

Evaluation of the Computer Operations of the Regional Planning Office, Arusha Region Report and Recommendations

**Report Prepared By The
Regional Planning Office, Arusha Region**

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CHAPTER ONE INTRODUCTION

Microcomputers are an important tool for both administration and planning. As part of the Arusha Planning and Village Development Project (APVDP), a microcomputer was introduced to improve the planning capabilities of the Regional Planning Office and to assist with the administration of development in Arusha Region.

Initially, APVDP provided a small computer system and installed it in the basement annex to the Resource Center as part of the Regional Planning Office. The system, an Ohio Scientific Challenger II Microcomputer with disk drive and a small printer, arrived in Arusha in May 1980. The staff of the computer center, paid by APVDP, is composed of a computer programmer and operator and an assistant computer programmer. The computer programmer and operator has much experience in computer programming, including the development of a personnel management system for the East African Community.

WORK ACCOMPLISHED TO DATE

The work accomplished to date on the Ohio Scientific micro-computer is listed in Annex A. The list includes data compilation and analysis for a village profile survey, a regional rainfall statistics analysis program and data files, water systems inventories and surveys, a small-scale industries survey, a transportation survey used to prepare a report on road maintenance priorities, and a population survey of Arumeru District. It also analyzes the use of the computer as a word processor.

The current program of work originally prepared for 1981-1982 is listed in Annex B. The program includes preparation of user's manuals for the existing data files and programs, use of the files for monitoring rainfall statistics and water system maintenance needs, and trial development of computer uses in financial management and personnel management.

THE ARUSHA REGIONAL PLANNING MODEL

In September 1981, initial collaboration was begun with the AID-sponsored International Population-Development Planning Program (IPDP) being carried out by the Research Triangle Institute (RTI) of North Carolina. The purpose of this program is to assist government planners to assess and plan for the impact of the population's growth and distribution on development. In Arusha Region, the project is assisting in the development of a regional planning model that includes a program for economic and demographic projections. The model provides a comprehensive collection of development statistics and indicators for use in annual and long-term planning and for quarterly evaluations.

In May 1982, the project coordinator in the Regional Planning Office traveled to the United States under the auspices of the program for a three-month program on economic and demographic analysis and use and programming of microcomputers. When the project coordinator returned from training in August 1982, RTI sent an IPDP/RTI staff member to install the regional planning model program and provide on-site training on an Apple II Plus computer system that the IPDP program provided to the Regional Development Directorate and installed in the Regional Planning Office. The regional planning model for Arusha Region is described in Annex C.

Annex D lists some of the major features of microcomputers that contribute to their usefulness in applications in developing countries.

EVALUATION

With the installation of two microcomputer systems in the Regional Planning Office, and after two years of testing of alternative uses of the systems, the Regional Planning Office has conducted this evaluation to assess past experience with microcomputers and to recommend a future program of activities regarding the computers, including training needs and training arrangements, servicing and maintenance of the computers, and other issues listed in the terms of reference.

CHAPTER TWO
TERMS OF REFERENCE

The evaluation was held in the Regional Planning Office, Arusha Region, on Saturday, August 21, 1982, after initial preparation by the computer center staff. The initial meeting took place at 9:30 a.m., followed by detailed discussions and review of documents and programs. A final meeting was held at 2:00 p.m. to make recommendations.

The evaluation team included:

- A.J. Lwelamila, project coordinator;
- T.M. Chikoti, computer programmer and operator;
- A.G. Johnston, rural development planning adviser, APVDP; and
- R. Scott Moreland, deputy director, Research Triangle Institute, International Population-Development Planning Program.

TERMS OF REFERENCE

1. Provide a listing of all activities of the Regional Planning Office computer to date.
2. Provide a complete list of equipment provided to date with costs.
3. Inventory the training that has taken place to date and assess the current levels of skills of the Regional Planning Office staff including the computer center staff.
4. Develop a program of activities for 1982/83. This should address the following areas, among others:
 - Arusha Regional Planning Model
 - Project Management

- Financial Management
 - Personnel Management
 - Data records and analysis:
 - Rainfall records;
 - Water systems inventories; and
 - Other.
5. Assess training needs and training possibilities: local, overseas, national.
 6. Computer Equipment Support: Assess procedures and sources of support for maintenance and repairs of computer equipment:
 - Local servicing;
 - National support: AID, private; and
 - Overseas procurement and repair.
 7. Computer Software Support (programs): Assess procedures and sources of technical programming support and sources for procurement of additional software programs.
 - Support for Regional Planning Model; and
 - Additional programs.
 8. Assess staffing needs of the Regional Planning Office computer operations.
 9. Assess sources of financial support for computer operations of the Regional Planning Office.
 10. Assess means through which the computers could be of use to the districts.
 11. Assess the over-all long-term sustainability of the micro-computer operations of the Regional Planning Office.

**CHAPTER THREE
FINDINGS AND RECOMMENDATIONS**

LISTING OF ACTIVITIES TO DATE

Annex A lists the work accomplished to date. The computer programmer has also prepared a list of data files and programs available. The activities list is to be updated to include a list of people who have used the various programs and data sets.

For the Apple II Plus:

- Machine set-up and testing, August 1982.
- Initial training in use of Arusha Regional Planning Model for Regional Planning Office staff.

INVENTORY OF EQUIPMENT AND COSTS

Ohio Scientific Challenger II.

Annex E lists the equipment and its costs. The total cost to date, including transportation, for the Ohio Scientific system has been \$10,456 (97,031/68 TSh). APVDP has paid these costs.

Apple II Plus.

Annex F lists the equipment and its costs. The total cost of equipment excluding transportation, for the Apple II Plus system has been \$4,666.00 (43,300 TSh). IPDP has paid these costs.

INVENTORY OF TRAINING THAT HAS TAKEN PLACE, AND
ASSESSMENT OF CURRENT LEVELS OF SKILLS

Training

1. Training program of two months in BASIC programming, by APVDP, 1980. Seven participants: two current computer center staff members, two programmers from the Tanganyika Farmer's Association, and three APVDP staff members.
2. Training in the United States by IPDP. One participant, 12 weeks: project coordinator. Ten weeks computer programming course at Control Data Corporation, Washington, D.C.; two weeks computer applications in regional planning, Research Triangle Institute, North Carolina, May-July, 1982.
3. Graduate Training in regional planning at Cornell University. Three of the participants in the APVDP-sponsored graduate program in regional planning at Cornell University had some course work and applications in the use of microcomputers:
 - o G. Khawange, Regional Water Office;
 - o C. Tingirawanyuma, Hanang District planning officer;
 - o G. Mwanga, Kiteto District planning officer.

Two other participants in this program also had some training but are no longer stationed in Arusha Region.

Assessment of Current Level of Skills

1. Computer programmer and operator: Excellent programming ability in BASIC and COBOL. Thorough knowledge of packaged programs and computer applications.
2. Assistant computer programmer: Knowledge of BASIC programming and operation of computer packages, file manipulation, and computer operation.
3. Regional Planning Office staff, Regional Functional Office staff, District Planning Office staff: Few have any experience with computers; however, all use hand calculators to process data and are capable of learning to use the Arusha Regional Planning Model and other packaged programs quickly.

4. APVDP secretarial supervisor: Trained in use of Ohio Scientific Word Processor; others could be trained.
5. Regional accountant: Salaries Section: Has experience with preparing data for computer processing; could quickly learn financial management package programs.
6. General Assessment: To date, only six professional staff and two administrative staff have actually used a micro-computer. However, a wide range of planning office and functional office staff could quickly learn to use the regional planning model and other packaged programs.
7. Technical Assistance: On site: APVDP Rural Development Planning Adviser; Consultants: RTI/IPDP.

PROGRAM OF ACTIVITIES FOR 1982/83

Arusha Regional Planning Model

Objectives

1. Tool for analyzing development data and projects to assist in developing the medium- and long-term plans.
2. Assist with project proposal development -- justification based on projected needs, presentation and analysis of available data.
3. Provide a comprehensive, up-to-date list of development statistics for the Region: for use with project proposals, district and regional annual plans.
4. Assist with quarterly evaluation of physical and financial progress reports.
5. Analysis of projections, trends, and interactions of population and other development indicators to analyze policy alternatives.

Operation of Regional Planning Model

1. Series of presentations of the Arusha Regional Planning Model:

- Prepare abstract (Annex C), distribute to Regional Planning Office staff, regional functional officers, and district planning officers with invitation to see the Arusha Regional Planning Model.
 - Presentation to district planning officers.
 - Presentation to Regional Planning Office staff.
 - Presentation to Regional Functional Office staffs.
2. Update and expand data included in the model; establish a notebook with the source of each data item.
 3. Prepare sector reports and district reports.
 4. Prepare special reports on specific projects or policies.
 5. Run report on regional development statistics and projections for the regional annual plan.
 6. Schedule: Items 1-3 above, September - November 1982.
Item 5, December 1982.

Manpower Management

1. Hold a meeting with Regional Planning Office staff, Regional Manpower Management Office staff, and APVDP Consultant Liz Wily to discuss personnel record keeping.
2. Maintain up-to-date computer files of regional manpower statistics.
3. Discuss with Regional Manpower Management Office the potential for development of a computerized personnel management system.

Financial Management

1. Planning Office to develop a system of maintaining the development budget quarterly reports on the computer to assist with monitoring.
2. When the system is established, Regional Planning Office staff to meet with the regional accountant to show him how the monitoring is done and to discuss the potential for development of a computerized financial management system.
3. If there is a follow-on project to APVDP, the accounts should be kept on the Regional Planning Office computer.

Village Profile Information

1. The User's Manual is complete: T.M. Chikoti, "The Village Profile Exercises: Codes for Information Held in Computer Files," February 1982.
2. Special reports to be prepared as requested. The computer programmer to keep a list of special reports prepared.
3. Regional Planning Office to investigate the possibility of including the Ujamaa and Ushirika Village Information Survey data with the current village profile information.

Water Systems Inventory

1. Water Systems Inventory to be updated.
2. Regional Planning Office to work with Water Department staff (G. Khawange, in analyzing the data for planning purposes).

Rainfall Statistics

1. Computer center staff to obtain up-dated information from regional hydrologist.
2. Computer center staff to prepare a report and a user's manual.
3. Regional Planning Office to coordinate use of the data files and program with the regional hydrologist.

Word Processor

1. The Ohio Scientific Word Processor to be used for relevant documents.
2. The RTI/IPDP Program to procure a word processor program for the Apple II Plus computer.

Potential Uses of the Regional Planning Office Computers

The evaluation recommends that the Regional Planning Office concentrate on the above seven activities during the 1982-1983 year, as they constitute a full program of work for the two

computers and the staff. However, the potential uses of the computer systems in both planning and administration are almost unlimited. The following potential uses are given as examples:

1. Listing of resource center materials;
2. Stores inventory;
3. Financial management system;
4. Personnel management system; and
5. Water billing.

**ASSESSMENT OF TRAINING NEEDS AND TRAINING POSSIBILITIES:
LOCAL, OVERSEAS, NATIONAL**

Training Needs

1. Introduction to computer use and computer applications in planning and administration.
 - Regional Planning Office staff;
 - Regional Functional Office staff (particularly the deputies or desk officers); and
 - District Planning Office officers.
2. Several people with training in advanced programming, computer operation, and servicing.
3. Several people with some basic programming skills.

Training Opportunities: Proposed Program

1. Seminar on computer applications in planning.
 - Time and schedule: 2 weeks, Arusha, within next 4 months.
 - Location: Arusha International Conference Center.

- **Participants:**
 - Four from Regional Planning Office, Arusha;
 - Four from DEVPLAN, Dar es Salaam; and
 - Four from Ministry of Manpower (maximum, 10 participants).
 - **Funding and technical assistance:** RTI/IPDP Program.
 - **Computers available for the seminar:**
 - Regional Planning Office Apple II Plus;
 - Regional Planning Office Ohio Scientific;
 - DEVPLAN, Dar es Salaam, Apple II Plus; and
 - AID/Tanzania Apple II Plus.
 - Disk drive and computer to be supplied by RTI.
2. Seminar on computer applications for English-speaking Africa, sponsored by Battelle and The Future's Group.
- Consideration should be given to request RTI/IPDP to sponsor one participant from Arusha Region to attend above conference.
3. Short course training at Research Triangle Institute, North Carolina, for Mr. J.K.N. Mllay, planning officer, Regional Planning Office. -- two weeks, November 1982.
- Mr. J.K.N. Mllay is currently in the United States at a Department of Agriculture course on planning and analysis of agricultural development projects. Arrangements should be made for a two-week extension to Mr. Mllay's program to allow him to attend a two-week session on "Introduction to Computer Applications in Planning -- including the Arusha Regional Planning Model" at RTI, with the additional costs to be covered by the RTI/IPDP program.
4. Short course in the United States on advanced computer applications and on computer basic maintenance and servicing for Mr. T.M. Chikoti, computer programmer, Regional Planning Office -- six weeks, October-November 1982.
- One very critical training need is for some training in basic computer maintenance and servicing, along with some advanced skills in microcomputer operation and applications.
 - It is proposed that RTI/IPDP sponsor Mr. T.M. Chikoti for a six-week course in the above skills, as follows:

Three weeks: Community Computer (Ohio Scientific)
Washington, D.C.

Three weeks: Research Triangle Institute,
North Carolina (Apple)

Schedule: Mid-October/November

1982.

5. Presentation to District Planning Office and Regional Functional Office staffs.
6. Local training for Regional Functional Office staff on sector applications using the regional planning model.

**COMPUTER EQUIPMENT SUPPORT: PROCEDURES AND SOURCES
OF SUPPORT FOR MAINTENANCE AND REPAIRS**

Local Servicing

Given the lack of an official local servicing facility, there are three procedures:

1. Rely on local mechanics, both Tanzanian and expatriate technical advisers, who have some knowledge of electronics.
2. Rely on computer programmer, who will be given some training in computer servicing and maintenance.
3. If this is insufficient, resort to overseas repair.

National Support

At present there are no servicing facilities for repair of microcomputers in Tanzania.

However, AID should be requested to provide logistical assistance in arranging for overseas procurement and repair.

Overseas Procurement and Repair

Given the funding discussed below, repairs that need to be done in the United States or requests for procurement of replacement or additional equipment should be arranged by requesting the logistical assistance of AID, which maintains an office in Arusha.

- Apple II Plus. The RTI/IPDP Program will continue to provide funds for repair and procurement of replacement and additional equipment for the project until November 1984. At that time, alternative arrangements would have to be made. RTI will arrange the necessary logistical support and arrangements for payment with AID/Tanzania.
- Ohio Scientific. APVDP will continue to provide funds and logistical support for repairs and procurement until March 31, 1983. Beyond March 1983, APVDP and Development Alternatives, Inc. (DAI) will assist the region to apply to AID for additional support for continuing the computer operations of the Regional Planning Office.

For all of the above overseas repairs and procurement the region will arrange for the necessary import approvals from Treasury.

Procedures

1. Mailing: Until March 1983, APVDP will continue to provide logistical support for both systems. After March 1983, AID will be requested to provide logistical support for mailing through its Arusha office.
2. Preventive maintenance: Both DAI and RTI will immediately be requested to provide voltage regulators for the two computers.
3. Disk drives: In both cases, the disk drives are the most sensitive pieces of equipment:

- **Ohio Scientific:** APVDP has already provided a back-up disk drive.
- **Apple II Plus:** In case of malfunction, the region will ship defective drive to RTI. RTI will immediately ship replacement disk drive by air freight, and after repair will return the repaired disk drive as a back-up.

COMPUTER SOFTWARE SUPPORT

- **Ohio Scientific:** APVDP will continue to provide technical assistance and additional software, as needed, until March 1983. After that date, APVDP and DAI will assist the region to apply to AID for continuing support for the computer operations of the Regional Planning Office.
- **Apple II Plus:** RTI/IPDP Program will continue to provide technical assistance and additional software and materials as needed until November 1984.

STAFFING NEEDS OF THE REGIONAL PLANNING OFFICE COMPUTER OPERATIONS

At this point, with the professional planning staff having only limited computer capabilities, there is a need to maintain a full time support staff for the computer operations.

This report recommends that the two current positions, and the current personnel, be maintained:

- Computer Programmer -- T. M. Chikoti
- Machine Operator -- L. Rwebangira

The Regional Planning Office should immediately undertake arrangements to have these positions classified and to ensure that the payment of their salaries is taken over from APVDP by the region.

SOURCES OF FINANCIAL SUPPORT FOR THE REGIONAL
PLANNING OFFICE COMPUTER OPERATIONS

- IPDP of RTI (AID Contract AID/DSPE-C-0062) will maintain support of the operation of the Apple II Plus computer system and the Arusha Regional Planning Model until November 1984.
- APVDP, being carried out by DAI (AID Contract AID/ARF-C-1556) will maintain support of the operation of the Ohio Scientific microcomputer until March 31, 1983.
- APVDP and DAI will assist the region to apply to AID for support for the continuation of the Regional Planning Office Computer Operations beyond March 1983.

MEANS THROUGH WHICH THE COMPUTERS COULD BE OF USE TO
THE DISTRICTS IN ARUSHA REGION

- The Arusha Regional Planning Model is programmed to provide district-level statistics and analysis.
- District planning officers will be given presentations on the regional planning model, and on the other information available on the computers.
- District reports will be prepared using the regional planning model.
- District planning officers will be encouraged to come to the Regional Planning Office to use the computer facilities and the regional planning model.
- Arrangements could be made to provide presentations and training sessions at those districts with electricity (Arumeru, Hanang, Monduli, and Arusha Urban District).

ASSESSMENT OF THE LONG-TERM SUSTAINABILITY OF THE
MICROCOMPUTER OPERATIONS OF THE REGIONAL PLANNING
OFFICE, ARUSHA REGION

With the additional support from the IPDP and with the training proposed in this report, the evaluation team thinks that the introduction of microcomputers as a tool for regional planning should be continued in Arusha Region as a trial program.

With the activities outlined in this report serving as the basic program of activities for the coming financial year, a second evaluation of the long-term sustainability should be carried out after one year.

The sustainability of the computer operations will depend on the users, that is, the interest of regional and district planning officials and functional officers in using the machines. Training will be designed to introduce these officials to computer applications in planning and administration and to assist in implementing these applications.

CHAPTER FOUR
SUMMARY OF RECOMMENDATIONS

List of Activities

The Regional Planning Office computer staff should keep an up-to-date listing of all work that has been undertaken on the computers.

Inventory of Equipment

A complete inventory of equipment, software, and materials supplied to the computer operations shall be maintained in an official regional file.

Program of Activities for 1982/83

A complete program of activities for 1982/83 has been outlined in this report. The Regional Planning Office should concentrate on the limited set of activities proposed, including:

- Use of the Arusha Regional Planning Model;
- Development and maintenance of files of regional manpower statistics;
- Development and maintenance of a system for monitoring expenditures of the regional development budget;
- Preparation of special reports as requested based on the village profile information;
- Updating of water systems inventory and preparation of analytical reports for planning;
- Updating of regional rainfall statistics files and preparation of analytical reports; and
- Use of word processor for selected documents.

Assessment of Training Needs

The most important need is for training in the introduction of computer use and computer applications in planning and administration for regional and district planning officials and functional officers.

There is an additional need for training of several support staff in basic computer maintenance and service, and in computer programming and computer operation.

Proposed Program of Training

- Participation of four regional planning officials in a two-week seminar in Arusha on computer use and computer applications in planning -- to be sponsored by RTI/IPDP.
- Participation of one regional planning official in an Africa-wide conference on computer applications in planning for English-speaking Africa (to be sponsored by Battelle and the Future Group).
- Short Course for Mr. J.K.N. Mllay, planning officer, at Research Triangle Institute, North Carolina, in introduction to computer use and the Arusha Regional Planning Model -- a two-week extension to his present U.S. training program (to be sponsored by RTI/IPDP).
- Six-week course in the United States for Mr. T.M. Chikoti on advanced microcomputer operation, maintenance, and servicing: three weeks at Community Computer, Washington, D.C. and three weeks at RTI, North Carolina (to be sponsored by RTI/IPDP).
- Local training for regional and district planning and functional officers on use of the Arusha Regional Planning Model.

Computer Equipment Support

For local service, rely on local mechanics and expatriate advisers with some knowledge of electricity. For overseas repairs and replacement procurement, support to be provided by RTI and

DAI, with additional continuing support to be requested from AID. Local logistical support to be requested from AID through its Arusha office.

Computer Software Support

Technical support and additional software as needed to be provided by RTI and DAI, with additional continuing support to be requested from AID.

Staffing Needs of the Regional Planning Office Computer Operations

The two current positions of computer programmer and machine operator should be maintained, with current personnel. The Regional Planning Office should immediately undertake arrangements to have these positions classified and to ensure that the salaries are taken over from APVDP by the region.

Sources of Financial Support for the Regional Planning Office Computer Operations

The RTI/IPDP Program will maintain support for the Apple II computer until November 1984. APVDP/DAI will maintain support for the Ohio Scientific computer until March 1983. APVDP/DAI will assist the region to apply to AID for continuing support for the computer operations.

Means through which the Computers could be of Use to the Districts in Arusha Region

Attempts should be made to ensure that the computer operations are of use to the district planning offices as well as to regional officials. All programs should provide district-level statistics and analysis, and efforts should be made to assist the district officials to utilize the programs and data available.

Long-Term Sustainability of the Microcomputer Operations of the Regional Planning Office

The evaluation team thinks that if sufficient support and skills were available the introduction of microcomputers as a tool for regional planning should be continued in Arusha Region as a trial program. The long-term sustainability of the computer operations will depend on the interest of regional and district planning officials and functional officers in using the machines. Training should be designed to introduce these officials to computer applications in planning and administration and to assist in implementating these applications.

ANNEX A

WORK ACCOMPLISHED TO DATE:
OHIO SCIENTIFIC MICROCOMPUTER

ANNEX A

WORK ACCOMPLISHED TO DATE:
OHIO SCIENTIFIC MICROCOMPUTER

- Set up/testing of the machine, May 1980.
- Village Profile Survey: Create files and input the data. Reports have been prepared on request, including one analysis of the survey (Peterson and Peterson, 1980). Includes data on 151 villages in Arusha Region. Data has been used by Regional Planning Office, District Planning Offices, BRALUP, and others.
- Regional Rainfall Statistics: Analysis program and data files. All available rainfall statistics for Arusha Region (1935-1980) have been included in the computer files. An analysis program has been written and reports generated. Analysis is available by station, month, and year.
- Water Systems Inventories and Surveys: Two surveys of water systems in Arusha Region have been input to files. These include the Regional Water Development Department inventory of 457 villages in Arusha Region and a detailed survey of 131 villages with water systems carried out by APVDP. Reports are used to assist in planning.
- Small-Scale Industries Survey: Files contain extensive data on small-scale industries in rural and urban areas of Arusha Region. One major report compiled. Additional reports have been prepared at request of SIDO.
- Transportation Survey: Data used to prepare paper on road priority development (Ndulu, 1980) and other road priority information for Regional Planning Office. Data from Regional Works information and other data collected for the regional planning exercise.
- Works has also generated a spare parts computer inventory system, but this system is not currently being used.
- Background work has been completed for Water Department billing to be handled at regional level by this computer. Master files for all billing have been completed. This would improve turnover allowing timely billing and correction of errors. An initial request for approval of this system was rejected, until several problems are resolved. These problems will be investigated this year.

- Word Processor: The computer system includes a word processor, currently being used for selected APVDP documentation. This can easily be expanded and made available for additional administrative use, based on priority use of computer time. Short documents that go through a series of drafts are efficiently handled. Examples of documents include the APVDP documentation list and the Kiru Valley Preliminary Investigation.

- A training program in use of the computer and in computer programming in the BASIC computer language was conducted for two and one-half months for four programmers. Both of the current staff members of the computer center completed this course.

- Population Pressure Survey - Arumeru District: A population pressure survey was conducted in Arumeru District April-June 1982 as part of a project to assist the district to develop policies and strategies for dealing with population pressure. Data collection methods included a complete population count of the 131 villages in the district and a survey of village leaders in 42 villages. Data were compiled and analyzed on the computer with reports generated in both English and Swahili.



ANNEX B
COMPUTER PROGRAM FOR 1981/82

ANNEX B
COMPUTER PROGRAM FOR 1981/82

Computer Program for 1981/82

- Development and implementation of a system for personnel management, to be coordinated by the Regional Manpower Office.
- Development/trial of a system of financial managements, in phases:
 - Phase I. APVDP Accounting
 - Phase II. Monitoring of Regional Development Budget.
 - Phase III. Monitoring of all Regional Finances.
- Village Profile Information: Development of a manual for use of the villages profile information. Generation of basic reports, and special reports on request. Addition of data from the Ujamaa and Cooperative Development Department Village Information Survey.
- Regional and District Development Indicators: Files of regional and district development indicators will be developed for use in regional and district planning. These files will be up-dated regularly as current data becomes available.
- Monitoring of Village Water Systems: Regional Water Department inventory to be up dated regularly. Reports and analysis to assist with planning for water development.
- Updating and analysis of rainfall statistics: In cooperation with the Hydrology Department. Preparation of manual for users of the rainfall data and analysis programs. Generation of basic report, and additional reports on request.
- Word Processor: Training program for APVDP and Regional Planning Office secretaries. Expanded use for selected draft documents that require editing and revision.
- Review of computer facilities in Arusha Region: Investigate available resources: hardware, software, manpower, and maintenance. Investigate potential for collaboration with ESAMI TFA.

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- Computer listing and regular update for all resource center materials.
- Development/implementation of Stores inventory.

ANNEX C
ARUSHA REGIONAL PLANNING MODEL: ABSTRACT

ANNEX C

ARUSHA REGIONAL PLANNING MODEL: ABSTRACT

The Arusha Regional Planning Model is a microcomputer-based tool that can aid regional planners in the areas of population, education, health services, water, food, and livestock. It was developed by the Integrated Population - Development Planning Project of the Research Triangle Institute, North Carolina, under an AID contract. The model can be used to keep track of relevant information for the seven districts of Arusha and, in combination with pre-specified planning goals, calculate target levels for various outputs and resource requirements. It contains a demographic projections methodology for projecting population in the seven districts of Arusha Region.

The Arusha Regional Planning Model consists of seven "submodels."

- The Demographic Submodel tracks the population by age, and sex and gives information on demographic vital rates.
- The Education Submodel projects enrollment in each standard of primary school by age and calculates required teachers and classrooms.
- The Health Services Submodel projects requirements or goals for levels of health services personnel and infrastructure.
- The Water Submodel calculates requirements for various water sources based on target levels of service and population estimates.
- The Food Production Submodel calculates agricultural output of various food, subsistence, and cash crops.
- The Food Requirements Submodel gives the caloric and food requirements by type of food according to international standards.
- The Livestock Submodel projects the livestock population, meat production and milk production.

The model uses the Apple II+ computer and requires no special knowledge of computers to use. By simply responding to questions asked by the computer, the user can change assumptions, run the model for different districts, and view or printout the values of calculated variables for any sector of interest.

ANNEX D
MICROCOMPUTERS:
COMPUTER APPLICATIONS IN DEVELOPING COUNTRIES

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Computer applications in developing countries:

- Analyzing policy alternatives;
- Improving the management and growth of small businesses;
- Strengthening management and information systems to improve institutional capabilities; and
- Applying improved science and technology to the needs of the developing countries.

Contribution:

- Increased accessibility to substantial computational and analytical power;
- Relatively cheap and do not require sophisticated programming;
- Potential to contribute to substantially improved analytical and planning capacity;
- Permits substantial decentralization of this computer power to regions and districts;
- Educational value through interactive computing with a lively presentation of material;
- Speed of manipulating information:
 - Field data can be entered immediately into computer for analysis, and
 - Accounts can be completed in minutes;
 - Tremendous value for financial management; and
 - Microcomputer is small and self-contained, with the capability of expansion through the addition of peripheral devices.

Examples:

- **Presentation of population projections and their impact on development.**

ANNEX E
OHIO SCIENTIFIC CHALLENGER II MICROCOMPUTER:
LISTING OF EQUIPMENT, SOFTWARE, AND MATERIALS
AND THEIR COSTS

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AND THEIR COSTS

ITEM	COST (U.S. dollars)
<u>Equipment</u>	
48K Microcomputer, Challenger II, CSP, DF, 65U	\$3,300.00
OKIDATA Printer with interface	960.00
AC 3P Monitor	129.00
MOV Voltage Spike Protector	20.00
1 pair Joysticks	39.00
1 A-15 Cable	10.00
M82A Printer with CA-9 interface	645.00
DMS Nucleus	300.00
DMS-Stats	500.00
7 - SSJ	10.50
Technical Newsletters	13.50
30 Disks	159.00
2 Cartons Paper for OKI Printer 9 1/2 X 11	60.00
1 book on OSI	7.95
a book Basic handbook	6.45
1 book Basic Handbook	14.95
1 ED-8	35.00
1 G-D-7	35.00
1 Pascal and Fortran	450.00
1 WP-6502 Word Processor	125.00
Customization	600.00
Instant Basic	9.95
12 Ribbons	30.00
2 cartons paper	60.00
Miscellaneous, Transportation, Repairs, New Disk Drive	<u>2,935.70</u>
Total Costs	10,456.00

ANNEX F
APPLE II MICROCOMPUTER:
LISTING OF EQUIPMENT, SOFTWARE, AND MATERIALS
AND THEIR COSTS

ANNEX F
 APPLE II PLUS MICROCOMPUTER:
 LISTING OF EQUIPMENT, SOFTWARE, AND MATERIALS
 AND THEIR COSTS

ITEM	COST (U.S. dollars)
<u>Equipment</u>	
Apple II Plus computer with 48K RAM(SN433298)	1,000.00
One Apple II Disk Drive with Controller (SN652386)	495.00
One Apple II Disk Drive without controller (SN652381)	413.00
One Epson MX-100 Printer	701.00
None Apple Monitor II (SN321721)	173.00
AP 102 Computer Carrying Case	95.00
One Grappler Interface Controller for printer(SN8571)	137.00
One Acme Transformer	75.00
 <u>Documentation, Software, and Materials</u>	
Microsoft Softcard Premium System (includes One Microsoft Z-80 Card, Videx 80 column video card, and 16X RAM	570.00
Visicalc	187.00
Visitrend/Visiplot	224.00
Box of 1/4 inch floppy diskettes	28.00
Documentation and Miscellaneous	568.00
	\$4,666.00
Total Cost (exclusive of transport)	

Documentation:

Apple soft Tutorial
 Apple soft Reference Manual
 DOS Manual
 Softcard, Vol. I
 Softcard Vol. II
 Videoterm 80 column Display Manual

Regional Planning Model for Arusha:
Technical Description and User's Manual
Visicalc Manual
Visitrend/Visiplot Manual
Grappler Interface Manual
Apple II Monitor Owner's Manual
Apple II Reference Manual
Epsom MX Printer Manual