2

THE USE OF STATISTICS AND INDICATORS ON GENDER ISSUES IN POLICY

A TRAINING PACKAGE

PREPARED BY

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International Research and Training Institute
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OBJECTIVES OF THE TRAINING WORKSHOP

General

- To enhance the capacity of national development officials, particularly government statisticians and programme planners, in designing policy and programmes that adequately and effectively take into account gender-related issues and problems;

- To improve the use of existing information and statistical data in developing gender-specific indicators that define interaction between or amongst different socio-economic variables and specific policy targets.

Specific

At the end of the training process, participants are expected to:

- identify and define the role of women in achieving specific policy goals and targets;

- identify steps and statistical tools required to adequately and effectively integrate gender issues in development planning and policy design;

- utilize statistical tools in defining policy goals and programme designs that are gender sensitive;

- develop plans and strategies for application of gender-sensitive statistical indicators in actual planning at different practical levels (national, regional, provincial, etc.).

General Structure of the Training Package

The training package has two main parts, namely, 1) the trainer's guide and 2) training manual for the trainees. Corresponding elements and tools provided for each part and session are outlined below:

Trainers Guide

- General Guidelines for the Trainers
  - The participants
  - Training Method
  - Training tools
  - Guidelines for Training Exercises
  - Duration of the entire Training-Workshop
  - Suggested Agenda
- Part One: Pre-Workshop Resources and Exercises
  - Objectives
  - Pre-workshop Preparations
- Part Two: Training-Workshop
  - Session One: Available Statistics and Indicators on Gender Issues
    - Objectives
    - Training Tools
    - Training Strategy
    - Guidelines for Presentations/Discussions

Session Two: Gender-sensitive Statistics and Indicators: Tools for Developing a Framework for Gender Analysis in Policy

Objectives
Training Tools
Training Strategy
Guidelines for hands-on exercises

Session Three: The Use/Application of Gender-sensitive Statistics and Indicators in Defining Policy Targets

Objectives
Training Tools
Training Strategy
Guidelines for Hands-on Exercises
Guidelines for developing country-specific strategies

Session Four: Recommendations for Improving The Use of Gender-sensitive Statistics and Indicators in Policy

Objectives
Guidelines for drawing-up recommendations

Session Five: Evaluation of the Training and the Training Package

Objectives
Evaluation Form
Report of the evaluation

Training Manual for the Trainees

Introduction
- Objectives of the package and the training workshop
- What is INSTRAW

Part One: Pre-Workshop Resources and Exercises
- Objectives
- Understanding Gender
- Exercises
- Suggested Readings

Part Two: Actual Training-Workshop

Session One: Available Statistics and Indicators on Gender Issues
- Objectives
- Participants' presentation of Country Reports

Session two: The Importance of Gender-sensitive Statistics and Indicators in Policy
- Objectives
- Guidelines/instructions and instruments for undertaking for Hands-on Exercises

Session Three: The Use and Application of Gender-sensitive Statistics and Indicators in Defining Policy Targets
- Objectives
- Hands-on exercises
- Developing of Country Strategies and Recommendations (Group Work)

Session Four: Recommendation for Improving the Use of Gender-sensitive Statistics and Indicators in Policy

Objectives
Recommendations

Session Five: Evaluation of the Training and the Training Package

Objectives
Completed evaluation

General Guideline for the Trainers

A. The Trainers

At least two trainers are necessary to implement the training package. The first trainer should have the basic knowledge of statistics and indicators on gender issues; and the second trainer should be able to understand and use of the models developed for the actual "hands-on" training.

The trainers are provided with the entire training package which provides the basic elements and guidelines for conducting the actual training-workshop. The training package, in no way, must be considered a rigid structure for implementing the training. Trainers should feel free to introduce any additional materials and modification of the approach which may help adapt the training package better to the specificities of the Country or region.

In general, the trainers have the following responsibilities

. together with the organizing committee/agency, ensure that the right participants are invited

. study the entire training package, both the trainer's guide and the manual for the trainees

. identify the part which corresponds to his/her sessions

. ensure that the pre-workshop exercises are done and completed by the participants before coming to the workshop

. ensure that all the training tools are available and set-up before each session

. conduct the session in clear and motivating manner

. ensure that the participants possess data inputs for the actual training workshop

. ensure that all the participants carry out the hands-on exercises and complete other requirements for every session

. monitor and facilitate plenary and group discussions and respond to technical/substantive questions

. carry out an evaluation of the sessions that correspond to his/her part

. ensure that recommendations/strategies are submitted prior to the last session on adoption of the recommendations and conclusions

B. TARGET GROUPS

This training package is primarily designed for:

- development planners at different levels;
- government statisticians;
- officials from relevant ministries/agencies who are directly involved in development planning
- researchers and experts from academic and research institutions;
- managers of relevant NGO programmes

Participants may vary in their level of awareness and sensitivity to gender issues. Government statisticians are likely to have lesser exposure to women's gender issues while corresponding government officials from relevant ministries, such as Ministry of Planning, Health, Social Services, Women's Affairs, etc., or their equivalents, may have had training on gender issues.

Similarly, development planners or government officials and other users of data may not be sensitive to the importance of gender-specific statistics and indicators and are unaware of the quantity and quality of existing data that could be utilized to improve their work. In this connection, some pre-workshop resources are included in this package introducing emerging concepts related to gender issues as well as exercises on statistics and indicators that participants are expected to complete prior to the actual workshop.

In view of the need to establish dynamic interaction between the producers (statisticians) and users (development planners) of statistics, two participants will be invited from each country (or administrative/political levels).

C. TRAINING METHOD

The actual training will be conducted through a combination of:

A. Pre-workshop learning and exercises
B. Participative presentation and discussions
C. Working group sessions
D. Hands on exercises

Pre-workshop learning and exercises

At least six weeks prior to the workshop, the trainers should ensure that the "pre-workshop" resources and exercises are sent to the participants, both the producers and the users. Participants are provided information necessary for having an overview or general understanding of the concept of gender and gender statistics and some preliminary exercises that will be required at the actual training. (A more detailed description of this step is provided under Part One of this Guide.)

Participative presentation

The entire training workshop will be conducted in five sessions. All the sessions will be introduced by the trainers during which the relevant concepts, training methods and tools will be explanied. In most sessions, participants are

expected to provide feedbacks and discuss results of their pre-workshop and workshop activities. Each session will have time allocated for open discussion.

Working group sessions

Some of the sessions include working group discussions, the objective of which is to establish more focused exchanges of opinion and to draw-up strategies or recommendations for follow- up work or improving the training methods.

Hands on Exercises

Parts Three and Four include hands-on exercises with computerized statistical models that were developed to illustrate more clarly how variables that relate to gender issues affect policy targets. These exercises will be carrired out with the close supervision of the trainers. Inputs to these exercises will be drawn from the data collected and compiled by the participants prior to coming to the workshop. Hence, participants are expected to run the models using country-specific data and are required to provide written reports at the end of the sessions.

Evaluation

Evaluation forms should be provided to the participants after each session (See ANNEX 3). These forms must be completed and submitted to the trainers before the start of the succeeding session. Comments and suggestions provided in each session's evaluation should be carefully considered in improving the remaining sessions.

It is suggested that towards the end of the training-workshop, the trainers provide a summary of the results of the session's evaluations.

A final evaluation of the entire training-workshop and the materials applied will be conducted at the end of the fourth day. The corresponding forms (See ANNEXES 4 and 5) should be given to the participants on the fourth day. Trainers should analyze the results and provide a consolidated report for discussion on the last day.

D. TRAINING TOOLS

Training Manual

The training manual contains pages where statistical information are to be provided. For example, dummy tables are created for population variables to be filled in by the participants.

Transparencies

Charts, tables and graphs are also provided in transparencies for easier presentation at the training.

Computerized Statistical

Three diskettes are provided in the Modelspackage which contain programmes and softwares for participants' hands-on exercises.

Additional Reading

Additional reading materials are provided at the end of the training manual.

E. TIMING OF THE TRAINING WORKSHOP

This Training package is designed for 4 1/2 day training-workshop. It is important to note here that the participants to the workshop may present different needs, particularly in view of the fact that some of the group are data producers and the rest are data users. Hence, depending on the collective level of skills of the participants and taking into account country/region-specificities, in some sessions, the training strategy may have to be modified.

F. HARDWARE AND SOFTWARE

. Computer - PC with at least 4MB RAM
. QUATTRO PRO For Windows
. Diskettes
. Overhead projector
. Flipcharts with easel
. Blackboard

H. HOW TO USE THE TRAINING PACKAGE

This training package is divided into two major parts, namely, 1) the trainer's guide and 2) the training manual for the trainees. Each part consists of several sections which are printed on different colors. The white pages correspond to sections which pertain to the trainers only. The blue pages contain materials which both the trainers and the trainees should have a copy of (e.g, Evaluation forms, pre-workshop resource package, etc.). Pink pages are for the trainees. They mostly contain informations related to or guidelines for the exercises.

Pre-Workshop Resources and Exercises

PRE-WORKSHOP RESOURCES

Objectives

The two major objectives of the pre-workshop resources are

(i) to draw participants attention to some of the emerging concepts and tools related to gender and gender analysis and
(ii) to enable the participants to make best use of existing statistical information and enhance their understanding of gender-specific statistics/indicators prior to the actual training-workshop

Training Tools

Pre-workshop resource package. The entire package is contained in the first part of the trainer's training manual.

Training Strategy

The pre-workshop resource package should be sent to the participants at least six weeks prior to the actual training-workshop. Results of the pre-workshop exercises contained in this section will be reviewed and discussed at the corresponding sessions of the actual workshop.

Results of the pre-workshop exercises I and II should be received at INSTRAW headquarters at least three weeks prior to the actual training-workshop. Based on these, trainers should prepare a synthesis of issues and problems identified in each country paper, particularly those that relate to the quality and use of existing data on gender issues. This synthesis should form part of the first lecture on Session One - Available Statistics and Indicators on Gender Issues

ANNEX 1A

PRE-WORKSHOP PREPARATIONS

Things to be done	How	When
1. Send the pre-workshop resource package to the participants.	by ordinary mail	Six weeks prior to the training
2. Send the Aide-memoire to the participants.	by ordinary mail by fax	five weeks prior three weeks prior
3. Send the last follow-up letter	by ordinary mail by fax	three weeks prior two weeks prior

I. Pre-workshop Resource Package

The Introductory Chapter and Part One of the Training Manual for the Trainees composed the Pre-workshop Resource Package. The entire package must be sent to the participants within the period indicated on the Table.

2. Aide Memoire

Suggested outline for the Aide Memoire

A. Title and objectives of the training-workshop
B. Qualifications to participate
C. Organizing agencies - what and where
D. Sponsorship
E. Requirements/deadlines
F. Date and Place of the training-workshop

3. Follow-up letter

Suggested outline for the follow-up letter

A. Reference to the invitation letter, the Aide-memoire and traning package
B. Reiterate deadlines for submission of pre-workshop exercises
C. Requirements prior to making administrative arrangements for travel

ANNEX II

SUGGESTED AGENDA

DAY 0

Trainers should make sure that both the hardware and the software are in good running condition. Although these facilities will be needed only on the third and fourth day, potential problems must be detected as soon as possible to allow for sufficient time to resolve them.

Upon arrival of the participants, they should be given a complete set of the following documents:

a. training manual
b. aide-memoire
c. housekeeping rules

DAY 1

Registration	30 mins
Opening session	1 hr 30 mins
Break	30 mins
Session One - Review of Available Statistics and Indicators on Gender Issues	
Lecture and country reports.....	3 1/2 hrs
Group Discussion	1 hr
Conclusions/recommendations	1 hr

DAY 2

Session Two - Gender-sensitive Statistics and Indicators: Tools for Developing Framework for Gender Analysis in Policy

Lecture	2 hrs
Hands-on exercises.....	3 hrs
Plenary Discussion/group presentations..	1 hr 15 mins

DAY THREE

Session Three - The use/application of gender-sensitive statistics and indicators in defining policy targets

Lecture	1 hr
Demonstration of the statistical model (POSIM)	1 hr 30 mins
Discussion	30 mins
Hands-on exercises	4 hrs

DAY FOUR

Feedback on the Hands-on exercises

Group report	1 hr 30 mins
Plenary Discussion	1 hr 30 mins

Session Four - Recommendations on improving the use of gender-sensitive statistics and indicators in policy..... 2 hrs

DAY FIVE

Session Five - Evaluation of the Training and the Training Pacakage ..... 1 hr 30 mins

Adoption of the Report/Recommendations and Closing Session ..... 2 hrs

ANNEX 3

EVALUATION OF THE DAY'S SESSIONS

Using the scale from 1 to 5 (1 very much and 5 not at all), please indicate how satisfied you are with each of the following:

	Design of training training	Lectures/ presentations	Contents	Exercises/ Group Work
Session #1				
Session #2				
Session #3				
Session #4				

General comments and suggestions to improve the design, contents and exercises for each relevant session

Day 1

Day 2

Day 3

Day 4

ANNEX 4

FINAL EVALUATION OF THE TRAINING

1. In general, how useful was the training-workshop for you

____very useful _____useful _____moderately useful _____not useful

2. Using the scale from1 to 4 (1 for all and 4 for none) did you achieve the objectives of the training-workshop?

____1 _____2 _____3 _____4

3. What did you like best about the training?

4. What did you like least about the training?

5. What did you gain from the training?

6. What use do you think you will make of your experience at the workshop offer its completion?

ANNEX 5

Evaluation of Pre-Workshop Exercises and the Training Materials

Dear participant:

Your response to the following questions will help us improve the training materials applied and future training. Additionally, they will also give as indications on how to proceed with the evaluation of the impact of the present training. Please assess the materials, methods used organization and the trainers in terms of their effectiveness and usefulness to you. For each , check the rating which most accurately reflect you assessment and give us your comments or suggestions at the end of the questionnaire.

To what extent did the pre-workshop package help you to:	Very little	To some extent	Quite a lot	A great deal
1. Prepare for attendance at the workshop proper?				
2. Participate and contribute at the workshop?				
3. Improve your understanding of the need for reliable statistics, particularly on gender issues?				
4. Prepare your draft country paper?				
5. Make better use of the information resources of your country?				

6. Improve your understanding of gender- specific statistics?

_____

7. Define information needs?

_____

8. Identify information that is currently available?

_____

9. Identify key indicators?

_____

10. Present data in an accessible form?

_____

11. Identify gaps between needed and available information?

_____

12. Develop preliminary action plans for bridging information gaps.

_____

13. Develop other action plans

_____

14. What do you see as the strengths of this package?

_____
_____
_____
_____
_____

15. What do you see as its weaknesses?

16. Could you suggest ways in which the package could be improved to make it more useful for users in other parts of the world?

Other Comments:

Pre-Workshop Resources and Exercises

Training Manual

Objectives and Structure of the Training-Workshop

Trainer's Guide

Opening Session

Opening Session

Objectives

- To review the objectives, structure and methodology of the training-workshop
- To know more and understand the objectives of the sponsoring agencies/organizations
- To meet the training team and the other participants
- To exchange ideas and experiences on gender issues and gender statistics

Training Design

Activities/Topics	By Whom	Duration
A. Opening and keynote address	INSTRAW Representative Co-sponsoring agency/ies	10 mins 5 mins each
B. Introduction of training team Introduction of participants	Individuals Individuals	10 mins 20 mins
C. Review of workshop objectives, structure & methodology	Trainers	25 mins
D. Review and adoption of the training agenda	Trainers/participants	10 mins
E. Review of administrative/ logistics arrangements	Organizers	10 mins

A. Opening and Keynote Addresses

A high official from the sponsoring country should officially open the training-workshop

Whenever possible, the Director of INSTRAW should give the keynote address which should emphasize the following:

1. What is INSTRAW? It's objectives, location, major programme areas?
2. What is INSTRAW's role in improving people's understanding of the concept of gender?
3. What is and has been INSTRAW's contribution in improving the use and quality of statistics and indicators?
4. What is the relevance of the current training-workshop, particularly in region/country?
5. INSTRAW's networking strategy -- collaboration with different types of agencies

B. Introduction of the training team and the participants

It is important that the participants meet personally each member of the training team, particularly the organizers, the trainers, coordinators and those responsible for administative and logistics arrangements. Hence, apart from introducing individual names, each member of the team should clearly define and explain her/his role during the entire duration of the training-workshop.

The two participants (data producer and data user) from each country are encouraged to sit next to each other, particularly, during the opening session. When introducing their names, each individual should identify herself/himself as data producer or data user, the agency/office she/he works for and the level of responsibility she/he has. The team from each country should also be encouraged to share the experiences they had while working together on the pre-workshop exercises with the rest of the group. Some interesting questions such as the following could be asked of them:

1. Did you discuss the concept of gender when working on the exercises? If so, did each or one of you acquire a new understanding of the term "gender"?
2. Did you discuss the problems encountered when compiling the statistics and indicators required for the exercises?
3. For data users - did you improve your knowledge of the type and

quality of existing data on gender issues?

4. For data producers - did you understnad better the needs of the data users? what for and what type?

C. Review of the workshop objectives, structure and methodology

Together with the participants, the objectives of the training-workshop should be clearly defined. Questions relating to the practicality of the objectives should be discussed, to avoid frustrations/disappointments after the traning-workshop. In order to meet those objectives, the trainers must also clearly emphasize the expectations from the participants. Inform the participants that the agenda can be found on page XX of their training manual.

The structure and the methodology of the training-workshop should be introduced to the participants. From the trainer's guide, the entire section on the general structure should be shared with the participants through photocopies. The methodology to be applied for each session should also be carefully explained. Each trainer should outline the training tools and methods that be will required for each session, particularly for sessions three and four, during which the hands-on exercises will be conducted.

As group discussions and group work form part of the training methodology, the trainers must also explain what is expected, in terms of outputs, from each of those sessions. It is also useful to explain here that for such group discussions/work, each group should elect a group leader/moderator to facilitate the discussion and put together the group report. TRANSPARENCY 1 SHOULD BE SHOWN TO THE PARTICIPANTS.

It is also very useful to emphasize punctuality and attendance.

D. Review and adoption of the training-workshop agenda

To provide sufficient time for the participants to prepare themselves for each session, the agenda should clearly be presented to them. Inform the participants that the agenda can be found on page XXX of their manuals.

E. Review of administrative/logistics arrangements

Organizers will have to clarify the following items with the participants before proceeding with the training-workshop:

1. daily subsistence allowance
2. ticket arrangements
3. board and lodging
4. access to food and shopping centers, medical clinics, etc
5. transportation arrangement
6. housekeeping rules
7. workshop facilities/equipments
8. secretarial assistance
9. communications services
10 recreational activities

Information about receptions, dinners, excursions and any other social activities must also be provided.

Session One

Available Statistics and Indicators on Gender Issues

Session one - Available Statistics and Indicators on Gender Issues

Objectives

. To assess the quantity and quality of available statistical information on gender/women's issues.

. to identify and define some of the conceptual problems that affect the reliability of existing data.

. To draw-up strategies for improving statistics and indicators on gender issues.

Training Tools

. Pre-workshop resource package/Country Reports
. Trainer's Guide
. Transparencies

Duration

5 1/2 hrs

Training Design

Activities/Topics	Method	By Whom	Tools
1. General overview: Available statistics and indicators on gender issues	Lecture	Consultant/ Trainer	Technical paper Flipcharts Transparencies Blackboard
2. Country Reports based on the results of the Pre-workshop Exercise II	Presentations	Participants	Country Papers Flipcharts Transparencies Blackboard
3. Identification of issues and problems with available statistics and indicators on gender issues	Group discussion	Moderator, trainer and participants	Flipcharts Blackboard
4. Recommendations/ strategies for improving statistics and and indicators on gender issues	Group discussion	Moderator, trainer and participants	Flipcharts Blackboard
5. Presentation of group reports	Plenary discussion	Group leaders	

Guidelines for Presentations and Discussions

1. Lecture on Available Statistics and Indicators on Gender Issues [30 mins].

This presentation is expected to draw from or complement the results of the prew-workshop exercise II, which should have been received at INSTRAW three weeks prior to the actual workshop. The lecturer/trainer assigned to prepare and give this presentation must be given a copy of the results of individual country exercises together with the following recommended outline:

General Outline

A. Data Sources
   Census
   Surveys
   Administrative Records

B. Concepts, definitions and classification
   . Work
   . Employment
   . Unpaid family workers
   . Household head
   . Usual place of residence
   . Family & household
   . Informal Sector
   . Economic production
   . Own account worker

C. Methodological and procedural issues

D. Data gaps and additional statistics required

2. Country Reports[maximum of 20 mins each country]

These presentations will be based on the country reports which resulted from the pre-workshop Exercise II. The two participants from each country are encouraged to prepare and make the presentation together, dividing the country report based on the producers's and the users' points of view .

3. Group Discussions [1 hour]

Each group should be composed of not more than six participants and will be coordinated and guided by a group leader/ moderator to be elected by group members. The major tasks of the group include the following:

a. to identify issues and problems concerning the availability and quality of statistics/indicators on gender

b. to identify recommendations or strategic solutions to each corresponding issue/problem

As explained earlier, the moderator has the responsibility to summarize the general issues and problems highlighted in the country reports/presentations as this will form the basis for the plenary discussions and for identifying/establishing strategies for improving statistics and indicators on gender issues.

The following table should be able to guide the moderator in summarizing issues and problems raised in the country reports and the ensuing discussions as well as in identifying/establishing strategies or recommendations. Table 1 provides a hypothetical example which could be followed for other topics selected as in Table 2 and 3.

Table 1

Topic	Variables	Issues/Problems	Strategies/ Recommendations
Women in Population and Development	**1. Household**	**Conceptual** **. Definition of heads of households** **. Composition of households** **. Sharing of household responsibilities**	
		Methodological **. data gathering** **. data processing** **. data tabulation** **. data analysis** **. data gaps**	
	2. Level of education	**Conceptual**	
		Methodological	

In Pre-workshop Exercise 3, the participants were asked to collect and compile two sets of data which will be used as individual inputs for executing hands-on exercises in Sessions Three and Four. These statistics and indicators include those that relate to a) population and development issues and b) general WID profile. Towards the end of Session One, the trainors must collect the following tables from the participants.

A. *Data related to population and development issues.* For participants who selected this topic for Exercise Two should have collected already the following data. For those who selected other topics, please make sure that you bring with you the following information.Whenever possible, data must be collected from different sources.

Check which administrative level data correspond to:

_____ country (please specify) _____
_____ region of a particular country (please specify) _____
_____ province (please specify) _____
_____ other (please specify) _____ _____

Statistics/Indicators (1970-1995)	Census	National Surveys	Administrative Records
1. Total population, by sex and age			
2. Population growth rate			
3. Age at marriage by sex			
4. Enrolment ratio (male and female) for first and secondary levels			
5. Economic activity rate by sex			
6. Prevalence of female contraceptive use			
7. Infant mortality rate			

B. Women in Development indicators. All participants are required to collect and compile the following information for the actual training-workshop:

Statistics/Indicators	Census	National Surveys	Administrative Records
1. Highest level of education of education by sex			
2. Access to capital by sex			
3. Access to land resources by sex			
4. Access to extension services by sex			
5. Market wage by sex			
6. Control of own income by sex			
7. Family planning practices by sex			
8. % of men's income for home			
9. Average family size			

Session Two

Gender-sensitive Statistics and Indicators: Tools for Developing Framework for Gender Analysis in Policy

Session Two: Gender-sensitive Statistics and Indicators: Tools for Developing Framework for Gender Analysis in Policy

Objectives

- To raise awareness among planners, decision-makers and technical experts the importance of gender-sensitive statistics and indicator in policy
- To illustrate some statistical tools and framework for analyzing the multisectoral dimensions in the planning process, including gender issues

Training Tools

- Lecture/presentations
- Data collected from each participating country
- Hands-on exercises
  - WID statistical models on diskettes
  - computers - PC with at least 4 MB
  - overhead projector
  - datashow - LCD Polaview
  - flipcharts
  - transparencies

Prior to introducing the session, the trainers should install the computers and prepare the WID model on diskettes.

Duration 7 Hrs

Training Strategy

Activities/Topics	Method	By Whom	Tools
1. Statistics and Indicators on Gender Issues and the Platform for Action for the Advancement of Women	Lecture	Trainer	Paper Flipcharts Transparencies
2. The Importance of gender-sensitive statistics and and indicators in designing policies	Lecture	Trainer	Trainer's guide Flipcharts Transparencies Blackboard
3. Women in Development WID Simulation Model of the Pre-workshop	Hands-on Exercises	Trainer Participants	Training Manual WID Model on diskettes National data
4. Presentation of results	Plenary Discussion	Trainer Participants	Flipcharts Tranparencies

Guidelines for Presentations and Discussions

1. Lecture on Statistics and Indicators on Gender Issues and the Platform for Action for the Advancement of Women

As reflected in the Platform, statistics and indicators are basic to the implementation of the recommendations and strategies adopted at the Fourth World Conference on Women to improve the status of women. The Platform fully recognizes the progress that has been achieved during the past two decades in compiling statistics and indicators on women. Moreover, it also urges governments and relevant national and international organizations to improve the use of these data and available methodologies for conducting gender-based analysis in policies and programmes and for dealing with the differential effects of policies on women and men (par 209b). It is therefore imperative that all follow-up activities and projects that relate to gender statistics be coherent with the objectives set out in the Platform.

The role that both data producers and data users play in responding to the Platform is very crucial. It is therefore very important that the training-workshop be able to fully sensitize the participants to the specific problems and needs that must be addressed at the national level in order to meet those objectives.

To this end, the following outline should be provided to the trainer/consultant engaged to make the presentation on this topic:

A. Objectives of the Platform for Action
B. Areas where gender statistics are critically needed
   i) human rights
   ii) empowerment of women, both political and economic
   iii) health
   iv) communications and media
   v) education
   vi) others
C. Specific recommendations outlined in the Platform for improving the use and quality of gender statistics
D. Specific roles and responsibilities of data producers and data users

2. Lecture on The Importance of Gender-sensitive Statistics and Indicators in Policy

Basically, the presentation on this topic will be based on the WID model prepared by INSTRAW and DESIPA. The complete description and illustration of this model can be found in the training manual. Corresponding exercises are also included in the manual. Based on this, the following outline is therefore suggested and must be provided to the corresponding lecturer/trainer:

A. The use of quantitative information in designing a WID model
B. Introduction of the INSTRAW/DESIPA WID model and the assumptions applied
C. The structure of the model
D. Definition of variables and data requirements
E. Demonstration of the computerized WID model and the exercises

3. Hands-on Exercises

Participants should be divided into groups depending on the number of computers available. Ideally, each group/ computer should not have more than four (4) people - two pairs.

The following softwares must be installed in each computer:

1. MS-DOS
2. LOTUS 123 or QUATTRO PRO

Taking into account that the succeeding exercises will be using QUATTRO PRO, it is deemed practical to use this software for this exercise as well.

Prior to running the model, the participants are required to provide data that reflect the relative status of women and men, in terms of the following variables:

1. education (e)
2. capital (k)
3. land (l)
4. market wage (w)
5. control of own income (y)
6. family size
7. allocation of time on
   a) household activities
   b) wage/paid activities
   c) agricultural production
   d) subsistence agriculture

At the end of the exercise, the participants are required to prepare a brief summary of the substantive results of the data analyzed and an evaluation of the model.

4. Plenary Discussion

Group reports should be presented at the plenary session by each group leader. Presentations must be brief, highlighting the issues and problems encountered when executing the models and any suggestions or recommendations they may have.

Session Three

The Use/Application of Gender-sensitive Statistics and Indicators in Defining Policy Targets

Session Three: The Use/ Application of Gender-sensitive Statistics and Indicators in Defining Policy Targets

Objectives

. To illustrate how policy tragets may change when socio-economic factors are addressed with a gender perspective

Training Tools. Training manual

. Trainer's guide
. POPSIM model on diskettes
. QUATTRO PRO for Windows/LOTUS 1-2-3
. Computers - PC
. Datashow - LCD Polaview

Training Design

Activities/Topics	Method	By Whom	Tools
1. Selection of statistical variables that define gender differences and identification of policy targets	Lecture	Trainer	Paper Flipcharts Transparencies
2. The Population Growth Model (POPSIM)	Lecture	Trainer	Trainer's guide Training Manual Transparencies
	Hands-on Exercises	Trainer Participants	Training Manual POPSIM Model on diskettes National data Computers
	Group report	Participants	

Guidelines for Presentations and Discussions

A. Lecture on Selection of variables that define gender differences and identification of policy targets

Using the population growth model (POPSIM) as an example, the trainer can illustrate how correlations between and amongst variables are determined and how are variables are selected as significant factors in achieving a certain policy target. Trainers should study the POPSIM model included in the Training Manual.

As explained in the manual, POPSIM is a simulated model for determining national population growth, which is calculated using a linear function based on eight indicators, namely:

1) male age of marriage
2) female age of marriage
3) gross first and second enrolment ratio

4) female economic activity rate
5) male economic activity rate
6) female contraceptive rate
7) infant female mortality rate
8) infant male mortality rate

In the manual, the establishment of correlations between/among variables has not been included. Similarly, the selection of the eight varibales was not explained, which is indeed an important element in defining gender-sensitive indicators that significantly affect policy targets.

It is therefore necessary that the trainer make a brief description of the correlation and regression analysis, using linear functions in either the LOTUS 123 or QUATTRO PRO.

B. Demonstration of the POPSIM Model and Hands-on exercises

Participants may maintain the same groupings established in Session Two. Prior to the exercise, trainers must ensure that the following programmes are installed and in good running conditions in each of the available computers:

1. Microsoft Windows
2. QUATTRO PRO for Windows
3. POPSIM

Participants are also required to provide the following data for executing the exercise:

1) male age of marriage
2) female age of marriage
3) gross first and second enrolment ratio
4) female economic activity rate
5) male economic activity rate
6) female contraceptive rate
7) infant female mortality rate
8) infant male mortality rate
9) population growth rate - actual and projections until 2025

Step-by-step guideline for running the programmes is included in the Training Manual.

C. Group Report

Each group is required to write a report reflecting the following elements:

1. The status of women and men in the country in terms of the eight variables analyzed
2. How realistic is the target population growth rate set for the country?
3. How do the eight gendered variables affect the target population growth?
4. Are the population policy targets realistic?
5. The usefulness/weaknesses of the POPSIM model

D. Plenary Discussion

Group reports should be presented at the plenary session by each group leader. Presentations must be brief, highlighting the issues and problems encountered when executing the models and any suggestions or recommendations they may have.

Assumptions

A. The following factors are inversely correlated to population growth:

1. *age at marriage*
2. *educational attainment*
3. *economic participation*
4. *contraceptive prevalence*

B. When the above-mentioned factors are broken down by sex, the correlation coefficient would be different for both sexes

C. Infant mortality rate is positively correlated to population growth

Taking the above assumptions into account, some regression/correlation analyses were ran for the following combinations of variables.

A. Indicators for Total Population against population growth rates

1. *Average age at marriage and population growth rate (PGR)*
2. *Average gross first and second enrolment ratio and PGR*
3. *Average economic activity rate and PGR*
4. *Average infant mortality rate and PGR*

B. Indicators by sex against population growth rates

1. *Average age at marriage by sex and PGR*
2. *Average gross first and second enrolment ratio by sex and PGR*
3. *Average economic activity rate by sex and PGR*
4. *Average female contrceptive prevalence rate and PGR*

Results had shown that:

1. **Assumptions A, B and C are true. This implies that statistically, it is proven that**

   --- *higher the age at marriage, results to lower population growth rate*
   --- *higher the level of enrolment in both first and second levels gives lower population growth rate*
   --- *higher the economic activity results to lower the population growth rate*
   --- *high prevalence of contraceptive use results to lower population growth rate*
   --- *high infant mortality rate results to higher population growth rate*

2. **When broken down by sex, the data could also reveal that:**

   --- *while the abovementioned correlations could be established, the changes in the characteristics of the female population have greater impact on the population growth behaviour, while changes in corresponding variables for the male population do not cause any significant impact onto the population growth behaviour.*

Session Four

Strategies/Recommendations for Improving the Use of Gender-sensitive Statistics and Indicators in Policy

Session Four : Strategies/recommendations for Improving the Use of Gender-sensitive Statistics and Indicators in Policy

Objectives

. To identify country-specific strategies that will help respond to the need for improved statistics and indicators on gender issues
. To draw-up recommendations for integrating gender perspective in policvy designs and programme planning

Training Design

Activities/Topics	Method	By Whom	Tools
1. Identification of issues and problems with available statistics and indicators on gender issues	Group discussion	Moderator, trainer and participants	Flipcharts Blackboard
2. Recommendations/ strategies for improving statistics and and indicators on gender issues	Group discussion	Moderator, trainer and participants	Flipcharts Blackboard
3. Presentation of group reports	Plenary Discussion	Group leaders	

Session Five: Evaluation of the Training and the Training Package

Objectives

. To evaluate the training method
. To identify specific recommendations for improving the training method and the training materials

Tools

. Evaluation Form (ANNEX 5 and 6)

On the fourth day, the participants should be provided with Forms for the Final Evaluation of the Training and the Evaluation of Pre-Workshop Exercises and the Training Materials.

Participants should complete these forms and have them submitted to the trainers before end of the day. A summary of the information provided in the questionnaires should be prepared by the trainers for discussion at the plenary on the following day.

Once discussed and completed, comments and recommendations should be properly compiled.

Session Five

Evaluation of the Training and the Training Package

PRE-WORKSHOP RESOURCES

This part of the training package is to be provided to the participants at least one month prior to the workshop. Results of the pre-workshop exercises contained in this section will be reviewed and discussed at the corresponding sessions of the actual workshop.

Aims and Objectives

The two major objectives of the pre-workshop resources are

(i) to draw participants attention to some of the emerging concepts and tools related to gender and gender analysis and
(ii) to enable the participants to make best use of information resources and enhance their understanding of gender-specific statistics.

I. Understanding Gender

Introduction

During the past few years, a gradual conceptual shift from focus on women and development to a focus on gender and development has stimulated heated debates and to a great extent irreconcilable differences among scholars, politicians and different groups working on the advancement of women.

While others believe that the term "women" should be used because women have been ignored for too long, and that shifting to gender will take women off center stage, proponents of the gender focus maintain that focusing on women in isolation offers a lot of

limitations and ignores the real problem which originates from the subordinate status of women to men. Women's situation should be presented and analyzed in relation to that of men, defining the relationships between them and influencing mainstream development policies and programmes through a gender-sensitive approach

Statistically, data must be collected, processed, tabulated and analyzed by sex. Issues and problems concerning inequality between women and men in education, employment and access to services cannot be substantiated if data do not reflect the relative position of women to men. Most developmental issues have to be treated with great sensitivity to gender differences which statistical data must be able to provide. Moreover, there also exist issues and problems that specifically affect women and for which only data on women exist. Maternal health/mortality and prealence of anemia and other diseases/illnesses rɛalted to pregnancy are just few examples of these. Certain measures must be taken and systematically put in place to ensure that these statistical information are adequately and properly collected and analyzed. Statistical data are indeed required to demostrate the differences between these concepts and describe the disparities between women and men in certain developmental issues.

Hence, it is imperative that clear distinction between "gender" issues and "women's" issues is defined and concepts not used interchangeably.

While the concept of gender continues to receive a number of opposing arguments, most literature and documents dealing with development planning are now slowly adjusting to the concept.

In this connection, it is crucial that the users of the training package (or the training workshop) are acquainted with the emerging terms that carry a lot of explicit and implicit implications to the production, presentation, and analysis of statistical indicators for policy purposes.

EXERCISE I

Please provide in writing your answers to the following questions:

1. How do you define equitable and sustainable development?

2. Does your [office, ministry, project] consider women (or gender) as a factor for planning and implementingdevelopment projects and programmes? If not, has there been any policy meetings in your office to discuss this?

3. What does "gender" mean to you?

4. Have you used a gender or WID approach in your work? If yes, what did you do? How do you evaluate the outcome? Why? If not, have you thought about using such an approach?

5. Do you think there should be a link between macro-economic policy and women? In What way does the ministry of [agriculture, industry, etc.] this office analyze the link?

6. In the gender approach, there are discusson sonissues that range from the socio-economic contribution of women to development to stereotyping women as housewives. Do you consider these issues relevant for development planning? Can you elaborate?

7. Are women's interests, needs, and concerns relevant to your specific work? In what ways? If not, have there been any discussion on this?

8. Do you use sex disaggregated data in your work? Do you have any documents that illustrate how attention to gender (or women) has been built into the work of this [ministry, office, project? Can you provide us with examples?

9. Does your [ministry, office, project] have to follow a national plan or specific policy for women (or gender)? If not, have you thought about this?

Participants should write down their answers to the above questions and forward a copy to INSTRAW Headquarters, addressed to the training coordinator at least two weeks prior to the training-workshop. Participants must bring another to the actual training-workshop.

II. Gender-specific Statistics and Indicators

This chapter of the pre-workshop resources is designed for the two participants, a producer and a user (from each country, region, province, etc.) to review and eventually work together to complete a pre-workshop project. By working together, participants are expected to be able to:

- define information needs critical to a policy programme issue in your country,
- identify information that is currently available,
- identy key indicators
- present data in an accessible form,
- identify gaps between needed and available information,

- develop preliminary action plans for bridging information gaps,

- develop implementation and monitoring skills, and

- share your findings, conclusions, and proposals with the other participants at the workshop.

BACKGROUND

The Uses of Statistics

Statistics are essential for effective planning, for decision making, and for evaluating programmes and policies. They provide a factual basis for understanding and describing the world. Without statistical information, planning and decision making are too often based on individual perceptions of the world or on anecdotal evidence. The result can be misdirected policies and programmes that do not meet their objectives.

Who Uses Statistics?

Government departments and Ministries use statistics in forming policies and programmes and to monitor the impact of policies as they are implemented.

Semi-government and non-government organisations use statistics to measure and describe their areas of interest and responsibility, to identify programme target groups, and to plan, implement and monitor programmes.

University staff and others in similar positions use statistics in teaching and research.

Organisations and groups in the community (such as women's groups) use statistics to measure and understand the social situation, define problems and develop solutions to those problems.

The United Nations and its agencies and other international organisations, such as the World Bank or the International Monetary Fund, use statistics to measure and understand global and regional patterns and problems, to develop programmes in response to those problems, and to highlight areas in countries for which they could provide technical assistance and financial support.

The task of the statistician is to provide information to suit users, usually within a tight budget and with other constraints on resources.

Can Users' Needs Be Better Met?

All these users have different information needs. Some users may have more influence than others over the way statistics are collected and presented. For example, international demands for economic reporting often result in economic and labour market statistics that reflect only the formal sector and give no information on productivity in the informal sector. Yet, in developing countries, the informal sector makes a significant contribution to GDP and is the chief location of women's economic activity.

A better dialogue between statisticians and those who usestatistics can help ensure that existing statistical collections are modified and presented in ways that respond to the needs of a wider range of users.

The challenge to statisticians is to provide statistics that arerelevant, timely, accurate and accessible to all users.

The challenge to users is to know how to formulate their questions for a statistical answer, where to find statistics, how to assess the quality of statistics, and how to make the best use of the data that is available.

The purpose of this pre-workshop project is to encourage users and statisticians to work together to make statistics more relevant and accessible.

One of the ways in which statistical collections can meet a wide range of requirements is for them to present as detailed a picture as possible of the society they describe. Information on a population is most useful when it describes differences within that population and links those differences to key indicators of well-being, development or opportunity.

Statistics presented as aggregates of the total population may mask important differences between subgroups such as regional populations, ethnic groups, or women and men.

Gender Differences

In all countries, cultures and classes, women's lives are different from men's lives. The differences vary from culture to culture, but generally, women have the major responsibility for raising children, for managing the household and often for providing daily subsistence for their families. These responsibilities shape and constrain the ways in which they participate in the community and contribute to the economy.

In addition to caring for children and managing homes, many women work to provide food for their households. They work in fishing, fields, and gardens, and often sell the goods they produce.

All over the world, women's work is located in the householdand in the informal sector, and women's jobs are typically part time, temporary or seasonal, and multiple.

These differences mean that changes impact differently on women and men. For example, development schemes which

encourage the production of cash crops for export may appear to be increasing the wealth of an area if the returns are measured on a per capita basis. Examination of the returns for men and for women, however, may reveal that the greater part of the cash profit is going to the men, and figures on overall productivity may show that land once used for subsistence farming has gone to produce the cash crop and that women and children have less to live on as a result.

To enable planners to make informed decisions, statisticians need to present data that is accurate, reliable, current, gender-specific, and that meets users' diverse needs: this is the aim of this pre-workshop package.

EXERCISE II

Developing Your Country Paper

General Approach

In this first pre-workshop project, the user and the statistician will have to work together on a case study to explore information needs and how well existing statistical collections can meet these needs.

Method

1. Choose a problem, programme or issue which you can analyse in terms of the needs of both women and men. This becomes your case study.

2. Specify the information needs relevant to your selected case study.

3. Identify the information available from existing statistical collections to meet your specified information needs.

4. Develop key indicators.

5. Present the data in a form that is easy to follow.

6. Assess the adequacy of existing data to resolve the issues in the case study.

7. Summarise the outcomes of steps 1 to 6 and develop the summary as a draft country paper to bring to the workshop.

8. Together with the output from step 7, bring the collected information or dataset to the training workshop.

(Each of these steps is explained in more detail in the following pages.)

This project should enhance your appreciation of what you can achieve with existing statistical resources. It should also increase your awareness of any gaps and inadequacies in the data. Ways of overcoming these will be discussed at the workshop. You will be asked to complete your country paper after the workshop. Discussions at the workshop should help you to develop recommendations for overcoming gaps and inadequacies in the data and help you improve your capacity to understand the importance and use of statistics by sex.

Step 1 Select Your Case Study

The user participant should initiate step 1. To start, select a problem, programme or policy issue. Following is the list of priority areas which are selected for the relevant exercises to be conducted at the actual training:

1. factors related to population growth;
2. environment;
3. migration

Having selected your case study, talk to as many people as possible to identify the information needed to describe accurately all the issues relevant to the core problem. Doing this will focus your data gathering on ways of meeting user group needs. It will also enable users to monitor outcomes.

Questions you might find helpful in deciding on the information needed include:

- What are the most urgent concerns in the issue you have chosen to look at?
- What are the important questions to be answered?
- What changes would you like to see in this area?
- What are the issues for women and for men?

Step 2 Identify Information Needs

Having identified the problem or issue for your case study, the next step is to define the details of the information needed, develop appropriate policies and programmes, and also to monitor and evaluate them.

The best way to start deciding on what information is needed is to consider what questions need to be answered. Talk to people in the area you have chosen to focus on about what they believe are the most important questions to be answered.

Having decided on the questions to be answered, the next step is to translate these into statistical information needs (at this stage, you need to meet with the statistician and the user have to work together and define the statistical information needs). Discussing the questions with others is helpful too. Alongside each question, itemise your information needs as illustrated in the next table.

When defining your statistical information needs, think about why the information is needed and how specifically you would use the statistics.

The statistician can advise whether a statistical answer can meet the user's information needs and help you clarify or refine concepts and terms.

Step 3 Identify Available Information

The statistician participant is best able to deal with this step. The information you need for your case study may be spread across a range of data collections, so it is important to examine all available data sources, induding, for example, the population census, household surveys, and administrative collections.

In searching the statistical output that is currently available, do not restrict yourself to statistics produced by the national statistical agency. Other government agencies, universities and non-governmental organisations may be additional sources of published information or administrative data.

When you have assembled information from the various sources, you may have much of the information you need. Sometimes, the available information might not precisely satisfy an information need, but it could give data related to it. Such information could well be adequate for the user's purpose.

What are indicators?

Indicators come from selecting, rearranging and otherwise manipulating basic data. In effect they summarise and focus statistical information. Their function is to show the most significant aspects of a situation. People can then use them to assess what is happening and make appropriate decisions. Indicators can usefully point to progress towards, or retreat from, desired goals. They can also provide signals for action. They can show differentials between population subgroups (for example, women and men, rural and urban populations) and how the differentials are changing over time.

Simple indicators consist of:

- summaries, arrays or selections of basic data such as:
  - proportions of a population with a given characteristic
  - rates of incidence or change
  - measures of severity
  - elapsed time
- means, medians and other measures of central tendency
- percentage distributions, frequency distributionsStep 4

Identify Key Indicators

Having considered the statistics you need for your case study and where to get them, you can now turn your attention to identifying, defining and calculating key indicators from the existing data. Choose the specific set of indicators that reflects the problems and questions identified earlier by the user, particularly those that are likely to have a differential impact on women and men.

In identifying and compiling your set of indicators, bear in mind that indicators can sometimes be misleading. It is the responsibility of the statistician to specify their limitations and to explain the concepts underlying the statistics.

Following is a table which identifies the major information required in developing and analysing the indicators that ought to describe the role of women and men in the population issues. It will be extremely useful if similar table is completed for the theme you have selected:

Table 1

Statistics and Indicators Relevant for Population and Development Analysis

Variables	*Indicators*	*Statistics/data required*	*Data sources*
1. **Population target**	Population Growth rate (PGR)	Total population by census years	Census
2. **Fertility levels**	Total fertility rate	Total population, total population by sex, age and year	Census, Household survey, Demographic survey, Vital registry
	Age-specific-fertility rate	Total population by sex, age, year Total pregnancy by age and year	
	Fecundity rate	Total population by sex, age, year Total pregnancy by age and year	survey, Vital registry
	Contraceptive prevalence rate	Total population by age and sex, Contraceptive use by sex, and year	Census, Vital registry
3. **Educational Attainment**	Enrolment ratio by level and sex	Total population by age and sex, by year, Total enrolment by age and sex, Total number of persons by degree, age and sex	Census Household survey Demographic survey Education administrative data, Other admin. data
	Highest educational attainment by sex		
	Highest educational attainment by sex and degree		
	Literacy/illiteracy rate by sex and age		

Step 5 Present the data

Having selected and gathered together relevant data from the existing stock and applied enough analysis to draw out relevant information, the next step is to present the information in an interesting way. Your objective is to produce a statistical overview which deals with the key concerns and issues identified by the user.

This step is best completed by the statistician in consultation with the user. To make the overview interesting use simple tables, diagrams and descriptive commentary so that the user can see trends and patterns in the data. The aim is to make the statistical information relevant and accessible to the user. Bear in mind that statistical information presented in the traditional way, in detailed tables, is usually dull and difficult for non-statisticians to understand.

Present the overview so that it deals with the problems and issues identified by the user, placing them in their broader demographic, social and economic context. Obviously, your presentation should be impartial and objective. It is not the task of the statistician to become involved in policy advocacy and policy criticism.

It is important to make both the women's and men's world visible in presenting statistical material. Prejudice about women still exists in every country. Women are much more invisible than men, both in society and in statistics. And what we don't see, does not exist! Hence the need for facts showing the situation of women relative to men.

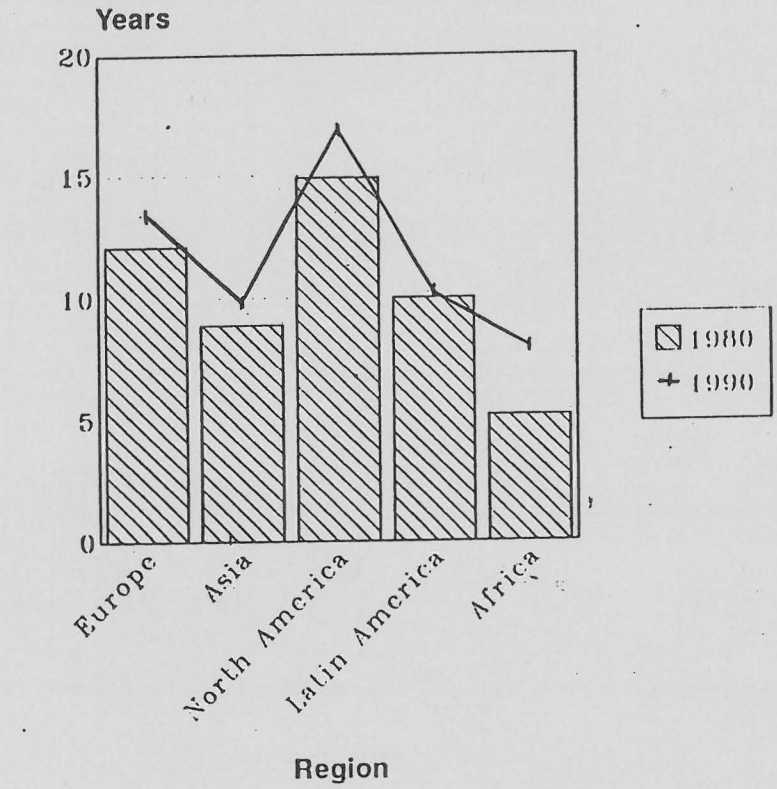
Whenever possible, present time series data so that readers canassess changes over time. Aim, whenever possible, to present comparisons at a regional level and between population subgroups. Often the picture at the national level is different from that at other levels of society.

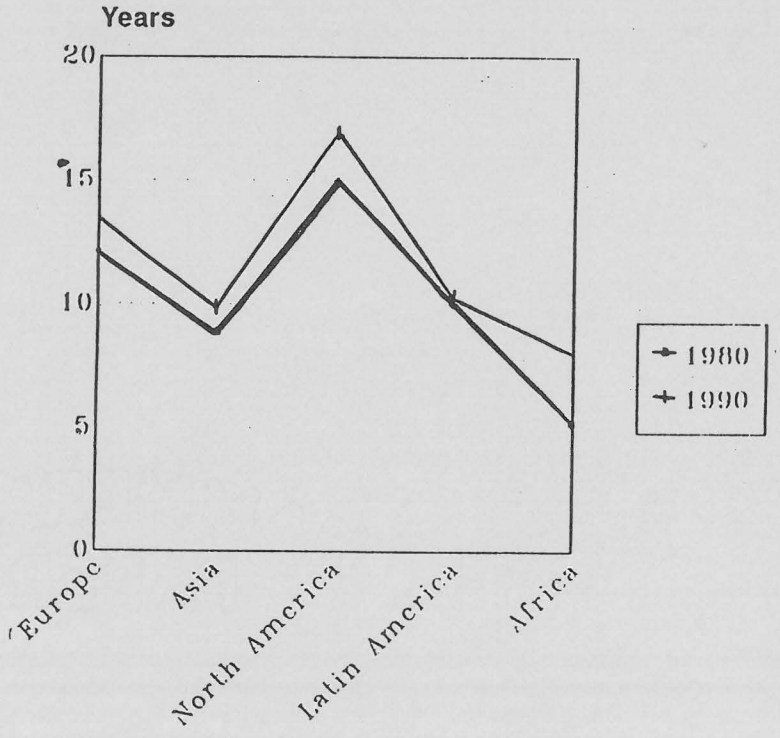
Some examples of interesting, digestible presentations are provided below.

....Cont.

Variables	*Indicators*	*Statistics/data required*	*Data sources*
4. **Economic activity**	Economic activity rate by sex and age, Labour force part. rate by sex and age Economic activity rate by type of employment/ type of occupation/ type of industry/ sex and age	Total population by age and sex, Total population employed by age and sex, Total population in different types of employment/ occupation/ industry	Census Labour force surveys
5. **Health Status**	Age-sex-specific Mortality rate Age-sex specific Morbidity rate Morbidity rate by age/sex and type disease Infant mortality rate Anthropometric measures by age/sex	Total population by sex and age, Total number of deaths by cause by sex and age Height and weight by age and sex	Census, Administrative records on health stat, Demographic surveys

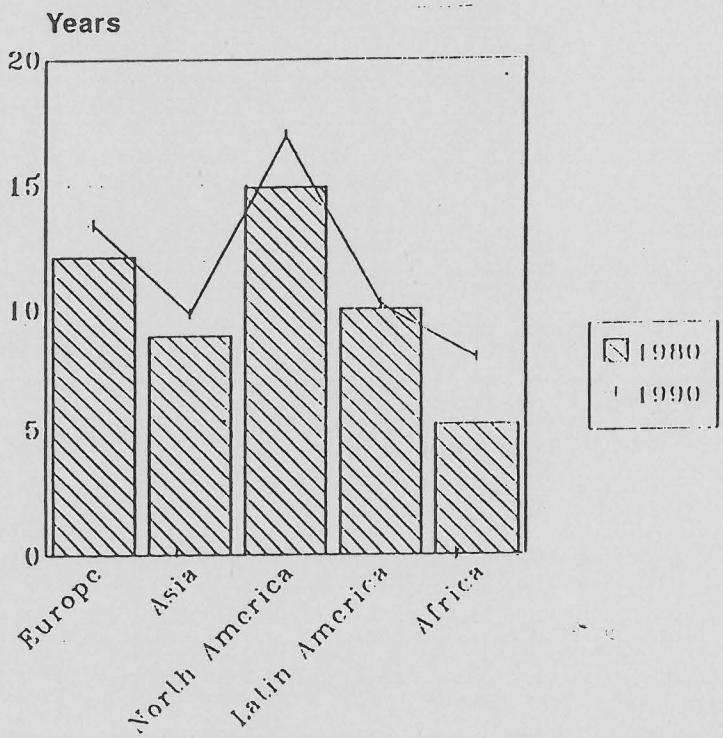
Expected Number of Years of
Formal Education for Female

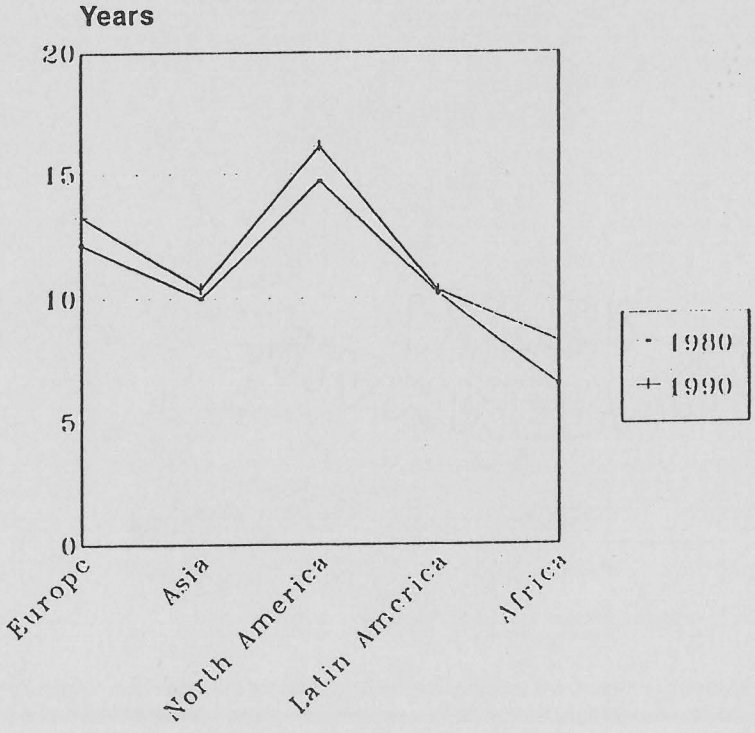




Expected Number of Years of

Formal Education for Male





Step 6 Assess the Adequacy of Existing Data

In this step in preparing your country paper, you evaluate the adequacy of existing statistical collections, based on your experience in steps 1 to 5. It might be useful if the statistician prepare separate evaluations from their different perspectives, meet to discuss them, and together develop strategy for improvement. Be prepared to discuss such strategies at the workshop.

You could consider the issue of adequacy under two main headings, namely:

- concepts, definitions, and classification systems, and
- data gaps.

Here are some questions that you may wish to consider in your evaluation:

- Are the concepts, definitions and classifications relevant to the issues that the user wants to address?
- Are the concepts, definitions and classifications consistent between collections and over time?
- Are the statistics accurate and up to date?
- Are they accessible to users?
- Are they presented in an easily understood way?
- Is all relevant collected information processed? If not,why not?
- Are the statistics frequent enough to meet the user's needs?
- Are the coverage and completeness of the collections suitable for the user's needs?

Your responses to questions like these should enable you to structure your evaluation around the key issue of making statistics more responsive to user needs.

Step 7 Prepare Country Paper

In this last step you should together prepare an overview of the six steps you have worked through. Outline:

- the problem you have used as your case study,
- the information requirements,
- the available statistics, and
- the key indicators you have developed.

Include the statistical overview you have produced and an account of the gaps and inadequacies that you have identified in available statistics. This will be your draft "country paper' for the workshop in.

Exercise III

Background

Some of the hands-on exercises to be executed at the actual training-workshop require data inputs from each participating country/region/province to make the results more relevant to the participants. It is therefore necessary that prior to coming to the workshop, both participants from each participating country or region/province/group collect the following statistical data from the indicated data sources.

A. *Data related to population and development issues.* For participants who selected this topic for Exercise Two should have collected already the following data. For those who selected other topics, please make sure that you bring with you the following information.Whenever possible, data must be collected from different sources.

Check which administrative level data correspond to:

_____ country (please specify) _____
_____ region of a particular country (please specify) _____
_____ province (please specify) _____
_____ other (please specify) _____

Statistics/Indicators (1970-1995)	Census	National Surveys	Administrative Records
1. Total population, by sex and age			
2. Population growth rate			
3. Age at marriage by sex			
4. Enrolment ratio (male and female) for first and secondary levels			
5. Economic activity rate by sex			
6. Prevalence of female contraceptive use			
7. Infant mortality rate			

B. Women in Development indicators. All participants are required to collect and compile the following information for the actual training-workshop:

Statistics/Indicators	Census	National Surveys	Administrative Records
1. Highest level of education of education by sex			
2. Access to capital by sex			
3. Access to land resources by sex			
4. Access to extension services by sex			
5. Market wage by sex			
6. Control of own income by sex			
7. Family planning practices by sex			
8. % of men's income for home			
9. Average family size			

SUGGESTED READINGS

I. Compiling Indicators on the Situation of Women

This section provides additional information on statistical indicators that could be helpful in the preparation of your country paper.

The Problem

Given the existing social and economic statistics, the problem becomes one of selecting indicators which are valid and reliable and also have broad applicability and wide appeal. There are different ways of selecting such indicators. The approach adopted here is the derivation of indicators in the various areas for which there is regular reporting, that is, labour force, education and so on. Given the reasons for recent demands for indicators on the situation of women noted previously, this report seeks to develop indicators which measure both the options open to women in the social and economic spheres of life and the differences between men and women in areas of concern to national and international bodies.

Illustrative Indicators

The illustrative indicators on the situation of women presented here have been developed to assist individual countries in their own selections. The illustrations are not meant to be comprehensive. It is necessary to keep the number of indicators within a manageable limit and yet not make the initial effort result in such a small list that it is not useable. In addition, the available current data in many developing countries limits the range of indicators for which bench-mark data are available. Hence, only some of the indicators identified in this report will be appropriate for any specific country.

In considering which indicators might be identified as principal indicators, it is necessary to examine the key problem areas with respect to the situation of women. This raises substantive questions related to the hypothesis that women and men are affected differently by their social and economic environments

and the assumption that a major goal in most societies is to move towards equality of the sexes with respect to social and economic situations. Among these questions are the following:

- What are the critical problems with respect to women's situation in individual countries? What changes are most likely to occur in these areas during the overall

transformation of societies (in, for example, education and training, labour-force status)?

- To what extent do women's needs for various services and types of employment differ from men's?
- What is the comparative situation of women within countries by ethnic group, by socio-economic group and by urban and rural residence?
- In what ways does the sexual division of labour or rights and duties over the means of livelihood affect women?

Importance of Indicators

The answers to these questions help to determine which specific indicators are more important than others. The questions themselves suggest that indicators will be derived from statistics describing economic activities, education and literacy, marital status and households, and basic population data by sex and age. The data for such indicators already exist in many countries in censuses, surveys and vital registration or other administrative registration and record systems. These will be discussed in detail in the next chapter. A brief overview is presented here for those readers who are less familiar with the content of these data sources and with general issues which concern all data collection efforts.

First and foremost, it is important to note that no single source can provide all of the data needed by different countries and by different users within those countries to describe the situation of women. There are three types of official national sources of basic data on women: Censuses of population and housing, sample surveys of the population and registration and administrative data systems. Although each of these major data sources has advantages and limitations, they must be seen as complementary in order to be used most effectively. Used in concert, they provide a considerable amount of data for indicators needed for planning, administration and research.

Censuses Population and housing censuses are probably the most comprehensive source of social and economic data needed for indicators in most countries. They provide universal coverage and a wide variety of data is collected to describe the size and characteristics of the population at specified intervals. Thus a broad range of possibilities exists for cross-classification of census data geographically and according to selected demographic, social and economic characteristics. Because population censuses are relatively infrequent, however, the data become outdated. Also, such large bodies of data are expensive to manipulate. Nonetheless, for most countries, censuses provide the starting

point for meeting data requirements and for experimentation in the construction of social indicators.

Surveys Sample surveys of the population provide a basis for updating census information for the nation as a whole and for some broad geographical areas. They are extremely flexible data sources and provide a comprehensive source of social and economic data between censuses. Almost any subject can be explored and many countries have developed extensive survey capabilities. There are many types of household surveys and each type has advantages and disadvantages. They all sample a small part of the entire population to obtain needed and timely information on topics as diverse as unemployment and energy use. Because the information is collected from a relatively small sample, it is generally not possible to obtain detailed cross-tabulation of social and economic data by small geographical areas.

Records Another potential data source is registration and administrative record systems. These include civil registration of births, deaths marriages and divorces. Unfortunately, although these sources are of great importance to women, they are often limited in content and coverage.

Complementary Relationships It is important to reiterate that the relationship between the Three major sources of data is complementary. The relationship between population and housing censuses on the one hand and population surveys on the other, is one between infrequent but geographically detailed cross-section data and more frequent but less geographically detailed data provided by sample surveys. They are complementary in other ways also. the census may cover a broad range of topics, but most are covered in only a brief fashion. These same topics may be examined in much greater detail in survey. For example, labour-force status and occupation may be covered in a census, but additional items such as skills, hours worked, secondary occupations and the like may be covered in a survey. Sample household surveys also provide a mechanism for collecting data quickly - for example, in response to the energy crisis and for studying voting patterns associated with civil rights or human rights legislation. Adequate survey design, usually dependent on the detailed population and ho maps and other material obtained through a census.

In short, the three major data sources (and collection methods) must be seen as reasonably well-defined processes with distinctive though overlapping characteristics with respect to content, detail, accuracy and timeliness of the data they generate. They are complementary and no one of them alone is the best or most adequate source of data for indicators on the situation of women. Some indication of the relative strengths and weaknesses of censuses surveys, and civil registration and administrative records in terms of seven specified criteria is provided in Table 1. The table suggests that the relative

advantages of the three basic sources are complementary: where one is strong, another is weak. Attention and resources must be directed towards upgrading census, registration and survey capabilities, especially in developing countries, if the needs of all users of statistics on women are to be served.

Source:
DIESA/INSTRAW (1988)
Compiling Social Indicators on the Situation of Women.
Santo Domingo: INSTRAW.

Table 1: CHARACTERISTICS OF THREE BASIC SOURCES OF DATA FOR INDICATORS ON THE SITUATION OF WOMEN

Criteria	Data Collection Method		
	Census	Civil Registration	Sample Survey
Tropical detail (richness and diversity of subject matter) Moderate	Moderate	Weak	
Accuracy Moderate	Moderate	Strong	
Precision (absence of sampling errors)	Strong	Strong	Weak
Timelines of data	Weak	Strong	Strong
Geographical detail	Strong	Strong	Weak
Information on population segment	Strong	-	Strong
Ease of organisation in a developing nation	Moderate	Weak	Strong

2. Sources of Basic Data

This section provides additional information on the sources introduced in Section 4

Developed Countries

The sources of basic data on women vary widely. In the developed countries basic data sources include censuses, surveys, civil registration data and other administrative records which can provide various indicators on a more or less regular basis. In addition, many developed nations have specialised household surveys which periodically focus exclusively on living conditions.

Developing Countries

In most developing countries, on the other hand, the basic data sources for social indicators are very limited. There may be a wide range of statistical experience in these countries but very few have long histories of population and housing censuses or reliable civil registration systems. Nor do they very often have extensive household survey programmes. In many cases, therefore, considerable upgrading and extension of basic data in the social fields are needed before a full range of useful social indicators can be developed. It may also be necessary to consider interim priority indicators from among different sources of data. In some countries administrative data or local community data may be the only feasible source of information at present, even though statistics collected and compiled by the national statistics system would be a preferable source. Mention should also be made of the array of techniques now available for preparing estimates from inadequate basic data, particularly in the demographic field. However, as these techniques are highly specialised, they will not be discussed here in detail

Statistical Services

A variety of activities carried out by national statistical services provide data on selected aspects of the situation of women. In this section the sources of information on the situation of women which can be used to develop indicators are reviewed. The types of data which are usually available will be described along with some discussion of coverage and accuracy.

In addition, some suggestions are made for slight modifications which might permit a better description of the situation of women. It should be noted that this report focuses on official national data

collection systems. It does not discuss indicators which might be drawn from specialised case studies and surveys which focus on particular cultural, socioeconomic or regional populations. Such studies can and have provided a substantial amount of information on different aspects of the situation of women. They are usually small-scale endeavours in local areas, however, and the results cannot be generalised to the country as a whole. They are not, therefore, reviewed in detail in the present report because the emphasis is on indicators which can be developed from national data systems.

Censuses

Censuses of population and housing are probably the best source of information on the size and distribution of the female population (and also of the total population) by a variety of social and economic characteristics. The major unique features of census data in most countries are the availability of small-area data and comparability across countries. It is necessary to point out two characteristics of population censuses. First, the primary statistical unit in the population census is the individual. Therefore information on education, income and the like may be obtained for all persons cross-classified as desired and comparisons made among significant age and sex groups. Second, although topics recommended for the 1970 and 1980 rounds of censuses are very similar, the international recommendations issued in 1980 give much more flexibility to regions and countries in the choice of topics. Whereas in 1970 both "priority" topics and "other useful" topics were considered in detail in the international recommendations, in 1980 the selection, definition and application of "other useful" topics were left to each region and country. The principal topics in the 1980 global recommendations which appear relevant to the purposes of this paper include the following:

- place of residence,
- relationship to head or other reference person in the household,
- sex,
- age,
- marital status,
- educational attainment and attendance,
- economic activity,
- occupation,
- industry, and
- status in employment.

Two additional topics which are reviewed in the global

recommendations but which were not included in the majority of regional recommendations are income and sector of employment.

The topics noted suggest that it is possible to make comparisons by sex and age and for rural and urban populations from census data in those countries which followed the international recommendations. In fact, however, national practices with respect to defining concepts and measures may differ where countries have modified the recommendations to meet their own particular needs and conditions. For example, the unpaid family worker is defined in different ways from one country to the next. Even within countries concepts may be defined one way for a census and one or more different ways for survey purposes, depending on the agency collecting the data. This is particularly true with respect to labour-force concepts but applies to other areas also, and anyone using the data for national, subregional and/or for international comparisons should carefully check the definitions of the concepts used.

On the positive side, population and housing censuses clearly permit the identification of different sub-samples to be studied in greater depth through sample surveys, and they contain key questions which enable the user to identify groups of households or individuals to be singled out for a particular analysis. For example, one might take the question on relationship to head of household and sort out only female-headed households during the processing phase of the census. Further analysis might compare female-headed households with other types. Also, one could match individual person characteristics with household characteristics. This is a complicated operation for most countries, particularly for those countries where the operation is still done by hand, but it is possible.

The censuses of population and housing are useful for many purposes with respect to defining the situation of women but are not always the best source of information, particularly for rural women. Here census, of population and housing might be supplemented with some data from censuses and surveys of agriculture. Many of the same items recommended in 1980 for population censuses are also recommended for censuses of agriculture, but the units of enumeration and tabulation differ. In censuses of agriculture, including those carried out using sampling techniques, which is becoming a common approach, the holding or the plot which is farmed tends to be the basic unit and most data

are presented for "holders" and members of their households. These holders include private holders and members of their households, but they may also include participants in cooperatives or other collective endeavours. However, data are collected on hired agricultural workers and their households in the agricultural censuses of only a few countries.

In sum, censuses of population and housing provide numerous items which may be further disaggregated in order to provide indicators on the situation of women. In many countries these data may be supplemented by the censuses of agriculture, where particular attention must be paid to the situation of rural women.

Household Surveys

Household surveys sample a small part of the population to obtain timely information on one or more topics of current interest. They usually focus on a limited number of topics, such as employment or fertility, but include more questions on those topics than can be included in a census. They also usually cover many basic socio-economic characteristics, such as those included in censuses, to provide background for the interpretation and analysis of the

in Pay

segregation and wage discrimination, and recognize women's unpaid work as economically productive. These are matters for legislators, business leaders, and statistical services. But these are also matters for men and, above all, women. Men are not going to open the doors to their domains. Women are. And equipped with better skills and different views of their role in life. they will.

Source: United Nations. (1990)
The World's Women.
New York: UN Publication.

II. Key Issues from Human Development Report 1993

1. New concepts of human security must stress the security of people, not only of nations.

The concept of security must change-- from an exclusive stress on national security to a much greater stress on people's security, from security through armaments to security through human development, from territorial security to food, employment and environmental security.

The world has already made a good start:

- Global military expenditures have declined cumulatively by around $240 billion since 1987.
- Nuclear warheads will be cut by two-thirds by the year 2003 as a result of the recent US-Russia agreement.
- More than two million people have been demobilized from the armed forces since the beginning of the 1990s.
- Defence industries are expected to have cut nearly a fourth of their work force by 1998.

This is a beginning, but a formidable agenda still awaits policy-makers.

- *Use defence cuts to enhance human development*--Despite major reductions in arms expenditure, the expected peace dividend in industrial countries has yet to materialize. A close link must be created between defence cuts and the unfinished social agendas in these countries.
- *Ease the transition from defence to civilian production*--Industrial countries need to plan the transition to a peace economy by retraining defence workers and creating more jobs for them in the civilian sector. Unless this is done, there will be pressures to give further export subsidies to the arms industries--pressures that several industrial countries have already succumbed to. This way of easing the adjustment problems of today's defence industry is bound to lead to enhanced conflict and deferred human progress in the developing world. It is irresponsible to entice poor countries to buy expensive military toys at the same time they are advised to reduce military spending. For developing countries, even partial demobilization of their standing armies will require large-scale job creation.

- *Accelerate disarmament in the developing world*--Although the cold war has ended between the East and the West, it remains to be phased out in the developing world. If developing countries merely froze their militan77 spending at the 1990 level during the next decade, this would release nearly $100 billion for their essential human development agendas--which, combined with the restructuring of aid allocations proposed later, will be enough for universal literacy, primary health care and safe drinking water by the year 2000. This will also require some major initiative from industrial countries. Needed especially are time-bound targets to phase out military bases and military assistance, internationally monitored restraints on military shipments, and an enlightened donor-recipient policy dialogue on reductions in military spending.

- *Forge new reg˜onal and international alliances for peace*--Preventive diplomacy is needed to diffuse tensions around the globeing output would necessarily increase em*before* there are blowups. This demands a new role for the United Nations, not just in peacekeeping but in peacemaking and peacebuilding. After all, an ounce of prevention is better than a ton of punishment. During 1992, the UN had to intervene in several internal conflicts, from Bosnia to Somalia, and the number of UN soldiers quadrupledtomorethan50,000.Withconflicts in countries displacing those between them, the time has probably arrived for the UN to have a permanent military force, mainly for the new goal of peacemaking. But military force is only a short-term response. The long-term solution is faster economic development, greater social justice and more people's participation. The new concepts of human security demand people-centred development, not soldiers in uniform.

2. New models of sustainable human development are needed--to invest in human potential and to create an enablingenvironment for the full use of human capabilities.

The purpose of development is to widen the range of people's choices. Income is one of those choices--but it is not the sum-total of humanlife.

Human development is development *of* the people *for* the people *by* the people. Development *of* the people means investing in human capabilities, whether in education or health or skills, so that they can work productively and creatively. Development *for* the people

means ensuring that the economic growth they generate is distributed widely and fairly. Earlier *Human Development Reports* (1990-92) concentrated on these first two components. This Report advances the argument by concentrating on development *by* the people--on giving everyone a chance to participate.

The most efficient form of participation through the market is access to productive and remunerative employment. So, the main objective of human development strategies must be to generate productive employment. It has long been assumed that pursuing economic growth through increasing output would necessarily increase employment. This clearly has not happened. Over the past three decades, the growth rate for employment in developing countries has been about half that for output. And as output rose in many OECD countries in the last decade, employment lagged behind. ILO projections for the next decade hold no comfort. On present trends, employment's growth will continue to lag far behind that of both output and the labour force.

We are witnessing a new and disturbing phenomenon: *jobless growth.* And policy-makers the world over are searching for development strategies that combine economic growth with more job opportunities. No comprehensive programme has yet emerged, but governments can do several things to increase employment. Governments can:

- *Invest* generously in basic education, relevant skills and worker retraining.
- *Liberate* private enterprise and make markets more accessible to everyone.
- *Support* small-scale enterprises and inormal employment, mainly through reform of the credit system and fiscal incentives.
- *Create* an efficient service economy for the future by investing in the new skills required.
- *Encourage* labour-intensive technologies, especially through tax incentives.
- *Extend* employment safety nets through Labour-intensive public works programmes in periods of major economic distress.
- *Reconsider* the concept of work and the duration of the work week, with a view to sharing existingwork opportunities.

Policy-makers are searching not only for development models that are people-centred. They also want development to be more sustainable--to protect the options of future generations. This means

that the conventional definition of capital must be broadened beyond physical capital to include human and natural capital.

The supposed choice between economic growth and sustaining the environment is false and dangerous. Growth is imperative if poverty is to be reduced. But the distribution of growth must change, and it must become less wasteful of natural resources in both rich and poor nations. The new models of development must also recognize that poverty is one of the greatest threats to the environment. That is why it is as important to address the "silent emergencies" of poverty (water pollution, land degradation, environmental diseases) as it is to focus on the "loud emergencies" (global warming, ozone depletion) that usually dominate the headlines.

In short, the new models of sustainable development must be much more sensitive to people and to nature.

3. New partnerships are needed between the state and the market to combine market efficiency with social compassion.

Heated ideological discussions have often marred an objective analysis of the relative roles of markets and the state. Some believe in the benevolence of the state and the need for constantly correcting the ill effects of the market. Others glorify the virtues of the market-place and argue that the economy should be liberated from the dead hand of state bureaucracy. Both groups assume, to a large extent, that the state and the market are necessarily separate and even antagonistic--that one is benevolent, the other not. In practice, both state and market are often dominated by the same power structures.

This suggests a more pragmatic third option: that people should guide both the state and the market, which need to work in tandem, with people sufficiently empowered to exert a more effective influence over both.

If people's interests are to guide both the market and the state, actions must be taken to allow people to participate fully in the operations of markets and to share equitably in their benefits. Markets should serve people--instead of people serving markets. After all, markets are only the **means--people** the end.

Changing markets to make them more people-friendly would start

by maintaining the dynamism of markets but adding other measures that allow many more people to capitalize on the advantages that markets offer.

- Preconditions--People need the education and health standards to take advantage of market opportunities. Also needed is a reasonable distribution of productive assets (particularly land) so that people do not come to the market with totally unequal buying or selling power. Since poorer people often have very little access to credit, governments need to reform their credit systems to give access to the poor. In addition, governments have to ensure that markets are open to all--irrespective of race, religion, sex or ethnic origin. Other preconditions for effective people-friendly markets include adequate physical infrastructure (particularly in rural areas), a free and rapid flow of information, a liberal trade regime and a legal system that encourages open and transparent transactions.

- Accompanylng conditlons--are needed to ensure that markets work as freel~ and efficiently as possible. One of the most important is a stable macroeconomic environment--especially to ensure stability in domestic prices and external currency values. But markets would also benefit from a comprehensive incentive system, with correct price signals, a fair tax regime and an adequate system of rewards tor work and enterprise. Markets should also be able to work untrammelled by arbitrary and unpredictable government controls.

- *Correctilje actions*--When markets do not produce a desirable outcome, the state needs to regulate and correct. This would include protecting competition through antimonopoly laws, consumers through regulations on product standards, workers through adequate and well-enforced labour legislation, and such vulnerable groups as children and the elderly. It would also include protecting the environment, by banning certain types of pollution and ensuring that polluters pay.

- *Soclal safety nets*--must be in place to catch the victims of the competitive struggle. Sometimes, this support need only be temporary, for the short-term unemployed, for example. But there will always be those excluded wholly or partially by the market: the very young, the very old, the disabled and those with heavy domestic commitments. In several developing countries, such social safety nets include employment schemes

for the unemployed, pension schemes for the old, feeding programmes for malnourished children and mothers, and free basic health and education for all low-income groups.

The need to create people-friendly markets is all the greater now that so many countries have embarked on strategies of economic liberalization and privatization. Many developing countries have already undertaken bold programmes to liberalize trade and finance, reform their taxation systems, deregulate the labour market and reform or privatize public enterprises. The countries of Eastern and Central Europe and the former Soviet Union have been undergoing an even more dramatic transition--from command economies to market economies. The experiences of 11 developing countries and transition economies--Argentina, Brazil, China, Egypt, Ghana, India, Kenya, Malaysia, Poland, Russia and Viet Nam--are analysed in this Report.

One of the most significant aspects of economic liberalization has been privatization. Between 1980 and 1991, nearly 7,000 enterprises were privatized, around 1,400 of them in the developing world, chiefly in Latin America. As one element in a coherent private sector development strategy, privatization can greatly stimulate private enterprise. But mistakes are already being made in the process of privatization. The Report lists "seven sins of privatization": maximizing revenue without creating a competitive environment, replacing public monopolies with private ones, using nontransparent and arbitrary procedures, using the proceeds to finance budget deficits, simultaneously crowding the financial markets with public borrowings, making false promises to labour, and privatizing without building a political consensus.

For economic transitions to be guided by the interests of the people--and for markets to be made people-friendly--requires new patterns of governance centred around the rising aspirations of the people.

4. New patterns of national and global governance are needed to accommodate the rise of people's aspirations and the steady decline of the nation-state.

Pressures on the nation-state, from above and below, are beginning to change traditional concepts of governance. On the one hand, globalization on many fronts--from capital flows to information

systems--has eroded the power of individual states. On the other, many states have become too inflexible to respond to the needs of specific groups within their own countries. The nation-state now is too small for the big things, and too big for the small.

National governments must find new ways of enabling their people to participate more in government and to allow them much greater influence on the decisions that affect their lives. Unless this is done, and done in time, the irresistible tide of people's rising aspirations will inevitably clash with inflexible systems, leading to anarchy and chaos. A rapid democratic transition and a strengthening of the institutions of civil society are the only appropriate responses. Among the many specific steps that must accompany such a transition, the two main ones are to decentralize more authority to local governments and to give much greater freedom to people's organizations and non-governmental organizations (NGOs) --instruments of people's participation discussed at length in this Report.

The decentralization of power--from capital cities to regions, towns and villages --can be one of the best ways of empowering people, promoting public participation and increasing efficiency. Many industrial countries delegate 25% or more of total government spending to the local level. But the governments of developing countries remain much more centralized, delegating only 10% or less of budgetary spending and giving local governments few opportunities to raise funds through taxation or borrowing.

Where decentralization has taken place, it has often been quite successful, encouraging local participation, reducing costs and increasing efficiency. This is evident from experiences all over the developing world-- from the Rural Access Programme in Kenya to the *gram sabhas* in the Indian state of Karnataka and the local bridge construction in the Baglung district of Nepal.

Decentralization also increases the pressure on governments to concentrate on human priority concerns. Given a fair chance, local people are likely to choose ready access to basic education and health care rather than the construction of distant colleges or hospitals.

One danger of financial decentralization is that the richer regions can raise more through local taxation and so will get better services. But experience shows how to overcome this. Brazil allows

states to collect taxes but then redistributes them so that the richer states in the South and South-East get back only a quarter of the taxes collected from them, while the poorer states in the North get back more than twice what is collected there.

Decentralization can, however, end up empowering local elites rather than local people. So, there can never be effective local participation in developing countries without a redistribution of power--if decentralization is to promote human development, it must be accompanied by genuine democracy at the local level.
Another major instrument for people's participation is their organization into community groups. Indeed, people's organizations and NGOs have grown dramatically in recent years, offering a powerful means of correcting the failures of both markets and governments. People's organizations tend to be formed in response to a felt need or a common interest. People might simply form self-help groups to pool their labour, obtain credit or buy goods in bulk. Or they might be responding to a failure by government to provide infrastructure or social services or to a failure of markets to protect vulnerable groups.

Although NGOs have increased in number and financial clout, there have been few systematic evaluations of their effectiveness. In broad terms, they have had a clear impact in four main areas:

- *Advocacy on behay of the disadvantaged*--On such issues as human rights, the environment, women, poverty alleviation and indigenous peoples, NGOs have organized powerful advocacy groups that have changed the thinking of national and international policy-makers.

- *The empowerment of marginalized groups*--In most developing countries, poverty is often caused less by an absolute shortage of resources than by their skewed distribution. NGOs' emphasis on empowerment and their support of people's organizations have often enabled marginalized groups to resist local elites and claim their rights. In many countries, particularly in Asia and Latin America, they have been pressuring governments to provide land for the landless and embark on agrarian reform.

- *Reaching the poorest*--NGOs often manage to reach groups that governments find the most difficult to help, particularly the poorest 20% of the population and those in the rural areas,

where government services may be thin or non-existent. It is doubtful, though, that they reach the very poorest--most NGOs probably miss the poorest 5-10%.

- *Providing emergency assistance*--One strength of NGOs is the ability to respond quickly and effectively to emergencies. Their network of contacts allows them to give advance warning of disasters and urge international action. And their independence means that they can operate in circumstances that are politically difficult for official organizations.

Although NGOs are effective in these and other respects, it is important to keep the scale of their operations in perspective. In the early 1980s, one estimate suggested that NGOs touched the lives of about 100 million people in developing countries--60 million in Asia, 25 million in Latin America and some 12 million in Africa. Today, the figure is probably nearer 250 million and rising--but that is still only a fifth of the 1.3 billion people living in absolute poverty in developing countries.

The small impact of NGOs is also evident at the national level. In Bangladesh, the Grameen Bank, one of the most internationally renowned NGOs providing credit for the poor, accounts for a mere 0.1% of total national credit.

This is not a criticism of NGOs--it is a reminder of a stark reality: NGOs can supplement government but never replace it. The decentralization of government authority and the emergence of NGOs are powerful processes for greater participation by people. But they can be effective only if the overall framework of national governance changes--to become genuinely democratic and participatory.

Let us also recognize that the forces of democracy are not likely to be so obliging as to stop at national borders. This has major implications for global governance. States and people must have the opportunity to influence the global decisions that are going to affect them so profoundly. This means making the institutions of global governance much broader and more participatory. There should, in particular, be a searching re-examination of the Bretton Woods organizations. And the United Nations must acquire a much broader role in development issues. To contribute effectively to sustainable human development will probably require some form of Economic Security Council within the UN, where all nations can

participate on the basis of geographical representation--with none holding a veto --to provide a new decision-making forum.

5. New forms of international cooperation must be evolved--to focus directly on the needs of the people rather than on the preferences of nation-states.

The new emphasis on human security coupled with sustainable development will have to be matched by a fresh approach to international development cooperation.

So far, the basic motivation for donors to give aid has been to win friends in the cold-war confrontation between socialism and capitalism. Some bilateral donors did place greater emphasis on developmental and humanitarian concerns, and so did the multilateral agencies. But in general, the dominant objectives have been political.

More than half of US bilateral assistance in 1991 was earmarked for five strategically important countries: Israel, Egypt, Turkey, the Philippines and El Salvador. Wlth five million people and a per capita income of $1,000, El Salvador received more US assistance than Bangladesh, with 116 million people and a per capita income of only $210. And the strategic significance of Egypt has been such that it received aid of $370 per poor person in 1991. Compare that with just $4 per poor person for India--even though Egypt has nearly twice the income of India.

Bilateral of ficial development assistance (ODA) is badly allocated, showing the considerable potential for beneficial restructuring: Twice as much ODA per capita goes to high military spenders as to more moderate spenders.

- Only a quarter of ODA goes to the ten countries containing three-quarters of the world's poor.

- Less than 7% of ODA is earmarked for human priority concerns.

- Most of the $15 billion in technical assistance is spent on equipment, technology and experts from industrial coun-tries--rather than on national capacity building in developing countries.

Aid is allocated this way because it suffers from the scars of the cold war, from a focus on nation-states rather than on people, from a bias towards the public sector and from a reliance on western development models.

The changed circumstances of the 1990s demand an entirely new approach to ODA:

- *Focus ald on human priority issues*--Aid should be directed at human priority issues, such as health and basic education, and at environmental security and reducing population growth. Clear and specific goals in these areas--identified, implemented and monitored--would obtain greater public and legislative support in donor nations. At least 20% of total aid should be allocated to human priority concerns, three times the present 6.5%.

- *Base ODA allocations on levels of poverty*--ODA should be allocated to people rather than to countries, and it should go where the need is the greatest, to the poorest people wherever they happen to be. For example, the ten countries containing three-quarters of the world's poorest people should get around three-quarters of ODA, not the present one-quarter.

- *Link ODA with mutual concerns*--ODA must be in the mutual interest of recipients and donors. Recipients would be justified in insisting that ODA allocations be guided by their priorities in the fields of human development, poverty alleviation, employment creation and accelerated economic growth. Donors, by contrast, could legitimately link their ODA policy dialogue with their concerns on such matters as human rights, reducing international migration pressures, pollution, nuclear proliferation and drug trafficking--as well as the control of terrorism. Perhaps as much as 3% of aid funds could be earmarked for spending within donor nations to prepare public opinion for these post-cold-war realities and to increase public awareness of the interdependence of the North and the South.

- *Adopt a new people-centred policy dialogue*--ODA should be accompanied by a new form of policy dialogue based on the real interests of people, rather than those of the developing country governments that negotiate aid. This means putting much more pressure on governments to improve the distribution of income and assets, to direct spending away from military towards social concerns and to attend to the larger issues of better national governance.

- *Use technical asslstance for national capacity building*--Technical assistance should be used increasingly to hire national experts, to invest in local institutions and to accelerate human development in the recipient countries. The ultimate criterion for judging the success of any technical assistance programme must be that it has built adequate national capacity and phased itself out over a predefined period.

- *Place ODA in a larger framework of sharing global market opportunities*--ODA can make a significant contribution to developing countries, but it must also be conceived in a larger framework. As the 1992 Report pointed out, developing countries are being denied market opportunities worth ten times the annual flows of ODA. The long-term solution to poverty is not charity. It is more equitable access for poor nations to ~lobal market opportunities.

- *Create a new motivation for aid*--The old motive of fighting the cold war is dead. The new motive must be the war against global poverty, based on the recognition that this is an investment not only in the development of poor nations but in the security of rich nations. The real threat in the next few decades is that global poverty will begin to travel, without a passport, in many unpleasant forms: drugs, diseases, terrorism, migration. Poverty anywhere is a threat to prosperity everywhere.

Women --the non-participating majority

Women, a majority of the world's population, receive only a small share of developmental opportunities. they are often excluded from education or from the better jobs, from political systems or from adequate health care.

- *Literacy* --Women are much less likely than men to be literate. In South Asia, female literacy rates are only around 50% those

of males. And in many countries the situation is even worse: in Nepal 35%, Sierra Leone 36%, Sudan 27%, and Afghanistan 32%. Women make up two-thirds of the world's illiterates.

- *Higher education* --women in developing countries lag far behind men. In Sub-Saharan Africa, their enrolment rates for tertiary education are only a third of those of men. Even in industrial countries, women are very poorly represented in scientific and technical study: in Spain, the ratio of female to male third-level students in these fields is 28%, in Austria 255, and in Canada 29%.

- *Employment* --In developing countries women have many fewer job opportunities: the employment participation rates of women are on average only 50% those of men (in South Asia 29%, and in the Arab States only 16%). Even when they do find work, they tend to get paid much less: in the Republic of Korea, women's wages are only 47% those of men. Wage discrimination is also a feature of industrial countries: in Japan, women receive only 51% of male wages.

Women who are not inb paid employment are, of course, far from idle. Indeed, they tend to work much longer hours than men. The problem is that the work they do, in domestic chores and caring for children and the elderly, does not get the recognition it deserves in national income accounts.

- *Self-employment* --Women's opportunities for self-employment can be restricted in a number of ways. In some countries they are still not allowed to own property, or to offer collateral for bank loans or even to drive.

- *Politics* --In some countries, women are still not allowed to vote. And women almost everywhere are underrepresented in government: in 1980, they made up just over 10% of the world's parliamentarians and less than 4% of national cabinets. In 1993, only six countries had women as heads of government.

- *Health* --Women tend on average to live longer than men. But in some Asian and North African countries, the discrimination against women -through neglect of their health or nutrition- is such that they have a shorter life expectancy. Indeed, comparing the populations who should be alive, based on the global mortality patterns, it seems that 100 million Asian

women are "missing".

One of the greatest health risks for women in poor countries is childbirth. Maternal mortality rates in the developing world are more than 15 times higher than in the industrial countries.

- *National statistics* --Women aRe often invisible in statistics. If women's unpaid housework were counted as productive output in national income accounts, global output would increase by 20-30%.

Women in Japan

Japan, despite some of the world's highest levels of human development, still has marked inequalities in achievement between men and women. The 1993 human development index puts Japan first. Buth when the HDI is adjusted for gender disparity, Japan slips to number 17. Here is why:

In education, the tertiary enrolment ratio for females is only two-thirds that of males.

Similarly in employment, women are considerably worse off. Women's average earnings are only 51% those of men, and women are largely excluded from decision-making positions: they hold only 7% of administrative and managerial jobs.

their representation is even lower in the political sphere. women obtained the right to vote, and to be elected to parliament, only after the Second World War. Yet today, only 2% of parliamentary seats are held by women, and at the ministerial level there are no women at all (compared with the 9% average for industrial countries and 13% for the other countries of Asia). Nevertheless, one or two women have achieved important political positions, and a number of women were among the founders of the Social Democratic Party.

In legal rights in general, Japan's patrilineal society is only gradually changing to offer women greater recognition and independence. Only in 1980 were the inheritance rights of Japanese women raised from one-third to one-half of their late husband's property (the rest goes to the children). And in other aspects the law is still not gender-neutral. Thus, the legal age of marriage is 18 for men, but 16 for women. And after divorce, a

man can remarry immediately, but a woman has to wait six months.

Japan now has political and non-governmental organizations pressing for change. The League of Women Voters, for instance, is lobbying for a correction in the disparity of seat distribution in parliament, and for a greater participation of women in policy-making.

Source: United Nations (1993)
Human Development Report 1993.
New York: UN Development Programme.

3. Collecting data on Women in Development

Why are Statistics Needed?

Women's Groups and Organisations

- To measure and understand the situation and status of women.
- To assist in identifying the most disadvantaged groups of women.
- To measure progress and the changes in the situation and status of women.

Government Ministries

- To measure and understand the situation and status of women.
- To assist in identifying the most disadvantaged groups of women.
- To assist in the formulation of policies and programmes designed to improve the situation and status of women.
- To monitor changes and measure the impact or effectiveness of policies and programmes.

Semi-government and Non-government Organisations

- To measure and understand the situation and status of women.
- To assist in identifying specific programme target groups.
- To assist in planning, implementation and monitoring of specific programmes relating to the situation and status of women.

Universities and Other Researchers

- To provide basic teaching and research material on the situation and status of women.
- To assist in identifying specific problem areas in which research would be useful.
- To encourage institutional support for national policies relating to improving the situation and status of women.

United Nations and Other International Organisations

- To measure and understand global and regional patterns relating to the situation and status of women.
- To assist in developing global and regional programmes to

improve the situation and status of women.

- To highlight specific areas in countries for which technical assistance and financial support could be provided.

Other Individuals and Organisations

- Provide a basis for responding to specific requests for information on the situation and status of women.

Use of Data on Women

Appropriate socio-economic statistics and indicators on women al necessary to improve the status of women. Because appropriate statistics on women are not available, women's needs are not adequately considered in the planning of many development initiatives. O a smaller scale, relevant data on women is also requires to support proposals for individual projects which involve women.

Although statistical data can be biased, it is readily accepted as a objective measure. Statistical information provides a means of making comparisons between different groups, allowing relative disadvantage to be identified and quantified. Statistical data also permits quite small changes to be monitored over time.

Statistics on women play an important role in the process informing women about their own status and in informing society about the need to improve women's status. This educational role of statistic is important because it is the attitudes of society which largely determine the status of women.

Data Needs

Employment

A major area of concern is employment. Data is needed on women's economic activities, on their occupations and on the income they earn. Give that many women live in rural areas with a subsistence lifestyle, it important that the data adequately cover employment in the information sector. Unfortunately, informal sector data is poor even for males.

Education

Another major area where statistical data on women is required is education, especially women's access to education and educational attainment.

Demographics and Health

Demographic and health data on women also provide useful indicators of women's status. For example, early marriage and child bearing are associated with low status, as are high birth rates and high mortality. Information on nutrition, morbidity rates and access to medical services also might be required.

Other Needs

There are many other areas in which statistical data on women are required for effective measurement and monitoring of the status of women. These cover the legal, political and social aspects of women's lives. For example, data showing the incidence of violence against women may be needed in order to convince others of the scale of this often-ignored crime and the need to deal with offenders. The number of women holding local or national political positions, or other public offices, might be necessary for monitoring purposes. Information on services and facilities available to women also may be required.

It should be noted that wherever data on women is produced, parallel data on males should also be produced, if applicable. The status of any person or group is measured by comparison with other persons or groups, and in the case of women, the comparison is made with males. Where data, such as fertility rates, apply only to women, international comparison is appropriate.

In some instances, there is a need for data on a special group of women who have a different status due to a particular characteristic. Examples include childless married women, unmarried women, very poor women, illiterate women, professional women, widowed women, disabled women, migrant women or women with an absent, migrant spouse.

Data Sources

Much of the data on women is obtained from population censuses and from household surveys.

Censuses

Population censuses usually provide quite comprehensive demographic information on women, including marital status, fertility and mortality rates. (In some countries, vital registration data also provides this information). In addition, a census provides information on employment, educational attainment, as well as a whole range of other potentially useful information including ethnic origins, religion, household structure, and migration. However, a census will not provide very detailed data, because the costs involved in surveying the whole population prohibit detailed questionnaires.

Household Surveys

Household surveys provide more detailed data than censuses, and in urban areas include income and expenditure surveys, and employment surveys. When rural surveys are conducted, they almost invariably take the household as the unit of production. As a result even if women's economic activities are listed (and they rarely are) women's contribution to the economy is not obvious.

In some countries, agricultural censuses have been carried out. These are a potential source of valuable information on the rural economy, but to date have not been used to produce information on the activities of individuals.

Administrative Records

Administrative records may provide valuable information on women, although they may not be published or classified by sex. However sex may be obvious from people's names.

Making the Best Use of Currently Available Data

It must be recognised that there already is a great deal of data available which indicates the socio-economic position of women. Most of this data has not been exploited. Not only is it important to use already-available data, but also no serious request for additional data can be made until existing data has been thoroughly explored. It is thus a priority to examine all existing sources of data. In doing so, women's leaders will not only gain a better understanding of the situation of women, but also they will develop the knowledge necessary to define which data should be gathered.

Each country should create a central information centre where

relevant data on women can be stored and made available to a wide range of users. The development of a central database will help identify gaps in statistics on women so that positive action can be taken to fill the gaps.

The location of such a database will depend on the availability of resources--financial, physical and human. However, wherever the database is located, representatives of women's groups should collaborate with statisticians in planning the design and use of the database.

Also every effort should be made to identify existing data in order to minimise the cost of creating the database.

Distributing Available Data

Every country should try to produce a short pamphlet (about ten pages long) containing basic data on women taken from censuses and surveys. This pamphlet should cover demographic characteristics, education, labour force participation and Income. This pamphlet will help spread knowledge about women's status and Indicate gaps in Information about women.

Improving Data on Women in Development

The low status of women and the poor quality of data on women is of course inextricably linked. The fact that women have low status means that data on women has low priority, which in turn means that data is not available to support the case for improving women's status. The production of data on women has low priority, not only because women have a low status, but also because resources for the production of statistics in general are scarce. It is important to break this cycle.

One of the ways to improve the quality of data on women lies in increasing communication between statisticians and women's leaders, so that each has a better understanding of the Issues which concern the other. Women's leaders should be involved in defining the content of census and survey questionnaires, for example. If women were trained in the use of statistics and felt able to communicate with statisticians, and if statisticians understood better the needs of women concerning data, more appropriate data might be produced.

Special Unit

Ideally, a special unit responsible for women's socio-economic statistics and indicators should be set up within the government

with representatives from departments working with statistics, planning, women's issues, etc. However, if it is not possible to have a special unit in the government, then a group of academics, voluntary workers, and women statisticians could be asked to set up a women's unit. The special unit should make sure that:

- Methods for collecting and analysing socio-economic statistics about women are continually reviewed and improved.
- Data is relevant to women's concerns and cover women in all socio-economic groups and categories.
- Socio-economic indicators about women are produced and well publicised.

In summary, the following points should be considered in order to improve the range of data of women:

- Identify women's activities both inside and outside the home and break main activities into smaller components to get complete statistics on various aspects of women's work.
- Encourage collection of non-traditional data sources. Some data may be overlooked if it is usually assumed to be about women's personal concerns. In fact, data on child care, unemployment and under employment among married women are increasingly accepted as social concerns, not Just personal concerns.
- Establish data priorities and focus on the particular agency in the government responsible for collection. For example, maternal mortality data from the department dealing with health; household survey data on the hours spent carrying water from the department responsible for water supplies (by sex and in the wet and dry seasons).
- Organise discussions with people who benefit from programmes and projects in order to identify issues as well as data needs. Emphasise the benefits of participatory research and data gathering in order to obtain valid data and mobilise people for participation.
- Since existing data may over represent the educated, urban elites, emphasise improving data collected about the majority of women in a nation, especially the rural poor.

Regional Exchange of Information

Even where useful data does exist in published form, it has not been utilised by women. This problem occurs because women's leaders have not been adequately trained to use statistical information. This is not to suggest that women's leaders should be

trained statisticians, but they could benefit from some basic statistical knowledge and an appreciation of the uses for statistical information. Training for women in statistical communication is clearly needed. It is worth repeating here that it is not the responsibility of statisticians to make use of and generally analyse data on women: it is the role of women's leaders to place the data in context and to use and disseminate it as they see fit.

Although there is a moderate body of statistical information on women already in existence, this data could in many cases be improved to make it more appropriate to the needs of women. This is particularly important for data on women's employment, which is needed for the integration of women's concerns into the economic sections of development plans.

One of the ways of encouraging the better use and production of statistical information on women is through the regional exchange of information. One suggestion would be to organise regional meetings on a regular basis (say every two years) specifically concerned with monitoring the status of women. This would cover two aspects: first, the actual status of women, and changes in that status, and second, methods of measuring and monitoring the status of women including identifying data needs and improving data utilisation. Such meetings would require detailed country reports on both aspects of data management. Although such a meeting might begin with very modest aims, over time expertise could be developed.

Finally, in addition to establishing a database on women, consider giving an award or plaque to the government office which makes the most progress in improving data on women. This event could be publicised by having a prominent woman present the award.

Source:
United Nations. (1991)
Training Manual on the Technical Processing of Information Concerning Women in Development.
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Session One

Available Statistics and Indicators on Gender Issues

Session One -- Available Statistics and Indicators on Gender Issues

Objectives:

- To assess the quantity and quality of available statistical data on gender/women's issues
- To identify and define some of the conceptual problems that affect the reliability of existing data
- To draw-up strategies for improving statistics and indicators on gender issues

General format of the session

As reflected in the agenda, the session will be conducted through lectures, country presentations, and group and plenary discussions.

Introductory lectures will be given by the trainers.

Each team (from participating country/region/province) will be to present their country papers (based on the results of the pre-workshop Exercise II).

Group Work 1-1

Group discussions will follow country presentations. The main objectives of the group discussion are:

... to identify issues and problems concerning availability and quality of statistics/indicators on gender issues

... to formulate recommendations or strategic solutions to each corresponding issue or problem identified.

Each group may be composed of participants from different countries/region or provinces and may have selected different topics for their paper. In cases like this, the group is encouraged to discuss the most common and urgent conceptual and methodological issues that need to be addressed in compiling, processing and analysing data related to each topic relevant to the group. To facilitate the discussion, Table 1-M has been prepared to assist the participants in summarising the conclusions and recommendations of the group.

For the group discussion, the participants will be divided into several groups of no more than six members each. Each group will be guided by a moderator elected or selected by its members. The main responsibilities of the moderator are outlined in the following page.

Immediately following the group discussion, the moderator of each group will have to present the results of its session. It is recommended to use Table 1-M for a guided presentation.

Table 1-M

Topics	Indicators	Issues/Problems	Strategies or Recommendations

Responsibilities of the Moderators:

1. Convene the group discussions on time
2. Ensure that all the members are present and actively involved in the discussion
3. Guide the group in understanding the objectives of the session and setting the procedure to be followed during the discussion
4. Facilitate the discussion and ensure that the focus of the discussion is maintained
5. Ensure that Table 1-M is completed and the summary of the group discussion and conslusions is prepared
6. Present the group report at the plenary session

Session Two

Gender-sensitive Statistics and Indicators: Tools for Developing Framework for Gender Analysis in Policy

A Women in Development Model
Statistical Simulation Model

Exercise III

SESSION TWO: Gender-sensitive statistics and Indicators: Tools for developing a framework for gender analysis and policy

Objectives:

. To raise awareness of planners, decision-makers and technical experts on the importance of gender-sensitive statistics and indicators in policy designs and programme planning

. To illustrate some statistical tools and framework for analyzing and integrating women/gender issues in mainstream development process

General format of the session

Lectures will be given to highlight some of the general guidelines or strategies set at international level for improving statistics and indicators on gender issues. Recommendations contained in the Platform for Action will be specifically highlighted and discussed.

In introducing the importance of gender-sensitive statistics and indicators in designing policies and development programmes, a lecture/demonstration of the WID model prepared by INSTRAW and DESIPA will be given. This model is explained in the following pages of this section.

Participants are encouraged to read and study the explanatory text, particularly the assumptions/hypotheses applied in constructing the statistical model.

Following the lecture, the participants will be divided into several groups, (not more than four members in each group) for hands-on exercises.

Group Work 2-1

For the hands-on exercises, each group will be assigned a computer with LOTUS-123 or QUATTRO PRO alreay installed. In this section of the training manual, two diskettes are provided which contain computerized simulated WID model, one is prepared for urban sector and the other for the rural sector. Step-by-step instructions on how to run the programmes contained on the diskettes are provided in the following pages as well.

Once the model and the programme are understood by the participants, country-specific data will be applied in the model. The data required for this exercise include the following (Note: these data should have been collected as part of the pre-workshop exercises):

1. education by sex
2. access to capital by sex
3. access to land by sex
4. acces s to extension services by sex
5. market wage bys sex
6. control of own income by sex
7. family planning practices (prevalence)
8. % of men's income for home

The relative status of women to men in each of the abovelisted variables should be determined using ratios. The application of these information into the model is contained in this section of the manual.

At the end of the hands-on exercises, the participants are required to prepare written report reflecting the following:

1. usefuleness of the UNWID Model, in terms of

    a. understanding the importance of gender-specific statistics and indicators in analyzing the factors that affect development policies and objectives

    b. deriving gender-specific indicators from raw statistics

    c. formulating assumptions and hypotheses when establishing development models which takes into account gender perspective

2. an analysis of the quality of statistics used in the exercise

3. an analysis of the WID situation in respective country/region or province, based on the set of indicators derived and the application of the model

4. recommendations on how to further improve the quality of statistics and indicators on gender issues

This report should be submitted to the trainers which will serve as basis for discussion.

UNITED NATIONS

MODEL FOR: WOMEN IN DEVELOPMENT

FOREWORD

One of the main features of the last three United Nations Development Decades has been the central role of women in all aspects of development. As United Nations agencies have sought to assist governments in development planning, UN technical advisers have been learning increasingly that socio-economic planning that does not account for the contribution of women to development through their reproductive and productive roles cannot lead to sustainable development. Unless women become equal partners with men --both as contributors and beneficiaries-- development programmes cannot yield the desired results. Gender is a crucial variable in the development formula.

Since 1975, when the first women's decade was inaugurated, the entire UN system has tirelessly supported the efforts of member countries in making women active participants in the development process. The number of conventions, strategic plans and actions implemented since then are a testimony to the unwavering support the United Nations has lent to women's advancement.

The technical cooperation programme of the United Nations has a substantial and far-reaching mandate to promote women in development (WID) issues. The United nations Department for Economic and Social Information and Policy Analysis (DESIPA), and its predecessor organizations, have always assigned the highest priority to women's roles and issues connected to women in development. Promotion of WID has been sustained, despite limited resources and in the face of a dramatically increasing demand for technical cooperation.

One operational area which is of the highest priority to the United Nations --human resource development through training-- has always claimed priority in technical cooperation despite scarcity of means. DESIPA's specific measures to promote women in development have entailed efforts to design training tools and raise awareness on issues of concern.

Women have always contributed to survival, sustenance and development. However, the scope and measured value of that contribution has remained modest, and women have been viewed as passive contributors --unseen, unacknowledged and invisible. In effect, women's potential for genuine economic contribution has remained untapped, and women often have been deprived of the benefits of change and progress.

Like many other international, governmental and non-governmental agencies, DESIPA is keenly aware of the urgent need to raise awareness of women's role in development. The Task Force on Women in Development which was established under the chairmanship of Ms. Dunja Pastizzi-Ferencic, Former Director of the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW), has adopted an approach to raise the awareness of women's issues in development, as well as to ensure that WID issues and concepts are translated into action and incorporated into concrete programmes. With regard to these models, one strategy is to establish analytical training tools that provide a framework for logical and consistent thinking about WID issues. The second is to raise awareness among planners, policy makers, politicians, administrators and government decision-makers about such issues by

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I. INTRODUCTION

Issues related to "women in development" (WID), or more specifically, the contribution of women to national socio-economic development in the Third World, have received increasing attention in the last two decades. This is especially true since the 1975 International Women's Conference in Mexico. Many studies have attempted to document the quantitative contribution of women. Many writers have attempted to provide a theoretical rationale as well as empirical evidence for the proposition that improving the role of women in various ways can be beneficial or even necessary for development to take place. The arguments are many, and it is not the purpose of this study to summarize the findings to date. Interested readers, however, may find a sample of these studies in the bibliographic references in Appendix 4 of this report.

In the developing countries, where action is taking place, hundreds of well-intentioned women-oriented development projects are now being financed by donor agencies in an effort to capitalize on the potential contribution of women. In general, development planning is paying more attention to the role of women. It can be expected that, as more studies are undertaken to analyze the role of women in development, increasing emphasis will be put on re-assessing development projects to fully involve women in the process.

In spite of all this interest in WID, there still is no clearly defined analytical model which permits a systematic assessment of women's contribution to social and economic development. The model discussed here is a very modest attempt to capture some of the economic elements of the potential contribution of women to the development of an economy. The model is limited to examining women's role in an agricultural household. Since the vast majority of Third World women live in rural areas and their families subsist on agricultural production, this model will be relevant to a large proportion of the population.

Another reason for such "stereotyping" is that the contribution of rural women has been traditionally left out of formal analysis because their activities are mostly non-market-oriented. As an "awareness raising" model, it is important to highlight the often understated contribution of these women. The model is conceived at the micro level (i.e., the household) and therefore it faces the same problems as any micro model — aggregation of results from the micro to the macro (i.e., regional and national level use), is justified only under certain conditions.

The purpose of the model is to provide an analytical device which can show the affect of various policies in the arena of women in development on social and economic progress. It is a model that demonstrates an analytical framework with which WID issues can be imaginatively and logically discussed. It is, in essence, an example of such analysis. The model is useful for training participants in workshops and

PURPOSE

- Provide a training model for WID
- Raise awareness of WID issues
- Provide a framework for analyzing WID

BASIC ASSUMPTIONS OF MODEL

1. Sexual division of labour
2. Sexual division of productive activities
3. Sexual disparity of resources
4. Unequal economic power leading to adverse effect on productivity
5. Women spend much time in non-income activities
6. Fertility related to education, labour force participation, family planning

FEATURES OF MODEL

- Household (micro) level model
- Comparative static model
- Rural, agricultural family

MAIN INPUTS

- Education level
- Share of Control of women's income
- Access to capital and land
- Share of men's income going to the home
- Access to family planning
- Access to agricultural extension
- Level of Market wage
- Prices of agricultural products
- Amount of product marketed
- Amount of time available

MAIN OUTPUTS

- Production
- Cash income
- Time working in agriculture
- Time working in market wage job
- Time working in non-income homework
- Index of family welfare

II. THE MODEL

A. Background and main assumptions

As already mentioned, there are a number of elements that one would ideally like to have included in a general WID model. For the purposes of teaching a method with minimal complications, the scope here has been limited to a few key aspects. After all, the function of a model is to simplify reality so that interrelationships among the factors involved become easier to understand. In theory, one can add more elements to a model to more closely approximate real life, but there is always the risk of the model becoming so complicated and intimidating that it could turn out to be a veritable black box. With this "trade-off" in mind, the model constructed is a compromise. More specifically, it is built on a few assumptions, which are stylized facts observed in many developing countries. No claims are made, however, that these assumptions accurately describe the situation of women in any particular country.

To keep the model simple and well-focused on the role of women, assumptions regarding the contribution of men have been simplified, but not denied or overlooked. What is intended in making these assumptions is to highlight the role of women, other conditions being equal. The aim is to prove how government policies aimed at strengthening women's role can improve the welfare of families. From an analytical point of view, the assumption regarding men's contribution is justified because (1) calculations are greatly simplified, and (2) the model's validity is not compromised, since men's contribution in the areas included in this model is not negated or impeded by policies directed at women.

The basic assumptions of this model are discussed below:

Assumption 1: There is a sexual division of labour.

This assumption implies that for a given productive activity (e.g., growing crops), men's and women's tasks vary. For example, men may clear the land and plant the crops, and leave weeding and harvesting to women.

Assumption 2: There is a sexual division of productive activities.

This assumption is based on the observation that men and women are often engaged in different productive activities in agriculture. For example, in West Africa women have their own crops, which they tend (as opposed to predominantly "male" crops). Similarly, women are usually responsible for the care of small animals (chickens and goats) whereas men tend the larger animals (cattle). Women grow crops used for family consumption, such as garden vegetables and other staples. Men's crops are often cash crops that are mainly for the market. Sexual division of labour also applies to the kind of activity in which men and women engage. Women, more than men, engage in handicrafts, which are both used

earning activities as child care and housework. Compared to women, men spend considerably less time on such home activities. These non-income earning activities have social value, yet are overlooked in the measurement of gross national product (GNP) or other development indicators that are conventionally used. The actual amount of time a woman spends in such activities is directly influenced by the size of her family. Therefore, family size also affects the amount of time a woman spends in other activities, such as agriculture or market wage-earning employment. The model also takes into account the amount of time men spend on household activities, which is assumed to be a small proportion of the time women spend on these activities.

Assumption 6: Fertility is related to women's education, labour force participation and access to family planning services.

Almost all studies of the determinants of fertility show that female education and labour force participation are important factors in determining fertility. Since family planning services provide knowledge and means for controlling fertility, there is a direct correlation between access to such services and fertility. Family planning practice involves both men and women. However, it is observed that the intensity of practice is higher on the part of women than men. In this model it is assumed that the proportion is 1:5 for men to women.

B. The structure of the model

In this section, the structure of the model is defined and relationships among the variables are explored. Relationships are expressed as mathematical equations. An attempt is made to explain the significance of each parameter and the rationale behind each one of the expressions.

The present model differs from most other computer models which have been developed for analyzing issues in developing countries (such as the United Nations Population and Development Simulation Game) in two important aspects.

First, it is not a macro model with variables defined at the national or regional level. It is a household, or micro level model. Many WID issues, especially in the rural agricultural sector, can be better identified and defined at the micro level, and it is at the grassroots level that policy interventions are urgently needed and are also likely to become more effective. This does not exclude macro analysis, but aggregation from the micro to the macro level entails another step not considered in this model.

Second, the model is a static model — a time dimension is not present in it. This does not imply that comparison over time is not possible. One can compare the final outcome under different policy options and derive conclusions, such as, "if policy A is changed, the resulting effects will be...." But the model does not reveal the amount of time it actually takes to implement policies or for their effects to fully materialize. Nor is the mechanism through which policies are implemented discussed. Put simply, this

The term "retained income" refers to that part of the income over which the earner has control. (Yf and Ym, which we will define later in this chapter, are retained incomes). For ease of use and understanding, many of the above variables are employed in the model as index variables above or below 1, relative to a reference level. The reference level can be relative to men's standard as in the example, and at the same time it can be for a specific scenario to permit comparison with others. Index numbers represent relative values rather than absolute levels. By indexing these variables, computations are simplified since the numbers become much smaller. This also facilitates comparison of the impact of changes in policies between different scenarios or countries. For example, a situation where "women's education is increased by 50%" is more general than one where "government funding for women's education is increased from $10 million to $15 million." By indexing variables, it is possible to allow for country-specific reference levels to be used without changing the structure of the model. For example, in some countries the reference level of education for women (index value 1) may be two years' primary schooling while in some others it may imply finishing five years of primary school. The model, however, can be used in analyzing the impact of raising female education in either group of countries.

The main endogenous/dependent variables are:

- Total agricultural output produced by women/men (Of/Om);
- Total cash income that women/men earn (Yf, Ym);
- Total time spent on agricultural production by women/men (Lf, Lm);
- Total time spent on market employment by women/men (Mf, Mm);
- Total time spent on home work by women/men, averaged by the size of the household (Hf, Hm);
- Family size (S); and
- Household welfare index (U).

By manipulating the model's exogenous variables, users can explore their impact on the model's main endogenous variables. Many of the exogenous variables are the model's equivalents of policy interventions.

The first element inside the bracket is a constant term (0.2), which is not related to wage rate. It represents the amount of time one will allocate to market wage employment independent of wage rate because one needs cash income to purchase necessary personal or household items not produced by any member of the family. The term 0.1 w captures the positive relationship between the portion of one's time spent in market employment and wage rate. As a whole the main implication of this equation is that a person devotes 80% of his/her time or a percentage determined by the expression (0.2 + 0.1 w), whichever is smaller, to market wage employment. In other words, a person decides what proportion of his/her time is to be used for market wage employment when a wage rate is given, with the constraint that it will not exceed 80%. This 80% limit is set because in the present model the household is rural and therefore a person has to reserve some time for farming on his/her own piece of land and also for house work. Nonetheless, 80% is an arbitrary limit used to illustrate the point and, therefore, should not be taken as fixed. In reality, this limit is determined by social as well as cultural factors such as the degree of self-sufficiency and cultural stigmas against women working outside the home.

Next, the amount of time spent in home activities is taken as a function of the size of the family. Home activities include child care, food preparation, water and fuel gathering, and can include tending small animals such as chickens and goats. Based on empirical observations of traditions and customs, it is assumed that men spend less time in home activities than women do. Therefore, the expressions used to determine the percentage of time spent in home activities are:

$$hf = 0.1 + 0.05\ S, \text{ and}$$

$$hm = 0.01 + 0.01\ S.$$

In these equations, h is the proportion of one's time spent in non-market, non-crop, home activities, and S is the size of the family. This formulation needs very little explanation.

Finally, the amount of time remaining will be used for agricultural production. Therefore, the expression for calculating this residual is $l = 1 - m - h$, which applies to both sexes.

Now, to summarize the use of time among three different components:

1) Amount of time allocated to market employment

   $M = m.T = \text{Min}\ [(0.2 + 0.1\ w), 0.8].T$

2) Amount of time devoted to household chores

   $Hf = hf.T = (0.1+0.05S)T$

   $Hm = hm.T = (0.01+0.01S)T$

3) Amount of time spent in agricultural production

   $L = l.T = (1 - m - h).T$

$Of = [Lf.Ef.vf + Lm.Em.(1-vm)]^{0.4}Kf^{0.3}Af^{0.1}gf^{0.1}Rf^{0.2}$, where

Of = total agricultural output produced by women;

Lf = total time spent on agricultural production by women;

Ef = female education level;

vf = % of female agricultural time spent on own crop;

Lm = total time spent on agricultural production by men;

Em = male education level;

vm = % of male agricultural time spent on own crop;

Kf = as defined in the list of exogenous variables;

Af = access to agricultural extension services for women;

gf = share of women's income controlled by women; and

Rf = amount of land available to women.

It may be noticed that both women's and men's education enter the production function. This is because the level of education acts as a "quality" index and so positively affects production in conjunction with the level (or quantity) of labour. The term (Lf.Ef.vf) gives quality-adjusted labour input contributed by women; vm is the percentage of men's agricultural time devoted to men's own crop. Hence (1-vm) is the percentage of men's agricultural time used to help women in women's crop. For instance, men may spend some time to clear the land and to plant the crop for women, as was assumed earlier. Then the term (Lm.Em.(1-vm)) represents the quality-adjusted labour input, to the production of women's crop, made by men. Thus, the term inside the brackets is the total quality-adjusted labour input, both by women and men, in the production of women's crop.

The other terms in the equation are self-explanatory. Kf is the capital input, Rf is the land input, and Af and gf are the other two non-traditional inputs, namely agricultural extension services and the incentive factor. The small constants represent the productivity, or productive power, of each factor. They appear in the equation as the power parameters in the exponential expressions. In this functional form, an increase or decrease in any particular production factor will have an effect on the total output modified by its power parameter. A greater power parameter means the greater impact a change in input will have on total output. The difference in the magnitude of these constants thus represents the difference in the productivities of different factors, or the contribution of each factor to total output.

By strict analogy, men's production function is expressed as:

$$Om = [Lm.Em.vm. + Lf.Ef.(1-vf)]^{0.4}Km^{0.3}Am^{0.1}gm^{0.1}Rm^{0.2}$$

wf = wage rate earned by women in market employment in percentage. (See how wage rate is determined in Section C of this chapter, page 8.)

Since most of women's production is consumed by the family, only a portion will be marketed for cash. (Of.Pf.df) gives the total income derived from selling this fraction of women's production in the market. Out of this income women control gf percent. Therefore, the first term in the formula helps calculate the cash income that is derived from selling some of women's production which is actually controlled by women. The rest of the income derived from women's production goes to men's account because women do not have total control over the fruits of their labour. By the same token, some income derived from the sale of men's production may become available to women. This may be compensation for the work women have done to help men with their crop or to market men's production for them. The term (Om.Pm.dm.(1-gm)) in the Yf equation captures this element. It may be noticed that (1-gm) represents the fraction of income from selling men's crop that is actually controlled by women. The presence of this term does not contradict Assumption 4, which states that there is a sexual inequality regarding economic power. This inequality lies in the magnitudes of gf and gm. A small gf (female control) and a large gm (male control) imply inequality.

Since wage rate is defined in terms of a fraction of the market value of one's production, the product (Of.Pf.wf) is the wage level for female market employment. Multiplying the wage level by the amount of time women spend on such employment (Mf) gives the female income derived from wage employment.

To recapitulate, in the female income equation, the first term on the right side is the cash income under women's control — retained income — derived from the sale of the portion of women's output not consumed by the family; the second term represents the income under women's control derived from the sale of the portion of men's crop not consumed by the family. These two terms give the total cash income derived from the sale of agricultural production. The last term captures cash income derived from women's market employment.

The equation for male cash income is an exact duplicate of women's income equation, with subscript "m" "f" interchanged. Therefore, only the equation is given without further detailed term-by-term explanation.

$$Ym = Om.Pm.dm.gm + Of.Pf.df.(1-gf) + Mm.Om.Pm.wm.$$

It is to be noted that Ym is used in the final equation where a part of men's income has been used as contribution to family expenditure.

as a summary of the model's outcome under one set of policy interventions, with a given set of parameters, so that different policy alternatives can be compared. Unlike some micro-level models, the household welfare function here is not an objective function of a welfare-maximizing model. When the present model is solved, it does not automatically search for the highest value of this function subject to the other relationships. If one did not consider the financial and social costs and other constraints involved in each policy option, the index, in principle, could be increased indefinitely.

The welfare index is a function of three main components of household welfare — cash income used for the household, agricultural production retained for household consumption and the amount of time spent in home activities. Although these are not the only factors that affect the well-being of a household, others are not being taken into account for the sake of manageability and because of the illustrative nature of this model. It, nevertheless, captures the essence of household welfare. Income and home consumption summarize the production side of the model, and any policy change that affects women's and men's production will be reflected through these two components. The amount of time spent in home activities which captures the level of physical well-being of the household is a function of family size and is influenced by family planning, women's education and economic participation. The household welfare index is, in fact, the outcome of a utility function (a device economists use to measure the satisfaction derived from consuming goods and services) which has weights attached to each of its components. Users can change these weights to reflect their own priorities. If a component is considered to be unimportant, a zero weight can be assigned to it. Similarly a component with high priority can be given a greater weight. By assigning different weights one can compare the values of the index to see how the ranking of policies will change even if all other factors (policy as well as parameters of the model) are held unchanged.

The household welfare function is expressed as:

$$U=[Yf + s.Ym]^{w1}[Om(1-dm)+ Of.(1-df]^{w2}(Hf+Hm)^{w3}, \text{ where}$$

s = share of men's total retained income going to the home;

Hf = women's total time spent at home, averaged by the size of the household;

Hm = men's total time spent at home, averaged by the size of the household; and

w1, w2, w3 = weights assigned for each component of household welfare (exogenous).

All the remaining variables are as defined earlier.

It is easy to recognize that the first term (Yf + s.Ym) is the income component of the household welfare. It has been repeatedly observed in developing countries that most, if not all, of women's income is spent on the household. Women use their income to cover expenses for nutrition, clothing for the family, etc. Because women traditionally engage in production activities that require a very small investment, they contribute the bulk of their income, whatever its size, for the welfare of the household. This is the

econometric estimation. However, it is doubtful that appropriate data exist. National statistical and demographic yearbooks normally do not provide the kind of micro data required for such estimation. Specially designed household surveys have to be conducted to collect the necessary data. (Please see Appendix 3 for the important variables that should be included in surveys.) Alternatively one may use a combination of individual country studies which can be distilled into "stylized facts" for a set of stereotype countries.

In the present study data from a variety of sources have been used to establish a base solution for the model. While many of the parameters are "reasonable" for many developing countries, there is enough variation across countries and even within countries to suggest that a data bank of parameters needs to be established and a data base of solutions derived from the data bank. It is beyond the scope, however, of the present study to establish a data base for a set of real countries.

As pointed out in the introductory chapter, this model is constructed as a tool for teaching the user a method to conceptualize and possibly analyze issues connected with women in development, rather than provide practical solutions. If one can master the method presented in this model and apply it for solving the problems in his/her own country by modifying or expanding it, the primary objective of this model will have been achieved.

	ROWS	COLUMNS		
		A B C	E F G	H I
Headers	1 . . . 6			
Endog. Variables	7 8 : 26 . . 30			
Exog. Variables and Parameters	31 : : 59	For the current solution		For the reference solution

In the first panel (columns A to C), the current solution is presented. A reference (or baseline) solution is saved in columns H and I. The percentage changes between the current and reference solutions are provided in columns E to G.

In the upper left part (rows 7 - 30) of the current solution panel the values of the model's endogenous variables for the current solution are found. In the bottom left panel the values of the model's exogenous variables and its parameter values (rows 31 - 59) are found.

Similarly for the reference solution, the values of the endogenous variables are found in the same rows (7 - 30). As in the current solution panel, the values of the exogenous variables as well as of the parameters, which were used to establish the reference run, are presented in rows (31 - 59). Unlike the cells in the current solution panel which contain the 1-2-3 formulas for calculating endogenous variables, the reference run panel contains only values, because these are the results of the application of the same formulas.

The model contains simultaneous relations between variables. To solve the model, the spreadsheet iterates several times before arriving at a solution. This is done through the "recalculation" command with iterations set, for this model, to 10. Users are advised not to change the status of the recalculation mode.

If users wish to establish a new reference run, the exogenous variables and parameters should be

TABLE 1A

Reference Run
Value of Exogenous Variables

Exogenous Variables	Men	Women
Education (E)	1.0	0.4
Capital (K)	1.0	0.6
Land	1.0	0.5
Extension Services (A)	1.0	0.7
Market Wage as % of Agr. (w)	1.0	0.6
Control of Own Income (g)	1.0	0.7
Prices (P)	1.0	1.0
% Prod. Marketed (d)	0.8	0.2
Family Planning (FPP)	0.2	1.0
% of Men's Income for Home	0.1	

Table 1B on the next page shows the solution to the model for the Reference Run. Different patterns of time use can be noted between men and women. These are within the range of values as reported in Dixon-Mueller (1985). The base solution family size is set at 5.64, representing a relatively high level of fertility, but an (as yet) incomplete family.

TABLE 2

Impact on Household Welfare of Increasing Women's Education to the Same Level as Men

Allocation of Time	Men	Women	% Changes	
Pct.Time Home Activities (h)	6.14%	35.71%	-7.44	-6.46
Pct.Time Wage (m)	0.00%	26.00%	0.00	0.00
Pct. Time Ag. Production (l)	63.86%	38.29%	0.78	6.89
% Ag.Time Own Crop (v)	90.00%	80.00%	0.00	0.00
Time Use (Day equivalents)				
Total Available (T)	00.00	300.00	0.00	0.00
Wage Employment (M)	90.00	78.00	0.00	0.00
Home Activities (H)	18.43	107.13	-7.44	-6.46
Ag. Production (L)	191.57	114.87	0.78	6.89
Tot. Agric.Production	82.48	45.76	3.41	34.03
For Market	65.99	9.15	3.41	34.03
For Home	16.50	36.61	3.41	34.03
Cash Income	7492.13	2147.89	3.42	34.03
FAMILY SIZE	5.14		-8.76	
HOUSEHOLD WELFARE	325.00		19.24	

Columns 1 and 2 of Table 2 above give the values of the solution while columns 3 and 4 give the percentage changes from the Reference Run for each variable. The interpretation of this and the following tables should be focused primarily on the qualitative, rather than the quantitative information they contain. Hence, what is of interest is the changes in their signs and not so much their magnitude. As can be seen, there are significant changes in the solution. Female and male home activities decrease, while time spent in agricultural activities increases. Agricultural output increases because of the increase in time spent in agriculture and in the level of education. It may be noticed that the rate of increase in women's production is higher than that of men. Cash income increases proportionately. Family size decreases as a result of this increase in women's education. The combined effect on household welfare is positive. An interesting result is the effect on men. Because some of women's income is appropriated by men any increase in women's income does have a corresponding impact on

TABLE 3

Impact on Household Welfare of Increasing Women's Wage Level to That of Men

Allocation of Time	Men	Women	% Changes	
Pct.Time Home Activities (h)	6.48%	37.38%	-2.40	-2.08
Pct.Time Wage (m)	30.00%	30.00%	0.00	5.38
Pct. Time Ag. Production (l)	63.52%	32.62%	0.25	-8.95
% Ag.Time Own Crop (v)	90.00%	80.00%	0.00	0.00
Time Use (Day equivalents)				
Total Available (T)	300.00	300.00	0.00	0.00
Wage Employment (M)	90.00	90.00	0.00	15.38
Home Activities (H)	19.43	112.15	-2.40	-2.08
Ag. Production (L)	190.57	97.85	0.25	-8.95
Tot. Agric.Production	79.70	33.35	-0.08	-2.31
For Market	63.76	6.67	-0.08	-2.31
For Home	15.94	26.68	-0.08	-2.31
Cash Income	7238.99	3006.37	-0.08	87.60
FAMILY SIZE	5.48		-2.82	
HOUSEHOLD WELFARE	344.00		26.23	

Effects of Increased Family Planning

In this exercise (presented in Table 5 below) family planning access has been increased to simulate the adoption of more effective contraceptive methods. The experiment consists of doubling the family planning index variable. This has the expected effect of decreasing family size and, *inter alia*, decreasing home activities and increasing agricultural time.

TABLE 5

Impact on Household Welfare
of Increased Family Planning

Allocation of Time	Men	Women	% Changes	
Pct.Time Home Activities (h)	6.26%	36.29%	-5.69	-4.94
Pct.Time Wage (m)	30.00%	26.00%	0.00	0.00
Pct. Time Ag. Production (l)	63.74%	37.71%	0.60	5.27
% Ag.Time Own Crop (v)	90.00%	80.00%	0.00	0.00
Time Use (Day equivalents)				
Total Available (T)	300.00	300.00	0.00	0.00
Wage Employment (M)	90.00	78.00	0.00	0.00
Home Activities (H)	18.77	108.87	-5.69	-4.94
Ag. Production (L)	191.23	113.13	0.60	5.27
Tot. Agric.Production	80.02	34.63	0.33	1.43
For Market	64.02	6.93	0.33	1.43
For Home	16.00	27.70	0.33	1.43
Cash Income	7268.22	1625.42	0.33	1.43
FAMILY SIZE	5.26		-6.70	
HOUSEHOLD WELFARE	276.00		1.22	

Obviously there are many more policy possibilities. Users are encouraged to run their own policy options. Through these exercises with different policy options, the user can see the impact of these changes on the time use, agricultural production, family size and household welfare index.

APPENDIX 1

AN EXAMPLE OF PARAMETER ESTIMATION

Before applying any theoretical model, one needs to estimate all the parameters of the model. This requires the expertise of an econometrician. Various methods have been developed to empirically estimate a model, but only the simplest method will be outlined in this appendix as an illustration of how it can be done. Since teaching statistics and econometrics is not the purpose of this documentation, the technical issues, both in statistical manipulation and econometrics theory, will not be discussed here. Only a simple example using women's production equation will be introduced to show the procedure of parameter estimation.

The theoretical proposition underlying the production equations (women's as a special case at hand) is that a set of factors of production are necessary in producing agricultural output. These factors may be substituted for one another, but all are required. Furthermore, each factor has a productivity, or productive power to contribute to the production of output. In our particular model, five factors are included — labour, capital, agricultural extension services, share of women's income controlled by women and land. Mathematically this relationship can be expressed as:

$$Of = [Lf.Ef.vf + Lm.Em(1-vm)]^a\ Kf^b\ Af^c\ gf^d\ Rf^e, \text{ where}$$

lowercase letters a, b, c, d and e are the parameters representing the productivity of respective production factors.

To empirically estimate these parameters, data should be collected on women's total agricultural output, how much time men and women spend in agricultural production, the education levels of men and women, the percentage of men and women's agricultural time used for their own crops, the amount of capital women have, women's access to agricultural extension services, the share of women's income controlled by women and the amount of land women can use. After these data have been collected over a reasonably large sample, one can proceed to the estimation step. Notice that we have a non-linear equation here. To use the simplest and most common regression method, the equation has to be transformed into a linear form. This can be accomplished by taking the natural logarithm:

$$\ln(Of) = a.\ln[Lf.Ef.vf + Lm.Em.(1-vm)] + b.\ln(Kf) + c.\ln(Af) + d.\ln(gf) + e.\ln(Rf).$$

This transformed equation can be estimated by the Ordinary Least Squares (OLS, for short) method. The resulting estimated values of the parameters a, b, c, d and e can then be plugged back into the women's production function, and the equation can be called an empirically based relationship.

APPENDIX 2

BASICS OF OPERATING A PERSONAL COMPUTER (PC)

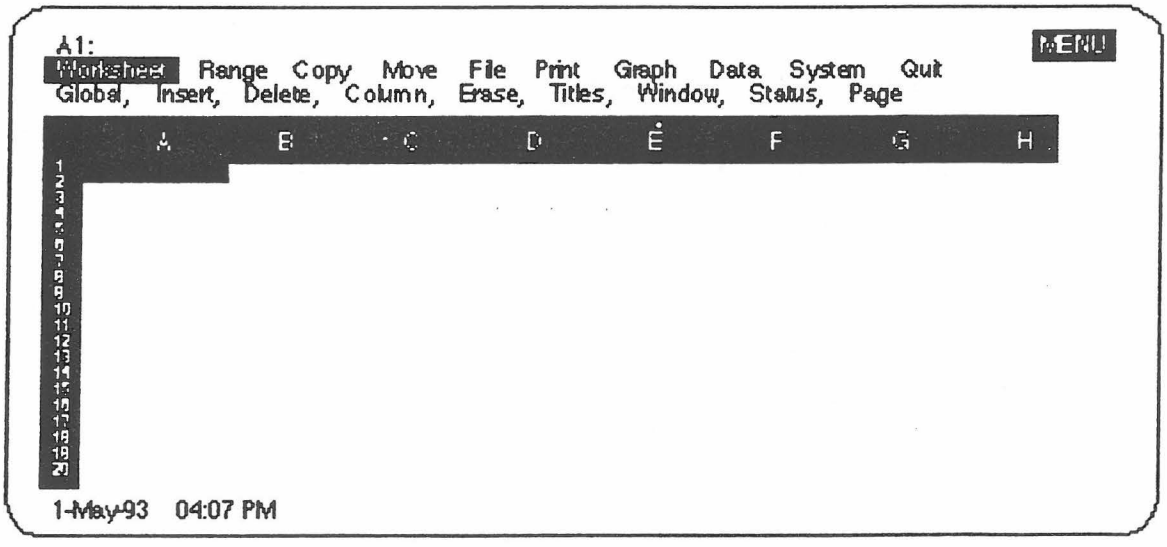
A. Hardware requirements and employment of software

As explained in the text of this document, a personal computer with a DOS operating system is required to run this model. The machine should be able to support the LOTUS 1-2-3 program. The model itself is contained in a single LOTUS spreadsheet bearing the file name RURWID.wk1. To view the story board, a computer with graphics capability is necessary. The minimal requirement is a graphic display terminal and a computer with a graphic card installed. Any IBM-XT or above or its "compatibles" will be sufficient. The story board can be brought up on the screen by using DOS commands.

Since the purpose of this document is teaching a method of analyzing WID issues rather than teaching computer techniques, the coverage of this appendix will be limited to materials necessary to use the software including its appropriate use and manipulation. An introduction to the basic concepts and skills needed by this model will also be covered.

To activate the story board, the program disk has to be inserted in drive A or B and the drive door closed. Typing "CD\STORYBD <------'" and "ST UNWID.SH <------'" in the same sequence, brings the story board on the screen. The space bar has to be pressed to view the next screen and subsequent items. To interrupt, the "ESC" key may be pressed followed by "Yes" or "No" when asked, according to whether one wants to continue.

To use the worksheet, in which the model itself is stored, LOTUS 1-2-3 needs to be installed and activated first. After the product logo screen, a worksheet appears on the screen. At this stage, the menu mode has to be entered by pressing "/" at which time the screen should look like this:



MS - DOS

MS-DOS is a PC operating system. It has its own language one needs to know in order to use it.

A. Terms and symbols

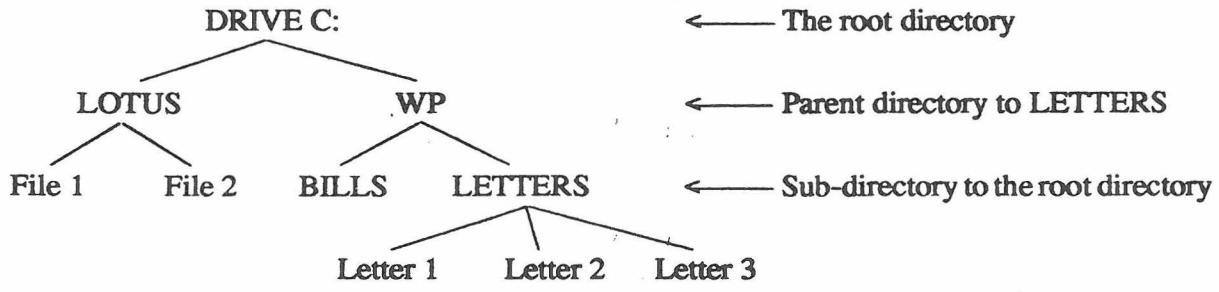
FILE. A file is a collection of related information, much like the items in a file folder. It can contain numerical data or texts. A file on a diskette needs a name, just like a file folder needs a label for identification purpose.

A file name consists of two parts — (1) a name (1-8 characters), and (2) an extension (1-3 characters). A period (.) separates the two parts. The extension is mainly for describing the contents of a file.

A file name can be entered either in upper or lower case letters. DOS automatically converts them to uppercase letters. For example, RURWID.WK1 is a file name, URBWID.WK1 is another. These two names also constitute an example in which the file names themselves indicate that the two files are related.

DIRECTORY. A directory is the table of contents of a disk. Sometimes one may want to divide the many files on one disk into groups of related files, (for example, all LOTUS files and all other types of documents such as menus, circulars, letters, bills, receipts etc.) and give a unique name to each group. Each group will have its table of contents, hence there can be more than one directory on one disk. These directories are often called sub-directories. This is often the case with the hard disk.

Sometimes a subdirectory is further divided into another level of subdirectories. Such multi-level divisions give rise to the terms "root directory" and "parent directory". The root directory is the highest level directory on a computer. The directory one level above the current working directory is the parent directory of a working directory. The following diagram depicts one example of a "directory tree":



To access a file in a directory tree, one needs to follow the "path". For example, to use File 1, the path to follow will be C:\LOTUS then specify the file name "File 1". To edit Letter 3, "C:\WP\LETTERS Letter 3" will be the command to use.

But if this subdirectory is new, you have to create it first, then make it the current directory. Say we call this subdirectory NSD, you need to do the following:

MD\NSD <------'

CD\NSD <------'

Step 4: If there are no subdirectories on the source disk, type: "COPY ^ A: *.* <------' " and all files will be copied from drive A to drive C under the subdirectory you have chosen. But if there is more than one subdirectory on the source disk, it is necessary to specify which subdirectory files you want to copy. Suppose we would like to copy all files in the subdirectory named "dn", we have to type: "COPY ^ X:\dn^*.* <-----' ".

(2) From floppy to floppy

If you wish to copy the contents of one diskette entirely to another diskette use the DISKCOPY command. It works in the following manner:

Step 1: Put MS-DOS disk in drive A and close the drive door (if you have MS-DOS on hard drive you do not need this part) then turn on the computer.

Step 2: At the MS-DOS prompt, type "DISKCOPY ^ a: b: <------' ".

Then you will be prompted to insert the "source" diskette in drive A and the "target" diskette in drive B and close the drive doors. Follow these instructions (Remove DOS disk from drive A first, of course).

Step 3: Press any key (space bar, for instance) to start the copying process. Then self-explanatory instructions will be given by the computer. Follow them exactly.

If only some of the files on a diskette need to be copied, the steps will be the same except the file names on the source diskette (including their extensions) will have to be included in the copy command.

D. Installing or copying the program RURWID on a PC

It is very easy to install a program, since only a few steps need to be followed. In our example, the program to be installed is RURWID. Since this program is contained in a spreadsheet written in LOTUS 1-2-3, the LOTUS software will have to be installed first. Then a simple retrieve command in 123 will start the RURWID program. The procedure will be slightly different for computers with or without a hard drive. To copy the programs, you will need to create directories — LOTUSWID for the RURWID.WK1 file, and STORYBD for the ST UNWID.SH~ file. Copying should be done through DOS commands.

ENTER DATA. Move the cell pointer (or the cursor) to the cell where you wish to enter the data and simply type the data. To make the entry, press "<------/ " after finishing typing.

EDIT DATA. Once data are entered, they can be edited if desired. Move the cell pointer to the cell then press the "Edit" key, F2, and the Edit mode will appear at the upper right corner of the screen. Use the arrow keys to move inside the entry and make changes. Press "<------/ " to complete.

APPENDIX 3

ITEMS ON WHICH DATA SHOULD BE COLLECTED FOR CONSTRUCTING A RURWID MODEL

It is to be noted that these items are illustrative and not exhaustive. Each researcher should design the study and topics to be investigated on the basis of the scope and focus of the study and the characteristics of the context in which the study is to be conducted. A specific reference period should be predetermined, such as the previous week or month.

I Household size and structure (those who slept in the household previous night)

1. Head of household
2. Relationship of each person to head of household
3. Personal data of each member:
   - (i) Name
   - (ii) Sex
   - (iii) Age
   - (iv) Civil status
   - (v) Educational level attained
   - (vi) Main occupation
   - (vii) Subsidiary occupation

(From the above information, the actual person to be interviewed should be selected. This person should be a female who is either head of a housefhold or is responsible for the household. She should be requested to give her own and her spouse's (if applicable) information, as well as information on the other relevant members of the household.)

4. Fertility status of the interviewee
   - (i) Number of children born alive
   - (ii) Number still living
   - (iii) Of the living, number living in the interviewee's household
   - (iv) Of those living with the interviewee, how many work, and give income to the interviewee
   - (v) Income provided by such members during the reference period

VII Credit

(i) Did the interviewee use any credit during the reference period (the same as for agricultural production reference period) and, if yes, where was credit obtained from, how much, and what were the terms and conditions

(ii) For what purposes was credit used

VIII Family planning

(i) Type of services available

(ii) Where available

(iii) Contraceptive use: (a) yes (b) no

(iv) If yes type of contraceptive used

(v) Cost per unit

(vi) Length of use

(vii) Does the spouse use contraceptive and, if yes, what type

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Session Three

The Use/Application of Gender-sensitive Statistics and Indicators in Defining Policy Targets

Session Three: The Use/ Application of Gender-sensitive Statistics and Indicators in Defining Policy Targets

Objectives

- To identify factors affecting development policy issues
- To analyze how policy targets may change when determinant factors are disaggregated by sex
- To draw-up set of recommendations on improving statistics and indicators on gender issues.

General format of the session

Lectures will be given on definition of variables that relate to specific development issues, definition and analysis of policy setting policy targets and illustration of a statistical development model (Population Growth Model -POPSIM) that attempts to integrate gender perspetive.

Lectures will be followed by hands-on exercises. The same groupings will be maintained for this session.

Group Work 3-1

Prior to carrying out the exercises, participants must ensure that the following softwares have been installed into their computers (or that they have easy access to them):

1. Microsoft Windows
2. QUATTRO PRO for Windows
3. POPSIM Model

The step-by-step guideline for running the POPSIM Model is provided in the pages that follow.

Data inputs required to apply the model to specific country include:

1. population by year and by sex
2. population growth rates
3. educational level (first and second enrolment ratios) by sex
4. economic activity rate by sex
5. age at marriage
6. contraceptive prevalence use
7. infant mortality rates

This set of data should have been collected as part of the pre-workshop exercises.

Issues and guide questions that participants must keep in mind and address while executing the POPSIM programme:

1. The accuracy and reliability of the data provided in WISTAT
2. Alternative statistics and indicators from other data sources, ie. administrative records or regular national surveys
3. Reasons for the discrepancy between (1) and (2). How can this discrepancy be resolved?
4. A choice has to be made on which data should be applied. Participants must borne in mind that their respective government, most of the time, develops policies/programmes based on official statistics and indicators.
5. Are the assumptions and hypotheses applied in the model valid?
6. Do the independent variables and indicators included in the model provide sufficient/fair representation of the existing differences between women and men in pertinent development sectors? Please elaborate your response.
7. Are there other factors that should have been included in the model to improve its use for policymaking and programme designing?

Response to the above questions must be submitted in writing to the trainers.

Gender-specific Indicators in a Population Growth Model [POPSIM]

This model forms part of a training package prepared by INSTRAW on gender statistics and indicators. The main objective of presenting and using the model is to demonstrate how gender-specific variables can affect policy indicators, such as total population and growth rate.

Population growth is calculated in this model which is called POPSIM by using a linear function based on eight indicators: male and female age of marriage, gross first and second enrolment ratio and economic activity rate, as well as female contraceptive rate and infant mortality rate.

The model in no way claims that this linear function represents a realistic calculation of projected growth rate. Indeed, the coefficients for each indicator may be changed within the model if the user feels that a more appropriate ratio among the indicators should be assigned.

If you understand that the linear function used in the model is for demonstration purposes only and not necessarily recommended for actual problem solving, you may conrtinue running the programme.

POPSIM:
A POPULATION GROWTH SIMULATION MODEL

Installing the program

The name of the file on the diskette is called POPSIM.WB1 (referred to in this document as POPSIM). The file should be copied onto the hard disk (Drive C) in a subdirectory called \INSTRAW\ which is situated in the Quattro Pro directory (QPW). If it desired to copy the program onto a different subdirectory, a slight modification of the program is required.

Overview of the model:

POPSIM sets up data for eight indicators: female contraceptive rate, infant mortality rate, and individual data for female and male in the areas of age of marriage, gross enrolment ratio for first and second levels and economic activity rate. A linear function then calculates the growth rate from 1995 to 2025. This is referred to as the reference data. (The user can adjust any of the values of the indicators before this reference data is set.) Then the user may change the values of any indicator to see the effect that these changes would have on the future population and growth rate.

Details:

When POPSIM is executed, an initial message is flashed onto the screen for a few seconds announcing the name of the model, followed by a screen issuing a disclaimer. The disclaimer states the purpose of the model and emphasizes that the linear function which calculates the growth rate is very general and should not be considered as sacrosanct. It even notes that the weights for each indicator is flexible and may be set by the user. POPSIM will not run unless the

user agrees that the model is for demonstration purposes only. The user agrees by pressing the "Y" (or "y") key.

Pressing any other key or clicking the m~u~e will terminate the model. When the user agrees, a box appears entitled, "OBTAIN DATA".

The title of the box is displayed in a blue bar on top of the box. This is the first of a series of boxes which will guide the user through POPSIM. Each box provides information and options which the user may select, usually through "push buttons" that are clicked by the mouse in order for an action to take place. In this manner, the user may further the model or examine results of the model to date.

After the initial data is set up from the "OBTAIN DATA" box, the "REVIEWING REFERENCE DATA" box appears. This gives the user the opportunity to review and modify the data values for each indicator. Although many options are available in this box, the most significant one is the ACCEPT REFERENCE DATA option because this option freezes the reference data. Other options may display other boxes, but POPSIM will always return to the "REVIEWING REFERENCE DATA" box until the ACCEPT REFERENCE DATA option is chosen.

Once the ACCEPT REFERENCE DATA is selected, another main box appears. This is the "MODIFYING REFERENCE DATA" box which, too, has many options. These options allow the user, among other things? to modify the reference data and see the affect these modifications would have on the population growth rate. Every option chosen from this box will perform an ctivity, then return to the "MODIFYING REFERENCE DATA" box until the Exit POPSIM option is selected.

OBTAIN DATA box.

This is the first box appearing in POPSIM. Its purpose is to obtain the initial data to start the setup of reference data. The user can choose one of two options:

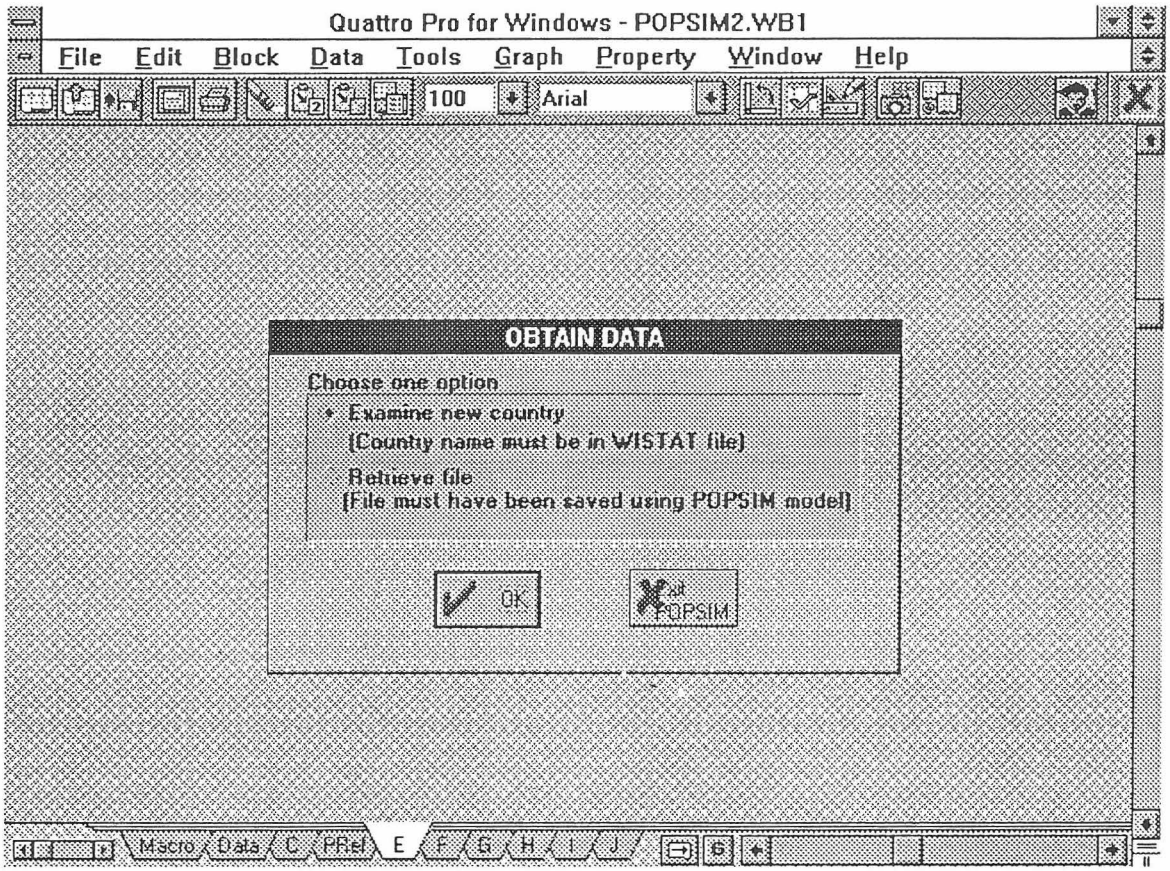
Examine new country:

This option allows the user to choose country data from the WISTAT series of countries. A few countries -- those with too little data to generate projections -- have been eliminated, but by and large most countries are still within the data base.

Although the WISTAT file contains data for virtually every five year period from 1970 to 2005 (and for 2025) for infant mortality rate and for both male and female economic activity rate, it contains a maximum of only three data points -- the years 1970, 1980 and 1990 -- for the remaining five indicators.

In order to project all indicators to 2025, POPSIM uses the following logic: if at least two of the three years are available, POPSIM undertakes a linear projection using the last two data points; if only one year is available, it is used as a constant from that year to the year 2025; if no data points are available, no projection is done.

There is a minimum and maximum value (referred to as "min/max" values) that is associated with each indicator. Should an indicator go beyond these values during the linear projection, the value for that year and all following years to 2025 are set to either the minimum or the maximum value, whichever applies. Annex A shows the minimum and maximum values for each indicator.


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
OBTAIN DATA
Choose one option
Examine new country
(Country name must be in WISTAT file)
Retrieve file
(File must have been saved using POPSIM model)
OK
Exit POPSIM
Macro Data C PRef E F G H I J

Below is an alphabetical listing of all the possible boxes of POPSIM. Within each box listing appears a description of all the possible choices the user has for the box. It is suggested that the user go through the model by reading these descriptions as each box appears.

COUNTRY CONFIRMATION box.

When the "COUNTRY NAME" box receives the first few characters of the country, it seeks all of the countries starting with those characters. POPSIM will then put the first name of the list in this box and request confirmation that this is the required name. Clicking the Yes button confirms the correct name. Clicking the No button will display the next country on the list of possible countries.

COUNTRY NAME box.

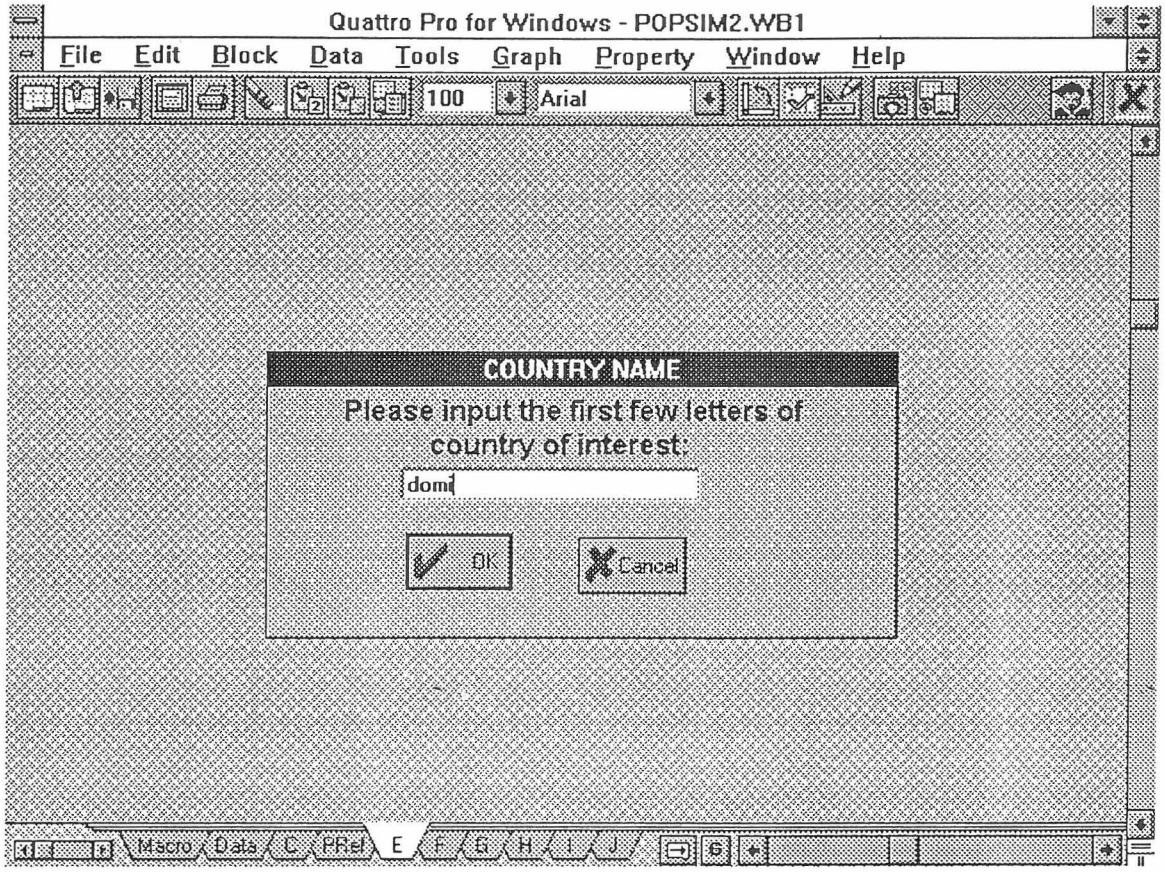
This box appears if the user selected the Examine New Country option in the "OBTAIN DATA" box. It requests the user to input the first few letters of the required country. The spelling of the country must be in accordance to the WISTAT file. As little as one (the first) character may be input. Click OK to continue POPSIM, or click Cancel to cancel the command.

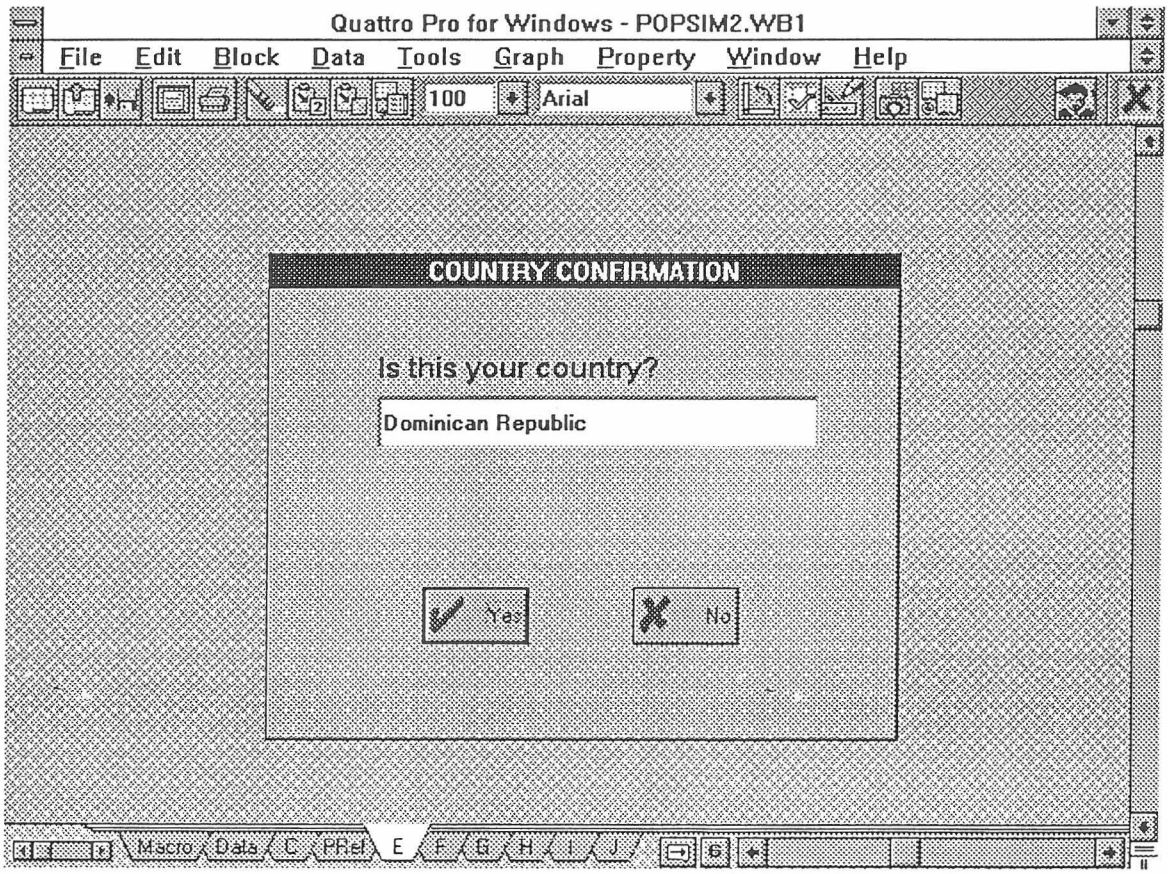
ERROR MESSAGE box.

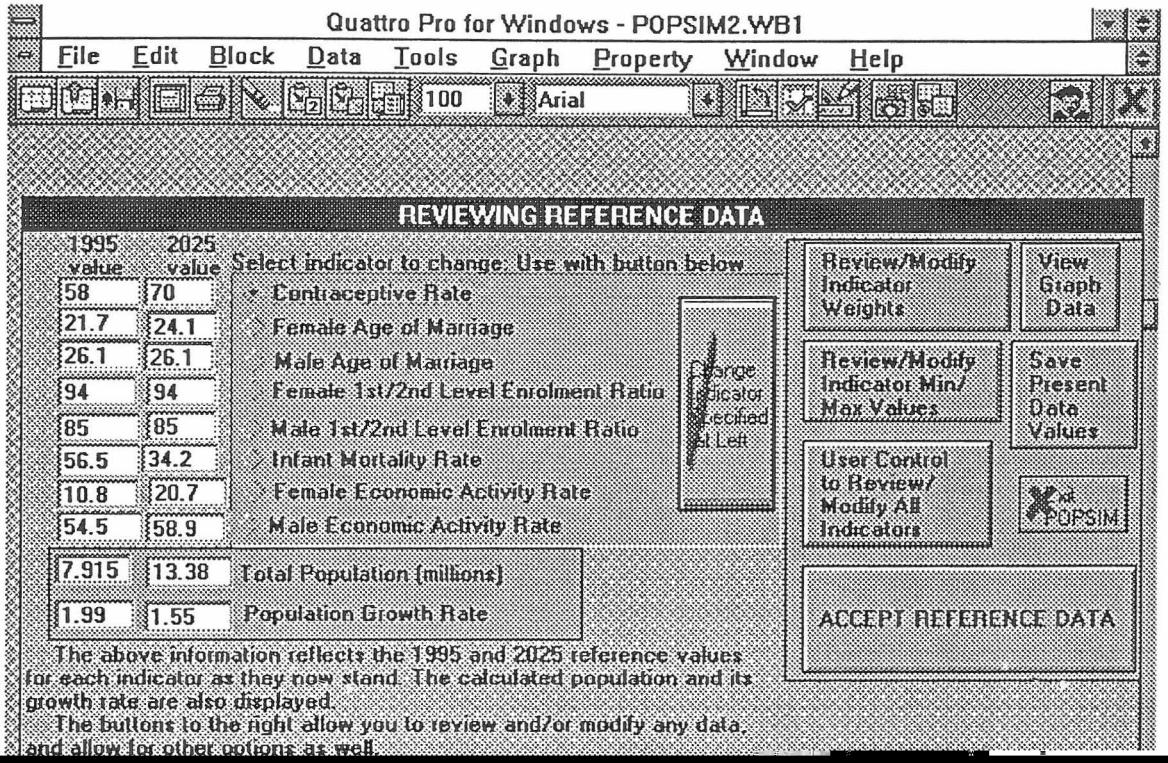
Contains various error messages that may occur in POPSIM.

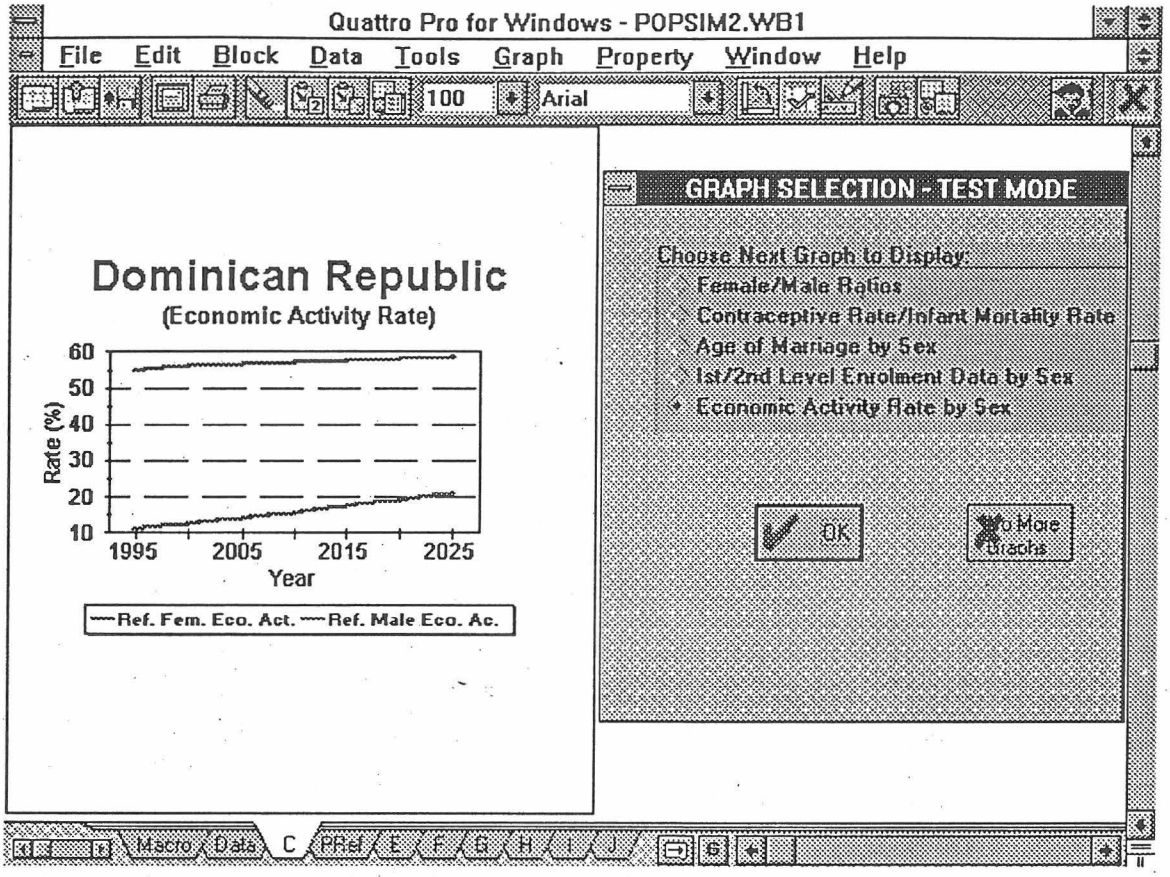
GRAPH SELECTION box.

This box appears when the View Graph Data button is clicked. It first appears with a graph displaying the population and its growth rate. The box offers a variety of


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
COUNTRY NAME
Please input the first few letters of country of interest:
domi
OK
Cancel
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
COUNTRY CONFIRMATION
Is this your country?
Dominican Republic
Yes
No
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
REVIEWING REFERENCE DATA
1995 value
2025 value
Select indicator to change. Use with button below
58 70 Contraceptive Rate
21.7 24.1 Female Age of Marriage
26.1 26.1 Male Age of Marriage
94 94 Female 1st/2nd Level Enrolment Ratio
85 85 Male 1st/2nd Level Enrolment Ratio
56.5 34.2 Infant Mortality Rate
10.8 20.7 Female Economic Activity Rate
54.5 58.9 Male Economic Activity Rate
Change Indicator Specified At Left
7.915 13.38 Total Population (millions)
1.99 1.55 Population Growth Rate
The above information reflects the 1995 and 2025 reference values for each indicator as they now stand. The calculated population and its growth rate are also displayed.
The buttons to the right allow you to review and/or modify any data, and allow for other options as well.
Review/Modify Indicator Weights
View Graph Data
Review/Modify Indicator Min/Max Values
Save Present Data Values
User Control to Review/Modify All Indicators
Exit POPSIM
ACCEPT REFERENCE DATA


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
Dominican Republic
(Economic Activity Rate)
Rate (%)
60
50
40
30
20
10
1995
2005
2015
2025
Year
Ref. Fem. Eco. Act.
Ref. Male Eco. Ac.
GRAPH SELECTION - TEST MODE
Choose Next Graph to Display:
Female/Male Ratios
Contraceptive Rate/Infant Mortality Rate
Age of Marriage by Sex
1st/2nd Level Enrolment Data by Sex
Economic Activity Rate by Sex
OK
No More Graphs
Macro
Data
C
PRef
E
F
G
H
I
J

different graphs that may be displayed. This box will reappear with each graph display until the No More Graphs button is clicked.

MESSAGE box.

The message in this box is displayed when the user clicks the User Control to Review/Modify All Indicators, available from both the "REVIEWING REFERENCE DATA" box and the MODIFYING REFERENCE DATA" box. The message reminds the user to press Ctrl/C on the keyboard when he/she is finished modifying the data. (This reminder also appears in red text under the indicator headings.) Click OK to gain user control.

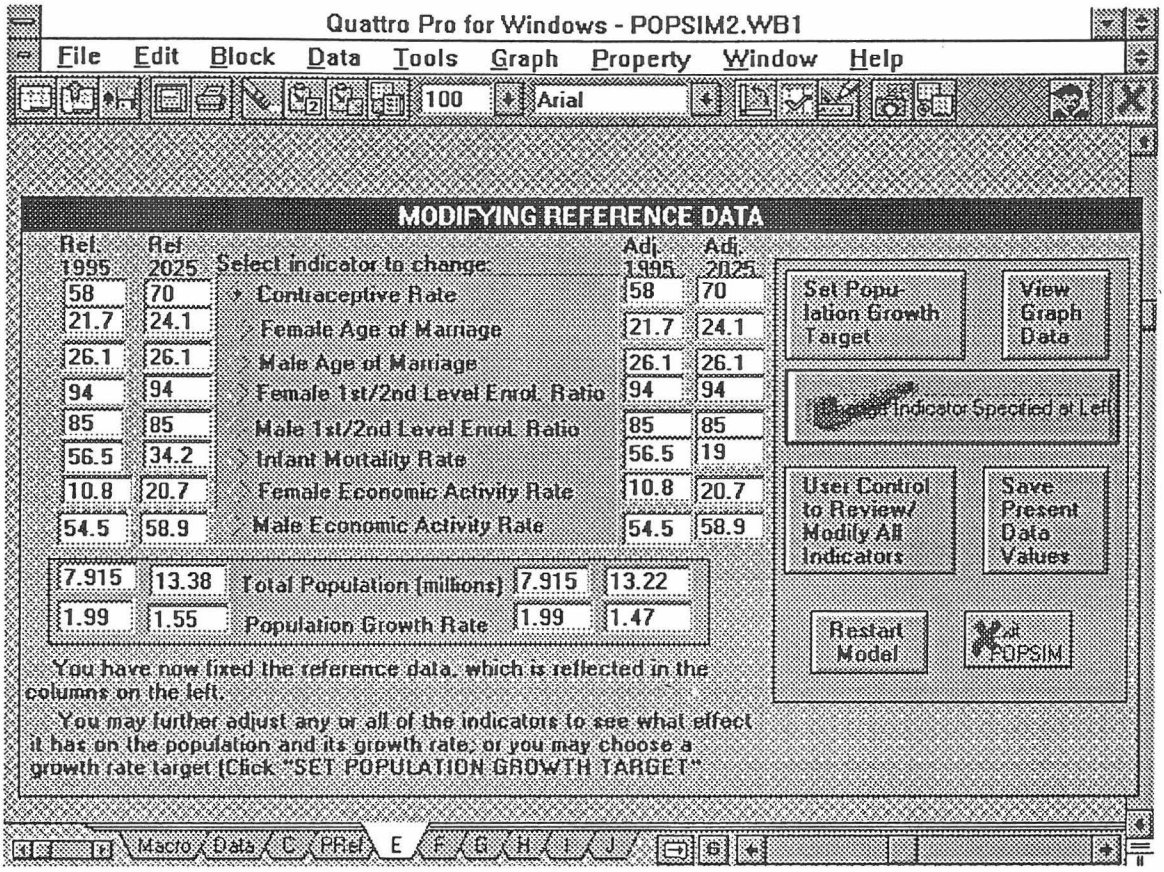
MODIFYING REFERENCE DATA box.

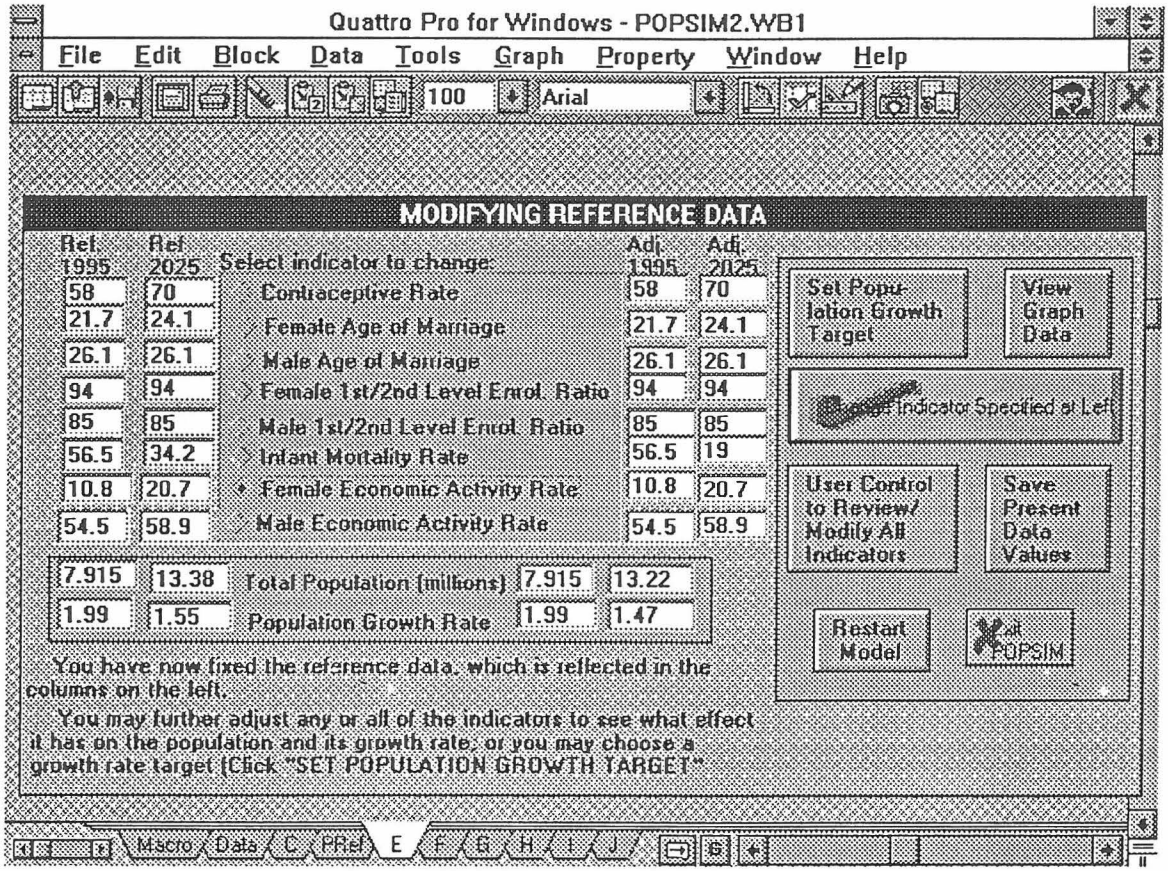
This box appears when the user finally accepts the reference data and is ready to change the data to determine subsequent effects on the population and its growth rate. The box is somewhat similar to the REVIEWING REFERENCE DATA" box, but this box displays both the reference values and the latest adjusted indicator values for 1995 and 2025. When this box is first displayed, the adjusted values are the same as the reference values, but the adjusted values eventually change as the user modifies the indicators.

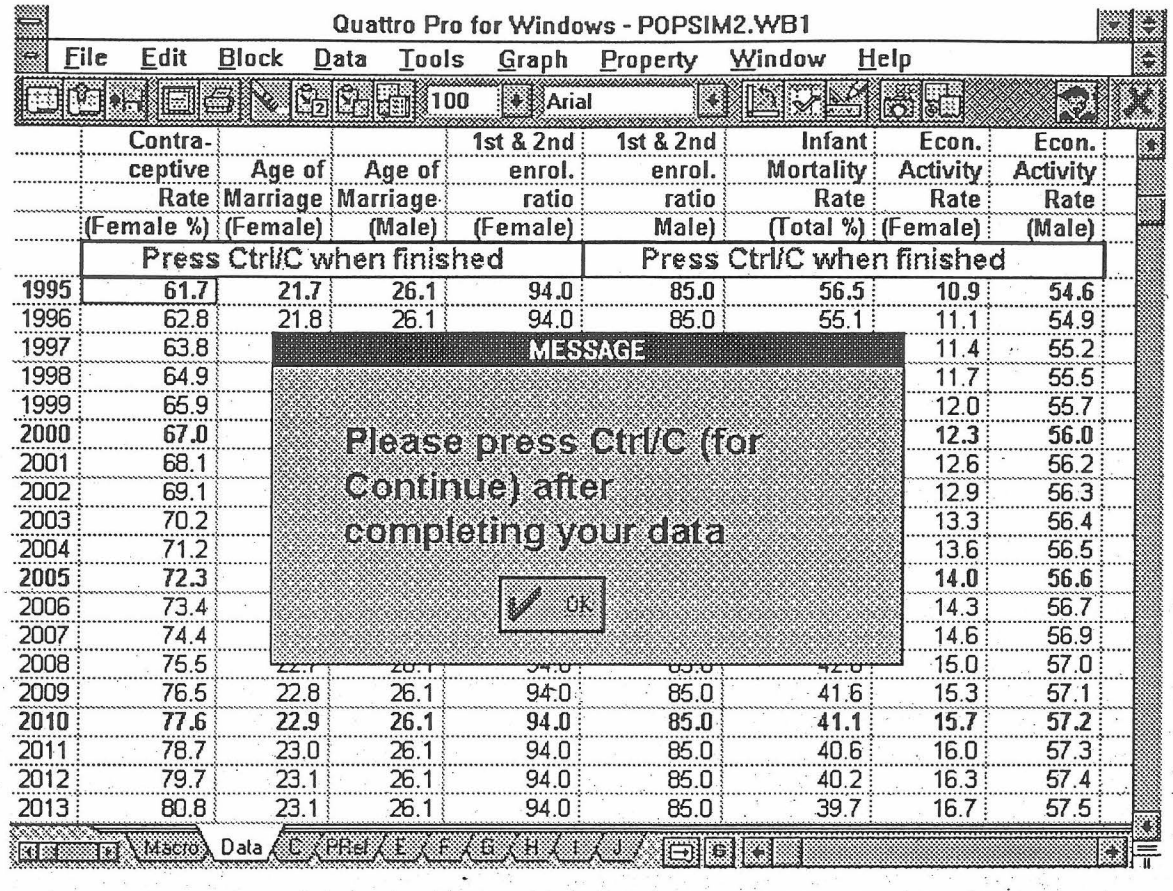
The options in this box are:

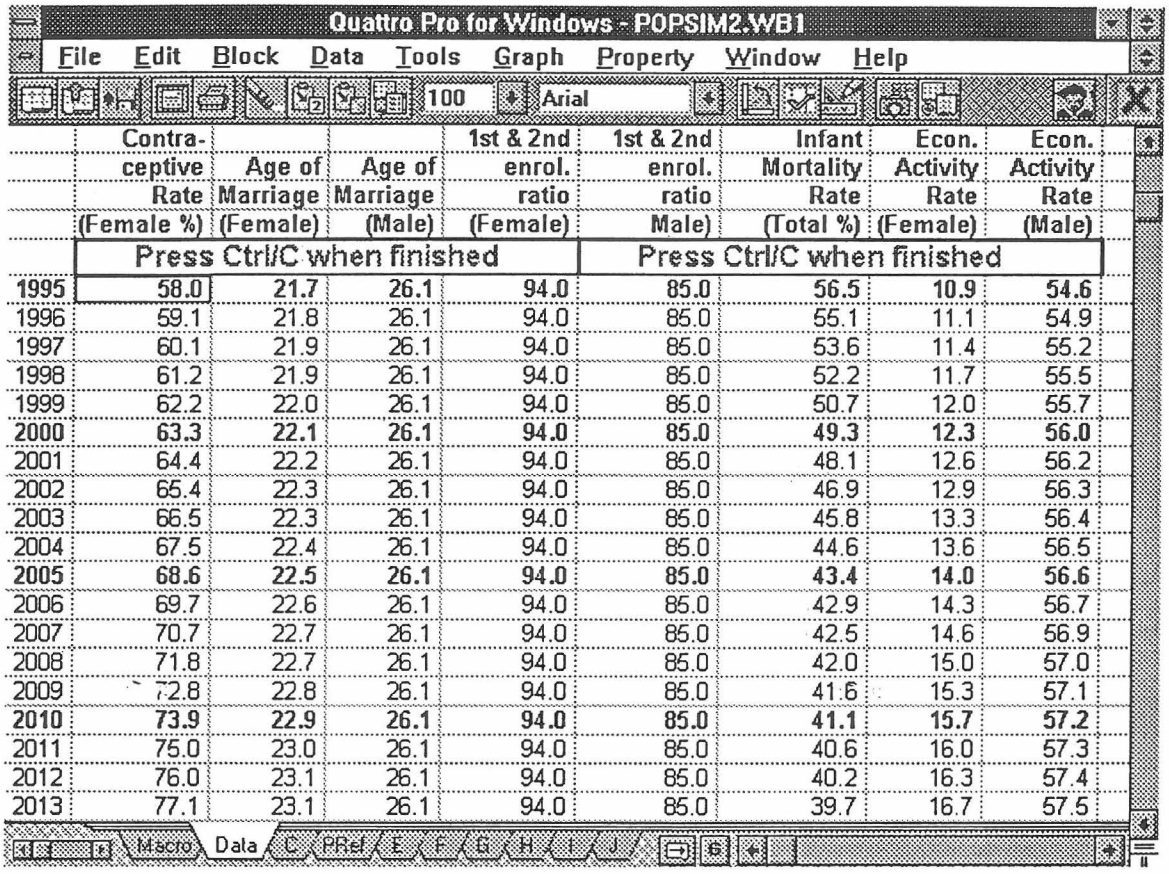
Change Indicator Specified at Left:

This is similar to the button of the same name in the "REVIEWING REFERENCE DATA" box. (Note that the position of this button is different than the previous box because of space constraints.)


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
MODIFYING REFERENCE DATA
Ref. 1995
Ref. 2025
Select indicator to change:
Adj. 1995
Adj. 2025
58 70 Contraceptive Rate 58 70
21.7 24.1 Female Age of Marriage 21.7 24.1
26.1 26.1 Male Age of Marriage 26.1 26.1
94 94 Female 1st/2nd Level Enrol. Ratio 94 94
85 85 Male 1st/2nd Level Enrol. Ratio 85 85
56.5 34.2 Infant Mortality Rate 56.5 19
10.8 20.7 Female Economic Activity Rate 10.8 20.7
54.5 58.9 Male Economic Activity Rate 54.5 58.9
7.915 13.38 Total Population (millions) 7.915 13.22
1.99 1.55 Population Growth Rate 1.99 1.47
Set Population Growth Target
View Graph Data
Indicator Specified at Left
User Control to Review/ Modify All Indicators
Save Present Data Values
Restart Model
POPSIM
You have now fixed the reference data, which is reflected in the columns on the left.
You may further adjust any or all of the indicators to see what effect it has on the population and its growth rate, or you may choose a growth rate target (Click "SET POPULATION GROWTH TARGET"
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
MODIFYING REFERENCE DATA
Ref 1995
Ref 2025
Select indicator to change:
Adj. 1995
Adj. 2025
58 70 Contraceptive Rate 58 70
21.7 24.1 Female Age of Marriage 21.7 24.1
26.1 26.1 Male Age of Marriage 26.1 26.1
94 94 Female 1st/2nd Level Enrol. Ratio 94 94
85 85 Male 1st/2nd Level Enrol. Ratio 85 85
56.5 34.2 Infant Mortality Rate 56.5 19
10.8 20.7 Female Economic Activity Rate 10.8 20.7
54.5 58.9 Male Economic Activity Rate 54.5 58.9
7.915 13.38 Total Population (millions) 7.915 13.22
1.99 1.55 Population Growth Rate 1.99 1.47
You have now fixed the reference data, which is reflected in the columns on the left.
You may further adjust any or all of the indicators to see what effect it has on the population and its growth rate; or you may choose a growth rate target (Click "SET POPULATION GROWTH TARGET"
Set Population Growth Target
View Graph Data
Indicator Specified at Left
User Control to Review/ Modify All Indicators
Save Present Data Values
Restart Model
Exit POPSIM
Mscro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100 Arial
Contra-ceptive Rate (Female %)
Age of Marriage (Female)
Age of Marriage (Male)
1st & 2nd enrol. ratio (Female)
1st & 2nd enrol. ratio Male)
Infant Mortality Rate (Total %)
Econ. Activity Rate (Female)
Econ. Activity Rate (Male)
Press Ctrl/C when finished
Press Ctrl/C when finished
1995 61.7 21.7 26.1 94.0 85.0 56.5 10.9 54.6
1996 62.8 21.8 26.1 94.0 85.0 55.1 11.1 54.9
1997 63.8 11.4 55.2
1998 64.9 11.7 55.5
1999 65.9 12.0 55.7
2000 67.0 12.3 56.0
2001 68.1 12.6 56.2
2002 69.1 12.9 56.3
2003 70.2 13.3 56.4
2004 71.2 13.6 56.5
2005 72.3 14.0 56.6
2006 73.4 14.3 56.7
2007 74.4 14.6 56.9
2008 75.5 15.0 57.0
2009 76.5 22.8 26.1 94.0 85.0 41.6 15.3 57.1
2010 77.6 22.9 26.1 94.0 85.0 41.1 15.7 57.2
2011 78.7 23.0 26.1 94.0 85.0 40.6 16.0 57.3
2012 79.7 23.1 26.1 94.0 85.0 40.2 16.3 57.4
2013 80.8 23.1 26.1 94.0 85.0 39.7 16.7 57.5
MESSAGE
Please press Ctrl/C (for Continue) after completing your data
OK
Macro Data C PRef E F G H I J



	Contra-ceptive Rate (Female %)	Age of Marriage (Female)	Age of Marriage (Male)	1st & 2nd enrol. ratio (Female)	1st & 2nd enrol. ratio Male)	Infant Mortality Rate (Total %)	Econ. Activity Rate (Female)	Econ. Activity Rate (Male)
	Press Ctrl/C when finished				Press Ctrl/C when finished			
1995	58.0	21.7	26.1	94.0	85.0	56.5	10.9	54.6
1996	59.1	21.8	26.1	94.0	85.0	55.1	11.1	54.9
1997	60.1	21.9	26.1	94.0	85.0	53.6	11.4	55.2
1998	61.2	21.9	26.1	94.0	85.0	52.2	11.7	55.5
1999	62.2	22.0	26.1	94.0	85.0	50.7	12.0	55.7
2000	**63.3**	**22.1**	**26.1**	**94.0**	**85.0**	**49.3**	**12.3**	**56.0**
2001	64.4	22.2	26.1	94.0	85.0	48.1	12.6	56.2
2002	65.4	22.3	26.1	94.0	85.0	46.9	12.9	56.3
2003	66.5	22.3	26.1	94.0	85.0	45.8	13.3	56.4
2004	67.5	22.4	26.1	94.0	85.0	44.6	13.6	56.5
2005	**68.6**	**22.5**	**26.1**	**94.0**	**85.0**	**43.4**	**14.0**	**56.6**
2006	69.7	22.6	26.1	94.0	85.0	42.9	14.3	56.7
2007	70.7	22.7	26.1	94.0	85.0	42.5	14.6	56.9
2008	71.8	22.7	26.1	94.0	85.0	42.0	15.0	57.0
2009	72.8	22.8	26.1	94.0	85.0	41.6	15.3	57.1
2010	**73.9**	**22.9**	**26.1**	**94.0**	**85.0**	**41.1**	**15.7**	**57.2**
2011	75.0	23.0	26.1	94.0	85.0	40.6	16.0	57.3
2012	76.0	23.1	26.1	94.0	85.0	40.2	16.3	57.4
2013	77.1	23.1	26.1	94.0	85.0	39.7	16.7	57.5

User Control to Review/Modify all Indicators:

This is similar to the button of the same name in the "REVIEWING REFERENCE DATA" box.

Save Present Data Values:

This is similar to the button of the same name in the "REVIEWING REFERENCE DATA" box.

View Graph Data:

This is similar to the button of the same name in the "REVIEWING REFERENCE DATA" box. However, in this case both the reference data and the adjusted data are displayed for comparison purposes. If there is no change between reference data and its adjusted data the two graph lines will overlap one another. Therefore, only one line will appear. The color of the line indicates the "adjusted" data, but the reference data graph is "hiding" under it and cannot be seen.

Set Population Growth Target:

This option permits the user to fix the values of all the indicators in a given year, set a population growth rate in the future, then choose an indicator to change to see if the population growth rate can be achieved.

Restart Model:

This allows the user to go back to the initial "OBTAIN DATA" box and either read in more WISTAT data or restore a previously saved file. The model starts all over again.

Exit POPSIM:

This button exits POPSIM.

Retrieve file:

This option permits the user to read in data from a previously saved file, thus allowing previously saved information to be worked on. The file must have been saved using POPSIM and must be stored in the same directory as POPSIM.

Once the choice is made, the user clicks either the OK button, which will continue POPSIM, or the Exit POPSIM button, which will terminate the program.

RESULTS OF TARGET INQUIRY box.

This box appears as the answer to the Set Population Growth Target, which was clicked on the "MODIFYING REFERENCE DATA" box. After reviewing the results, the user may click the OK button or may modify the previously specified target information by clicking the Modify button.

RETRIEVE FILE box.

This box appears if the Retrieve File option is clicked from the "OBTAIN DATA" box. It requests the name of the file to be retrieved. POPSIM adds the extension ".WB1" to the file, and the file is sought on the /INSTRAW/ subdirectory. If the file is found, its data is used in the "REVIEWING REFERENCE DATA" box, which next appears on the screen. If no file is found, an error message is displayed.

Clicking the Cancel button returns to the "OBTAIN DATA" box without any action being taken.

REVIEW/MODIFY INDICATOR WEIGHTS box.

This is the box that is displayed should the user want to review and/or change the weights assigned to each of the eight indicators used to calculate the population growth. It is accessed from the Review/Modify Indicator Weights option in the "REVIEWING REFERENCE DATA" box. If the user clicks OK, the new values are used. while Cancel will revert back to the unmodified values.

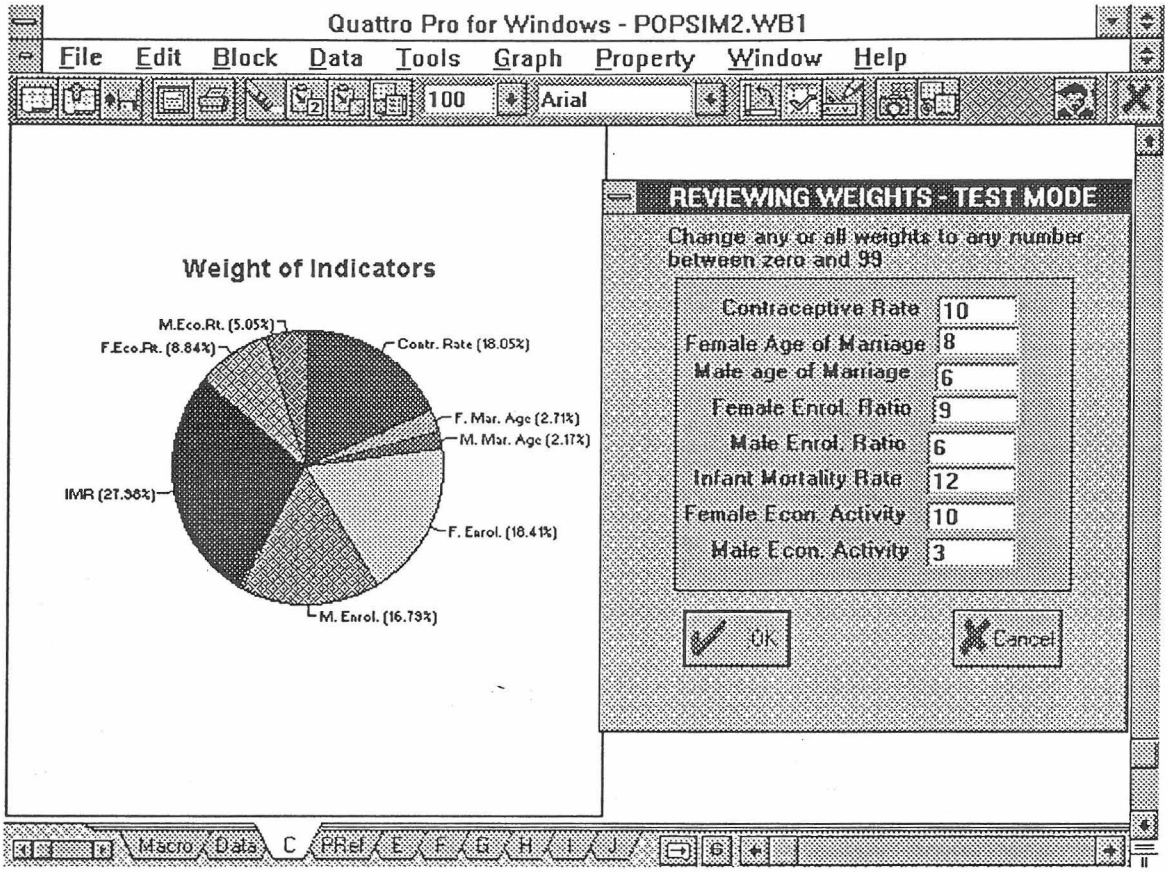
REVIEWING MIN/MAX VALUES box.

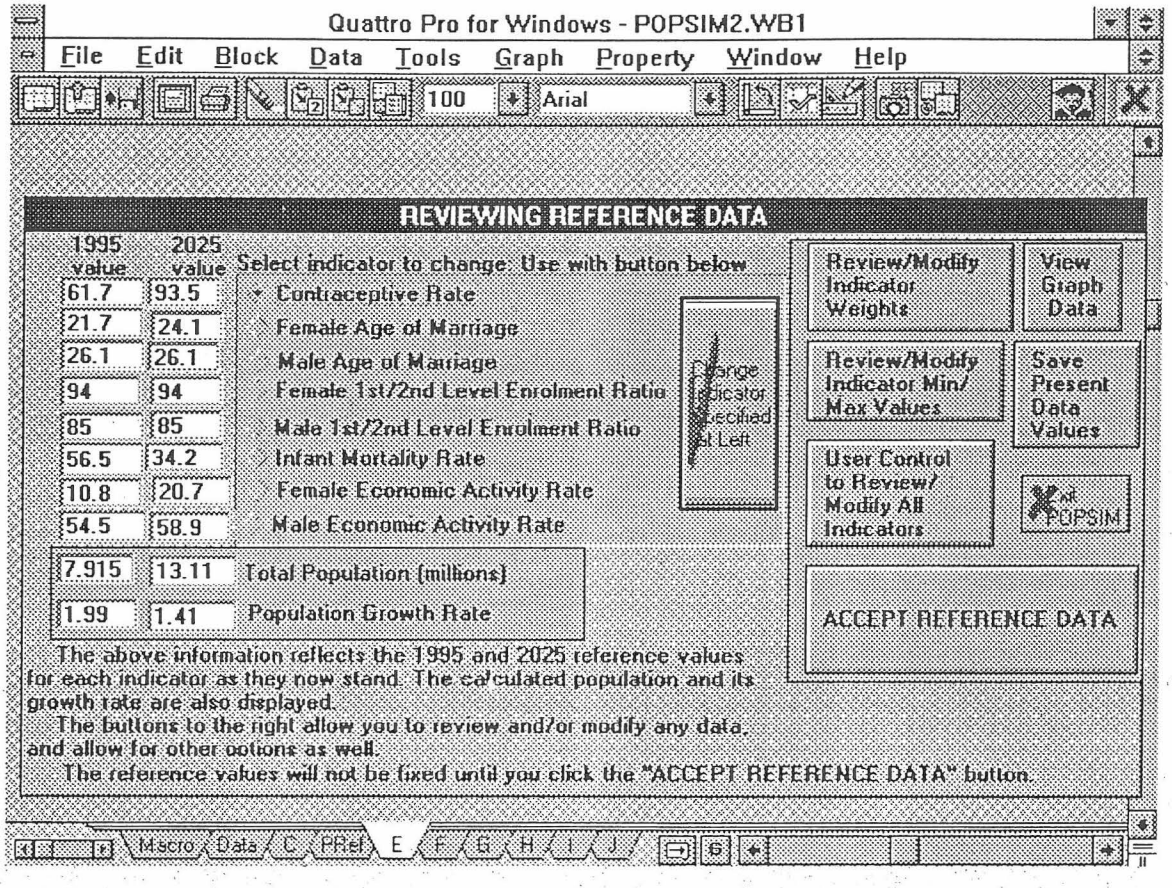
The minimum and maximum values may be modified before the reference values are frozen. This box appears when the Review/Modify Indicator Min/Max Values is clicked from the "REVIEWING REFERENCE DATA" box. The box displays the values for each indicator and allows modification if desired. If the user clicks OK, the new values are used, while Cancel will revert back to the unmodified values.

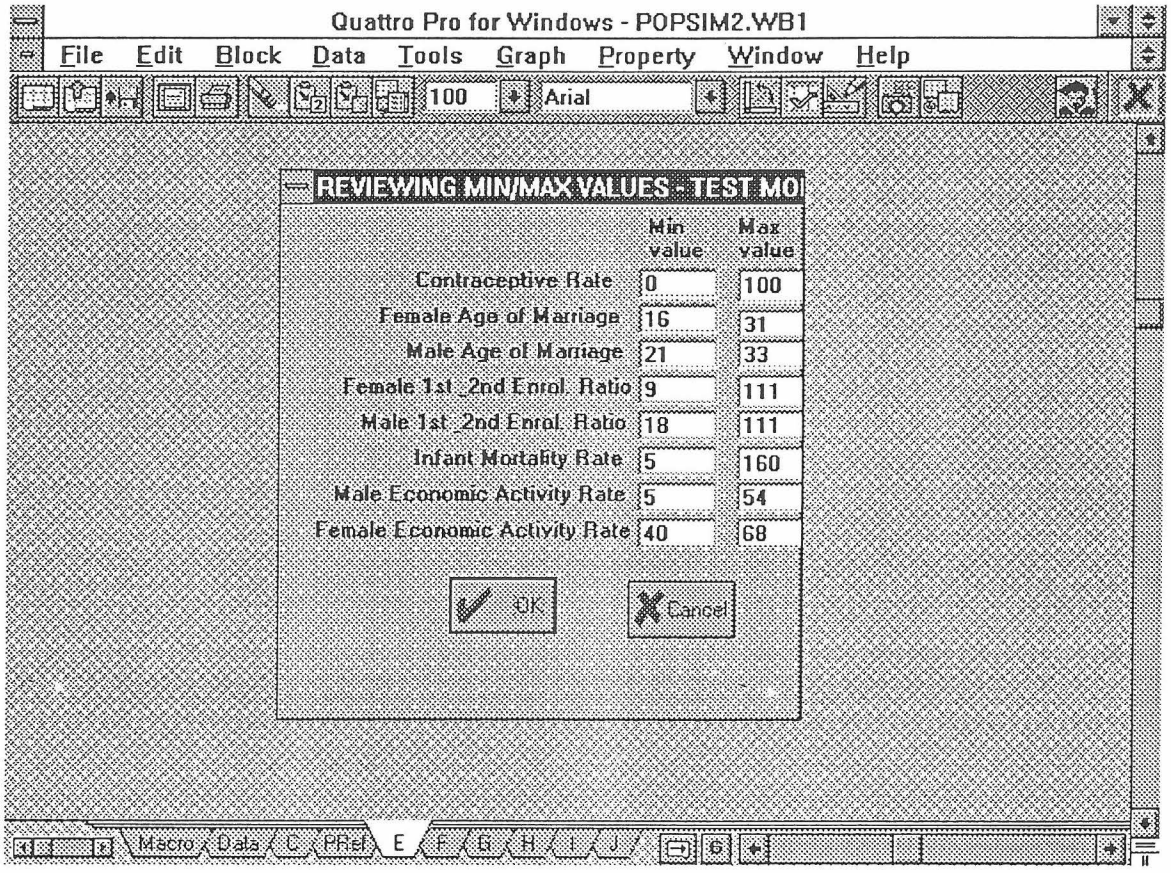
REVIEWING REFERENCE DATA box.

Initially, this box appears after the processing from the "OBTAIN DATA" box is completed -- i.e., either the initial values are computed by projecting WISTAT data or by reading in a file. However, before accepting these values as reference data the user may review and modify any or all values of all indicators.

The box displays the earliest and latest values (1995 and 2025) for each indicator in POPSIM as they now stand. The box also displays the population and its growth rate for these two years. The user has a variety of options to choose from while viewing this box. After POPSIM executes the any user-selected option in this box it once again displays the box, updating any necessary values. The


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
Weight of Indicators
M.Eco.Rt. (5.05%)
F.Eco.Rt. (8.84%)
Contr. Rate (18.05%)
F. Mar. Age (2.71%)
M. Mar. Age (2.17%)
IMR (27.38%)
F. Enrol. (18.41%)
M. Enrol. (16.79%)
REVIEWING WEIGHTS - TEST MODE
Change any or all weights to any number between zero and 99
Contraceptive Rate 10
Female Age of Marriage 8
Male age of Marriage 6
Female Enrol. Ratio 9
Male Enrol. Ratio 6
Infant Mortality Rate 12
Female Econ. Activity 10
Male Econ. Activity 3
OK
Cancel
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
REVIEWING REFERENCE DATA
1995 value
2025 value
Select indicator to change. Use with button below
61.7
93.5
Contraceptive Rate
21.7
24.1
Female Age of Marriage
26.1
26.1
Male Age of Marriage
94
94
Female 1st/2nd Level Enrolment Ratio
85
85
Male 1st/2nd Level Enrolment Ratio
56.5
34.2
Infant Mortality Rate
10.8
20.7
Female Economic Activity Rate
54.5
58.9
Male Economic Activity Rate
Change Indicator Specified at Left
7.915
13.11
Total Population (millions)
1.99
1.41
Population Growth Rate
Review/Modify Indicator Weights
View Graph Data
Review/Modify Indicator Min/ Max Values
Save Present Data Values
User Control to Review/ Modify All Indicators
Exit POPSIM
ACCEPT REFERENCE DATA
The above information reflects the 1995 and 2025 reference values for each indicator as they now stand. The calculated population and its growth rate are also displayed.
The buttons to the right allow you to review and/or modify any data, and allow for other options as well.
The reference values will not be fixed until you click the "ACCEPT REFERENCE DATA" button.
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
REVIEWING MIN/MAX VALUES - TEST MOI
Min value
Max value
Contraceptive Rate 0 100
Female Age of Marriage 16 31
Male Age of Marriage 21 33
Female 1st_2nd Enrol. Ratio 9 111
Male 1st_2nd Enrol. Ratio 18 111
Infant Mortality Rate 5 160
Male Economic Activity Rate 5 54
Female Economic Activity Rate 40 68
OK
Cancel
Macro Data C PRef E F G H I J

process is repeated until the user chooses the "ACCEPT REFERENCE DATA" option, which freezes the reference data.

Below is a description of all the options available in the "REVIEWING REFERENCE DATA" box:

ACCEPT REFERENCE DATA:

This button is pushed when the user ready to accept all values as the model's reference values. Then the next phase of POPSIM occurs, allowing the user further adjustment to the reference data to examine changes in the population growth up to the year 2025.

Change Indicator Specified at Left:

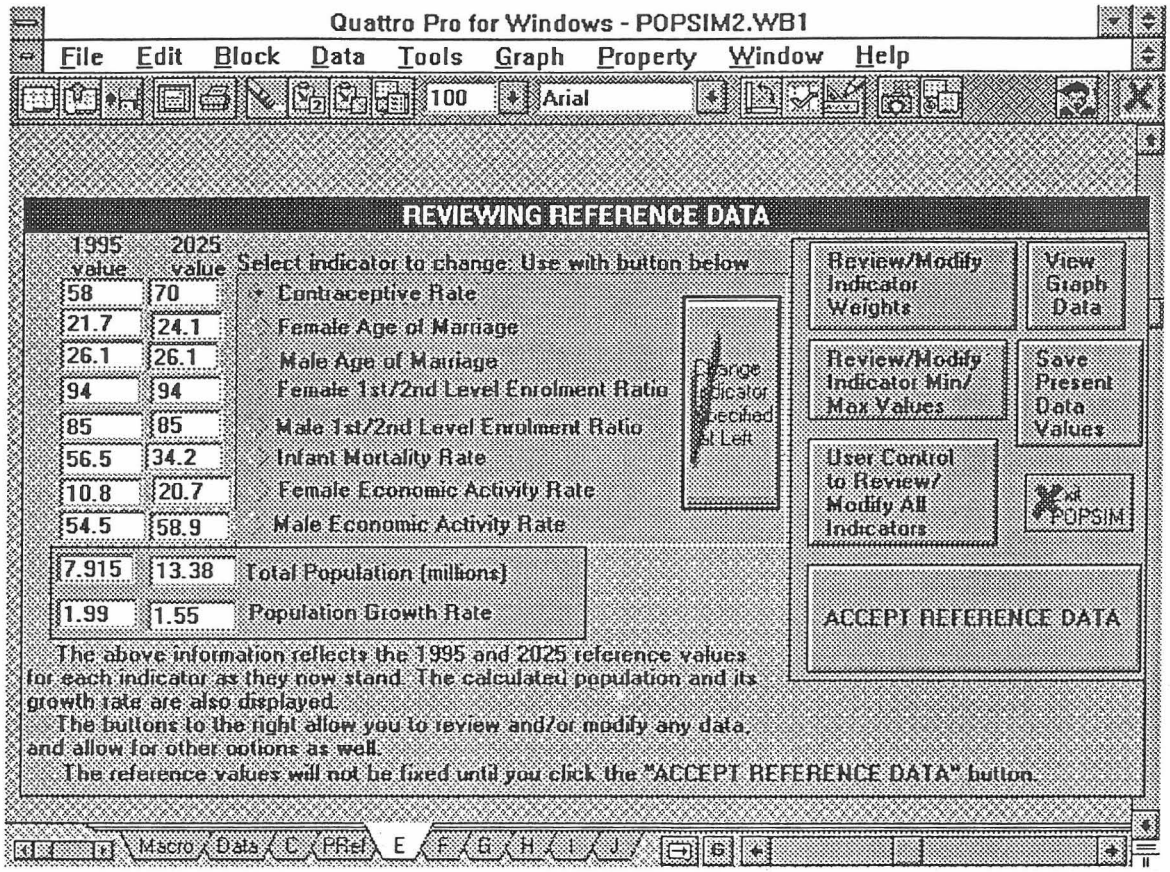
This green-checked button is situated next to the names of the eight indicators. The user, via the computer, can change the values of individual indicators, one indicator at a time. If the user selects this button, another box will appear (the "SET VALUES" box) which will permit the user to modify the data of the indicator selected by the user.

View Graph Data:

The user may be interested in seeing a graphical representation of the reference values for population, growth rate and various indicator. This may be accomplished by selecting this button. A graph of the population and growth rate is displayed along with a "SELECT GRAPH" box from which the user may select another graph to be displayed. This process continues until the No More Graphs button is selected from the "SELECT GRAPH" box.

Review/Modify Indicator Weights:

The calculation of the growth rate for a particular year (as well as its population) is determined by a linear


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
REVIEWING REFERENCE DATA
1995 value
2025 value
Select indicator to change. Use with button below
58
70
Contraceptive Rate
21.7
24.1
Female Age of Marriage
26.1
26.1
Male Age of Marriage
94
94
Female 1st/2nd Level Enrolment Ratio
85
85
Male 1st/2nd Level Enrolment Ratio
56.5
34.2
Infant Mortality Rate
10.8
20.7
Female Economic Activity Rate
54.5
58.9
Male Economic Activity Rate
7.915
13.38
Total Population (millions)
1.99
1.55
Population Growth Rate
Review/Modify Indicator Weights
View Graph Data
Review/Modify Indicator Min/ Max Values
Save Present Data Values
User Control to Review/ Modify All Indicators
POPSIM
ACCEPT REFERENCE DATA
The above information reflects the 1995 and 2025 reference values for each indicator as they now stand. The calculated population and its growth rate are also displayed.
The buttons to the right allow you to review and/or modify any data, and allow for other options as well.
The reference values will not be fixed until you click the "ACCEPT REFERENCE DATA" button.
Macro
Data
C
PRef
E
F
G
H
I
J

function using all eight indicator values for that year, taking into consideration the weight assigned to the indicator when calculating the growth rate. Clicking this button allows the user to review and, if desired, to modify the weights attached to the eight indicators.

When completed, the "REVIEWING REFERENCE DATA" box is displayed again, and the user can see what effect the new weights have on the population and its growth rate.

For consistency purposes, the weights can be modified only before the reference data is accepted.

Review/Modify Indicator Min/Max Values:

Each of the eight indicators has a minimum and maximum value beyond which no value is allowed. The min/max values roughly represent the min/max values for each indicator throughout the entire WISTAT file. However, the user may desire to modify these values, thus allowing certain indicators more flexibility.

For consistency purposes, the weights can be modified only before the reference data is accepted.

Save Present Data Values:

This button allows the user to save all the present values on a file. The name of the file is specified by the user. The user can then modify any or all values during this run, then at a later time read in the saved reference data and start again from that point onward.

User Control to Review/Modify All Indicators:

This button passes complete control over to the user, displaying the data for all indicators from 1995 to 2025. It gives the user the opportunity to modify all data personally rather than modify each indicator via POPSIM. This option is recommended only for users who are

familiar with the Quattro Pro system and who wish to set the values of progressively increasing years using more sophisticated formulas than is presently done via the computer.

This button can also be used if the user wishes to exceed the min/max values for an indicator without altering the min/max table because POPSIM does not check any values during the user-control phase.

After reviewing and modifying all indicator values, the user presses Ctrl/C in order to continue POPSIM,

Exit POPSIM:

This button exits POPSIM.

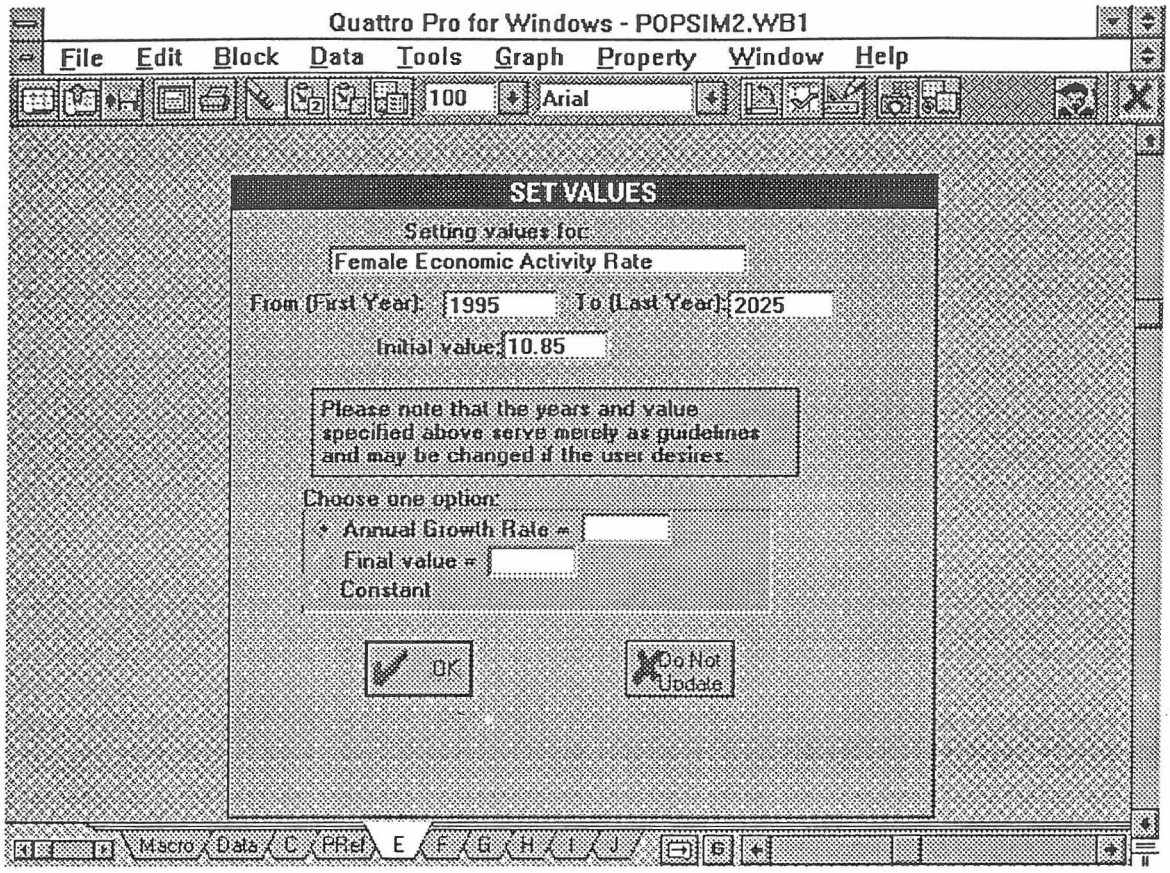
SAVING DATA box.

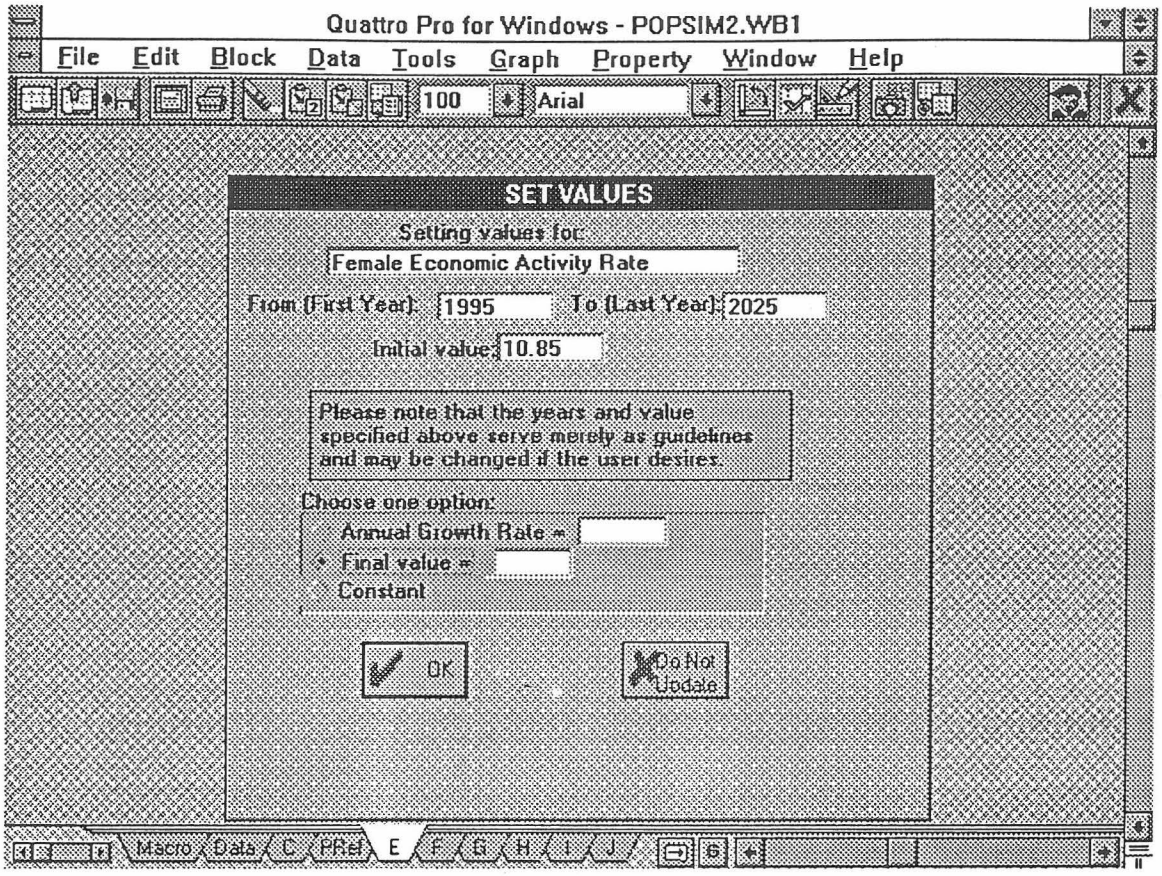
This box is displayed after the Save Present Data Values button is clicked either on the "REVIEWING REFERENCE DATA" box or the "MODIFYING REFERENCE DATA" box. It requests the name of the file onto which POPSIM will copy the present data values. The name must conform to the usual file names in the DOS/Windows system -- i.e., eight characters or less, must start with a letter or a number, etc. POPSIM will affix the ".WB1" extension to the name and save it on the \INSTRAW\ subdirectory once the OK button is clicked. Clicking the Cancel button returns to the "OBTAIN DATA" box without any action being taken.

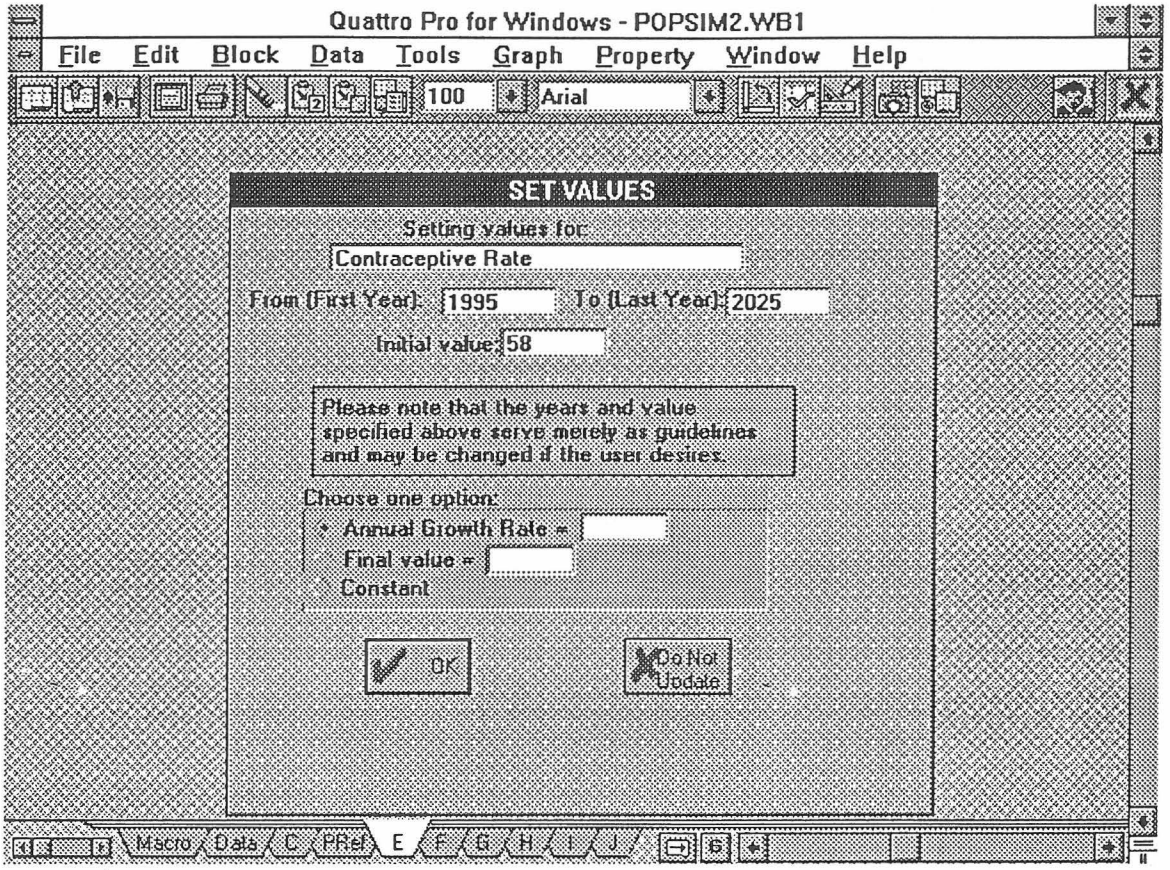
If a file with the requested name is already present, a Quattro Pro message appears asking whether or not the file shouldbe replaced. Clicking the relevant button will produce an appropriate response.

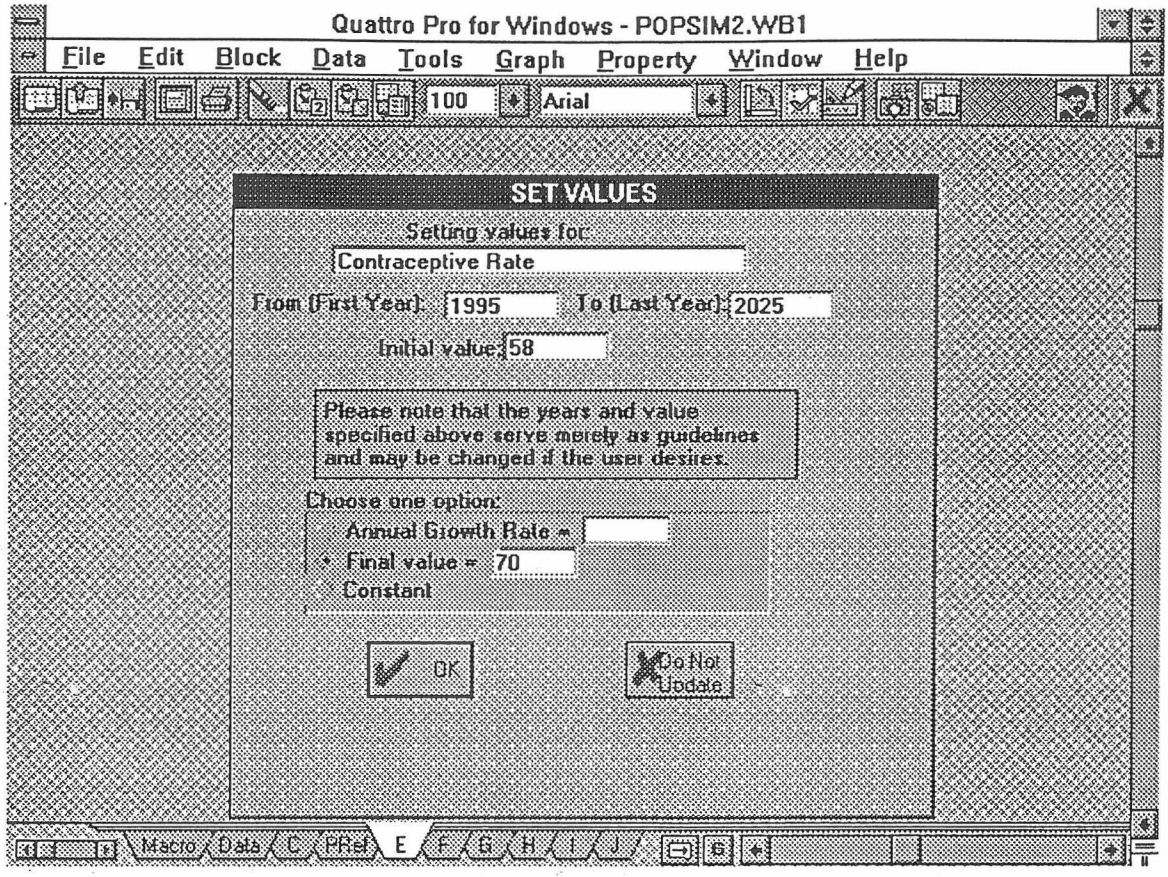
SET VALUES box.

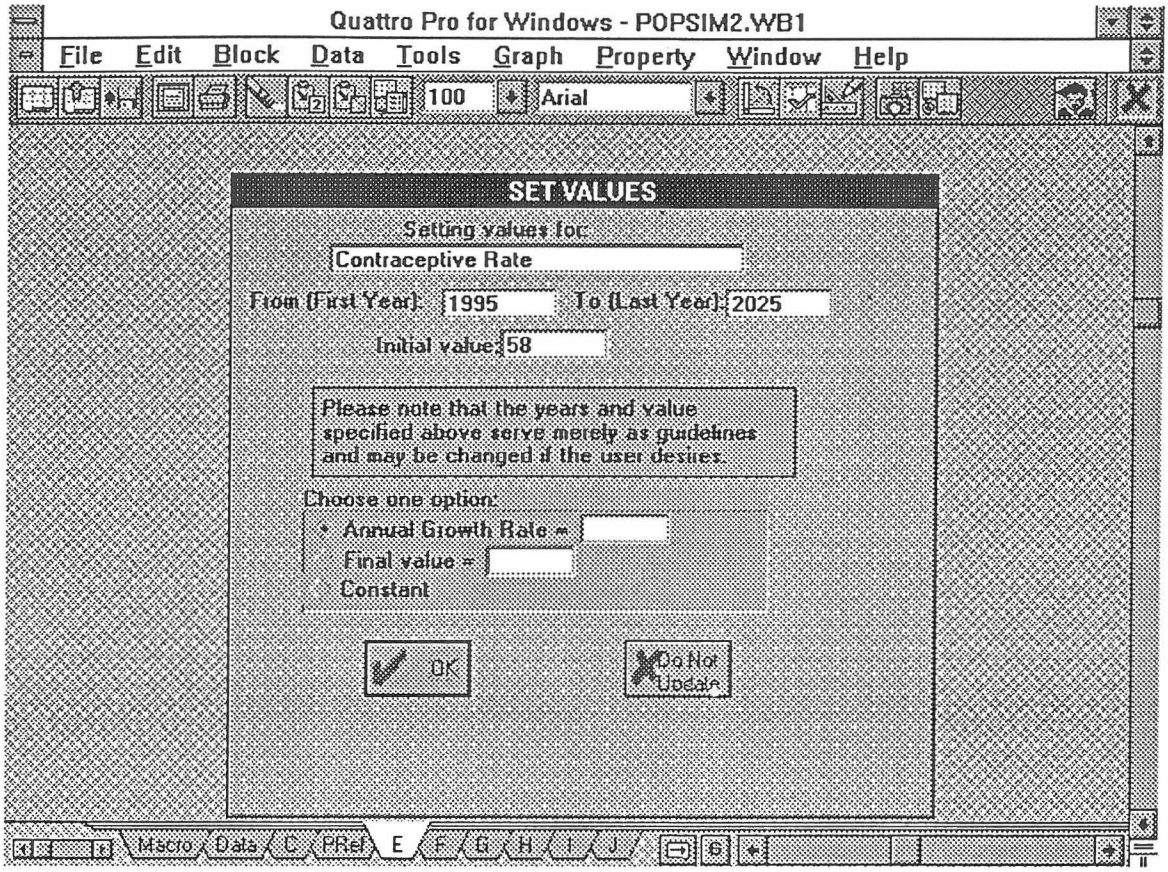
This box appears when the user wants to change a particular indicator, either before setting the reference values (from the "REVIEWING REFERENCE DATA" box) or

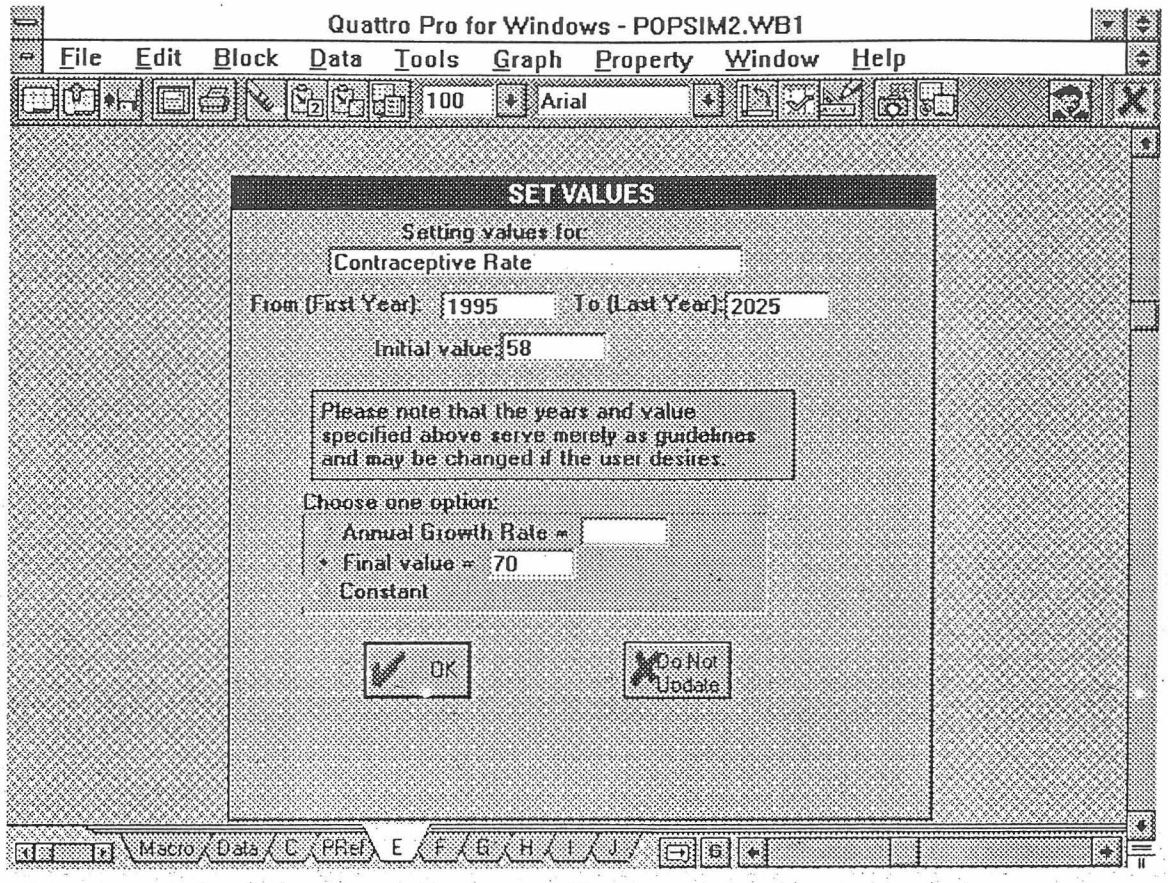

Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SET VALUES
Setting values for:
Female Economic Activity Rate
From (First Year): 1995
To (Last Year): 2025
Initial value: 10.85
Please note that the years and value specified above serve merely as guidelines and may be changed if the user desires.
Choose one option:
Annual Growth Rate =
Final value =
Constant
OK
Do Not Update
Macro Data C PRef E F G H I J

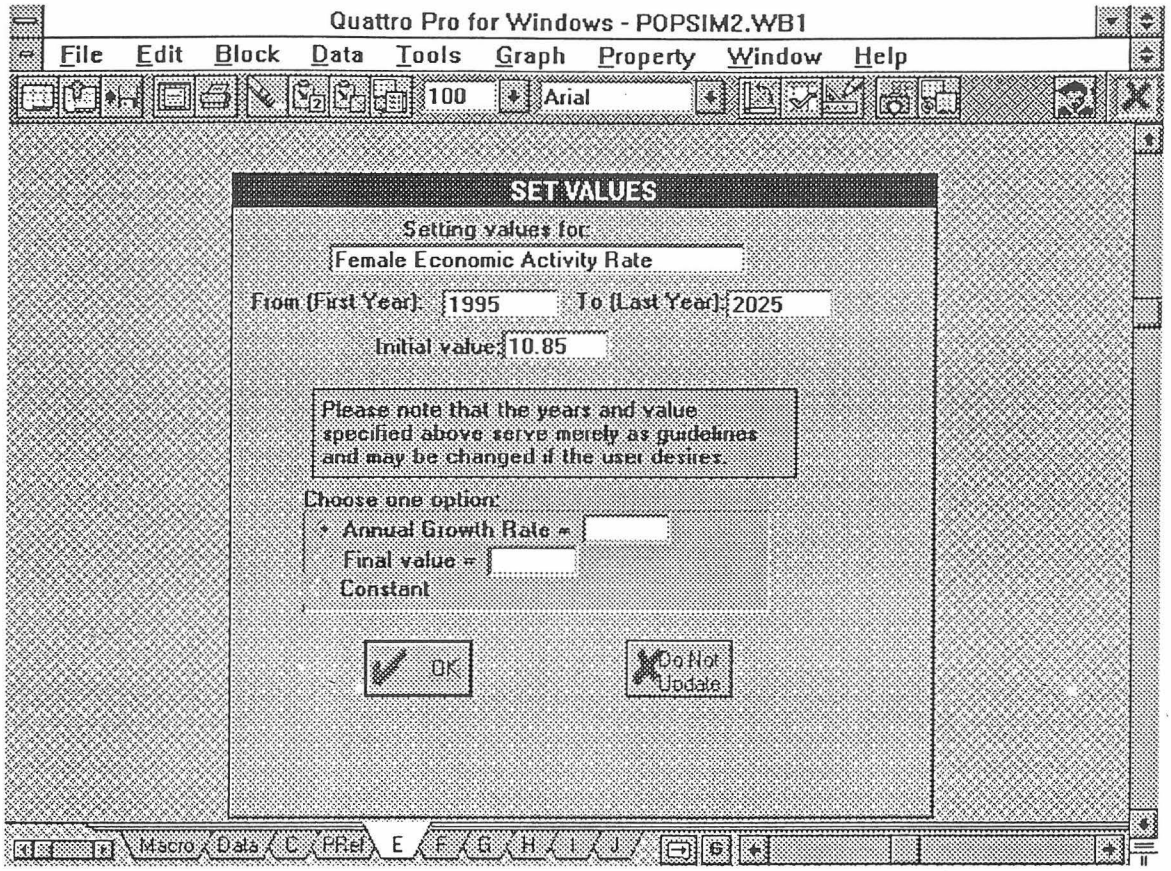

Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SET VALUES
Setting values for:
Female Economic Activity Rate
From (First Year): 1995
To (Last Year): 2025
Initial value: 10.85
Please note that the years and value specified above serve merely as guidelines and may be changed if the user desires.
Choose one option:
Annual Growth Rate =
Final value =
Constant
OK
Do Not Update
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SET VALUES
Setting values for:
Contraceptive Rate
From (First Year): 1995
To (Last Year): 2025
Initial value: 58
Please note that the years and value specified above serve merely as guidelines and may be changed if the user desires.
Choose one option:
Annual Growth Rate =
Final value =
Constant
OK
Do Not Update
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SET VALUES
Setting values for:
Contraceptive Rate
From (First Year): 1995
To (Last Year): 2025
Initial value: 58
Please note that the years and value specified above serve merely as guidelines and may be changed if the user desires.
Choose one option:
Annual Growth Rate =
Final value = 70
Constant
OK
Do Not Update
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SET VALUES
Setting values for:
Contraceptive Rate
From (First Year): 1995
To (Last Year): 2025
Initial value: 58
Please note that the years and value specified above serve merely as guidelines and may be changed if the user desires.
Choose one option:
Annual Growth Rate =
Final value =
Constant
OK
Do Not Update
Macro
Data
C
PRef
E
F
G
H
I
J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SET VALUES
Setting values for:
Contraceptive Rate
From (First Year): 1995
To (Last Year): 2025
Initial value: 58
Please note that the years and value specified above serve merely as guidelines and may be changed if the user desires.
Choose one option:
Annual Growth Rate =
Final value = 70
Constant
OK
Do Not Update
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SET VALUES
Setting values for:
Female Economic Activity Rate
From (First Year): 1995
To (Last Year): 2025
Initial value: 10.85
Please note that the years and value specified above serve merely as guidelines and may be changed if the user desires.
Choose one option:
Annual Growth Rate =
Final value =
Constant
OK
Do Not Update
Macro Data C PRef E F G H I J

adjusting the reference values to determine alternatives in adjusting the growth rate (from the "MODIFYING REFERENCE DATA" box). The user has chosen the indicator to be changed in the previous box.

The box displays the name of the indicator to be modified and three values: the years "1995" and "2025" as the start and end years of the change, as well as the present 1995 value. The years and initial value merely serve as guidelines and may be modified as the user wishes. There is a note to this effect in the box. When satisfied with the endpoint years and the initial value, the user then chooses the method of change between these two years. Three methods of change are presently available:

(a) an annual growth rate change, in which the user inputs the rate. POPSIM will store the initial value as data for the first year and will implement the specified growth rate up to the last year;

(b) a user-input final value which will be the value of the last year. POPSIM will calculate the compounded annual growth rate between the start and end years and adjust each year in between accordingly; or

(c) a constant value between the first and last year. If any calculated value exceeds the min/max values of the indicator, the value for that year and subsequent years is set to the min/max value. A message that this is happening is flashed on the screen. Should the user specify the last year as a year earlier than 2025, the calculation will be performed up to the specified end year and the "SET VALUES" box will reappear. This time, the start year will equal the previous last year plus one and the end year is again set to 2025. The start value in this case will be a projection of the previous calculated method. For example, if the user changes a particular indicator- from 1995 to 2015 using some start value with a 1 % growth rate~ POPSIM will calculate this rate up to the year 2016 and will indicate the latest value when the box reappears. The user of course may change it, but it is the user's responsibility to account for all years up to 2025. Any year not accounted for by user input will contain the data previously estimated by the computer or by an earlier version of user input, thus possibly causing an inconsistency within the values of the indicator.

Clicking OK will implement the calculation specified. Clicking Do Not Update will continue to run POPSIM

without implementing the calculation. This is handy if the user mistakenly specified a wrong indicator in the previous box or for any reason does not wish to implement the changes presently reflected in the box.

SETTING TARGET box.

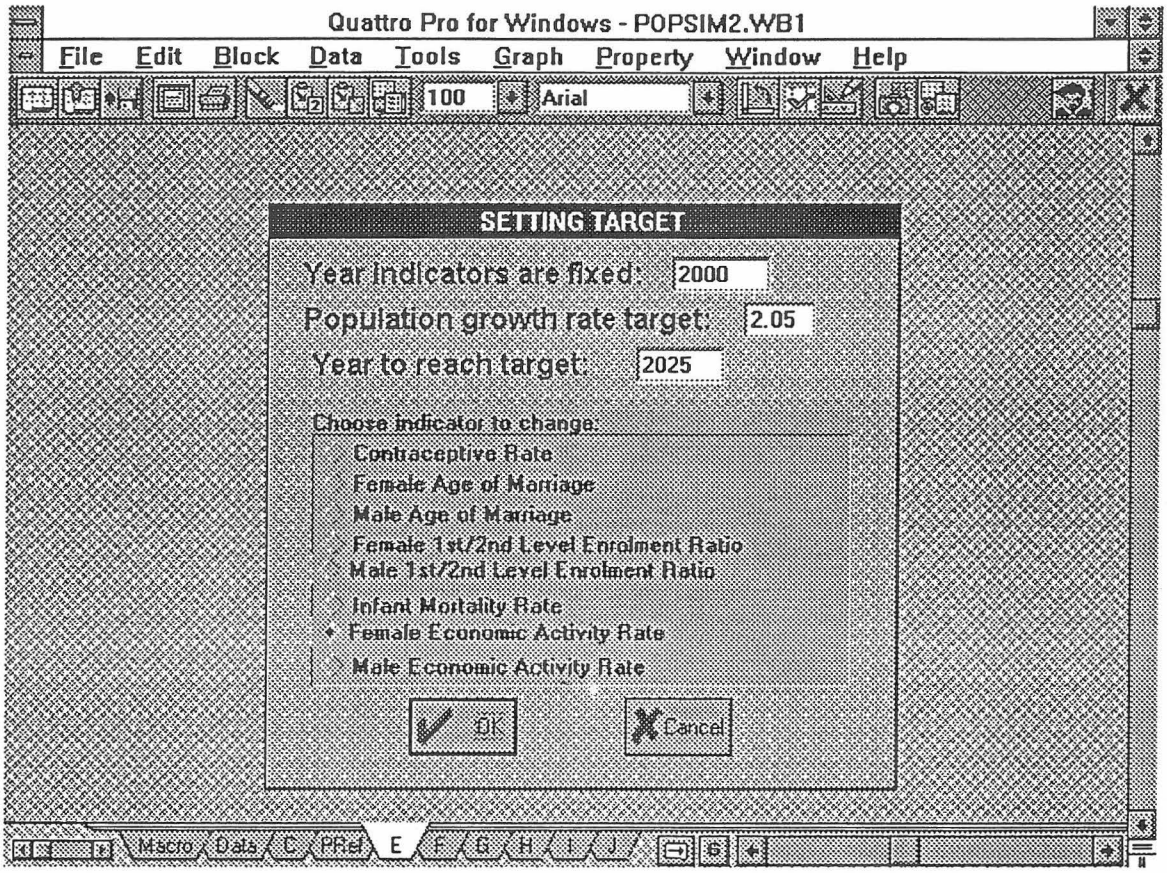
This box is displayed if the user clicks the Set Population Growth Tar~et option in the ... box. The user must input the year in which all indicator values are fixed, the population growth rate target and the year in which it is desired to reach this target. The user also selects the indicator to vary while the other indicators remain constant throughout the years. Clicking the OK button performs the operation, while clicking the Cancel button returns to the ... box without any action being taken.

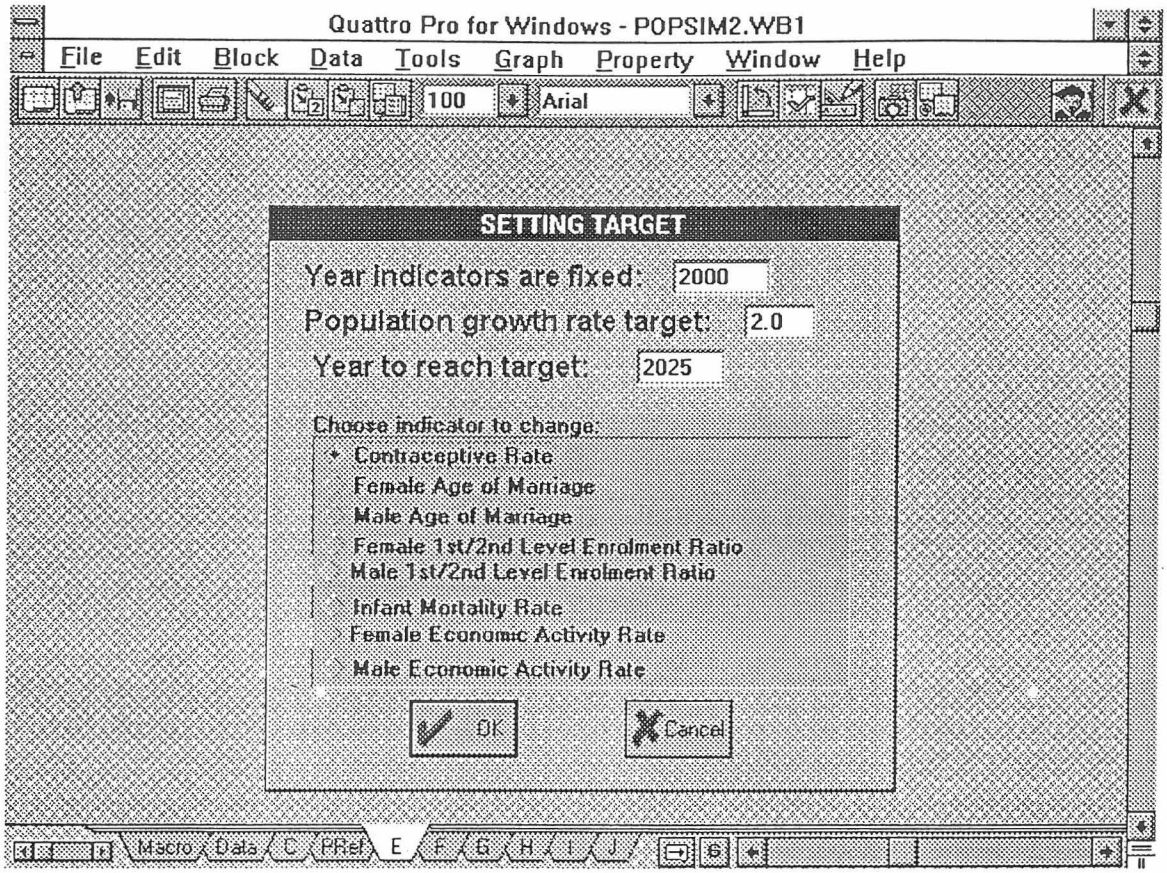
If it is not possible to achieve the target within the specified conditions an error message is displayed. Otherwise, the "SOLUTION" box is displayed with the answer.

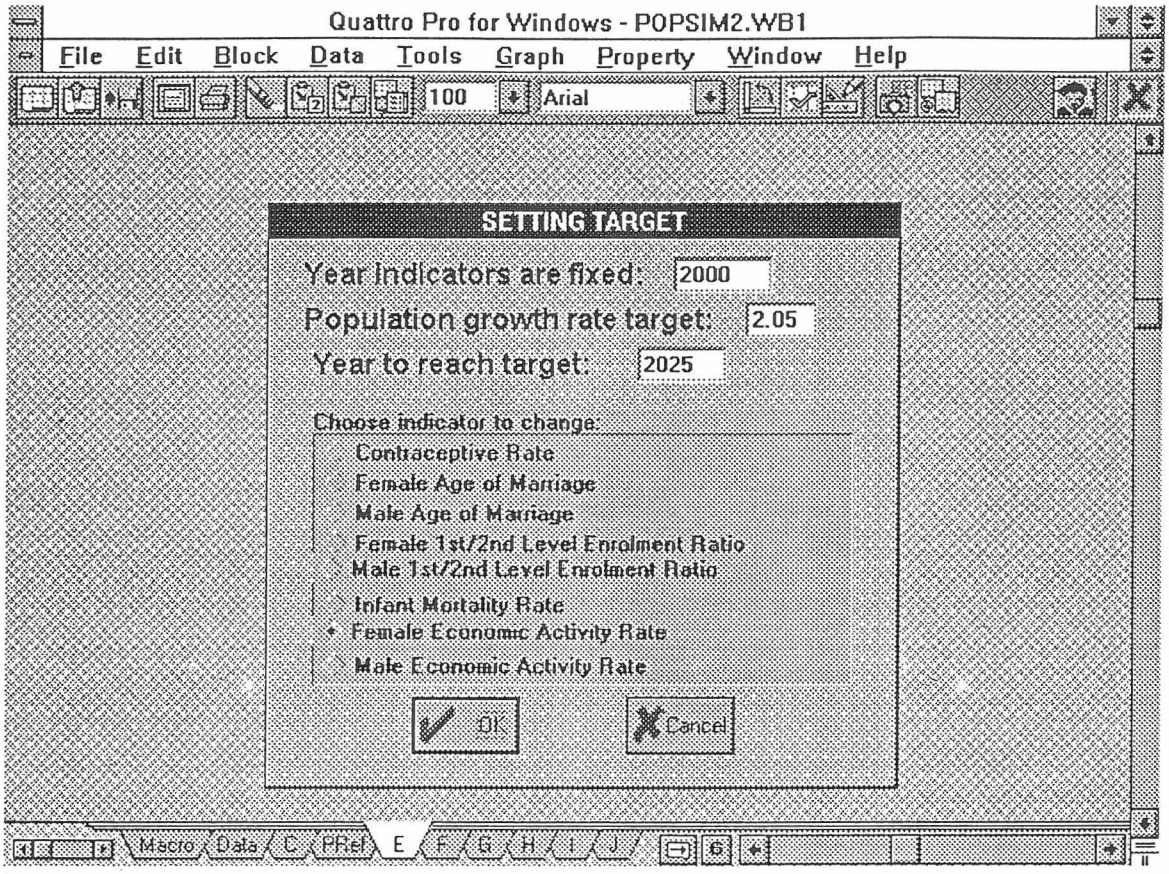
Please note that very often the indicator values in 1995 areso low that it is not possible to reach the target by the maximum year that is contained within the model, 2025. Better results are often achieved when the year in which the indicator values are fixed is later than 1995, when the values of the indicators are higher.

SYSTEM ERROR! box.

This error indicates a system failure. The model will not continue running after this error occurs. Please contact an attendant to report the error.


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SETTING TARGET
Year indicators are fixed: 2000
Population growth rate target: 2.05
Year to reach target: 2025
Choose indicator to change:
Contraceptive Rate
Female Age of Marriage
Male Age of Marriage
Female 1st/2nd Level Enrolment Ratio
Male 1st/2nd Level Enrolment Ratio
Infant Mortality Rate
Female Economic Activity Rate
Male Economic Activity Rate
OK
Cancel
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SETTING TARGET
Year indicators are fixed: 2000
Population growth rate target: 2.0
Year to reach target: 2025
Choose indicator to change:
Contraceptive Rate
Female Age of Marriage
Male Age of Marriage
Female 1st/2nd Level Enrolment Ratio
Male 1st/2nd Level Enrolment Ratio
Infant Mortality Rate
Female Economic Activity Rate
Male Economic Activity Rate
OK
Cancel
Macro Data C PRef E F G H I J


Quattro Pro for Windows - POPSIM2.WB1
File Edit Block Data Tools Graph Property Window Help
100
Arial
SETTING TARGET
Year indicators are fixed: 2000
Population growth rate target: 2.05
Year to reach target: 2025
Choose indicator to change:
Contraceptive Rate
Female Age of Marriage
Male Age of Marriage
Female 1st/2nd Level Enrolment Ratio
Male 1st/2nd Level Enrolment Ratio
Infant Mortality Rate
Female Economic Activity Rate
Male Economic Activity Rate
OK
Cancel
Macro Data C PRef E F G H I J

Annex A:

Minimum and Maximum Values Permitted for Each Indicator

Indicator Name	Minimum Value	Maximum Value
Contraceptive Rate	0	100
Female Age of Marriage	16	31
Male Age of Marriage	21	33
Female Gross First & Second Level Enrolment Ratio	9	111
Male Gross First & Second Level Enrolment Ratio	18	111
Infant Mortality Rate	5	160
Female Economic Activity Rate	5	54
Male Economic Activity Rate	40	68

Group Work 3-2

The exercise to be undertaken in this particular group work session is a continuation of the pre-workshop Exercise II. At the end of this group work, each team is expected to present a framework of a project proposal on the topic they selected for their paper. This framework should identify the following:

1. Statement of the problem.
2. Policy objective. If specific policy targets have been set by the government, this should be stated as the primary policy objective
3. Factors affecting the identified policy issue. For example, let's say, a team selected the topic *improving economic productivity of the country/region/province.* Participants should be able to identify the general factors affecting productivity which may include education, health, age distribution, access to capital and other resources, etc., of the target population. These factors should also be presented by sex/gender.
4. Definition of the role that women play in this particular issue.
5. Definition of the assumptions and hypotheses
6. Definition of indicators that can be used to test the assumptions and hypotheses set in (5).
7. Statistics required to derive the indicators defined in (6)
8. Possible data sources
9. Availability and quality of statistics identified in (7). Evaluation of the quality and reliability of these statistics should be done by source, if possible.
10. Steps to be taken by both data producers and data users to ensure that appropriate statistics and indicators are selected and made available to carry out the analysis.

The participants will be guided by the trainers throughout the entire process of developing the proposal.

RURAL WOMEN IN DEVELOPMENT MODEL

RURAL WOMEN IN DEVELOPMENT MODEL

UNITED NATIONS

Department for Economic and Social
Information and Policy Analysis
DESIPA

International Research and Training
Institute for the Advancement of Women
INSTRAW

This manual is based on its shorter version originally formulated by Professor Scott Moreland of the Center for Development Policy of the Research Triangle Institute, Research Triangle Park, North Carolina

FOREWORD

One of the main features of the last three United Nations Development Decades has been the central role of women in all aspects of development. As United Nations agencies have sought to assist governments in development planning, UN technical advisers have been learning increasingly that socio-economic planning that does not account for the contribution of women to development through their reproductive and productive roles cannot lead to sustainable development. Unless women become equal partners with men --both as contributors and beneficiaries-- development programmes cannot yield the desired results. Gender is a crucial variable in the development formula.

Since 1975, when the first women's decade was inaugurated, the entire UN system has tirelessly supported the efforts of member countries in making women active participants in the development process. The number of conventions, strategic plans and actions implemented since then are a testimony to the unwavering support the United Nations has lent to women's advancement.

The technical cooperation programme of the United Nations has a substantial and far-reaching mandate to promote women in development (WID) issues. The United nations Department for Economic and Social Information and Policy Analysis (DESIPA), and its predecessor organizations, have always assigned the highest priority to women's roles and issues connected to women in development. Promotion of WID has been sustained, despite limited resources and in the face of a dramatically increasing demand for technical cooperation.

One operational area which is of the highest priority to the United Nations --human resource development through training-- has always claimed priority in technical cooperation despite scarcity of means. DESIPA's specific measures to promote women in development have entailed efforts to design training tools and raise awareness on issues of concern.

Women have always contributed to survival, sustenance and development. However, the scope and measured value of that contribution has remained modest, and women have been viewed as passive contributors --unseen, unacknowledged and invisible. In effect, women's potential for genuine economic contribution has remained untapped, and women often have been deprived of the benefits of change and progress.

Like many other international, governmental and non-governmental agencies, DESIPA is keenly aware of the urgent need to raise awareness of women's role in development. The Task Force on Women in Development which was established under the chairmanship of Ms. Dunja Pastizzi-Ferencic, Former Director of the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW), has adopted an approach to raise the awareness of women's issues in development, as well as to ensure that WID issues and concepts are translated into action and incorporated into concrete programmes. With regard to these models, one strategy is to establish analytical training tools that provide a framework for logical and consistent thinking about WID issues. The second is to raise awareness among planners, policy makers, politicians, administrators and government decision-makers about such issues by

demonstrating, with the aid of statistics, how policies designed to support women in fulfilling their intrinsic socio-economic development potential, can achieve an equitable, balanced and sustainable development process. Through quantitative inputs and analyses in these statistically based frameworks emerge qualitatively significant and policy-relevant models.

Currently these models are teaching tools and conceptual frameworks to serve as a basis for recognizing the multisectoral dimensions in the planning process must employ to ensure equitable participation of men and women in development. These models cannot, as yet, be used for decision at the national level. However, if the required data at the national level can be collected, the validity of the models can be fully established. The models could then serve as the basis for development policy, investment planning and programmatic interventions --essential building blocks of socio-economic development.

Two members of the Task Force on Women in Development, Ms. Krishna Roy of the Population Division, DESIPA and Ms. Jeanne-Marie Col of the Public Administration and Development Management Division, DDSMS, prepared these models in collaboration with other colleagues. The models have been demonstrated international seminars, workshops and other training activities for middle and senior level government officials. Considerable interest and enthusiasm have been generated among audiences, resulting in a great demand for additional copies and more opportunities to use them. The models have now been amended and improved, and should be extensively disseminated. The United Nations International Research and Training Institute for the Advancement of Women has generously contributed to their publication.

It gives me great pleasure to present these models to interested development practitioners in the hope the models will be of help in enhancing women's contribution to sustainable development.

Jean-Claude Milleron
Under-Secretary-General for Economic and Social Information
and Policy Analysis
United Nations
New York

May 1994

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I. INTRODUCTION

Issues related to "women in development" (WID), or more specifically, the contribution of women to national socio-economic development in the Third World, have received increasing attention in the last two decades. This is especially true since the 1975 International Women's Conference in Mexico. Many studies have attempted to document the quantitative contribution of women. Many writers have attempted to provide a theoretical rationale as well as empirical evidence for the proposition that improving the role of women in various ways can be beneficial or even necessary for development to take place. The arguments are many, and it is not the purpose of this study to summarize the findings to date. Interested readers, however, may find a sample of these studies in the bibliographic references in Appendix 4 of this report.

In the developing countries, where action is taking place, hundreds of well-intentioned women-oriented development projects are now being financed by donor agencies in an effort to capitalize on the potential contribution of women. In general, development planning is paying more attention to the role of women. It can be expected that, as more studies are undertaken to analyze the role of women in development, increasing emphasis will be put on re-assessing development projects to fully involve women in the process.

In spite of all this interest in WID, there still is no clearly defined analytical model which permits a systematic assessment of women's contribution to social and economic development. The model discussed here is a very modest attempt to capture some of the economic elements of the potential contribution of women to the development of an economy. The model is limited to examining women's role in an agricultural household. Since the vast majority of Third World women live in rural areas and their families subsist on agricultural production, this model will be relevant to a large proportion of the population.

Another reason for such "stereotyping" is that the contribution of rural women has been traditionally left out of formal analysis because their activities are mostly non-market-oriented. As an "awareness raising" model, it is important to highlight the often understated contribution of these women. The model is conceived at the micro level (i.e., the household) and therefore it faces the same problems as any micro model — aggregation of results from the micro to the macro (i.e., regional and national level use), is justified only under certain conditions.

The purpose of the model is to provide an analytical device which can show the affect of various policies in the arena of women in development on social and economic progress. It is a model that demonstrates an analytical framework with which WID issues can be imaginatively and logically discussed. It is, in essence, an example of such analysis. The model is useful for training participants in workshops and

other training activities on WID issues. Its primary objective is to help workshop participants become familiar with a method of analyzing WID-related problems, and to internalize a framework for conceptualizing the issues involved and relationships among them in the context of development planning. Users of this model in its present stage of development can learn from it a method of logical thinking and analysis rather than derive specific, detailed real life solutions. It also may be useful to sensitize policy-makers to WID. Thus, it is an awareness-raising model.

Strictly speaking, the model in its present form is not an empirically-based model of the actual role and contribution of women in a particular country. On the contrary, it is a generalized model based on stylized "facts" relevant to a rural household. While the model is not empirically based, meaning the parameters are not the results of econometric regressions, it can be empirically verified (see Appendix 1 for a simple example for empirically estimating parameters for the basic equations of the model), and most of the relationships built into it are based on actual observations in the field. Moreover, efforts have been made in the actual computer version of the model to specify parameters typical of developing country situations. However, until empirical research is undertaken to verify the model, users are reminded that the model is a teaching tool and its results can only be viewed as tentative.

As a teaching tool, attempts have been made to simplify the model to the point where it is easy to learn and easy to use. This also implies that the model is by no means complete. But an effort has been made to keep its complexity to a minimum and to construct a meaningful model that approximates reality as closely as possible.

The computer version is a quantitative model which yields a numerical solution for the model's endogenous (i.e., dependent) variables. But the main interest in the model's use is in the qualitative information these quantities signify. It is the insight these numbers provide into women's contribution, not the quantification of the indicators themselves, that is most important. For example, the model should not be used to answer questions like "by how much does women's income go up or down when their access to education increases?", but, "does it go up at all and does it go up consistently?" or "does it go up by more than a similar policy oriented toward men?".

The model is very general, highly illustrative and easy to learn. It involves the use of a personal computer. The basic computer operations necessary for running it are introduced in Appendix 2 of this document. Readers who wish to refresh their knowledge of DOS and LOTUS 1-2-3 can use that section as a reference for some common terms and commands. A 5-1/4-inch DOS-formatted disk containing the model is included at the end of Appendix 2. The rest of this document is organized into three chapters. The theoretical model itself is first presented in Chapter II. Chapter III is a test run which includes a description of the simulation model and the results of exercises illustrating implications of policy changes. The manual ends with concluding remarks.

II. THE MODEL

A. Background and main assumptions

As already mentioned, there are a number of elements that one would ideally like to have included in a general WID model. For the purposes of teaching a method with minimal complications, the scope here has been limited to a few key aspects. After all, the function of a model is to simplify reality so that interrelationships among the factors involved become easier to understand. In theory, one can add more elements to a model to more closely approximate real life, but there is always the risk of the model becoming so complicated and intimidating that it could turn out to be a veritable black box. With this "trade-off" in mind, the model constructed is a compromise. More specifically, it is built on a few assumptions, which are stylized facts observed in many developing countries. No claims are made, however, that these assumptions accurately describe the situation of women in any particular country.

To keep the model simple and well-focused on the role of women, assumptions regarding the contribution of men have been simplified, but not denied or overlooked. What is intended in making these assumptions is to highlight the role of women, other conditions being equal. The aim is to prove how government policies aimed at strengthening women's role can improve the welfare of families. From an analytical point of view, the assumption regarding men's contribution is justified because (1) calculations are greatly simplified, and (2) the model's validity is not compromised, since men's contribution in the areas included in this model is not negated or impeded by policies directed at women.

The basic assumptions of this model are discussed below:

Assumption 1: There is a sexual division of labour.

This assumption implies that for a given productive activity (e.g., growing crops), men's and women's tasks vary. For example, men may clear the land and plant the crops, and leave weeding and harvesting to women.

Assumption 2: There is a sexual division of productive activities.

This assumption is based on the observation that men and women are often engaged in different productive activities in agriculture. For example, in West Africa women have their own crops, which they tend (as opposed to predominantly "male" crops). Similarly, women are usually responsible for the care of small animals (chickens and goats) whereas men tend the larger animals (cattle). Women grow crops used for family consumption, such as garden vegetables and other staples. Men's crops are often cash crops that are mainly for the market. Sexual division of labour also applies to the kind of activity in which men and women engage. Women, more than men, engage in handicrafts, which are both used

at home and marketed. Such sexual division of labour applies to market wage-earning jobs as well.

Assumption 3: There is a sexual disparity in terms of access to productive resources.

In addition to differences in productive activities and tasks, there are also disparities regarding access to factors of production other than labour. Such inputs as land, credit, extension services and education are complementary to labour in production, and access to them is not equal for both genders. There is documented evidence which shows that women are at a disadvantage on this count. In many countries women do not have rights to inheritance of land and property. Thus, in many cases they have no collateral to be able to obtain credit. Therefore, women try to substitute their own labour for the other factors of production to which they do not have easy access. It has been found that spouses help out in each other's crops (Assumption 1), and the most usual form this takes is through labour. Research in this area does not establish that spouses share capital to which men have access that women lack.

The obstacles to female access may vary from country to country, even from factor to factor. In some cases, it may be traditional inequalities between the sexes, or cultural stigma that discourages women from having direct contact with non-relative males who provide services. In other cases, women may be able to overcome these social disadvantages, but they still may find themselves tied entirely to child care and other household chores.

Assumption 4: Women and men have unequal economic power, and this inequality can adversely affect productivity.

Economic power has been defined in this study as the ability to retain the returns of one's labour or to have control over the use of such returns. Often, women are powerless to keep the fruits of their labour and are thus exploited. Blumberg's (1988) study makes a strong case for this assumption. In many African countries, men and women of the same household maintain separate purses. This phenomenon can be interpreted as an indication that women try to control their income. Studies have shown that the ability to retain one's income or returns from labour has a significant effect on the productivity of one's labour. These studies conclude that many well-meaning rural development projects could have been more successful in helping women if they had taken account of the relative control women have over their earnings. Where women have more control over their income, their responsiveness to the introduction of new technologies, seeds and production techniques is greater, and can lead to greater increases in productivity.

Assumption 5: Women devote a significant amount of their time to non-income earning activities.

The biological role of women as child-bearers and the societal norms of women's roles in the family result in women having to devote a significant amount of their time to such home-based, non-income

earning activities as child care and housework. Compared to women, men spend considerably less time on such home activities. These non-income earning activities have social value, yet are overlooked in the measurement of gross national product (GNP) or other development indicators that are conventionally used. The actual amount of time a woman spends in such activities is directly influenced by the size of her family. Therefore, family size also affects the amount of time a woman spends in other activities, such as agriculture or market wage-earning employment. The model also takes into account the amount of time men spend on household activities, which is assumed to be a small proportion of the time women spend on these activities.

Assumption 6: Fertility is related to women's education, labour force participation and access to family planning services.

Almost all studies of the determinants of fertility show that female education and labour force participation are important factors in determining fertility. Since family planning services provide knowledge and means for controlling fertility, there is a direct correlation between access to such services and fertility. Family planning practice involves both men and women. However, it is observed that the intensity of practice is higher on the part of women than men. In this model it is assumed that the proportion is 1:5 for men to women.

B. The structure of the model

In this section, the structure of the model is defined and relationships among the variables are explored. Relationships are expressed as mathematical equations. An attempt is made to explain the significance of each parameter and the rationale behind each one of the expressions.

The present model differs from most other computer models which have been developed for analyzing issues in developing countries (such as the United Nations Population and Development Simulation Game) in two important aspects.

First, it is not a macro model with variables defined at the national or regional level. It is a household, or micro level model. Many WID issues, especially in the rural agricultural sector, can be better identified and defined at the micro level, and it is at the grassroots level that policy interventions are urgently needed and are also likely to become more effective. This does not exclude macro analysis, but aggregation from the micro to the macro level entails another step not considered in this model.

Second, the model is a static model — a time dimension is not present in it. This does not imply that comparison over time is not possible. One can compare the final outcome under different policy options and derive conclusions, such as, "if policy A is changed, the resulting effects will be...." But the model does not reveal the amount of time it actually takes to implement policies or for their effects to fully materialize. Nor is the mechanism through which policies are implemented discussed. Put simply, this

model takes the user from one solution to another as policy variables are manipulated. In this sense the model does explain the eventual effect of a policy. This type of "what happens if..." comparison is often referred to as a "comparative static" study, as against a study of the concerned dynamic process itself.

The structure of the model reflects the main elements of women's role in rural, agrarian economies of the Third World, as well as the main assumptions listed in the preceding section. The model consists of four inter-related components:

- Allocation of time among various activities;
- Agricultural production;
- Cash income; and
- Family size.

The overall evaluation is summarized in a synthetic measure denominated "household welfare." A higher value of this welfare index represents a better outcome.

The main exogenous/policy variables in the model are:

- Level of education of women/men (Ef, Em);
- Share of women's/men's total cash income controlled by women/men (gf, gm);
- Access to capital for use by women/men for the purpose of their total production in agriculture (Kf, Km);
- Share of men's total retained income going to the home(s);
- Access to family planning services (FPP);
- Access to agricultural extension services for women/men (Af, Am);
- Rate of market wage for women/men (wf, wm);
- Percentage of agricultural time spent on own crops by women/men (vf, vm);
- Price per unit of agricultural crop of women/men (Pf, Pm);
- Share of agricultural product of women/men marketed for cash (df, dm);
- Amount of land available to women/men for agriculture (Rf, Rm); and
- Total amount of time available (T) (this is the same for both sexes).

It should be noted that percentage/share variables are represented in small letters and others in capital letters. Throughout the model, the subscript "f" refers to female variable and "m" to male variable.

The term "retained income" refers to that part of the income over which the earner has control. (Yf and Ym, which we will define later in this chapter, are retained incomes). For ease of use and understanding, many of the above variables are employed in the model as index variables above or below 1, relative to a reference level. The reference level can be relative to men's standard as in the example, and at the same time it can be for a specific scenario to permit comparison with others. Index numbers represent relative values rather than absolute levels. By indexing these variables, computations are simplified since the numbers become much smaller. This also facilitates comparison of the impact of changes in policies between different scenarios or countries. For example, a situation where "women's education is increased by 50%" is more general than one where "government funding for women's education is increased from $10 million to $15 million." By indexing variables, it is possible to allow for country-specific reference levels to be used without changing the structure of the model. For example, in some countries the reference level of education for women (index value 1) may be two years' primary schooling while in some others it may imply finishing five years of primary school. The model, however, can be used in analyzing the impact of raising female education in either group of countries.

The main endogenous/dependent variables are:

- Total agricultural output produced by women/men (Of/Om);
- Total cash income that women/men earn (Yf,Ym);
- Total time spent on agricultural production by women/men (Lf, Lm);
- Total time spent on market employment by women/men (Mf, Mm);
- Total time spent on home work by women/men, averaged by the size of the household (Hf, Hm);
- Family size (S); and
- Household welfare index (U).

By manipulating the model's exogenous variables, users can explore their impact on the model's main endogenous variables. Many of the exogenous variables are the model's equivalents of policy interventions.

C. Relationships among the "Building Blocks" of the model

The model is based on five major hypotheses regarding interrelationships. These interrelationships are:

1. Use of time

Other things being equal, the amount of time devoted to an activity will determine the output. Hence it would be useful to consider the allocation of a typical man's/woman's time among farming, market wage employment and non-crop home work. First, the model assumes a fixed amount of time (T) as being available to a person. This amount may be biologically determined as the natural time minus the hours needed to rest and to feed in order to sustain one's physical condition. T, therefore, may vary from person to person. However, this variance is not accounted for in this model.

In the following analysis it is assumed that the block of time one allocates to market wage employment is positively related to the market wage rate (w), meaning if the wage rate is higher, people will be induced to devote more time to market employment. In this model the market wage rate is expressed as a percentage of the total market value of time spent producing and marketing agricultural output. For example, assuming a hired agricultural worker produces a certain amount of output during a specific farming season, which can be sold for $100; out of this total market value of the product, if $50 are paid to the worker as wages, the wage rate in this example is 50% (or 0.5). The advantage of measuring wage rate this way is twofold. First, absolute quantity is simplified to a percentage. Second, one does not have to know exactly how many hours a person actually worked to calculate the average hourly wage rate, as illustrated by the above example.

The other fraction of the total value is reserved for repayment of principle and interest on loans the employer used to purchase capital equipment and returns for his labour, entrepreneurial and managerial services. This allowance can be viewed as the deduction made by the employer who provides the equipment, time and talent. The following equation describes the relationship between the share of total time devoted to market wage employment and the wage rate:

$$m = \text{Min}\,[(0.2 + 0.1\,w)\,,\ 0.8],$$ where

m = share of time devoted to market employment, and

w = wage rate.

This formula applies to both men and women, and hence subscripts have not been used. The mathematical function Min [... , ...] compares the values of all its arguments and assigns the smallest value to the variable on the left side. For instance, if the wage rate is equal to 1, then the value of the first argument will be $0.2 + 0.1 \times 1 = 0.3$, which is smaller than 0.8. Applying the formula, we then get $m = 0.3$, meaning the person will devote 30% of his/her total time to market employment.

The first element inside the bracket is a constant term (0.2), which is not related to wage rate. It represents the amount of time one will allocate to market wage employment independent of wage rate because one needs cash income to purchase necessary personal or household items not produced by any member of the family. The term 0.1 w captures the positive relationship between the portion of one's time spent in market employment and wage rate. As a whole the main implication of this equation is that a person devotes 80% of his/her time or a percentage determined by the expression (0.2 + 0.1 w), whichever is smaller, to market wage employment. In other words, a person decides what proportion of his/her time is to be used for market wage employment when a wage rate is given, with the constraint that it will not exceed 80%. This 80% limit is set because in the present model the household is rural and therefore a person has to reserve some time for farming on his/her own piece of land and also for house work. Nonetheless, 80% is an arbitrary limit used to illustrate the point and, therefore, should not be taken as fixed. In reality, this limit is determined by social as well as cultural factors such as the degree of self-sufficiency and cultural stigmas against women working outside the home.

Next, the amount of time spent in home activities is taken as a function of the size of the family. Home activities include child care, food preparation, water and fuel gathering, and can include tending small animals such as chickens and goats. Based on empirical observations of traditions and customs, it is assumed that men spend less time in home activities than women do. Therefore, the expressions used to determine the percentage of time spent in home activities are:

$$hf = 0.1 + 0.05\ S, \text{ and}$$

$$hm = 0.01 + 0.01\ S.$$

In these equations, h is the proportion of one's time spent in non-market, non-crop, home activities, and S is the size of the family. This formulation needs very little explanation.

Finally, the amount of time remaining will be used for agricultural production. Therefore, the expression for calculating this residual is $l = 1 - m - h$, which applies to both sexes.

Now, to summarize the use of time among three different components:

1) Amount of time allocated to market employment

   $M = m.T = \text{Min}\ [(0.2 + 0.1\ w),\ 0.8].T$

2) Amount of time devoted to household chores

   $Hf = hf.T = (0.1+0.05S)T$

   $Hm = hm.T = (0.01+0.01S)T$

3) Amount of time spent in agricultural production

   $L = l.T = (1 - m - h).T$

It may be remembered that Assumption 2 postulates that men and women raise different crops. To reflect that assumption, it is taken for granted that each sex spends a fraction of his or her agricultural time on his or her "own crops." This fraction is denoted by v. Therefore, women devote vf percent of their agricultural time tending their crops and (1 - vf) helping the males of the household with "male" crops. The same split, though very likely a different fraction, for which vm is used, applies to men as well. The rationale is that certain tasks performed by men, such as clearing the field and planting (as mentioned in Assumption 1), are necessary in women's production.

To summarize, the total amount of time available to a person is divided among different activities. The amount of time one uses for wage employment is directly related to the wage rate, with higher wages inducing more time to be allocated to such employment, up to 80% of one's total time. The amount of time a person devotes to household work is determined by the family size, since larger families require more time to care for. The rest of the time available will be allocated to agricultural production, where both sexes have their own crops and help the opposite sex with some of the tasks of raising their crops.

2. Agricultural production

For simplicity, it is assumed that there is only one agricultural/animal husbandry output per sex (crop or livestock). This means that the model does not allow one to analyze policies that affect production mix, since including more than one output would make the model unduly complicated, given its illustrative purpose.

In the tradition of economics, output is seen as a function of the factors of production — labour, capital and land. In addition, access to agricultural extension services and the share of income one retains from one's production (i.e., economic power or the incentive factor, which we also have referred to as retained income) directly influence productivity. Agricultural extension services enhance the productivity of all production factors. Economic power directly influences the incentive to work. The assumption is that if one is able to control only a small amount of the fruits of one's labour, then the incentive to shirk or seek other options will be high.

As a result, productivity and production will be lower. Therefore, greater economic power will lead to higher productivity via the economic incentive mechanism. Thus, agricultural extension services and the share of one's income under the control of oneself enter the production function in the same way as the other four traditional factors of production. A multiplicative functional form is employed to reflect the economic rationale that, while it is possible to substitute among factors, all are necessary. Following is the equation describing the women's production function in detail.

$Of = [Lf.Ef.vf + Lm.Em.(1-vm)]^{0.4}Kf^{0.3}Af^{0.1}gf^{0.1}Rf^{0.2}$, where

Of = total agricultural output produced by women;

Lf = total time spent on agricultural production by women;

Ef = female education level;

vf = % of female agricultural time spent on own crop;

Lm = total time spent on agricultural production by men;

Em = male education level;

vm = % of male agricultural time spent on own crop;

Kf = as defined in the list of exogenous variables;

Af = access to agricultural extension services for women;

gf = share of women's income controlled by women; and

Rf = amount of land available to women.

It may be noticed that both women's and men's education enter the production function. This is because the level of education acts as a "quality" index and so positively affects production in conjunction with the level (or quantity) of labour. The term (Lf.Ef.vf) gives quality-adjusted labour input contributed by women; vm is the percentage of men's agricultural time devoted to men's own crop. Hence (1-vm) is the percentage of men's agricultural time used to help women in women's crop. For instance, men may spend some time to clear the land and to plant the crop for women, as was assumed earlier. Then the term (Lm.Em.(1-vm)) represents the quality-adjusted labour input, to the production of women's crop, made by men. Thus, the term inside the brackets is the total quality-adjusted labour input, both by women and men, in the production of women's crop.

The other terms in the equation are self-explanatory. Kf is the capital input, Rf is the land input, and Af and gf are the other two non-traditional inputs, namely agricultural extension services and the incentive factor. The small constants represent the productivity, or productive power, of each factor. They appear in the equation as the power parameters in the exponential expressions. In this functional form, an increase or decrease in any particular production factor will have an effect on the total output modified by its power parameter. A greater power parameter means the greater impact a change in input will have on total output. The difference in the magnitude of these constants thus represents the difference in the productivities of different factors, or the contribution of each factor to total output.

By strict analogy, men's production function is expressed as:

$$Om = [Lm.Em.vm. + Lf.Ef.(1-vf)]^{0.4}Km^{0.3}Am^{0.1}gm^{0.1}Rm^{0.2}$$

3. Income

Net cash income has two main components. The first is income derived from the sale of agricultural production. This is determined by the level of production, the share of the production marketed and the prices.

The second component is the income derived from wage employment. Its size is determined by the wage rate and the amount of time devoted to such employment. As explained earlier, wage rate is expressed in terms of a portion of the market value of one's output because an allowance is made for repayment of loans made to purchase necessary capital equipment.

Consequent to the assumption (Assumption 2) that men and women engage in different productive activities (both agricultural and market wage employment), male and female income is calculated separately. What is meant by male/female income is the amount of income over which men/women have actual control, in the sense men/women spend this income in the way they see fit. In agricultural activities, there is also a division of tasks. Therefore, there may be tasks performed by one sex for the other which may be compensated for. For this reason it is useful to subdivide the first component of cash income, income from the sale of agricultural output, into male and female proportions. In market wage employment, men and women perform different jobs and are paid at different rates. But it is assumed in this model that no help from the other sex is needed to do one's jobs.

Following the reasoning above, women's cash income may be expressed through the following equation:

$Yf = Of.Pf.df.gf. + Om.Pm.dm(1-gm) + Mf.Of.Pf.wf$, where

Yf = Total cash income that women retain out of the total cash income they earn;

Of = Total agricultural output produced by women;

Om = Total agricultural output produced by men;

gf = share of women's total cash income controlled by women;

gm = share of men's total cash income controlled by men, where the term "cash income" pertains to the total cash income he earns from the agricultural sector alone;

df = share of women's agricultural production that is marketed;

dm = share of men's agricultural production that is marketed;

Pf = price per unit of women's crop;

Pm = price per unit of men's crop;

Mf = Total amount of time allocated to market employment by women; and

wf = wage rate earned by women in market employment in percentage. (See how wage rate is determined in Section C of this chapter, page 8.)

Since most of women's production is consumed by the family, only a portion will be marketed for cash. (Of.Pf.df) gives the total income derived from selling this fraction of women's production in the market. Out of this income women control gf percent. Therefore, the first term in the formula helps calculate the cash income that is derived from selling some of women's production which is actually controlled by women. The rest of the income derived from women's production goes to men's account because women do not have total control over the fruits of their labour. By the same token, some income derived from the sale of men's production may become available to women. This may be compensation for the work women have done to help men with their crop or to market men's production for them. The term (Om.Pm.dm.(1-gm)) in the Yf equation captures this element. It may be noticed that (1-gm) represents the fraction of income from selling men's crop that is actually controlled by women. The presence of this term does not contradict Assumption 4, which states that there is a sexual inequality regarding economic power. This inequality lies in the magnitudes of gf and gm. A small gf (female control) and a large gm (male control) imply inequality.

Since wage rate is defined in terms of a fraction of the market value of one's production, the product (Of.Pf.wf) is the wage level for female market employment. Multiplying the wage level by the amount of time women spend on such employment (Mf) gives the female income derived from wage employment.

To recapitulate, in the female income equation, the first term on the right side is the cash income under women's control — retained income — derived from the sale of the portion of women's output not consumed by the family; the second term represents the income under women's control derived from the sale of the portion of men's crop not consumed by the family. These two terms give the total cash income derived from the sale of agricultural production. The last term captures cash income derived from women's market employment.

The equation for male cash income is an exact duplicate of women's income equation, with subscript "m" "f" interchanged. Therefore, only the equation is given without further detailed term-by-term explanation.

$$Ym = Om.Pm.dm.gm + Of.Pf.df.(1-gf) + Mm.Om.Pm.wm.$$

It is to be noted that Ym is used in the final equation where a part of men's income has been used as contribution to family expenditure.

4. Family size

A major element in the analysis of women's contribution to development concerns fertility. Fertility is important, not only because it is women who bear children, but also because it is typically women who provide most of the care for them and such care is very time-consuming. Thus, factors that influence the number of children will, inter alia, affect other uses of women's time, which in turn determine the economic contribution of women to development. However, it goes without saying that caring for children itself is a significant contribution by women to the society at large.

In this model, fertility behavior is captured through a family size variable, since the model is static. Empirical studies have demonstrated that the size of the family is directly influenced by the level of female education, by access to family planning services and by women's participation in market oriented wage-earning activities, among many cultural and economic factors. More specifically, the present model singles out these three factors. All the three have been observed to work toward reducing the number of children born, which thus determines the family size. To reflect the fact that these factors exert different degrees of negative influence on family size, constants of different magnitudes have been used in the same manner they are used in the production function. One way to rationalize this formulation is to think of these three factors as producing a reduction in family size, with each factor having a different degree of effectiveness or power.

The mathematical presentation of this reasoning is:

$$S = 4.\ Ef^{-0.1} mf^{-0.2} (FPPf+FPPm)^{-0.1}, \text{ where}$$

S = size of family;

Ef = female education level;

mf = share of time devoted to market wage employment by women;

FPPf = family planning services available to women; and

FPPm = family planning services available to men.

The number "4" is a constant parameter, whose meaning in this model is the size of family at a reference point. The main reason for choosing "4" instead of "3" or "5", is to signify size of a nuclear family of parents and two children, implying replacement level fertility. Users can change this constant according to their own preferences or the more representative actual information from their countries.

5. Household welfare

A synthetic index denominated household welfare measures and ranks the impact of policies on the model's main outputs, namely, solutions to the endogenous variables. This index is designed to serve

as a summary of the model's outcome under one set of policy interventions, with a given set of parameters, so that different policy alternatives can be compared. Unlike some micro-level models, the household welfare function here is not an objective function of a welfare-maximizing model. When the present model is solved, it does not automatically search for the highest value of this function subject to the other relationships. If one did not consider the financial and social costs and other constraints involved in each policy option, the index, in principle, could be increased indefinitely.

The welfare index is a function of three main components of household welfare — cash income used for the household, agricultural production retained for household consumption and the amount of time spent in home activities. Although these are not the only factors that affect the well-being of a household, others are not being taken into account for the sake of manageability and because of the illustrative nature of this model. It, nevertheless, captures the essence of household welfare. Income and home consumption summarize the production side of the model, and any policy change that affects women's and men's production will be reflected through these two components. The amount of time spent in home activities which captures the level of physical well-being of the household is a function of family size and is influenced by family planning, women's education and economic participation. The household welfare index is, in fact, the outcome of a utility function (a device economists use to measure the satisfaction derived from consuming goods and services) which has weights attached to each of its components. Users can change these weights to reflect their own priorities. If a component is considered to be unimportant, a zero weight can be assigned to it. Similarly a component with high priority can be given a greater weight. By assigning different weights one can compare the values of the index to see how the ranking of policies will change even if all other factors (policy as well as parameters of the model) are held unchanged.

The household welfare function is expressed as:

$$U=[Yf + s.Ym]^{w1}[Om(1-dm)+ Of.(1-df]^{w2}(Hf+Hm)^{w3}, \text{ where}$$

s = share of men's total retained income going to the home;

Hf = women's total time spent at home, averaged by the size of the household;

Hm = men's total time spent at home, averaged by the size of the household; and

w1, w2, w3 = weights assigned for each component of household welfare (exogenous).

All the remaining variables are as defined earlier.

It is easy to recognize that the first term (Yf + s.Ym) is the income component of the household welfare. It has been repeatedly observed in developing countries that most, if not all, of women's income is spent on the household. Women use their income to cover expenses for nutrition, clothing for the family, etc. Because women traditionally engage in production activities that require a very small investment, they contribute the bulk of their income, whatever its size, for the welfare of the household. This is the

empirical reason for including a major part of women's income in the "income component" of the welfare index. Men on the other hand, it is hypothesized, give a small percentage of their income for family use. This may result from cultural factors or from the fact that men need to invest more of the income in their productive activities. The percentage they do contribute to household welfare in terms of cash income is denoted as "s". So "s.Ym" represents the amount of men's income contribution to the household. This amount may be greater than Yf in some cases. However, the hypothesis for the present model is that women contribute a considerably larger portion of their income to household welfare.

The second term [Om(1-dm) + Of(1-df)] is the home consumption component of the welfare function. Since dm(df) is the share of men's (women's) agricultural production marketed, 1-dm (1-df) is then the portion of the men's (women's) output retained for household consumption. This percentage multiplied by the total output (Om and Of for male and female outputs respectively) gives the amount of output retained for home consumption. As part of the crops produced by both sexes is consumed by the household, there are two parts to this component.

The last term (Hf+Hm) is the home activity component of the household welfare. As assumed in an earlier section, men spend a small proportion of their time caring for children or performing other household chores; women's time spent on such activities is much more substantial. However, both men's and women's time spent on the household enter the household welfare index. The amount of time used here is in per capita terms (time spent by women or men on each member of the household) since it captures the immediate impact of family planning on the welfare of the household. The rationale for this component in the index is quite obvious. Women and men devote their time to care for the children, to feed and clothe the family, etc. These activities do not have a market value (except for the opportunity cost which is not accounted for in this model), but they directly affect the well-being of a household.

In short, this household welfare index is being used to measure the overall impact of a policy on the well-being of the family. In calculating this index, the total cash income spent on household welfare, the amount of agricultural product a family consumes and time allocated to family-oriented activities are included.

D. Data and parameters of the model

The above model is general enough to become applicable to the situation of women across the Third World. Of course, African women differ from Asian and Latin American women, but the differences can be accounted for in the model in terms of parameter values, which define the functional relationships in the model. Hence, the model could eventually be established for three or four regions (North Africa and West Asia, Sub-Saharan Africa, Latin America, and Asia).

Ideally the parameters and functions in such a model should be established at the regional level through

econometric estimation. However, it is doubtful that appropriate data exist. National statistical and demographic yearbooks normally do not provide the kind of micro data required for such estimation. Specially designed household surveys have to be conducted to collect the necessary data. (Please see Appendix 3 for the important variables that should be included in surveys.) Alternatively one may use a combination of individual country studies which can be distilled into "stylized facts" for a set of stereotype countries.

In the present study data from a variety of sources have been used to establish a base solution for the model. While many of the parameters are "reasonable" for many developing countries, there is enough variation across countries and even within countries to suggest that a data bank of parameters needs to be established and a data base of solutions derived from the data bank. It is beyond the scope, however, of the present study to establish a data base for a set of real countries.

As pointed out in the introductory chapter, this model is constructed as a tool for teaching the user a method to conceptualize and possibly analyze issues connected with women in development, rather than provide practical solutions. If one can master the method presented in this model and apply it for solving the problems in his/her own country by modifying or expanding it, the primary objective of this model will have been achieved.

III. THE COMPUTER SIMULATION MODEL AND POLICY EXERCISES

The model described in the previous chapter is relatively simple and does not require very sophisticated software to solve. To simulate the model on a personal computer, the commercial software package, LOTUS 1-2-3, which is widely available, has been used. In this section, an introduction to the LOTUS-based model is given and a few policy exercises are carried out. The computer model is very simple and easy to use.

A. Organization of the worksheet

The United Nations Rural Women in Development Model is distributed as one single diskette. The model itself is contained in a single LOTUS spreadsheet bearing the file name RURWID.wk1. On the same diskette, there is another directory STORYBRD which contains a story board summarizing the purposes, assumptions used, and exogenous as well as endogenous variables of the model. As in the case of any software, a backup copy should be made before using the model. To run the RURWID model, a personal computer with a DOS operating system is required. The machine should be able to support the LOTUS 1-2-3 program. To view the story board a computer with graphics capability is necessary. The minimal requirement is a graphic desplay terminal and a computer with a graphic card installed. Any IBM-XT or above or its "compatibles" will be sufficient. The story board can be brought up on the screen by using DOS commands.

The worksheet is divided into three panels. The diagram on the following page illustrates the range and contents of each panel.

	ROWS	COLUMNS				
		A B C		E F G		H I
Headers	1					
	.					
	.					
	.					
	6					
Endog.	7					
Variables	8					
	:					
	26					
	.					
	.					
	30					
Exog.	31	For the				For the
Variables	:	current				reference
and	:	solution				solution
Parameters	59					

In the first panel (columns A to C), the current solution is presented. A reference (or baseline) solution is saved in columns H and I. The percentage changes between the current and reference solutions are provided in columns E to G.

In the upper left part (rows 7 - 30) of the current solution panel the values of the model's endogenous variables for the current solution are found. In the bottom left panel the values of the model's exogenous variables and its parameter values (rows 31 - 59) are found.

Similarly for the reference solution, the values of the endogenous variables are found in the same rows (7 - 30). As in the current solution panel, the values of the exogenous variables as well as of the parameters, which were used to establish the reference run, are presented in rows (31 - 59). Unlike the cells in the current solution panel which contain the 1-2-3 formulas for calculating endogenous variables, the reference run panel contains only values, because these are the results of the application of the same formulas.

The model contains simultaneous relations between variables. To solve the model, the spreadsheet iterates several times before arriving at a solution. This is done through the "recalculation" command with iterations set, for this model, to 10. Users are advised not to change the status of the recalculation mode.

If users wish to establish a new reference run, the exogenous variables and parameters should be

assigned appropriate values in the current run panel. The model will calculate the solution. After all the desired changes have been made, the current run panel should be copied over to columns H and I, including the values of the new baseline solution, exogenous variables and parameters.

B. Using the spreadsheet model to simulate policy options

Using the RURWID spreadsheet is straightforward. All of the cells where formulas are found are "protected" and cannot be altered unless the user unprotects them. The unprotected cells are those cells which are then under user control. These are the model's exogenous variables and parameters. A change in any of these will result in a new solution. The model is constructed in such a way as to obtain a new solution every time an exogenous variable is changed. Therefore it is very easy to use. To experiment with different options, the user needs only to change the value of the exogenous variable that corresponds to a particular policy, and the solution is automatically calculated. Any new solution can be compared to the reference solution by either comparing the endogenous variable values in the two solutions or by consulting the percentage change columns.

As it is presently set up, the spreadsheet allows for only two solutions at a time. However, more than two solutions can be stored by copying the values (endogenous, exogenous, parameters and percentage changes) of a solution over to empty columns.

It is time to experiment with a few policy options. The users are reminded that, as explained earlier, any lessons learned from these policy exercises should be understood as examples or scenarios. Empirical verification and further refinements are necessary to make these lessons relevant to any particular real life situation.

First, a baseline reference solution has to be established. In this reference run, parameters are given values that approximately correspond to what may be the situation in many developing countries. They are the parameters that have been used in describing the model. As discussed earlier in the Data and Parameters section, while these parameters may approximate reality, they are not statistically obtained. Therefore, the particular parameter values are arbitrary to a certain extent. But the arbitrariness does not interfere with the illustrative power of the model.

In Table 1A on the next page, "Reference" values of the model's exogenous and policy variables are presented. For ease of use and interpretation, many of these values are index numbers without units. For example, the education variable is such an index factor. Here for men the variable has a value of 1, whereas for women the value is set for the reference solution at 0.4. Similar differences can be noticed for other variables.

TABLE 1A

Reference Run
Value of Exogenous Variables

Exogenous Variables	Men	Women
Education (E)	1.0	0.4
Capital (K)	1.0	0.6
Land	1.0	0.5
Extension Services (A)	1.0	0.7
Market Wage as % of Agr. (w)	1.0	0.6
Control of Own Income (g)	1.0	0.7
Prices (P)	1.0	1.0
% Prod. Marketed (d)	0.8	0.2
Family Planning (FPP)	0.2	1.0
% of Men's Income for Home	0.1	

Table 1B on the next page shows the solution to the model for the Reference Run. Different patterns of time use can be noted between men and women. These are within the range of values as reported in Dixon-Mueller (1985). The base solution family size is set at 5.64, representing a relatively high level of fertility, but an (as yet) incomplete family.

TABLE 1B

Reference Solution
Rural Women in Development Time and Production Model

Allocation of Time	Men	Women
Pct.Time Home Activities (h)	6.64%	38.18%
Pct.Time Wage (m)	30.00%	26.00%
Pct. Time Ag. Production (l)	63.36%	35.82%
% Ag.Time Own Crop (v)	90.00%	80.00%
Time Use (Day equivalents)		
Total Available (T)	300.00	300.00
Wage Employment (M)	90.00	78.00
Home Activities (H)	19.91	114.53
Ag. Production (L)	190.09	107.47
Tot. Agric.Production	79.76	34.14
For Market	63.81	6.83
For Home	15.95	27.31
Cash Income	7244.52	1602.56
FAMILY SIZE	5.64	
HOUSEHOLD WELFARE	273.00	

Effects of Increased Education for Women

Table 2 on the next page shows the results of an exercise in which the education coefficient of women (0.4 in the Reference Solution) is raised to the level of men (1.0 in the Reference Solution). Given the initial differences between male and female education levels in the Reference Solution, this represents a significant increase in women's education coefficient amounting to 250%.

TABLE 2

Impact on Household Welfare of Increasing Women's Education to the Same Level as Men

Allocation of Time	Men	Women	% Changes	
Pct.Time Home Activities (h)	6.14%	35.71%	-7.44	-6.46
Pct.Time Wage (m)	0.00%	26.00%	0.00	0.00
Pct. Time Ag. Production (l)	63.86%	38.29%	0.78	6.89
% Ag.Time Own Crop (v)	90.00%	80.00%	0.00	0.00
Time Use (Day equivalents)				
Total Available (T)	00.00	300.00	0.00	0.00
Wage Employment (M)	90.00	78.00	0.00	0.00
Home Activities (H)	18.43	107.13	-7.44	-6.46
Ag. Production (L)	191.57	114.87	0.78	6.89
Tot. Agric.Production	82.48	45.76	3.41	34.03
For Market	65.99	9.15	3.41	34.03
For Home	16.50	36.61	3.41	34.03
Cash Income	7492.13	2147.89	3.42	34.03
FAMILY SIZE	5.14		-8.76	
HOUSEHOLD WELFARE	325.00		19.24	

Columns 1 and 2 of Table 2 above give the values of the solution while columns 3 and 4 give the percentage changes from the Reference Run for each variable. The interpretation of this and the following tables should be focused primarily on the qualitative, rather than the quantitative information they contain. Hence, what is of interest is the changes in their signs and not so much their magnitude. As can be seen, there are significant changes in the solution. Female and male home activities decrease, while time spent in agricultural activities increases. Agricultural output increases because of the increase in time spent in agriculture and in the level of education. It may be noticed that the rate of increase in women's production is higher than that of men. Cash income increases proportionately. Family size decreases as a result of this increase in women's education. The combined effect on household welfare is positive. An interesting result is the effect on men. Because some of women's income is appropriated by men any increase in women's income does have a corresponding impact on

men's income; besides, to the extent that some of women's time in agriculture is spent tending male crops, any increase in female agricultural labour translates into an increase in male crop production. Smaller family also reduces the amount of time men spend on home activities and leaves more time for production. This is another indirect impact on men.

Effects of Wage Equality

In the next exercise, given in Table 3 on the next page, the results of increasing women's wage level relative to that of men are seen.

Here the policy has the effect of changing the allocation of women's time away from home and agricultural activities and toward wage employment. In fact, there is only a minor effect on the amount of home activities of women as in the case of men. Less time available for women to devote to agricultural production means proportionately less time available to help in men's production. And therefore, although men's agricultural time increases, their production declines slightly. More wage employment means more cash income. The higher rate of female participation in formal market employment means that family size will diminish moderately. The welfare index increases as a result of increase in income.

TABLE 3

Impact on Household Welfare of Increasing Women's Wage Level to That of Men

Allocation of Time	Men	Women	% Changes	
Pct.Time Home Activities (h)	6.48%	37.38%	-2.40	-2.08
Pct.Time Wage (m)	30.00%	30.00%	0.00	5.38
Pct. Time Ag. Production (l)	63.52%	32.62%	0.25	-8.95
% Ag.Time Own Crop (v)	90.00%	80.00%	0.00	0.00
Time Use (Day equivalents)				
Total Available (T)	300.00	300.00	0.00	0.00
Wage Employment (M)	90.00	90.00	0.00	15.38
Home Activities (H)	19.43	112.15	-2.40	-2.08
Ag. Production (L)	190.57	97.85	0.25	-8.95
Tot. Agric.Production	79.70	33.35	-0.08	-2.31
For Market	63.76	6.67	-0.08	-2.31
For Home	15.94	26.68	-0.08	-2.31
Cash Income	7238.99	3006.37	-0.08	87.60
FAMILY SIZE	5.48		-2.82	
HOUSEHOLD WELFARE	344.00		26.23	

Effects of Increasing Women's Control of Own Income

In this exercise (summarized in Table 4, below) a woman's control of her earnings is raised to 100%.

TABLE 4

Impact on Household Welfare of Increasing Women's Control of Their Income

Allocation of Time	Men	Women	% Changes	
Pct.Time Home Activities (h)	6.64%	38.18%	0.00	0.00
Pct.Time Wage (m)	30.00%	26.00%	0.00	0.00
Pct. Time Ag. Production (l)	63.36%	35.82%	0.00	0.00
% Ag.Time Own Crop (v)	90.00%	80.00%	0.00	0.00
Time Use (Day equivalents)				
Total Available (T)	300.00	300.00	0.00	0.00
Wage Employment (M)	90.00	78.00	0.00	0.00
Home Activities (H)	19.91	114.53	0.00	0.00
Ag. Production (L)	190.09	107.47	0.00	0.00
Tot. Agric.Production	79.76	35.38	0.00	3.63
For Market	63.81	7.08	0.00	3.63
For Home	15.95	28.30	0.00	3.63
Cash Income	7242.47	1662.87	-0.03	3.76
FAMILY SIZE	5.64		0.00	
HOUSEHOLD WELFARE	278.00		1.97	

The above table shows that this has an immediate productivity impact in agriculture, but in the present model has no effect on the allocation of time. Household welfare increases due to the positive effect of women's income under their own control.

Effects of Increased Family Planning

In this exercise (presented in Table 5 below) family planning access has been increased to simulate the adoption of more effective contraceptive methods. The experiment consists of doubling the family planning index variable. This has the expected effect of decreasing family size and, *inter alia*, decreasing home activities and increasing agricultural time.

TABLE 5

Impact on Household Welfare of Increased Family Planning

Allocation of Time	Men	Women	% Changes	
Pct.Time Home Activities (h)	6.26%	36.29%	-5.69	-4.94
Pct.Time Wage (m)	30.00%	26.00%	0.00	0.00
Pct. Time Ag. Production (l)	63.74%	37.71%	0.60	5.27
% Ag.Time Own Crop (v)	90.00%	80.00%	0.00	0.00
Time Use (Day equivalents)				
Total Available (T)	300.00	300.00	0.00	0.00
Wage Employment (M)	90.00	78.00	0.00	0.00
Home Activities (H)	18.77	108.87	-5.69	-4.94
Ag. Production (L)	191.23	113.13	0.60	5.27
Tot. Agric.Production	80.02	34.63	0.33	1.43
For Market	64.02	6.93	0.33	1.43
For Home	16.00	27.70	0.33	1.43
Cash Income	7268.22	1625.42	0.33	1.43
FAMILY SIZE	5.26		-6.70	
HOUSEHOLD WELFARE	276.00		1.22	

Obviously there are many more policy possibilities. Users are encouraged to run their own policy options. Through these exercises with different policy options, the user can see the impact of these changes on the time use, agricultural production, family size and household welfare index.

IV. CONCLUDING REMARKS

The model described in the previous chapters is a relatively simple yet illustrative one. The primary goal of this model is to introduce a method for conceptualizing WID issues and for analyzing qualitative and to a lesser extent quantitative aspects of women's role in development. It is also intended as an awareness raising model, an illustration, which, it is hoped, will help policy-makers and the public understand the importance of WID issues. In this sense, it is a general model. But the model in its present form is not one which is based on generalized statistical evidences to define its parameters.

As a teaching tool, the model has been constructed to be simple, easy to learn and easy to use. The attempt to make it practically relevant has made the examples, it is hoped, interesting. But a compromise between immediate applicability and structural simplicity had to be struck. Hence, application of the model to any specific country will require extensive empirical verification and modification of the parameter values. Modifications also may be called for in the assumptions with respect to functions and their arguments, to account for cultural and social circumstances in any particular country. It is hoped that this model has demonstrated an analytical method with which one can customize the model to fit one's own needs and priorities.

APPENDIX 1

AN EXAMPLE OF PARAMETER ESTIMATION

Before applying any theoretical model, one needs to estimate all the parameters of the model. This requires the expertise of an econometrician. Various methods have been developed to empirically estimate a model, but only the simplest method will be outlined in this appendix as an illustration of how it can be done. Since teaching statistics and econometrics is not the purpose of this documentation, the technical issues, both in statistical manipulation and econometrics theory, will not be discussed here. Only a simple example using women's production equation will be introduced to show the procedure of parameter estimation.

The theoretical proposition underlying the production equations (women's as a special case at hand) is that a set of factors of production are necessary in producing agricultural output. These factors may be substituted for one another, but all are required. Furthermore, each factor has a productivity, or productive power to contribute to the production of output. In our particular model, five factors are included — labour, capital, agricultural extension services, share of women's income controlled by women and land. Mathematically this relationship can be expressed as:

$$Of = [Lf.Ef.vf + Lm.Em(1-vm)]^a\ Kf^b\ Af^c\ gf^d\ Rf^e, \text{ where}$$

lowercase letters a, b, c, d and e are the parameters representing the productivity of respective production factors.

To empirically estimate these parameters, data should be collected on women's total agricultural output, how much time men and women spend in agricultural production, the education levels of men and women, the percentage of men and women's agricultural time used for their own crops, the amount of capital women have, women's access to agricultural extension services, the share of women's income controlled by women and the amount of land women can use. After these data have been collected over a reasonably large sample, one can proceed to the estimation step. Notice that we have a non-linear equation here. To use the simplest and most common regression method, the equation has to be transformed into a linear form. This can be accomplished by taking the natural logarithm:

$$\ln(Of) = a.\ln[Lf.Ef.vf + Lm.Em.(1-vm)] + b.\ln(Kf) + c.\ln(Af) + d.\ln(gf) + e.\ln(Rf).$$

This transformed equation can be estimated by the Ordinary Least Squares (OLS, for short) method. The resulting estimated values of the parameters a, b, c, d and e can then be plugged back into the women's production function, and the equation can be called an empirically based relationship.

All other equations in the UNWID model can be estimated accordingly. To estimate the whole model, however, more sophisticated econometrics methods will yield better results, since the model involves simultaneous equations.

Readers are reminded once more that this model is intended to teach a method of analyzing WID issues, not as a device to generate policies. Therefore, the task of empirically establishing the model has been left out of this documentation. Consequently, only a simple illustration of estimation procedures, instead of a thorough introduction to econometrics, is given in this appendix. Interested readers may consult with econometricians or may read any econometrics textbook to more fully understand the technicalities involved in empirical applications.

APPENDIX 2

BASICS OF OPERATING A PERSONAL COMPUTER (PC)

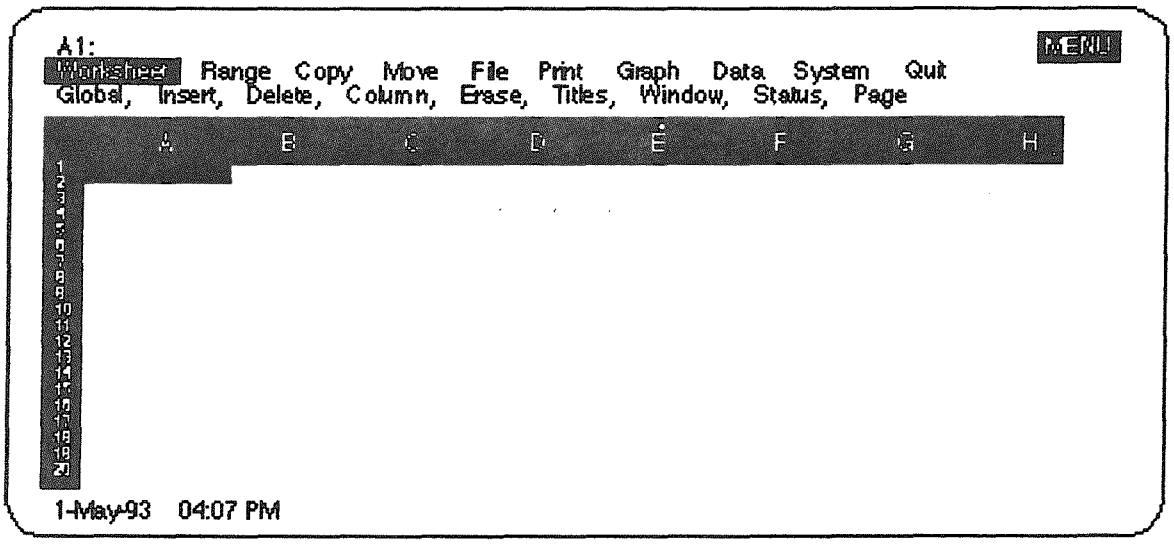
A. Hardware requirements and employment of software

As explained in the text of this document, a personal computer with a DOS operating system is required to run this model. The machine should be able to support the LOTUS 1-2-3 program. The model itself is contained in a single LOTUS spreadsheet bearing the file name RURWID.wk1. To view the story board, a computer with graphics capability is necessary. The minimal requirement is a graphic display terminal and a computer with a graphic card installed. Any IBM-XT or above or its "compatibles" will be sufficient. The story board can be brought up on the screen by using DOS commands.

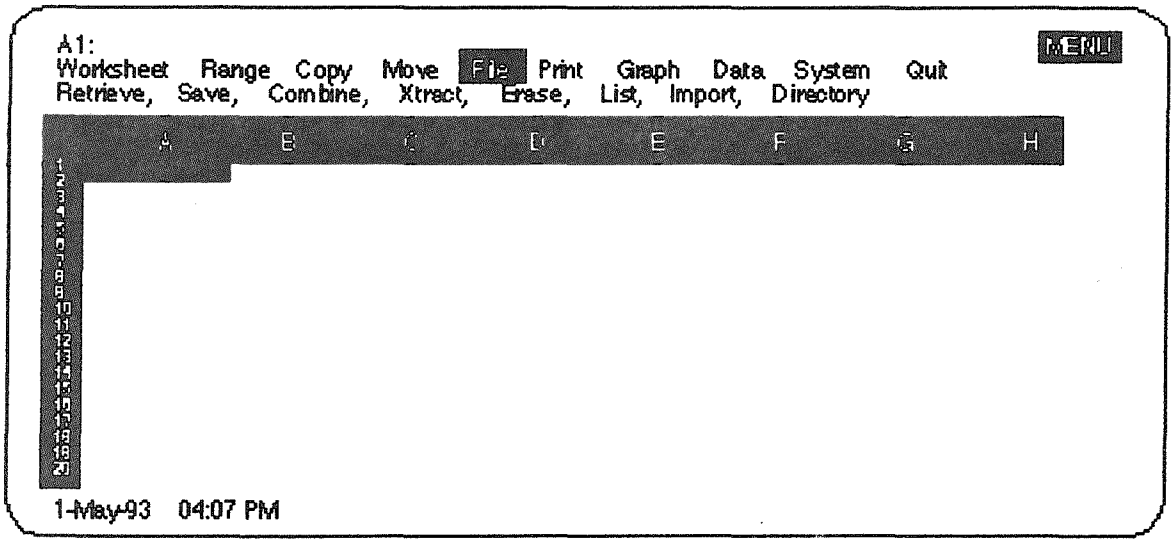
Since the purpose of this document is teaching a method of analyzing WID issues rather than teaching computer techniques, the coverage of this appendix will be limited to materials necessary to use the software including its appropriate use and manipulation. An introduction to the basic concepts and skills needed by this model will also be covered.

To activate the story board, the program disk has to be inserted in drive A or B and the drive door closed. Typing "CD\STORYBD <------/" and "ST UNWID.SH <------/" in the same sequence, brings the story board on the screen. The space bar has to be pressed to view the next screen and subsequent items. To interrupt, the "ESC" key may be pressed followed by "Yes" or "No" when asked, according to whether one wants to continue.

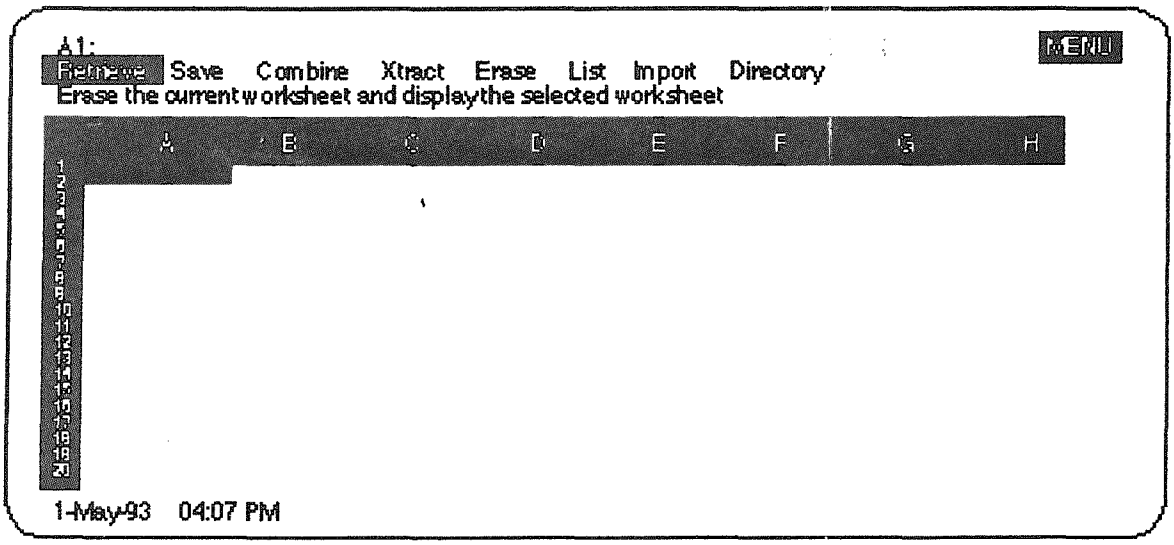
To use the worksheet, in which the model itself is stored, LOTUS 1-2-3 needs to be installed and activated first. After the product logo screen, a worksheet appears on the screen. At this stage, the menu mode has to be entered by pressing "/" at which time the screen should look like this:



The arrow key should be used to select/highlight the item "File" as shown in the following illustration:



Following this selection, the screen should be:



Selecting "Retrieve" and hitting "<------/ " will bring up the directory of files in the current drive. The user is prompted to specify from which drive and which file to retrieve. The next step is to type the drive letter followed by :\LOTUSWID\RURWID.WK1, and then pressing "<------/ ". This brings up the work sheet that contains the model.

A personal computer (in fact, any computer) needs an operating system to tell it what to do. The one used in this exercise is MS-DOS. There are a few terms, symbols and commands one needs to know before one runs a computer program such as the RURWID model, that will be illustrated here. Because the RURWID model is constructed in LOTUS 1-2-3, we also will introduce a few of its fundamentals.

MS - DOS

MS-DOS is a PC operating system. It has its own language one needs to know in order to use it.

A. Terms and symbols

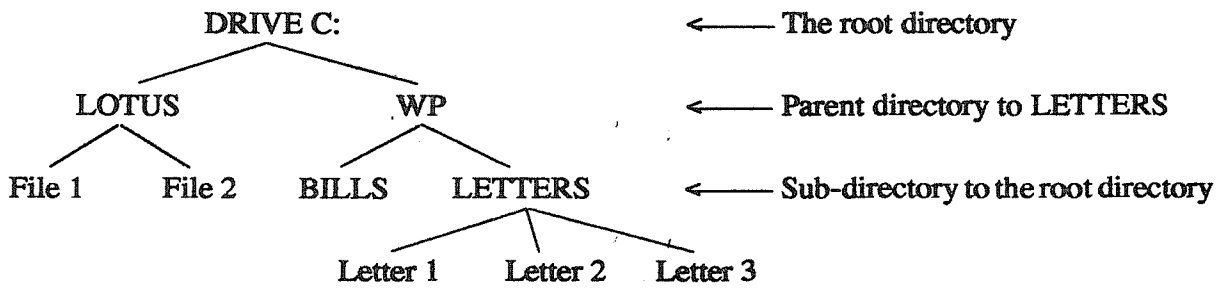
FILE. A file is a collection of related information, much like the items in a file folder. It can contain numerical data or texts. A file on a diskette needs a name, just like a file folder needs a label for identification purpose.

A file name consists of two parts — (1) a name (1-8 characters), and (2) an extension (1-3 characters). A period (.) separates the two parts. The extension is mainly for describing the contents of a file.

A file name can be entered either in upper or lower case letters. DOS automatically converts them to uppercase letters. For example, RURWID.WK1 is a file name, URBWID.WK1 is another. These two names also constitute an example in which the file names themselves indicate that the two files are related.

DIRECTORY. A directory is the table of contents of a disk. Sometimes one may want to divide the many files on one disk into groups of related files, (for example, all LOTUS files and all other types of documents such as menus, circulars, letters, bills, receipts etc.) and give a unique name to each group. Each group will have its table of contents, hence there can be more than one directory on one disk. These directories are often called sub-directories. This is often the case with the hard disk.

Sometimes a subdirectory is further divided into another level of subdirectories. Such multi-level divisions give rise to the terms "root directory" and "parent directory". The root directory is the highest level directory on a computer. The directory one level above the current working directory is the parent directory of a working directory. The following diagram depicts one example of a "directory tree":



To access a file in a directory tree, one needs to follow the "path". For example, to use File 1, the path to follow will be C:\LOTUS then specify the file name "File 1". To edit Letter 3, "C:\WP\LETTERS Letter 3" will be the command to use.

DRIVE. To use the information stored on a diskette, one needs to insert the disk in a floppy disk drive. Floppy drives are the slots at the front or side of a machine; they are usually referred to as drive A and drive B. The hard disk, which is often inside a machine, is normally referred to as drive C. A drive is activated by simply typing a letter followed by a colon, such as C: or A: etc.

PROMPT and DEFAULT DRIVE. A prompt is a symbol MS-DOS uses to let you know that it is ready to receive a command. It contains the default drive letter followed by the greater-than sign (>). The default drive is the drive where MS-DOS looks first for the file when executing a command, One has to specify the drive name before the file name when a command is given, if a diskette is placed in a drive other than the default drive. Of course, one can always change the default drive to be the drive where the diskette is usually placed. To do so, one would only type the drive letter followed by a colon and then press the "<------/ " key.

SYMBOLS. The sumbol "<------/ " is used throughout the document to represent "press the enter key." The symbol "^" indicates a space (or "press the space bar once") between two characters. Unless this "^" symbol appears, no space should be left in a command.

B. The DIR command

This is the command you use to see the table of contents (i.e., the directory) of a disk. The directory contains the names of the files, their sizes and the date they were updated last. Typing "dir <------/ " brings up the directory of the disk in the default drive, let us say, drive C. If one wishes to view the directory of the diskette placed in drive A, one either changes the default drive to A (done by by typing "A: <------/ ") then gives the DIR command or includes the drive name in the command by typing "A:dir <------/ ".

C. Copying files

(1) From floppy to hard drive

Step 1: Make the hard disk or C drive, the default drive by typing "C:<------/ ".

Step 2: Place the source diskette in drive A and close the drive door. Note that now drive A is the source drive.

Step 3: At the DOS prompt, follow the directory tree to make the subdirectory to which you wish to copy the file(s), the current directory. If this subdirectory already exists, for example with a name "SD", type the following at the prompt: CD\SD <------/ ".

But if this subdirectory is new, you have to create it first, then make it the current directory. Say we call this subdirectory NSD, you need to do the following:

MD\NSD <------/

CD\NSD <------/

Step 4: If there are no subdirectories on the source disk, type: "COPY ^ A: *.* <------/ " and all files will be copied from drive A to drive C under the subdirectory you have chosen. But if there is more than one subdirectory on the source disk, it is necessary to specify which subdirectory files you want to copy. Suppose we would like to copy all files in the subdirectory named "dn", we have to type: "COPY ^ X:\dn^*.* <------/ ".

(2) From floppy to floppy

If you wish to copy the contents of one diskette entirely to another diskette use the DISKCOPY command. It works in the following manner:

Step 1: Put MS-DOS disk in drive A and close the drive door (if you have MS-DOS on hard drive you do not need this part) then turn on the computer.

Step 2: At the MS-DOS prompt, type "DISKCOPY ^ a: b: <------/ ".

Then you will be prompted to insert the "source" diskette in drive A and the "target" diskette in drive B and close the drive doors. Follow these instructions (Remove DOS disk from drive A first, of course).

Step 3: Press any key (space bar, for instance) to start the copying process. Then self-explanatory instructions will be given by the computer. Follow them exactly.

If only some of the files on a diskette need to be copied, the steps will be the same except the file names on the source diskette (including their extensions) will have to be included in the copy command.

D. Installing or copying the program RURWID on a PC

It is very easy to install a program, since only a few steps need to be followed. In our example, the program to be installed is RURWID. Since this program is contained in a spreadsheet written in LOTUS 1-2-3, the LOTUS software will have to be installed first. Then a simple retrieve command in 123 will start the RURWID program. The procedure will be slightly different for computers with or without a hard drive. To copy the programs, you will need to create directories — LOTUSWID for the RURWID.WK1 file, and STORYBD for the ST UNWID.SH~ file. Copying should be done through DOS commands.

E. Operation of the programs

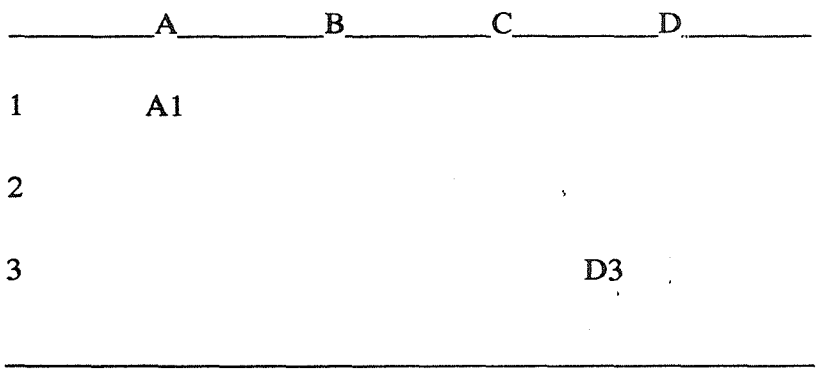
For operating RURWID.WK1 and ST UNWID.SH~, see pages 31 and 32.

LOTUS 1-2-3 (or just 123)

This is an MS-DOS based program, namely it operates in the DOS environment.

A. Structure of a worksheet and a few terms.

A worksheet is the LOTUS name for a spreadsheet. A LOTUS worksheet looks like the following illustration:



The worksheet is divided into columns (indicated by letters A. B. C.) and rows (indicated by numbers 1, 2, 3). Each cell is identified by its column/row "address". For example, A1 is the address of the cell at the intersection of column A and row 1. A number, a label (string of characters) or a formula can be entered in a cell. Grouping one or more cells in a rectangle forms a range. To define a range, you must press "/", choose "Range" from the menu then use the arrow keys to specify the cells to be included and then hit "<------/ " to finish. The range will be highlighted.

B. Some useful functions of LOTUS 1-2-3

HELP. This function provides on-screen help to the users at virtually any time in 1-2-3. To get help, press F1. The "help" mode comes on. Then use the arrow keys to select topics of further help. To exit from this mode, press "Esc" key and it returns to where you left the worksheet.

MENU. Press "/" to enter this mode and then use the arrow key to move within the main menu. The menu appears at the top of the screen. The second line is a short description of the command on which the cursor (the highlighted block) is positioned. To choose a particular item, move the cursor over and press "<------/ ". At each level of command, choice selection is done in the same way.

ENTER DATA. Move the cell pointer (or the cursor) to the cell where you wish to enter the data and simply type the data. To make the entry, press "<------/ " after finishing typing.

EDIT DATA. Once data are entered, they can be edited if desired. Move the cell pointer to the cell then press the "Edit" key, F2, and the Edit mode will appear at the upper right corner of the screen. Use the arrow keys to move inside the entry and make changes. Press "<------/ " to complete.

APPENDIX 3

ITEMS ON WHICH DATA SHOULD BE COLLECTED FOR CONSTRUCTING A RURWID MODEL

It is to be noted that these items are illustrative and not exhaustive. Each researcher should design the study and topics to be investigated on the basis of the scope and focus of the study and the characteristics of the context in which the study is to be conducted. A specific reference period should be predetermined, such as the previous week or month.

I Household size and structure (those who slept in the household previous night)

1. Head of household
2. Relationship of each person to head of household
3. Personal data of each member:
   - (i) Name
   - (ii) Sex
   - (iii) Age
   - (iv) Civil status
   - (v) Educational level attained
   - (vi) Main occupation
   - (vii) Subsidiary occupation

(From the above information, the actual person to be interviewed should be selected. This person should be a female who is either head of a housefhold or is responsible for the household. She should be requested to give her own and her spouse's (if applicable) information, as well as information on the other relevant members of the household.)

4. Fertility status of the interviewee
   - (i) Number of children born alive
   - (ii) Number still living
   - (iii) Of the living, number living in the interviewee's household
   - (iv) Of those living with the interviewee, how many work, and give income to the interviewee
   - (v) Income provided by such members during the reference period

II Women's and men's time use

(i) Time spent in different types of household activities — preferably a list of activities and time spent on each

(ii) Time used for one's own sustenance

(iii) Time spent in market wage earning job

(iv) Time spent on agricultural/animal husbandry production

(v) Time spent helping the spouse in his economic activity

(vi) Time spouse spent on interviewee's agricultural/animal husbandry production

III Household income

(i) Income obtained from market wage earning job during reference period

(ii) Total agricultural/animal husbandry production during the reference period — each product to be listed separately together with quantities produced and price per unit, how much was sold; how much was used for household consumption, and income gained during the reference period from each product (in the case of this question, the reference period should be either agricultural season or a year)

(iii) Of the income earned by the interviewee's spouse, how much was given to the interviewee

(iv) Income over which the interviewee had control/interviewee's retained income

IV Use of income

1. List of items of expenditure and the amount spent on each item including savings and how they were dealt with

V Capital available for production

(i) List of each type of capital used

(ii) Quantity of each type of capital used

(iii) Where and how obtained

(iv) Cost of each type of capital

VI Agricultural extension services

(i) What type of extension services were available to the interviewee during the reference period; each item to be listed separately, for the interviewee and, if possible, for the spouse, and the following information should be provided

(ii) Were these services provided by men/women

(iii) How much was their cost

VII Credit

(i) Did the interviewee use any credit during the reference period (the same as for agricultural production reference period) and, if yes, where was credit obtained from, how much, and what were the terms and conditions

(ii) For what purposes was credit used

VIII Family planning

(i) Type of services available

(ii) Where available

(iii) Contraceptive use: (a) yes (b) no

(iv) If yes type of contraceptive used

(v) Cost per unit

(vi) Length of use

(vii) Does the spouse use contraceptive and, if yes, what type

APPENDIX 4

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