AID Reference Center

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# RURAL ROADS SYSTEMS PROJECT

AID/AFR c1495

FIRST SIX MONTH REPORT FOR USAID
AND FAO

PROJECT NO. 615-0168

Prepared by: Harvey Gover.
Date: 14 September, 1978.

## Introduction:

The first 6-month report to FAO and USAID contain 4 sections and 5 appendixes. The report is organized as given below:

I. ACCOMPLISHMENTS DURING THE FIRST 6 MONTHS

II. MAJOR PROBLEM AREAS DETECTED

III. PROPOSED ACTIVITIES FOR THE NEXT 6 MONTHS

IV. CHRONOLOGICAL NARRATIVE OF ACTIVITIES

APPENDIX I. CURRENT ADMINISTRATIVE ORGANIZATION AND STAFF

APPENDIX II. MANAGEMENT PLAN FOR THE STATISTICAL DATA PROCESSING SECTION

APPENDIX III. SCHEDULE OF SUPPORT FOR DEVRES

APPENDIX IV. DISCUSSION OF SEMINAR ATTENDANCE

APPENDIX V. THE WANG MINI-COMPUTER

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## I. ACCOMPLISHMENTS DURING THE FIRST SIX MONTHS

### A. FAO NUTRITION MONITORING SURVEY:

1. IRS-IV Nutrition Module Data Validated.

2. Missing data located and file rectified.

3. An SPSS compatible file was created from the IRS IV Nutrition Module Data

4. SPSS compatible files were created from the Urban Food Purchasing Surveys I and II for Desmond McCarthy

5. Tabulations from the SPSS nutrition file were prepared

6. Tabulations from the Urban Food Purchasing Surveys were completed.

B. RURAL ROADS IMPACT STUDY

1. Rural Roads Nutrition module data validated after separate file creation program written.

2. SPSS compatible rural roads nutrition file created.

3. Nutrition tables compatible with IRS-XV tables produced.

4. Complete data dictionary for all RURAL ROADS IMPACT STUDY data prepared.

5. Validation rules for opening position data determined.

6. Program for creating a RURAL ROADS IMPACT STUDY data file written.

7. Program for validating data written.

8. Special program for placing standard weights and height on child nutrition records written. (To be tested after file is valid)

9. Program for initial tabulation written.

10. Opening Position data entered onto file.

11. Nutrition data combined with opening position data.

12. Three validation runs completed.

13. Preliminary tables from early data completed.

14. Data Dictionary modified to reflect validation rule changes.

15. Initial DEVRES requirements formulated (See Appendix III)

## II. MAJOR PROBLEM AREAS DETECTED

1. Limited CBS expertise in statistical data processing has caused my time to be fragmented by others asking for assistance.

2. An initially small staff, devoted to statistical data processing has grown rapidly, but this expansion has not been accompanied by enhanced management and organization (See Appendix I).

3. Poor data forms control has led to lost data and serious delays in the analysis of data.

4. Training of staff is restricted by lack of staff time, poor control of work requests and general lack of planning.

5. Work requests from users are accepted without regard for existing priorities or any adequate basis for estimation of time and staff required.

6. The archiving, documentation and use of already produced data is not systematically handled.

7. The newly arrived WANG 2200 MVP (See Appendix V) cannot be fully utilized until it has been included in a management plan and staff time allocated.

8. Breakdowns in the IBM computer and its peripherals has been frequent and adequate backup equipment is not available.

9. There is no systematic inclusion of data processing staff in the development of survey instruments.

10. Reliance on generalized software for file creation updates and tabulations is not accompanied by staff responsible for generalized software maintenance.

## III. PROPOSED ACTIVITIES FOR THE NEXT SIX MONTHS

### A. FAO NUTRITION MONITORING SURVEY:

1. Carry out the management plan given in Appendix II.

2. Merge nutrition data with Labour Force Survey and IRS IV household data.

3. Recreate the SPSS compatible file including household characteristic variables.

4. Update Nutrition file with follow-up data from survey out-liers.

5. Carry out additional tabulation requirements and validations.

B. RURAL ROADS IMPACT STUDY

1. Carry out the management plan given in Appendix II.

2. Complete validations for opening positions data.

3. Incorporate validation rules for cyclical data into program and dictionary.

4. Add cyclical data to RURAL ROADS IMPACT STUDY data file.

5. Carry out the DEVRES data analysis requirements (See Appendix III).

6. Investigate possible computerization of M.D.W. inventories and auxilliary files.

7. Investigate the development of a Time Series Analysis Program for the WANG computer.

8. Investigate the creation of extract files for use interactively on the WANG computer.

IV. CHRONOLOGICAL NARRATIVE OF ACTIVITIES

I arrived 5 February 1979 at 0830 in the morning. That same morning I checked in with USAID and with Parmeet Singh at Central Bureau of Statistics. While at CBS I established my office and reintroduced myself to my colleagues.

My arrival coincided with the annual preparation of data for the Economic Survey Report. In addition, many key personnel with long experiences in preparing data for this report had departed or were to do so imminently (e.g. Daniel Kiangura, P.Thornell, Jim Otto). Because of my experience within the CBS I was asked to give assistance towards preparation of this annual report. Thus, my initial activities with this contract were with the Economic Survey Report.

Data for the Economic Survey Report comes from 7 primary sources. These are: (1) the labour enumeration survey, (2) the primary school census,(3) the secondary school census,(4) the large farm census,(5) the intermediate farm census,(6) the census of industrial production and (7) the survey of services. Due to, in my opinion, a general weakening of staff during 1978 and early 1979 good control of data flow and processing was lost. This deterioration resulted in data being lost and the data files themselves not being adequately cleaned. Nearly all tables produced initially ould not be reconciled with earlier year's tabulations. A very difficult period followed wherein validation were rerun and tests made for missing data. It was not until early May that reconciliations of the Economic Survey Report were made and publication could proceed.

Intermixed with this early activity were initial data processing for the IRS-IV nutrition module and the nutrition module of the rural roads impact study. Early activities included preparing a listing of nutrition records for Mr.Omoro for validation purposes; meeting with David Alnwick, Dennis Cooley, and Desmond McCarthy to discuss preparation of an SPSS compatible file for nutritional analysis. Meetings were held with Mr.Akech to determine validation rules for opening position records on rural roads and cooperative tabulations for rural roads nutrition and IRS-IV nutrition module data.

Mr.Desmond McCarthy requested an extract file (SPSS-compatible) to be created from the earlier conducted Urban Food Purchasing Surveys I and II. This work proved trouble prone and took much longer than anticipated. The purpose of this data manupulation was to provide a basis for analysis of government food pricing policy. Extensive tables were prepared including for example: proportion of income spent for basic foods, rent, etc. Final tables were posted to him.

An SPSS compatible file created from IRS-IV nutrition module data was found to contain fewer children than anticipated. Retracing steps taken earlier we found that some data had not been successfully entered onto the IRS-IV nutrition module data file. By listing the number of respondents by cluster number these missing questionnaires were found and added to the file. The SPSS file was recreated and several series of tables were run. These tables analyse basic characteristics plus standard weights and heights for age (copies may be obtained from Mr.Akach or Mr.Omoro).

At approximately the same period of time the rural roads nutrition data were collected for the impact areas. The questionnaire for the rural roads study collect the same nutrition data that is found on the IRS-IV nutrition module. The IRS-IV file creation and update program was modified slightly to accept rural roads impact area nutrition data. These data were then validated (cleaned) and analysed in the same manner as the IRS-IV nutrition module data with the exception that geographic breakdown were by province and road. It was found that rural road impact area child nutrition differed little from nutrition data collected with the IRS-IV survey. (Copies of the tables can be obtained from Mr.Akach).

During April and May rural roads impact data for opening areas, opening position and household characteristics began arriving from the field. These data were then sight edited before being sent to the data entry section. While this activity was underway a data dictionary was prepared and a program written to validate and update these new record types.

Mr.Akach provided validation rules which were interpreted into computer programming checks for data accuracy. Preliminary tables design were made for household characteristics data, opening areas and opening positions data. Due to the programming implications of treating twenty different record types in the validation and update program the writing and testing of the dictionary and update program were time-consuming. It was not until late June that we had our first successful run-free tests. During July and August all data thus far collected were added to the data file.

Validation rules and validation coding sheets prepared earlier were put into use during July and August. The first validation runs against actual field data clarified some errors in our validation logic. Initial runs also showed that some early returns initially coded as road were incorrect and had to be recorded road 1.

Nutrition data which had been collected much earlier than opening position data for other household characteristics were initially written to a separate file for processing. This enabled us to do the same kinds of analysis for Rural Roads nutrition data as was done for IRS-IV nutrition module data. In August these data were added to the newly created rural roads master file. Three updates to this masterfile were accomplished. These updates were corrections made earlier for nutrition data and corrections for household member data, opening livestock and assets data, and opening areas data. Sample tables from these preliminary data were prepared for early analysis and further validation.

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# APPENDIXES

# APPENDIX - I

## CURRENT ADMINISTRATIVE ORGANIZATION AND STAFF

The purpose of this section is to describe the working environment for the production of statistics from survey sample data and administrative data within the Central Bureau of Statistics.

The computer for the government is operated by the Government Computer Centre. The Computer Centre is administratively within the Ministry of Finance. The computer itself is located in Herufi House, the Central Bureau of Statistics (CBS). CBS is however part of the Ministry of Economic Planning and Community Affairs. The Computer Centre include staff to manage the computer centre', operation manager, a senior systems programmer, approximately 15 computer operators and operation staff, and approximately 10 programmers (another 3 programmers are assigned to the National Social Security Fund (NSSF). Additionally the Computer Centre controls all data entry machines and personnel. Data entry equipments are primarily data diskette machine (IBM 3741's and 3742's) while some older card punching equipment are also maintained.

CBS itself has a small programming staff. This staff has emerged over the past five years in response to greater demand for statistical data from surveys and administrative sources. Traditionally the programming staff of the Government Computer Centre has focused on the processing of administrative data including government payroll, government accounts, CPE examinations, NSSF, Coast Water Billing, Motor Vehicle Registration, and Lands and Settlements. Since the early 1970's the collection of data through surveys has greatly expanded and the ability of the Computer Centre to accommodate the processing of social statistics has not.

For this reason CBS in conjunction with USAID has sent several candidates to the U.S. Census Bureau ISPC for training in data processing particularly as it relates to survey and census data. Trainees thus far have been Daniel Kiangura, Mr.Okoth,Mr.Oyiang and Miss Cheroigin, Mr.Macharia and Mr.Midiango. These staff are complemented by locally trained staff. For the most part the staff is new since February 1979 and has been growing since then. Assisting the local staff are five advisers: myself, two advisers for information systems, a census adviser, and an education statistics adviser. With the exception of myself all advisers came since April.

Collectively this staff is responsible for the processing of all statistical data within the government. Presently there are some 30 surveys, censuses and administrative files. To date there has not been an administrative organization encompassing the function of this group. Statistical data processing is characterized by "ad hoc" responses to user demands rather than a planned allocation of a programmers' time and thoughtful interaction between data users and data producers. Lack of planning for staff development has demoralized a competent staff capable of earning two to three times the current incomes outside the government. This situation calls for a remedy. An organizational structure for this purpose is proposed in Appendix II .

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# APPENDIX-II

## MANAGEMENT PLAN FOR THE STATISTICAL DATA PROCESSING SECTION

Following is the proposed plan for organizing the Statistical Data Processing Section. The schematic diagram presented is based on a horizontal breakdown of statistical functions within the bureau. Thus the staff is allocated to various statistical areas e.g. demography, labour, agriculture. While some groupings seem incompatible this was done to match existing staff with the wide variety of statistics processed.

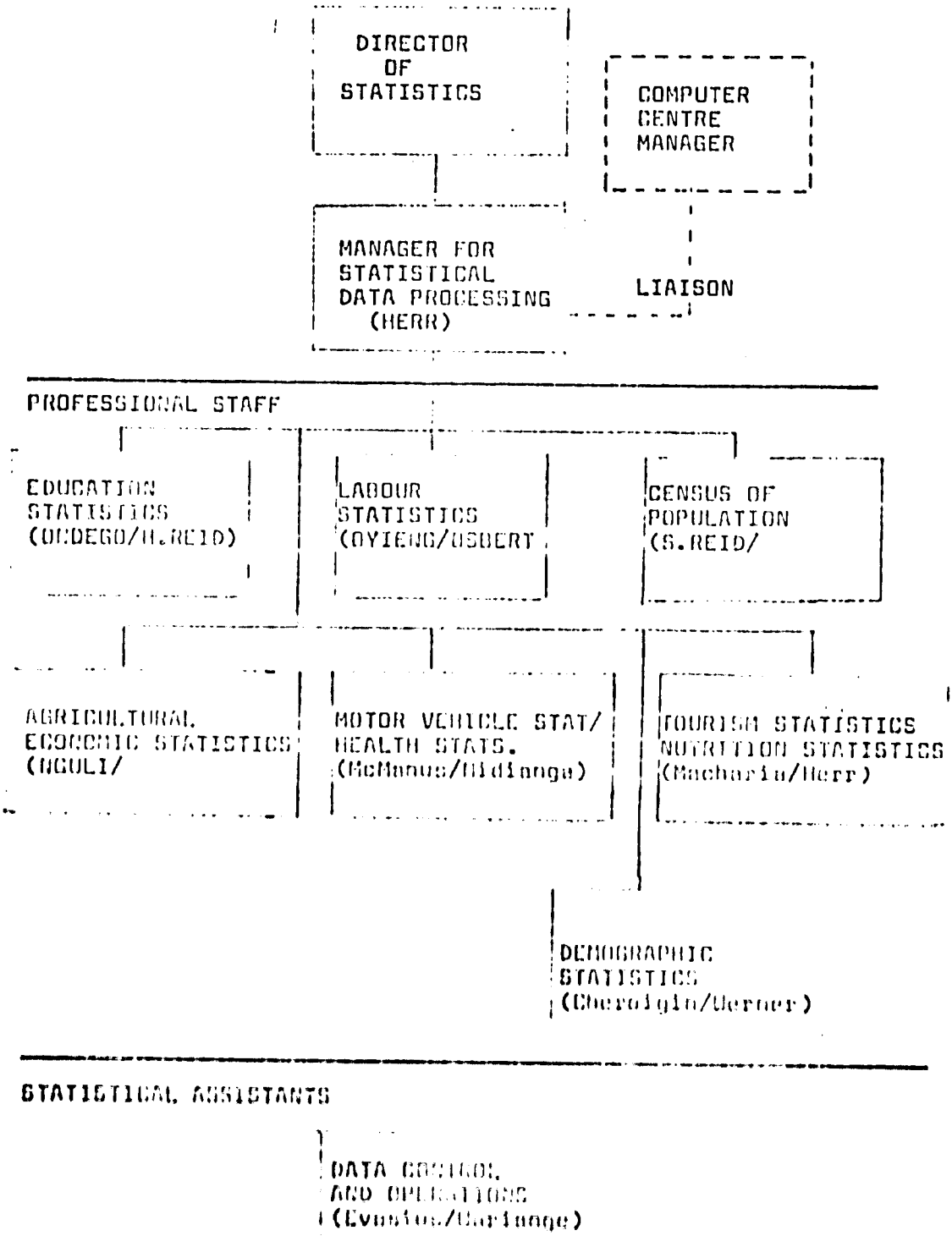
The objective of the organization is to overcome the ad hoc approach to statistical data processing by providing a structure that can be formally staffed. In the past advisors were recruited in response to the need of a particular survey or development effort. Often the advisor would find himself completely outside the existing administrative network; or in fact being disruptive to the existing organization. When the advisor left his work was left unattended in part because there was no staff assigned permanently on the basis of a particular survey or development effort.

Kenya staff in this section are trained as programmers, but are also qualified economists or statisticians. Many of them were formerly in comparable statistical areas before receiving training in data processing. An excellent link can therefore be provided between data users and data processing through these staff.

Vertical functions within our section are also provided. These functions are ones of data processing, data control and staff training. These functions cross statistical horizontal groupings. An example is software maintenance for generalized software packages; another is standardized system documentation. These functions are not catered to in the administrative scheme. Instead individuals having particular skills will be called upon to propagate these through staff training.

The first step toward implementing a plan have already been taken. These include the formation of a "Data Preparation and Processing Section Working Group"; initialization of a job and file control system; initialization of a data control scheme for primary and secondary school censuses; and the recruiting of a data control clerk. The agenda for the first meeting of the working group are included in this appendix.

## PROPOSED ADMINISTRATION PLAN FOR STATISTICAL DATA PROCESSING SECTION



A. HORIZONTAL FUNCTIONS

DP REQUIRED BY INTEREST GROUP

LABOUR STATISTICS:

LABOUR FORCE SURVEY; LABOUR ENUMERATION SURVEY; REGISTRY OF ESTABLISHMENT*; CENSUS OF INDUSTRIAL PRODUCTION; SURVEY OF SERVICES

DEMOGRAPHIC STATISTICS:

KENYA FERTILITY SURVEY; NATIONAL DEMOGRAPHIC SURVEY; FAMILY PLANNING;

ECONOMIC STATISTICS:

RASUP; INTEGRATED RURAL SURVEY; INCOME TAX STATISTICS; BUILDING COST INDEX; URBAN FOOD PURCHASING SURVEY; ENERGY MODULE

CENSUS OF POPULATION:

1979 CENSUS OF POPULATION
1969 CENSUS OF POPULATION (100%)
1969 CENSUS OF POPULATION (10%)

AGRICULTURAL STATISTICS:

LARGE FARM CENSUS; INTERMEDIATE FARM CENSUS; CROP FORECAST SURVEY; MARKET PRICE SURVEY; LACTATION STUDY; INTEGRATED RURAL SURVEYS; NISSP-II*

MOTOR VEHICLES STATISTICS:

NEW VEHICLE REGISTRATIONS; LICENCE RENEWALS; M.O.W.HIGHWAY TRANSPORT STUDY 1977: ORIGIN-DESTINATION STUDY 1977; M.V.INSURANCE STATISTICS

EDUCATION STATISTICS:

PRIMARY SCHOOL CENSUS; SECONDARY SCHOOL CENSUS; NON-FORMAL EDUCATION MODULE -DIV.OF LABOUR; LITERACY MODULE

TOURISM STATISTICS;

KENYA VISITORS SURVEY; MIGRATION STATISTICS; HOTEL STATISTICS*

HEALTH STATISTICS:

VITAL HEALTH STATISTICS; HEALTH CLINIC MONITORING SYSTEM*; COMMUNICABLE DISEASES*; BIRTH AND DEATH REGISTRATIONS

NUTRITION STATISTICS:

MALARIA-SICKLE CELL-NUTRITION SURVEY NUTRITION MODULE-IRS II AND IV; NUTRITION MODULE -RURAL ROADS IMPACT STUDY; W.H.O.NUTRITIONAL STANDARDS;*

* PROPOSED NEW SYSTEMS

B. VERTICAL FUNCTIONS

TRAINING FOR STAFF

SOFTWARE PACKAGE MAINTENANCE

DATA CONTROL ( FORMS, CARDS, DISKETTES, TAPES)

SYSTEM DOCUMENTATION

WANG MINI-COMPUTER ORIENTATION

PROGRAMME DE-BUGGING

FILE MATCHING AND MERGING

INFORMATION SYSTEM DEVELOPMENT

DATA ARCHIVING

TRAINING DATA USERS

C. RESPONSIBILITIES:

1. MANAGER FOR STATISTICAL DATA PROCESSING

- SUPERVISE THE CONTROL AND PRODUCTION OF STATISTICS
- ORGANIZE STAFF DEVELOPMENT
- EVALUATE INDIVIDUAL PERFORMANCE
- LIAISON WITH COMPUTER CENTRE MANAGER AND OPERATIONS STAFF
- PROVIDE JOB SCHEDULING FOR CBS STATISTICAL WORK TO COMPUTER CENTRE
- SUPERVISE USE AND OPERATION OF THE WANG MINI-COMPUTER
- REPORT THE PROGRESS OF STATISTICAL DATA PRODUCTION TO THE DIRECTOR
- ISSUE WORK ASSIGNMENTS TO STAFF
- DETERMINE WORK PRIORITIES WITH THE DIRECTOR
- ASSIGN INDIVIDUAL RESPONSIBILITIES FOR STAFF DEVELOPMENT AND TRAINING.

2. <u>SUB-SECTION RESPONSIBILITIES</u>:

The sub-sections for EDUCATION, LABOUR, CENSUS OF POPULATION, AGRICULTURAL/ECONOMIC, MOTOR VEHICLE/HEALTH, TOURISM/NUTRITION/MISC will all have common work responsibilities. These responsibilities are:

- PROVIDE DOCUMENTATION FOR ALL SYSTEMS ASSIGNED

- SYSTEMS DEVELOPMENT THROUGH INTERACTION WITH USERS
  - FORMS CONTROL
  - FLOW CHART
  - VALIDATION RULES
  - TABULATION REQUIREMENTS

- DATA COLLECTION FORMS DESIGN REVIEW THROUGH INTERACTION WITH USERS

- PROVIDE TIME ESTIMATES FOR ALL WORK REQUESTED

- COMPUTER PROGRAMMING

- PROGRESS REPORTS TO MANAGER

- MAINTAINING JOB AND FILE CONTROL LOG AND CORRESPONDENCE FILE FOR EACH ASSIGNED SYSTEM

- PREPARE A DATA DICTIONARY (FPS OR Cents-Aid II) TOGETHER WITH A COPY SYSTEMS DOCUMENTATION FOR ARCHIVAL PURPOSES. A BACK-UP COPY OF ALL FINAL TAPES SHOULD ALSO BE MAINTAINED.

- RETAIN FILE COPIES FOR ALL PROGRAMS DEVELOPED AND ALL SUCCESSFUL PRODUCTION RUNS

The DATA CONTROL AND OPERATIONS sub-section will have the following responsibilities:

- MAINTAIN THE DATA CONTROL SYSTEM BY;
  - ACCURATE RECORD KEEPING AND COUNTING OF BATCHED DATA
  - CONTROL AND TRANSFER OF DATA BETWEEN USER, DATA PREP, AND PROGRAMMER
  - MAINTAIN CABINET FILE FOR JOB AND FILE CONTROL LOGS, AND CORRESPONDENCE FILES
  - PERFORM DATA ENTRY AND CODING AS REQUIRED
  - RUN AND KEEP LOGS FOR STABLE SYSTEMS SUCH AS MIGRATION

3. <u>INDIVIDUAL RESPONSIBILITIES</u>

In addition to responsibilities to data users, each member of the staff will be given covering the vertical aspects of the sections responsibilities. These responsibilities will be assigned by the section manager and will include staff training assignments; information system development; software maintenance; training of data users and others. Those who have received formal training in software or hardware will be assigned the task of teaching others.

Data Preparation and Processing Section Working Group

Central Bureau of Statistics

A G E N D A:

I. Introduction of new arrivals:

Mr. Osbert
Mr. McHanus
Mr. Macharia
Mr. Midianga

II. Administrative Changes:

Over the past 5 years CBS has begun to develop its own data processing staff to process social statistics. This staff has been an 'ad hoc' response to individual survey requirements and there has been no overall organization structure within which these individuals can work. We now have grown to 14 (soon to be 15) persons. With this meeting we will begin to introduce new administrative measures to be followed. Eventually an organizational structure will be planned. This structure will form the basis of a new section within CBS. (Name of Section - Statistical Data Processing Section)

III. Problem Areas that we must rectify

1. Poor forms control, lost data
2. Inability to provide realistic estimates for work requested.
3. Poor documentation and run control.
4. Poor control of work requests.
5. Non-existent software maintenance(FPS,Cocents,SPSS,Cents-Aid etc)
6. Job scheduling is haphazard on IBM.
7. Poor utilization of the WANG - no training.
8. Inadequate training for 3741's poor utilization, could be used for simple data editing
9. Diskette control, when should data diskette be released.
10. Formal training has not been provided in SPSS, FPS, (perhaps advanced COBOL).
11. No provision for data archival.
12. Too often data collection forms are not seen by our section until after all data are collected (Please add to list from discussions).

IV First Steps to be Taken:

1. We will be asking each person to maintain a "JOB AND FILE CONTROL LOG" for each survey, census or related assignment undertaken. This Log will contain three separate types of forms (a) RECORD OF PROGRAM DEVELOPMENT (b) JOB SUBMISSION SHEETS, and (c) FILE CONTROL forms.

A RECORD OF PROGRAM DEVELOPMENT form will be kept for each program you write. For example a separate sheet will be maintained for a file creation and update program showing all runs attempted (whether successful or not) and their outcome plus a record of the length of the run. The job submission sheet for each run attempted should also be found in this Log.

Whenever a file is created or updated - this must be recorded on the FILE CONTROL form. The FILE CONTROL form is similar to the file control sheets now maintained by Evasius in the A-L and M-2 files. Our normal procedure is to have a setck of three tapes one of which is most current updated while the two remaining are previous updates. The tapes are cycled in this way until a final version of the file is achieved.

We will provide you with the forms and the file folder. Please give me your requirements this for the number of folders required. While active these files may be kept by the individuals, otherwise put them in the filing cabinet near Linda Wener's desk.

In one or two months we will review these JOB AND FILE CONTROL LOGS and attempt to arrive at realistic program development estimates. Please therefore be as accurate and complete as possible in your record keeping.

2. FORMS CONTROL, DATA CONTROL AND PREVENTION OF LOST DATA
(H.Reid)

Any of you who were here for the last Economic Survey Report will recall problems caused by missing data. This was particularly acute with the Primary and Secondary School Censuses resulting in many long hours spent detecting which schools were missing - the same was true for the Labour Enumeration Survey and the Large Farm Census.

A first priority for this year's primary and secondary school censuses has therefore been data control. Hazel Reid has developed a system for data control which has been in use for over a month. The data preparation section downstairs is pleased with it and are working with it well. Hazel will show you an example.....

We (Nguli and I) are now in the process of recruiting a data control clerk. Hazel will train the clerk for the secondary school census. This clerk will be located where Nguli is now and data control transactions will take place over the counter.

3. JOB SCHEDULING

Stan Reid and I have spent some time on job scheduling. The objective of this scheduling is to let the operations manager know in advance our weekly requirements. We will be testing this system shortly by asking each of you to submit weekly job schedules. It will also help us plan work loads.

4. SEATING ARRANGEMENTS (tentative schedule item)

5. SKILLS INVENTORY

Who is familiar with the following languages

IBM Assembler

FORTRAN:

COBOL

BASIC

SPSS

FPS

Cocents

Cents-Aid

Other languages or software

6. New Work:

In order to control work flow and work assignments it is requested that you do not accept any new assignments without first obtaining approval. Such approval is contigent on the assignment of Account Numbers, conflicting priorities and workload - our hope is to fit any new work into a realistic work schedule.

7. Next Meeting:

Tentatively schedule the next meeting for 25th September, 1979 but you will be notified.

11th September, 1979

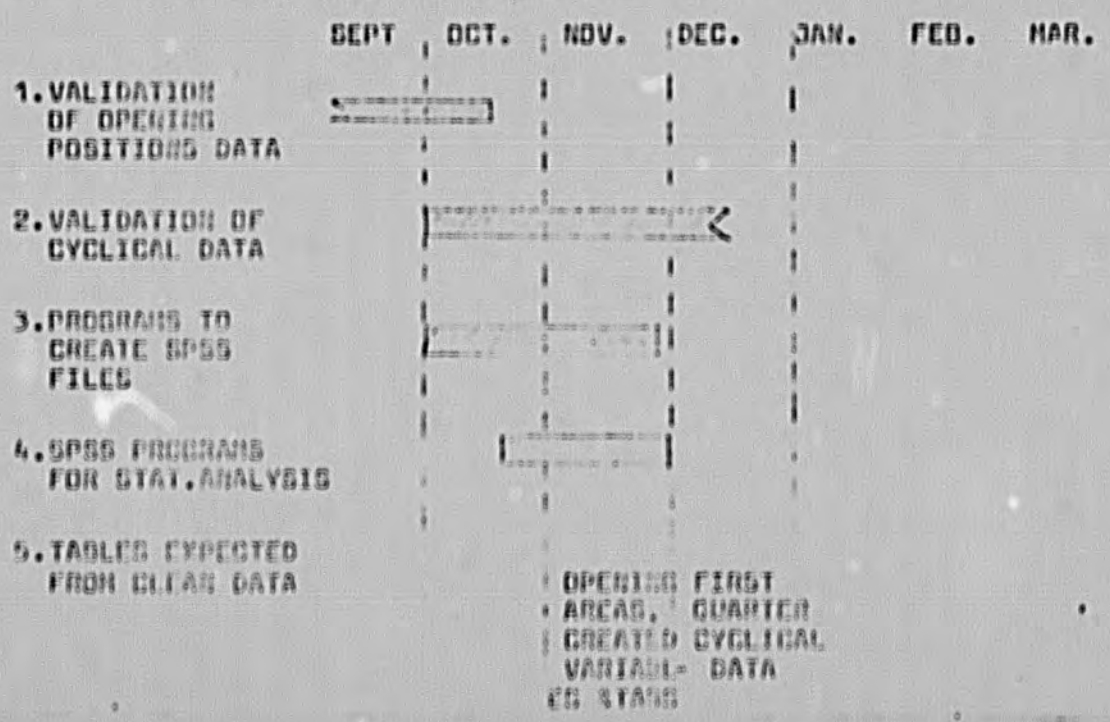
# APPENDIX - III

## SCHEDULE OF SUPPORT FOR DEVRES

Mr.Peter Moock and I went over the data dictionary describing the Rural Access Roads survey data. Mr.Moock then studied the file description and drafted a note about the kinds of analyses he would like to see. This list of created variables and tables is appended to the first annual DEVRES report.

I do not view this first list as comprehensive. My experience has shown that in the work of data analyses many cycles of analysis are required. Initial tabulation should be regarded as sheding light on further statistical analysis. Many of the proposed variables may be of little value statistically because of small sample sizes, which will probably lead to different data aggregation. My purpose in bringing this forward is to suggest that even if all the proposed created variables were constructed and presented to DEVRES this should not be viewed as being all they require.

The first cyclical data were collected in July of 1979. Many of the variables to be created require cyclical data for the first quarter (July-September); others require annual cyclical data, and others use only opening areas data. Those requiring only opening areas data can be prepared when we are satisfied all data for these records are correct and present. Validation of cyclical data will follow. When these data are considered valid an SPSS compatible file will be created and the necessary tables run. An approximate time schedule for these events is given below:



Thus we would anticipate statistical analyses from complete and valid opening position's data to be ready in early November, possibly earlier if validation continue smoothly. Cyclical data has not been keypunched as of this writing although it is imminent. We have therefore processed no cyclical data and are assuming that data entry and coding will not present us with extraordinary difficulties - if this should happen I will notify DEVRES and USAID in writing. Variables requiring annual or semi-annual cyclical aggregation (e.g. HM-YIELD; N-INVEST) will obviously not be prepared for some time.

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# APPENDIX- IV

## DISCUSSION OF SEMINAR ATTENDANCE

In June I attended a seminar in France at the request of the Director of Statistics. The seminar was sponsored by Data for Development, UNESCO, and IFIP ( International Federation for Information Processing). The seminar began on 17th June and ended 23 June. The purpose of the seminar was to discuss "information systems in public administration and their role in economic and social development". A list of participants follows.

Participants were divided into eight division groups each discussing a different development sector, e.g. Food and Agriculture National Resources, Industry et.al. It was strongly agreed to by most discussants across groups that these sectoral divisions were not useful for purposes of developing countries. It was pointed out by discussants that most LDC's have the biggest proportion of their population engaged in traditional rural activities where data on the more formal sectors is not of value. This brought to light a general tendency by centralized statistical offices to focus their activities on formal sectors while the population that should be monitored (those 80 to 90 percent rural residents) are ignored (Kenya however is much advanced due to its integrated rural surveys).

Various techniques for making information more useful at rural planning levels of aggregation were discussed. Among these were a village level registry file that might contain demographic profile, numbers of household, number of commercial structures, number of vehicles and other indicators useful in ranking villages for priority receipt of development resources. It was advised that the control agency collecting rural development data should also concern itself with the distribution downwards of the information it collects. The director and myself agreed that we should seek to exploit more fully rural information already collected by working more closely with the rural planners in the Ministry of Economic Planning and Community Affairs.

The seminar provided the basis for good rapport among discussants. There was valuable exchange of ideas and a general indication that most felt that information systems should not imply excessive computerization but the efficient use of

appropriately defined information. Several specific examples useful to Kenya came from Indonesia and Malaysia where village level personnel are active in data collection and planning. Kenya's examples of the Integrated Rural Surveys proved a useful example for many other countries.

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## Seminar on information systems in public administration and their role in economic and social development

### List of participants(as of 15 June 1979)

C. S. Abderrahmee, Government of Mauritania

A. Aranyi, Deputy Director, Computing Centre,Central Statistical Office, Hungary

C. Arvas, Head of Planning and Coordination,Statistika Centralbyran, Sweden

S. Arzoo, Statistical Office, Government of Bandladesh

G. Bager, Economic Affairs Officer, Projection and Programming Division, U.N. Economic Commission for Europe, Switzerland

L. Basave Aguirre, Secretary General,Secretaria de Hacienda y Credito Publico, Mexico

R. Beca, Charge de Mission, Mission a L'Informatique,France.

J. Beresford, President, Data Use and Access Laboratories,U.S.A.

J. Brackett, Chief, Demography Division, USAID, U.S.A.

H. Buur, Chief Consultant, Datacentralen, Denmark

A. Calado, Ministere de l'Industrie et Technologie,Lisbon,Portugal

P. Carrenno, Consorcio de Informacion y Documentacion de Cataluna, Spain

A. Cherif, Centre National de l'Informatique, Tunisia

A. Cherkaoui, Secretaire General, Secretariat d'Etat au Plan et au Developpment Regional, Morocco

C. Chiaramonti, Chef de Division, Institute National de la Statistique et des Etudes Economiques, France

K. Clark, Chief, Data Processing Section, United Nations Economic and Social Commission for Asia and the Pacific, Thailand

J-C. Cohen, Programme Director, Centre d'Etudes et d'Experimentation des Systemes d'Information, France

J. Coiner, Associate Professor, Hunter College, U.S.A.

W. Crouther, Resident Advisor, Bolivian National Information System

G. Dahl, Chr Michelsen Institute, Norway

L. Diaz-Zulaga, Directeur General de Planification y Presupuesto, Ministerio del Ambiente y de los Recursos Naturales Renovables, Venezuela

M. Diouf, Conseiller en Organisation, Bureau Organisation et Methodes, Secretariat General de la Presidence, Senegal

S. Douglas, Professor, London School of Economics, Great Britain

P. Dumas, Professor, Universite d'Aix-Marseille, France

A. Eigbefoh, Federal Capital Development Authority, Nigeria

M.J. Evers, Data Use and Access Laboratories, U.S.A.

J. Fobes, Consultant, Duke University, U.S.A. (former Deputy-Director General (UNESCO)

Y. Franchet, Directeur, Ecole National de la Statistique et de l'Administration Economique, France

J. Freese, Director General, Data Inspection Board, Sweden

T. Friend, Science Policy Research Unit, University of Sussex, Great Britain

C. Gotlieb, Professor, University of Toronto, Canada

B. Guesnier, Directeur de L'Institut d'Economie Regionale, Universite de Poitiers, France

D. Guneratne, Deputy Director, Department of Census and Statistics, Sri Lanka

C. Hakim, Department of Employment, Great Britain

K. Henderson, Director, Economic Planning Staff, Ministry of Overseas Development, Great Britain

A. Hernandez de Pitti, Director, Ministerio de Planificacion y Politica Economica, Panama

H. Herr, Consultant, Central Bureau of Statistics, Kenya

K. Jones, Norwegian Institute of Urban and Regional Planning, Norway

V. Jorssen, Associate Director, Computer Sciences, International Development Research Centre, Canada

J. Kekovole, Central Bureau of Statistics, Kenya

J. Kennerley, Chief, Science and Technology Unit, United Nations Economic Commission for Europe, Switzerland

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# APPENDIX - V

## THE WANG MINI - COMPUTER

Early in 1979 the Institute for Development Studies (IDS) at the University of Nairobi had ordered a WANG 2200 MVP mini-computer which was funded by the Friedrich Ebert Foundation of West Germany. At the same time the University itself was negotiating for a very large ICL main frame. When the ICL was received by the University the administration felt they could not justify an additional mini-computer and withdrew their permission for the WANG computer to be placed with IDS. At this time therefore the WANG computer agents had a fully funded computer on-hand looking for a home.

Discussions were held in March and April with ECO-SYSTEMS Limited (WANG agent) on the likelihood of CBS obtaining the funded WANG computer. With the assistance of the computer manager, the director of statistics, and the permanent secretary necessary documents and budgets were found and on 9 May 1979 the computer was installed in CBS. The short notice for receipt of the WANG has left us ill-prepared to fully utilize it. The development of a management plan for the statistical data processing section is directed towards overcoming this shortcoming.

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# WANG Mini-Computer Configuration

## Hardware:

- Model 2200 MVP CPU with 32K memory
- Model 2260 D 10 Disk Drive
- Model 2270 A-2D Dual Diskette Drive (IBM 3740 Compatible)
- 2 Model 2236 D Terminals
- Model 2236 NXD Multiplexer
- Model 2221 Line Printer
- 4 Disk Cartridges
- 100 Diskettes

## Software:

BASIC-II interpreter and operating system

Regression Analysis
Analysis of Variance
Cross Tabulations
Linear Programming
Multiple Comparisons
Analysis of Covariance
Non Parametric Statistics
Integrated Support Systems
General Libraries (Finance,State,Engineering)
Games
Text Edit Utilities
Login/Logout

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