

PD-AAU-263
47103

AGRICULTURAL POLICY ANALYSIS PROJECT
U. S. AGENCY FOR INTERNATIONAL DEVELOPMENT
CONTRACT NO. DAN-4084-C-00-3087-00

A WORKSHOP ON MICROCOMPUTER APPLICATIONS
TO AGRICULTURAL POLICY ANALYSIS
IN DEVELOPING COUNTRIES

Submitted to:

Abt Associates, Inc.
4250 Connecticut Ave., N. W.
Suite 500
Washington, D. C. 20008

Subcontractor:

Department of Agricultural Economics
Oklahoma State University
Stillwater, OK 74078

Directed by:

Elton Li
James N. Trapp
and
Daryll E. Ray

Department of Agricultural Economics
Oklahoma State University

January 24, 1986
Stillwater, Oklahoma
(Preliminary)

PROPOSAL

**A WORKSHOP ON MICROCOMPUTER APPLICATIONS
TO AGRICULTURAL POLICY ANALYSIS
IN DEVELOPING COUNTRIES**

Directed by

Elton Li

James N. Trapp

and

Daryll E. Ray

**Department of Agricultural Economics
Oklahoma State University**

I. NEED

Application areas for microcomputers in agricultural policy analysis continue to emerge as the computational capability and hardware versatility of this device expands. Tasks once thought suitable only for large mainframe computers are now not only physically feasible but are, in fact, economically preferable for implementation by a microcomputer.

The increasing availability of microcomputers is spreading a new awareness of their potential in the policy analysis process. Many policy workers in developing countries realize that, with the appropriate microcomputer hardware, software and training, a quantum leap in their information processing and analytical capacity is possible.

Some U.S. universities are offering short courses specially designed for agricultural policy workers in developing countries. The Stanford University Food Research Institute is in its third year of an annual 4-week workshop on "Microcomputer and Development." The short course is intended to be "a response to the growing need for microcomputer training that has special relevance to the decision-making and data analysis problems of developing countries." University of Minnesota is offering a 3 week short course titled "Microcomputer Acquisition and Uses in Development". This course is designed for "senior and middle level individuals with administrative, management, planning responsibilities from developing countries." Both short courses are designed for groups of about 30 participants.

The need for training in microcomputers is well recognized by policy workers in developing countries and by U.S. institutions which can offer the training.

II. CAPABILITIES AT O.S.U. FOR OFFERING TRAINING IN MICROS

The Department of Agricultural Economics at Oklahoma State University is a pioneer and leader in the application of microcomputers in agriculture economic teaching, research and extension. It is among the first in the nation to offer a "Microcomputer in Agriculture" course for undergraduate students. Microcomputers are often used as instructional aids and media by the teaching staff. The extension staff was developing microcomputer programs for use by farmers in the state of Oklahoma long before the potential of microcomputers was generally accepted. A wide range of research is conducted using microcomputers as a tool of analysis. In progress is the implementation of sector-wide agricultural policy simulator (POLYSIM) on an IBM PC computer.

The department is experienced in conducting various microcomputer "hands-on" short courses. These include short courses to faculty and staff in the Division of Agriculture, Oklahoma farmers, and Oklahoma bankers.

A 6-week "Agricultural Policy Analysis with Microcomputers" workshop was conducted during the autumn of 1984 for three analysts from the Ministry of Agriculture of the Republic of Liberia. Follow-ups have proven that the participants are now able to apply microcomputers effectively for preparing informational and analytical inputs to policy decision making.

Facilities

The Division of Agriculture at Oklahoma State University operates two microcomputer laboratories for instructional use and for use by students, staff and faculty. One lab contains twenty Apple IIe computers. The other lab contains twenty IBM PC computers.

The Department of Agricultural Economics maintains a wide variety of microcomputers for use by its staff and students. This includes Apple IIe, Apple Macintosh, IBM PC, IBM PC-AT, Telex 1186x, KayPro, and various Radio Shack models.

III. WORKSHOP APPROACH

Audience

The workshop is aimed at analysts whose duties are to prepare informational and analytical inputs to decision makers. Participants are assumed to have some knowledge of economic methods in agricultural policy analysis but no prior experience in computers is assumed.

Design Philosophy

The design philosophy of this microcomputer training program for agricultural policy professional is based on the premise that *no adult instructional program can be effective unless the need for learning is clearly established and demonstrated.* For an analyst to learn a particular software package, for example, it must first be shown to him/her why and how the software can improve on his/her usual way of performing his/her job duties.

Modular Approach

The course is divided into modules to better suit the background, interest, needs and aspirations of the participants. After the introductory modules, each participant, with the instructor, selects the appropriate advanced modules and sets the pace and depth these modules should be covered for maximum flexibility. Description of modules are listed below in "Workshop Specifics".

Informal Discussion Sessions

Informal discussion sessions are to be held regularly so that the instructor can identify and understand the job duties of the analysts and the kind of policy questions to which answers are sought. The instructor can then suggest the informational or analytical techniques and the types of software that are most appropriate. Training can then be tailored more suitably for that participant.

Use of Realistic Data

The participants are encouraged, or in fact, required to bring data with them from their everyday work for use in instruction. This assures the level of sophistication and type of data handling and analytical software taught are in accord with the type and amount of data available for each participant in their work. At the end of the course the participants should be able to take home materials that can immediately be applicable to their everyday work.

Concurrent Training in Other Areas

Training on microcomputers is best accomplished in conjunction with sessions on various techniques of policy analysis such as economic theory, econometrics analysis, linear programming and simulation. The microcomputer session can then serve as a lab session in implementing the ideas and techniques covered. Use of microcomputers open up the possibilities of applications of the more sophisticated analytical techniques which are otherwise impossible due to their computational complexities. The concepts of these techniques must be understood before microcomputer implementation.

Custom Programming Support

Training is concentrated on commonly available commercial packages. However, limited custom programming support is available if called for by unusual applications.

IV. WORKSHOP SPECIFICS

This is a 6 week workshop. Instruction is mainly conducted on the IBM PC microcomputer. The number of participants is limited to 6-20. Each participant has sole access to a machine.

The Typical Work Day

The typical work day of the participants starts with one or two hour sessions on various data handling and analytical techniques. The rest of the day consists of hands-on microcomputer instruction and supervised practice sessions. The participants are free to come in on weekends and evenings for more supervised practice sessions and informal discussion sessions.

Course Contents

The first week covers the common "productivity enhancement" type of software such as spreadsheet analysis, word processing and graphical packages. From then on the training of the participants diverges to suit their backgrounds, needs, interests and specific job duties. Training is available on data base management, statistical analysis, linear programming and its extensions, computer programming, project management, project evaluation, financial analysis, etc.

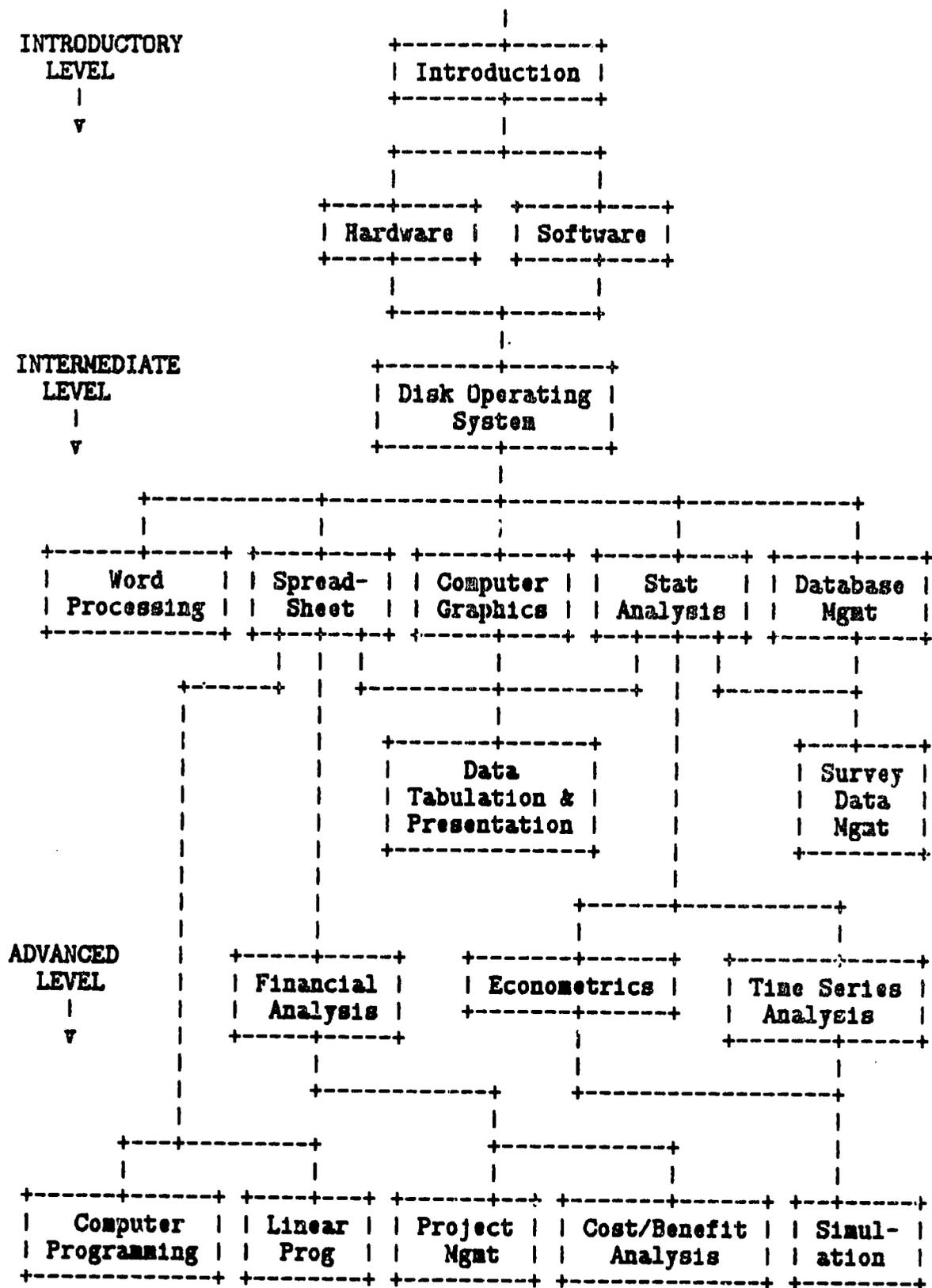
Specifically, the modules offered are:

1. **Introduction to Microcomputers and Their Functions in Agricultural Development Agencies.** (a) Basic terminology. (b) Components of a microcomputer. (c) Types of microcomputers. (d) How microcomputers work. (4 hours)
2. **Survey of Microcomputer Software and their Capabilities.** (a) Spreadsheets. (b) Graphics. (c) Statistical analysis. (d) Data base management. (e) Word processing. (f) Linear programming. (g) Simulation. (h) Project management. (4 hours)
3. **Survey of Microcomputer Hardware.** (a) Processing unit -- size, speed, compatibility. (b) Storage devices. (c) Monitors. (d) Printers. (4 hours)

4. **Introduction to disk operating system.** (a) What is D.O.S. and what does it do? (b) Introduction to IBM PC D.O.S. (c) Elementary D.O.S. commands. (6 hours)
5. **Introduction to Electronic Spreadsheets.** (a) Basic concepts. (b) Introduction to Lotus 1-2-3 spreadsheet program. (c) Potential applications. (16 hours)
6. **Word Processing.** (a) Basic skills. (b) Document creation with word processors. (c) Form letters and mail-merging. (d) Some popular commercial word processors. (12 hours)
7. **Statistical Concepts.** (a) Mean, variance, correlation, frequency tables, trends, maximums, minimums, etc. (b) Microcomputer software for generating simple statistics. (8 hours)
8. **Presentation of Data.** (a) Data tabulation with Lotus 1-2-3. (b) Graphical presentation with Lotus 1-2-3. (c) Presentation of simple descriptive statistics. (8 hours)
9. **Introduction to Data Management.** (a) Concepts of a database. (b) Data organization with Lotus 1-2-3. (c) Common database operations. (d) Preparation of data for further analysis. (16 hours)
10. **Advanced Computer Business Graphics.** (a) Hardware and software requirements. (b) Types of presentations. (c) Examples of business graphics packages (MicroSoft Chart, etc.). (16 hours)
11. **Advanced Lotus 1-2-3.** (a) Financial calculations. (b) Cost-benefit analysis. (c) Advanced features of the Lotus 1-2-3 spreadsheet. (16 hours)
12. **Linear Programming.** (a) Background to L.P. modeling. (b) Setting up the tableau. (c) Preparing tableau for microcomputer solution. (d) Commercial microcomputer L.P. packages. (e) Information needed to formulate L.P. tableau. (1 week)
13. **Econometrics Analysis.** (a) The classical linear regression model. (b) Extensions of the classical linear regression model. (c) Estimation of elasticities. (d) Multiple equation models. (e) Examples of microcomputer econometrics packages (E.S.P, T.S.P., R.A.T.S., etc.). (1 week)
14. **Time Series Analysis and Forecasting.** (a) Components of a time series. (b) Exponential smoothing techniques. (c) De-seasonalization. (d) ARIMA models. (e) Microcomputer packages for implementing the above techniques. (1 week)
15. **Simulation.** (a) Basic concepts. (b) Simulation with an electronic spreadsheet. (c) Kite/Trapp's electronic spreadsheet simulation model. (d) The F.A.O. CAPP model. (1 week)

16. **Analysis of Costs and Benefits of Government Intervention.** (a) Measurements of costs and benefits. (b) Consumer's and producer's surplus. (c) Microcomputer implementation of cost-benefit analysis. (1 week)
17. **Project Management.** (a) Fundamentals of project management. (b) Examples of project management software (MicroSoft Project, Harvard Project Manager, etc). (1 week)
18. **Advanced Database Techniques.** (a) Advanced concepts of data base management systems. (b) Use of microcomputer database packages -- Dbase II and Dbase III. (1 week)
19. **Microcomputer Programming and Software Design.** (a) Grand Tour of common programming languages available on the microcomputer: Basic, Pascal, C, Forth, Modula-2, Fortran, Cobol, PL/1, ADA, and APL. (b) Choosing the right language. (c) Principles of computer programming. (d) Software design principles.

V. COURSE SCHEMATICS



VI. COST

For information on the costs of the workshop contact:

Dean F. Schreiner
Department of Agricultural Economics
Oklahoma State University
Stillwater, OK 74078