

Summary Report
on
2nd In-Service Training Program
for
Economists from National Agricultural Research Institutions
in the Semi-Arid Tropics
(July 29-September 7, 1985)

Compiled by
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ICRISAT

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Introduction

The In-Service Training Program (ISTP) 1985 was the second of its kind organized by ICRISAT's Economics and Training Programs. In these programs staff of Economics Program attempt to share their research experience with the trainees, familiarize trainees with research methods suitable for farming system research and make an effort to learn from the trainees about their research problems in the various parts of the semi-arid tropics from where the trainees come.

The purpose of this small brochure is to briefly summarize the activities and experiences of the 2nd ISTP. We hope that the brochure helps the participants to remember what they had experienced when being at ICRISAT and that it helps to stimulate the interest of non-participants in the course.

GOALS OF THE TRAINING PROGRAM

For our 2nd ISTP we adopted the following goal:

After completing the course, participants shall be able

- to identify constraints which prevent farmers in the semi-arid tropics from increasing their production;
- to propose and evaluate means of alleviating or removing production constraints;
- to successfully infuse economic considerations into interdisciplinary farming systems research projects and programs; and
- have been exposed to the effective use of microcomputers and application software in economic research.

The names and addresses of the participants are listed below. This list should help trainees to stay in touch with each other.

It should be mentioned that two of the trainees were women. This may reflect the growing importance of women not as subjects of research but as actively involved and responsible researchers.

Name	Address
Mr. Abdal Hattar Mohammed Ahmed	Ministry of Finance and Economic Planning P.O. Box 1097, Khartoum Sudan
Mr. Benjamin Ahmed	Dept. of Agricultural Economics and Rural Sociology IAR, Ahmadu Bello University Zaria, Nigeria
Mrs. Yanni Chiche	Awasa Agricultural Research Station P.O. Box 8 Awasa, Ethiopia
Mr. H. Hesaratun	Division of Agricultural Economics and Projects Department of Agriculture P.O. Box 7, Petach Tikva Sri Lanka

Participants of the Program

Eleven trainees from seven countries participated in the program as follows:

<u>Country</u>	<u>Number of participants</u>
Burkina Faso	1
Ethiopia	1
Kenya	2
Malawi	2
Nigeria	2
Sri Lanka	2
Sudan	1

The academic backgrounds of the participants were quite varied, as were their research experiences and assignments. Some trainees had considerable experience in applied agricultural on-farm and experiment station research; others had more experience in planning, and others still had a good background in desk-based research.

It should be mentioned that two of the trainees were women. This may reflect the growing importance of women not as subjects of research but as actively involved and responsible researchers.

The names and addresses of the participants are listed below. This list should help trainees to stay in touch with each other.

<u>Name</u>	<u>Address</u>
Mr. Abdel Hafiez Mohammed Ahmed	Ministry of Finance and Economic Planning P.O. Box 2092, Khartoum Sudan
Mr. Benjamin Ahmed	Dept. of Agricultural Economics and Rural Sociology IAR, Ahmadu Bello University Zaria, Nigeria
Mrs. Yeshi Chiche	Awasa Agricultural Research Station P.O. Box 6 Awasa, Ethiopia
Mr. H. Hemaratne	Division of Agricultural Economics and Projects Department of Agriculture P.O. Box 7, Peradeniya Sri Lanka

- Mr. M. Makarfi Dept. of Agricultural Economics
Institute of Agricultural Research
PMB 1044, Zaria
Nigeria
- Mr. A.R. Mwenda Chitedze Research Station
P.O. Box 158, Lilongwe
Malawi
- Mr. J.D. Ndengu Blantyre A.D.D.
P.O. Box 30227
Chichiri, Blantyre 3
Malawi
- Mr. K.L. deSilva Division of Agricultural of Economics
and Projects
Department of Agriculture
P.O. Box 7, Peradeniya
Sri Lanka
- Mrs. L.N. Wambuguh National Potato Research Station
P.O. Box 338, Limuru
Kenya
- Mr. N.W.O. Wawire NSRS-Kibos
P.O. Box 1221, Kisumu
Kenya
- Mr. K. Zerbo ICRISAT
B.P. 4881
Ouagadougou
Burkina Faso

Academic Training Personnel

<u>Name</u>	<u>Position and Program</u>	<u>Topics</u>
V. Ballabh	Research Fellow Economics Program	- Decision analysis - Regression analysis
K.A. Dvorak	International Intern Economics Program	- Response function analysis - On-farm fertilizer experiments
J.W. Estes	Computer Services Officer Computer Services	- Fundamentals of micro- computers and their use
R.D. Ghodake	Economist Economics Program	- Whole-farm modeling - Linear programming
L.J. Haravu	Manager Library & Documentation Services	- Introduction to ICRISAT's library and documentation services
N.S. Jodha	Senior Economist Economics Program	- Introduction to farming in India - Farming systems perspective in agricultural research - Nutrition studies - Technical change, village institutions and poverty - On-farm research - Informal surveying methods
K.G. Kshir- sagar	Sr. Research Associate Economics Program	- Applications of budgeting analysis
R.A.E. Mueller	Principal Economist Economics Program	- Program coordinator - Technology assessment - Yield gap analysis - Introduction to village studies - Presentation of statistical material

M. von Oppen	Principal Economist Leader, Economics Program	- Marketing studies - Determining agricultural research priorities - Creative research tools
D.R. Mohan Raj	Editor Information Services	- Principles of report writing
Murari Singh	Statistician Statistics	- Principles of sampling - Design of on-farm experiments
R.P. Singh	Economist Economics Program	- Reconnaissance surveys - Questionnaire design - Management of formal surveys - Supervision of excursion to Shirapur village
R.P. Singh	Leader, Farming Systems Research Program	- Overview of ICRISAT's farming systems research
R.T. Hardiman	International Intern Farming Systems Research Program	- On-farm verification of deep Vertisol technology
K.V. Subba Rao	Sr. Research Associate	- Introduction to micro-computing - Exercises in linear programming
M. Asokan	Research Associate II	-do-
S. Lalitha	Research Associate I Economics Program	-do-
M.J. Bhende	Sr. Research Associate II	- Excursion to Shirapur village
V.B. Ladole	Research Associate Economics Program	-do-

The Program

Highlights of the program

Considerable emphasis was given to various aspects of surveying farmers and villages. The topics covered comprised informal as well as formal surveying methods, sample and questionnaire design, and the management of surveys. In the sessions on informal surveys the trainees were encouraged to narrate and write up their experiences when they, as researchers, had approached farmers for the first time. The trainees could exercise their surveying abilities during a visit to a village where ICRISAT has been conducting village studies for the last ten years. This excursion also provided an opportunity for the trainees to compare village life and production conditions in the semi-arid tropics of India with those in their home countries.

Another core section of the program was concerned with technology assessment. The trainees were exposed to budgeting analysis and whole-farm modelling and were helped to solve small problems on microcomputers.

A substantial amount of time was devoted to response function analysis, particularly the analysis of fertilizer response functions. In this segment of the program the concept of a response function was reviewed, problems associated with obtaining data from which such functions can be derived were covered in depth, and the use of response functions for determining best operating conditions was demonstrated.

The trainees were exposed to ICRISAT's marketing studies in order to enhance their awareness for factors affecting the adoption and profitability of agricultural technologies that lie outside the realm of farms and in order to complement the technology assessment component of the training program where sector effects had only been marginally touched.

A special feature of the program was the introduction to microcomputers and their uses in agricultural economics research. Trainees were introduced to various aspects of microcomputing and could gain hands-on experience with microcomputers.

Following a request from several trainees, we introduced a section on regression analysis. This section emphasized model building, choice of functional forms, and interpretation of diagnostic statistics and regression results.

Since the best research results are likely to have only a diminished impact when they are poorly communicated, a relatively small section on report writing and data representation was included in the program.

Trainees and staff of the economics program together played the "Green Revolution Game". In this game the decision making environment of small farmers is simulated and the players have to decide whether or not and how much inputs to purchase, when to apply inputs, how many wells are to be constructed on their farms etc. This game is well suited to expose the complexity and riskiness of farming under erratic natural and economic conditions. Evaluation of the performance of the players and discussion of the overall outcomes of the game under different strategies also helped to demonstrate the limits of economic performance criteria that are frequently used to judge how successfully farms are operated.

Activities by Week

The topics covered in each of the six weeks is given in this section.

Week 1

After a welcoming session on the first day the trainees were briefly introduced to the Economics Program and its research activities. Also on that day they were familiarized with the library documentation services. The second day was devoted to a review of several rather broad issues: agriculture in the SAT of India, nutrition studies, and the interdependencies between agricultural technology, village institutions and poverty. A full half-day was spent on a lecture and exercises in report writing. The second half of the week was devoted to lectures on survey methods and a visit to Shirapur village where the trainees stayed for two days visiting farmers in their fields and on their farm compounds. This visit gave the trainees an opportunity to make practical use of their skills in informally surveying farms.

Week 2

After a review of the trainees' reports of the visit to Shirapur village, the course shifted from informal to formal surveying techniques as an element of base-line studies. In this training period questionnaire design, management of formal surveys and principles of sampling were emphasized. In this week the trainees also were introduced to the microcomputers of ICRISAT's Training Program and to the use of spreadsheet software in budgeting studies.

Week 3

During this week a number of diverse topics were covered:

- (i) approaches to adoption and diffusion studies;
- (ii) introduction to the Economics Program's marketing studies;
- (iii) a little time was spent on the presentation of statistical material in research reports such that the major

conclusions drawn from data are effectively communicated to readers;

- (iv) introduction to the fundamentals of decision analysis;
- (v) approaches to establishing priorities for agricultural research, and
- (vi) methods of quantitative modeling of farms for technology assessment studies.

Also in this week, the trainees were given an example of a farm model and they could solve the model on microcomputers with a linear programming package.

Week 4

The week started with a review of the linear programming results from the whole-farm modeling exercise. In response to a request from several trainees, a series of lectures and exercises in regression analysis was included in the program. The theory and an example in yield-gap analysis was presented and discussed, and methods of market analysis were presented and discussed with the help of examples. Furthermore, the trainees participated, together with staff of the Economics Program, in the 'Green Revolution Game'. This game has some resemblance with the board game 'Monopoly' and simulates the decision environment of small farmers. This game is useful for stimulating the awareness of the players that initial resource endowments and luck are, besides allocative abilities, important factors determining performance of small farms.

The week concluded with a lecture on ICRISAT's deep Vertisol technology and a review of on-farm trials for the verification of this technology in various agroclimatic zones in the semi-arid tropics of India.

Week 5

This week was allocated to the trainees' individually arranged studies.

Week 6

On Monday, the trainees wrote summaries of the results from their individual studies and prepared for the presentation of their study projects in the afternoon of that day. The remainder of this week was devoted to response analysis, in particular the analysis of production response to fertilizer. This segment of the training program covered:

- concepts of economic response analysis;
- the response function;

- data requirements for response functions;
- statistical principles for the design of on-farm experiments;
- estimation of response functions;
- economic data required for response analysis; and
- economic analysis of fertilizer experiments.

The last day of this week was used for settling various administrative matters and the trainees were bid farewell during a small function at which they were presented with certificates for their program participation.

Individual Studies of the Trainees

During the fifth week of the training program the trainees were given the opportunity to carry out small research projects on problems that the trainees themselves had identified.

Unfortunately, not all of the trainees had brought data with them that they could analyze during their individually arranged studies. Several trainees therefore had to take recourse to data supplied by the Economics Program.

All trainees, particularly those that made use of microcomputers, were supported in their research by staff of the Economics Program.

The topics selected by the trainees for their individually arranged studies were the following:

- (i) Whole-farm modeling: An evaluation of sorghum-pigeonpea intercropping.
- (ii) Economics of wheat production in irrigated agriculture in Nigeria.
- (iii) Economic analysis of fungicides on groundnuts in Malawi.
- (iv) Economic analysis of fertilizer use.
- (v) Study of reasons for lack of adoption of recommended practices by farmers in Sri Lanka.
- (vi) Review of methods for technology evaluation and their applications.
- (vii) Whole-farm modeling using linear programming.
- (viii) Steps towards estimating a supply function for an agricultural commodity.
- (ix) Evaluation of quantitative methods and applications

software for economic analysis of farm trials.

- (x) Selecting sites for testing and modifying packages of agricultural technologies.
- (xi) Towards a research proposal for measuring the impact of distance from market on farmgate prices for inputs and outputs and land productivity of potato farms in Kenya.

Suggestions from the Trainees for Future Training Programs

In order to obtain some specific feedback from the trainees, we asked them to fill out a short questionnaire that they could return anonymously. The problem areas addressed in the questionnaire and a summary of the responses are given below.

Question 1: How the trainees learnt about the training program?

Most of the trainees learnt about the program through institutional channels, e.g., Ministry of Agriculture, Institute directors, etc. Three trainees, however, were informed by participatns of last year's training program. None of the trainees appears to have been informed by any of the individual addressees to whom announcements had been sent.

Question 2: Whether trainees initiated participation, or were sent by supervisors?

Only two trainees initiated their participation, the rest was sent on the initiative of their supervisors.

Question 3: Assessment of travel arrangements?

With one exception the travel arrangements made by ICRISAT were regarded as satisfactory.

Question 4:

Suggestions for small changes in the course in order to make the course more useful; in particular which topics should be added or extended and which should be dropped or reduced?

Several trainees suggested the course component on quantitative methods, e.g., linear programming and regression analysis be extended and more time be used for practical exercises. Four of the trainees also suggested the duration of the course be extended, their recommendations ranging from seven weeks to three months. Two trainees suggested that more time be given for individual studies with the additional time either being arranged as a single block or interspersed between separate training blocks. Four trainees suggested that the proportion of time spent on lectures be reduced in favour of practical exercises. The one trainee who came from a country where French is spoken, suggested that trainees with limited knowledge of English should be offered the possibility to improve their

English prior to the course.

Question 5: Ranking according to preference of a cafeteria of course alternatives comprising:

- (a) Same course with no major changes;
- (b) Same course but with more time for individually arranged studies;
- (c) Same course with no time for individually arranged studies;
- (d) A specialized course on quantitative methods in agricultural economics research;
- (e) A specialized course on data collection, data processing and analysis in farming systems research;
- (f) A course on basic economic principles in agricultural research;
- (g) A course on marketing and market analysis for food crops in developing countries;
- (h) A course on the use of microcomputers and application of software in agricultural economic research.

The trainees' preference rankings are summarized in Table 1. From the table it is evident that if the time for individual studies is to be changed then it should be extended rather than eliminated because alternative 'c', a course with unchanged contents but no time for individual studies, was ranked much lower than alternative 'b', a course with extended time for individual studies. It appears, however, that the trainees would prefer specialized courses on quantitative methods (alternative 'd') or on data collection and analysis (option 'e') to the present, rather broad, course. The comparison of only alternatives 'd' and 'e' (Table 2) shows that most trainees who have a strong preference for one of these courses also have a strong preference for the other. Furthermore, most trainees would prefer a course on data collection and analysis to a course on quantitative methods. Only two of the trainees who have a strong preference for a course on quantitative methods ranked a course on data collection very low.

Question 6: Use of recreational facilities

The facilities mostly used by the trainees were the shuttle bus to town, magazines from the library, sunday film shows, the swimming pool, and the trainees lounge. The volley-ball court, tennis court, and cricket field have, in contrast, been rarely used.

Table 1. Frequencies of rankings and average preference rankings of program alternatives.

Program alternative	Average rank	Rank							
		1	2	3	4	5	6	7	8
a	5.6	-	1	1	1	2	1	3	2
b	3.7	4	-	-	2	2	2	1	-
c	7.0	-	-	1	-	-	1	4	5
d	2.7	1	7	1	1	-	-	-	1
e	3.1	4	2	2	-	1	-	1	1
f	4.9	1	-	1	3	2	1	2	1
g	4.3	-	-	4	2	3	2	-	-
h	4.6	1	1	1	2	1	4	-	1

Note: 1 = highest rank
8 = lowest rank

- (a) Same course with no major changes;
- (b) Same course but with more time for individually arranged studies;
- (c) Same course with no time for individually arranged studies;
- (d) A specialized course on quantitative methods in agricultural economics research;
- (e) A specialized course on data collection, data processing and analysis in farming systems research;
- (f) A course on basic economic principles in agricultural research;
- (g) A course on marketing and market analysis for food crops in developing countries;
- (h) A course on the use of microcomputers and application of software in agricultural economic research.

Table 2. Preference ranking of Course Alternatives 'd' and 'e' by the Trainees.

	Trainee										
	1	2	3	4	5	6	7	8	9	10	11
Preference rank for 'd'	2	3	2	2	2	2	2	8	2	4	1
Preference rank for 'e'	8	2	1	1	3	1	1	5	7	3	2

d = Course on quantitative methods.

e = Course on data collection, data processing and analysis in farming systems research.

Question 7: Use of book allowance

The trainees are provided with a book allowance and we asked them their preferences for the use of this allowance:

- (a) to purchase a prescribed list of books;
- (b) choose from a list of recommended books available at ICRISAT; or
- (c) purchase books available from ICRISAT or from bookshops in town.

With two exceptions trainees preferred alternative 'c'. Two trainees would prefer to purchase books from a prescribed list of books.