professional societies in their particular discipline	76
Visited agricultural experiment stations and observed research in progress in laboratory and field	69
Visited manufacturing plants, such as cotton ginneries, cotton oil mills, packing plants, fruit and vegetable canneries, dairy processing plants, and dairy farms	51
Became familiar with the activities and programs of farmer organizations, such as the American Farm Bureau, The National Grange, The Farmer's Union, and State and county livestock associations	50
Visited the vocational agriculture department of a local high school and studied the Future Farmer's of America organization	47
Went out with extension education personnel to observe their methods of transmitting new information to farmers	47
Viewed exhibits of agricultural products machinery and livestock at county and state fairs	41
Attended livestock, grain, or soils judging contests	35
Attended farmer's field days conducted by the Extension Service	31
Became acquainted with 4-H Club work and attended a 4-H Club meeting	27
Worked and lived with an American farm family	26
Attended annual conferences of the Agricultural Extension Service personnel	15

Use of the Participants' Time

Factors working against the most effective use of the participants' time during the training program did not appear to be serious, except possibly worry concerning their families in India, homesickness, and time spent in extra curricular activities such as university programs, church functions, and addressing various groups of people (Table 6).

Table 6. Factors that worked against the most effective use of the participants' time during their training program

Factors	Yes	No
	Percent	
Worry concerning family in India	17	83
Participation in extra curricular activities, such as university concerts, dramas, sports events, church functions, and addressing civic clubs and other groups	15	85
Homesickness	13	87
Living quarters unsatisfactory	11	89
Lack of opportunity for contact with university president, deans, and other administrative officials	11	89
Participation in international student club activities and affairs	11	89
Hospitality extended by American families	10	90
Health poor part of the time	8	92
Lack of time and/or interest by the Campus Coordinator and/or Administrator	8	92
Disinterest on part of American students	6	94
Discrimination due to color of skin	3	97
Financial conditions	3	97
Language difficulty	0	100

Use Made of Training

Thirty-eight percent of the participants reported that they are using "almost everything" learned in training in their present assignment. An additional 48 percent said that they use "quite a bit." These two groups said that transmitting what they learned "pretty much comprises" their jobs and that part of their day-to-day activity consists of transmitting their training-acquired skills to others. Thirteen percent said that in their present employment they could use only "a little" of what they learned in training and only one percent said they spent no time sharing with others what they learned (Table 7).

Table 7. Use the participants are making of the training received in their present employment

Use made of training	Percent
Almost everything	38
Quite a bit	48
A little	13
None of the training	<u>1</u>
Total	100

In this context it must be recognized that a relatively short period of time has elapsed since some of the participants have returned to India. Experience indicates that as time passes the participants tend to be placed in better positions than they had before undergoing training. Indian government and college officials are very much concerned and interested in using the talents of the participants in the most effective way. Their

interest has been manifested by the fact that over half of the returned participants have received promotions since their return. Forty-four percent have received one promotion, 6 percent two promotions, and one percent three promotions. Undoubtedly promotions will soon come to many of the 49 percent who have not yet received one.

Twenty-six percent of the returned participants have undertaken additional graduate work since returning to India. Five percent have earned the Ph. D. degree from Indian institutions and 8 percent are undergoing training that will lead to the Ph. D. Thirty-five percent have completed or are taking additional specialized training.

Research Activities

Another measure of the use made of the training is the number of research projects the participants have underway or under their direct supervision. The results: Two-thirds of them were working on research projects. Thirteen percent were responsible for one project; 20 percent for two; 13 percent for three; 6 percent for four; and 15 percent for five or more (Table 8). Since a third of the participants are not doing research, a sustained effort is needed to use their talents along this line more effectively.

Of the participants engaged in research, slightly more than half of them are working on projects involving both laboratory analysis and field experimental work; about one-fourth with only field experiments; one-fifth with projects involving only laboratory analysis; and three percent doing exclusively library research.

Table 8. Percentage of participants that have research projects under their direct supervision at the present time

Number of research projects	Percent
None	33
One	13
Two	20
Three	13
Four	6
Five or more	<u>15</u>
Total	100

Presently, 35 percent of the returned participants are directing graduate students in their thesis projects. Of these, 44 percent are advising 4 or more students; 15 percent, 3 students; 26 percent, 2 students; and 15 percent only 1 student.

Samples of outstanding research reported as already being completed by returned participants are as follows: (1) Inducing fruit setting in cardomons on the plains of Kerala; (2) Breeding of a drought-resistant strain of rice which is being distributed to farmers for cultivation trials; (3) Developing a high yielding variety of peanuts; (4) Significant progress made on the control of bunchy top disease of bananas; (5) Initiated fertilizer trials on dryland ragi as a result of inadequate data revealed from extensive demonstration results; (6) Post harvest treatment of oranges to maintain quality; (7) Therapeutics of night blindness in calves; and (8) Inheritance studies on qualitative and quantitative characters in eggplant. In general, the research projects of the returned participants are oriented to practical food production problems. This represents an important and desirable trend.

Publications

The number of publications is also a measure of the use made of the participants' training. Although the data in Table 9 give the total number of publications of the participants since they began their professional career, it still remains a crude index of how effectively they are using their total training. It is noted that from a third to two-fifths of the participants have never published a professional or a popular article. This is partly due to the dearth of opportunity to pursue research because of the nature of their present and previous employments. On the other hand, numerous opportunities have been available to many of the participants and certainly these have not been exploited as they should have been. Only 21 percent of the participants have published as many as two professional articles and only 28 percent have published more than four.

Table 9. Percentage distribution of professional articles published by the participants in recognized Indian and foreign journals and popular articles published in trade journals and newspapers

Number of publications	Professional articles		Popular articles	
	Senior author	Junior author	Senior author	Junior author
	----- Percent -----			
None				
1 - 2	34	55	43	87
3 - 4	21	19	29	6
5 - 6	17	8	15	4
7 - 8	9	7	5	2
9 - 10	7	4	1	0
11 - 14	2	1	2	0
15 or more	<u>8</u>	<u>4</u>	<u>2</u>	<u>0</u>
Total	100	100	100	100

Impediments to the Participants' Progress

Impediments to progress in the teaching and research programs of the participants are obvious. The impediments were more obvious in some institutions and states than in others. Roughly, half of the returned participants are frustrated and discouraged in their present assignment because of administrative "red tape," incompetent and inadequate clerical and stenographic help, lack of scientific equipment and scientific journals, and inadequate communication. Also expressed by over half the participants as impediments were inadequate housing, lack of opportunity for professional advancement, and inadequate transportation for use in their research programs. These and other impediments listed in Table 10 are serious and greatly handicap the carrying out of effective teaching, research, and extension education programs. Most of the problems are recognized by the institutions and respective state governments. More positive action than has been taken in the past is required to remove these obstacles to progress. Many of the deficiencies noted could be corrected with little or no additional funds.

Table 10. Impediments to progress in the participants' present teaching and research programs

Impediment	Percentage of participants indicating
Lack of adequate scientific equipment	51
Lack of adequate space	39
Lack of adequate scientific journals	58
Opportunity for self-expression on academic affairs and teaching and research programs through:	
Faculty meetings	40
Committee meetings	36
Research councils	43

(Continued)

Table 10. (Continued)

Impediment	Percentage of participants indicating
Frustration and discouragement due to:	
Administrative "red tape"	57
Delay in sanctioning of budget items	41
Incompetent and inadequate clerical and stenographic staff	48
Lack of office materials and supplies	31
Needless delay in forwarding official papers	42
Inadequate communications:	
Telephone	54
Inadequate discussions on research problems involving staff members of different disciplines	57
Regularly scheduled meetings of departmental staffs	33
Meetings of general college faculties to discuss policy matters	34
Opportunity to attend a professional meeting once a year	52
Inadequate transportation:	
For faculty to come to and from their work at the college	38
For use in connection with field research programs	51
Inadequate housing provided for the staff and workers by the college	54
Lack of opportunity for professional advancement	57
Freedom to pursue a research problem of their own choice	35

Recommendations for Assuring an Effective Program

The important objectives and relatively high cost of the participant training program demand that every effort be made to increase its effectiveness. Some suggestions for assuring an effective program are:

1. The program sought and its success depends on public understanding. It is suggested, therefore, that some effort and some talent be devoted to the task of building public understanding--public understanding of the reasons for the policy of the United States in giving assistance in the development of projects in the less-developed countries like India; that is, public understanding of the importance of the programs involved.
2. Participants need to become more aware of the importance of communications in the development of peoples and nations and must better understand themselves and other people in order to become more effective in bringing about desirable changes.
3. The participant selection program should be planned on the basis of need. The weaker departments of the colleges, in terms of staff, should be given first priority in the selection of participants for training.
4. Careful study plans based on the needs of the university should be prepared immediately after selection of the participants and approved by the university. The university should have complete autonomy in selecting the participant and in approving his program.
5. In order to assure a maximum period of service on returning to India, participants, other than administrative officers, should be preferably under 35 years of age.
6. American customs, habits, university life, and campus procedures should be explained in detail and frequently enough to be absolutely sure that the participants understand clearly what is expected of them.

7. Adequate time to complete the training program should be approved in advance. Some flexibility in the time allowed would be desirable.
8. Deficiencies in scholastic preparation should be corrected as far as possible before the participants' departure to the United States. This is particularly true for Ph. D. candidates with respect to language and mathematics requirements.
9. Thesis and dissertation projects should be selected with utmost care. Problems to be worked on should find immediate application to Indian conditions.
10. With the exception of college administrators, practical training and field experience should be required in the study program of all participants as a means of demonstrating the use of applied science and extension methods.
11. Participants need opportunities to share their new ideas and knowledge with others after they return to India.
12. Participants should be assigned in their institution to work in the subject matter fields in which they received their advanced training.
13. Teaching loads should be adjusted so that the participants will have time to do some research.
14. Adequate funds should be made available to enable the returned participants to initiate research in the disciplines in which they were trained. The impediments to research indicated in Table 10 should be removed as completely as possible.
15. Among the factors considered for promotion, more emphasis should be placed on merit. Greater incentive will thus be provided to do a better job of teaching, research, and extension education.

16. A follow-up program for improving the effectiveness of the participants' work would be desirable. If a technical advisor could be assigned to work directly with the participants, his services would be in great demand. Such an advisor could help materially in advising on a variety of problems associated with teaching, research, and extension programs. Limited rupee funds could be made available to such an advisor to support the participant in initiating and carrying out numerous projects.
17. Returned participants should attend and participate in regular college and regional seminars to keep abreast of new research findings and teaching techniques. It would be desirable for all participants to meet together at least once every two years to hold a seminar on an appropriate topic.