

USE OF MICROCOMPUTERS IN A POPULATION AND DEVELOPMENT WORKSHOP

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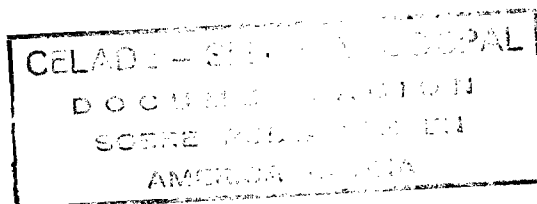
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ABSTRACT

In addition to its many and varied strictly demographic activities, CELADE has recently become involved in training professionals in the use of quantitative techniques in the field of population and development. With its various and excellent courses in demography there is a strong evidence that CELADE is doing a good job of meeting the region's training needs in the area of demography. However, there is a sense that many professionals working as planners have difficulty analyzing demographic and socioeconomic data with a view to using the results in determining national and regional planning strategies.

The seminar is heavily user-oriented with emphasis on hands-on experience with microcomputers. Participants are given the opportunity to do elementary statistical analysis, run population projections, and analyze real data using large-scale socio-demo-economic models. Data are all "live" and exercises are designed to mimic, as much as possible, the investigative process. Participants are especially encouraged to concentrate on the problem of interpreting the results obtained by way of the microcomputer.



1. Introduction

CELADE has recently been offering a course in quantitative methods of analysis in the area of population and development. This presentation discusses various issues related to the experience with special emphasis on the application of microcomputers as a teaching and demonstration tool. The first part of the presentation consists of a brief review of CELADE and its activities. The second section describes the workshop itself with emphasis on how microcomputers were incorporated as pedagogical and demonstration tools. The third section discusses some of the practical aspects of the use of microcomputers and some of the lessons that were learned. The concluding sections evaluate the experience and make recommendations for further activities of this kind.

2. What is CELADE and what does it do?¹

As a result of recommendations made within the United Nations organization, an agreement was signed in 1957 between the Government of Chile and the United Nations for the establishment of the Latin American Demographic Centre in Santiago, Chile. In 1967, in order to meet the needs of the Central American and Caribbean countries and Panama, a CELADE office was set up in San José, Costa Rica; and in the year 1979, activities were started in the English-speaking countries of the Caribbean.

The Regional Population Program which is being carried out through CELADE has the following objectives:

- To foster understanding of the relations between demographic and socioeconomic factors of development;
- To develop the capacity of countries to carry out population censuses and surveys;
- To improve the quality of population statistics and their usefulness for socioeconomic planning;
- To maintain up-to-date basic information on the demographic evolution of the countries of the region;
- To develop conceptual frameworks and inputs for formulating, implementing and evaluating population policies and programs;
- To train professionals in demographic analysis and population studies; and
- To publish and disseminate results of projects.

¹ The contents of this section are a summary of pertinent sections of the publication CELADE What is it? What does it do? How does it work? (CELADE-Santiago, date not specified).

The activities of CELADE comprise four areas:

a. Analysis of demographic trends

The aim of the work done under this program is to keep the demographic indicators for the countries of the region up-to-date. CELADE takes an active part in the development and application of techniques of demographic analysis, particularly methods using inadequate demographic data. The specific work carried out under this program involves the preparation of estimates and projections of key demographic variables.

b. Population and development

The central aim of CELADE's activities in the field of population and development has been to establish the conceptual and methodological bases required for taking population dynamics into consideration in economic and social planning. Examples of topics CELADE has studied are trends in urbanization; emigration of professionals; and regional development.

c. Teaching and training

One of the main objectives of the establishment of CELADE was the training of demographers and teaching has continued to be one of its priority concerns. The training program has been expanded and diversified so as to allow the inclusion of a larger number of participants and a wider range of topics. Today the teaching program is implemented under five main headings: Master's Degree Program, regional and national intensive courses in demography, training courses in specific fields, specialized courses and workshops, and a research fellowship program.

d. Information on population

The aim of CELADE's population information program is to strengthen countries' capacity for utilizing bibliographical material and demographic data and to improve the exchange of information among the countries of the region, and between Latin America and other regions. This is being achieved through the use of appropriate technology in documentation and electronic data processing. CELADE also has an active publication program whose fundamental objective is to help meet regional needs in respect of scientific and technical literature on population.

3. The population and development workshop

With its various widely-acclaimed courses in demography there is strong evidence that CELADE is doing a good job of meeting the region's training needs in the area of demography. However, there is a sense that many professionals working as planners have difficulty analyzing demographic and socioeconomic data with a view to using the results in determining national and regional planning strategies. (Availability and quality of data are, in many cases, no longer serious impediments to such activities.)

CELADE, being a demographic research organization, is very interested in promoting the incorporation of demographic variables in the planning process.

In order to respond to this perceived need, CELADE-San José organized in its own office in July 1986 a two-week seminar on the use of quantitative methods and models in the area of population and development. The response was overwhelming (over 50 applications) and only half of the applicants could be accepted. A second version of the workshop was offered in January 1987 to accomodate those applicants who were turned down for the first workshop. Finally, this second version was immediately followed by a four-week course in Honduras with similar goals and methodologies as the first two workshops. The workshop has so far been offered only in Spanish.

It is very important to understand the objectives of this workshop, both for what it intends to achieve and what it intends to avoid. First of all, the workshop is not meant to train demographers, in the strictest sense of the word, nor is it meant to train professionals in any particular method of analysis or theoretical framework. Rather, the spirit of the workshop is to expose potential planners to various tools, both practical and theoretical, that can be used for the incorporation of demographic variables in the socioeconomic planning process. In this sense the workshop has a bent that is more philosophical than technical. The goal is, at the very least, to encourage a quantitative and systematic way of thinking that is based on sound and well-known methodologies and that can be applied by planners in their everyday work.

The objectives of the workshop offered in Honduras were officially stated as follows (these objectives also accurately summarize the aims of the other two workshops offered in San José.):

- Discuss the theoretical and practical aspects, relevant to national planning activities, of the analysis of the interrelationship between population dynamics and socioeconomic development.
- Develop methodologies and conceptual frameworks that allow the study of demography and population studies jointly with other disciplines.
- Train technicians and professionals in the use of methods which facilitate the inclusion of demographic variables in the planning process.

In summary, whatever the secondary objective or approach of the workshop, the primary goal is to instill an appreciation of the many, varied, and complex relationships between demographic and socioeconomic factors.

The workshop is heavily user-oriented with emphasis on hands-on experience with microcomputers. Participants are given the opportunity to do elementary statistical analysis, run population projections, and analyze real data using large-scale socio-economic-demographic models. Participants are also encouraged to concentrate on the problem of interpreting the results obtained by way of the microcomputer.

The workshop consists of several modules which are not necessarily given independently and, in fact, most sessions incorporate sections from several modules simultaneously. (An outline of the workshop schedule is included as an Appendix.) The course is structured more around problems and exercises than modules. To solve each exercise participants need to invoke several modules simultaneously.

The demography component is designed so that participants become acquainted with basic demographic concepts such as size and age-sex structure of a population together with the three principal demographic variables, namely fertility, mortality, and migration. On the substantive side, there is also a population and development module whose aim is to concentrate on the theoretical relationships between demographic and socioeconomic factors and on the incorporation of demographic variables in the socioeconomic planning process.

From the more technical, or methodological, point of view the microcomputer module aims not only to expose participants to the potentially impressive capabilities of these machines but also to permit participants to carry out realistic exercises with large amounts of live data. The statistical analysis module is a very important component of the workshop and is intended to demonstrate, using very rudimentary statistical techniques, how data can be massaged, how one can extract the maximum for a dataset, and how one can translate substantive concerns into the language of statistical analysis of empirical data.

The modeling module is offered as part of the workshop in order to provide participants with yet one more tool that can be useful in the planning process. Modeling techniques are especially appropriate for planners since they facilitate the study of large numbers of variables and the relationships between them. The modeling systems presented allow the participants to appreciate the variety and complexity of these systems. Running the gamut from the unidirectional with limited number of variables to the recursive with hundreds of variables, different models serve different purposes. Some are limited to applications and demonstrations while others can be used to help carry out research and investigations.

The population projection module offers participants the opportunity to learn not only the basic techniques of population projections but also how these techniques are actually implemented with real, live data. Finally no workshop incorporating microcomputers would be complete without a module including computer software, namely computer programs and packages. Apart from the programs and packages mentioned above (e.g., projections, statistical analysis), participants also edit data files using a word processor and perform simple operations with worksheet-type based data files.

In addition to these experiences, microcomputers have also been introduced in CELADE's annual four-month demography course in San José, called the Curso Regional Intensivo de Demografía (CRID). The workshop concentrates primarily, if not almost exclusively, on demographic methods but there are two weeks devoted to the study of relationships between demographic and socioeconomic variables. The ninth version of CRID, offered in August-December 1986, included, for the first time, the use of microcomputers in this module of the course.

4. Role of microcomputers in the workshop

The microcomputer, in its present state of development and at its currently very accessible price, has the potential to revolutionize the way in which third world planners, analysts, technicians and professionals approach their work. The microcomputer, used wisely, offers an almost infinite number of uses and ways of facilitating certain tasks. The microcomputer, in the hands of a national planner, can serve as a means of capturing data, storing information, rapidly retrieving quickly-needed answers, performing simple and complex statistical analysis, performing demographic analyses (such as projections), and implementing complex models unthinkable only a few years ago. This is the essential justification for the inclusion of the microcomputer in this workshop. The aim of this section of the paper is to discuss some of the practical aspects of the use of microcomputers in such a workshop.

Participants in the workshop were selected with very little regard to their competence with respect to microcomputers. In other words, the basic assumption was that there would be at least some for whom working at a computer would be an entirely novel experience. As it turns out, in all three workshops at least half the class had never set eyes on a microcomputer.

The number of participants accepted was determined to a great degree by the number of microcomputers available. The office was able to mobilize 7 microcomputers and, with a ratio of about 3 users per machine, the desired class-size was set at about 20. This turned out to be a very manageable number given the

additional constraints of class-room size and other physical limitations. In addition, from a pedagogical point of view, this class-size turned out to be just right for the efficient transmittal of new concepts, on the one hand, and for an interesting climate of frank discussion, on the other hand.

The participants were arranged, 3 to a machine, in a U-shaped form with the open end of the U facing the front and the blackboard. A microcomputer was made available for the instructor but in most cases this was not used and in fact is no longer part of the physical set-up of the class. Rather, instructors are encouraged to use the overhead projector, blackboard, and handouts to transmit ideas to the participants. Thought has been given to using a large screen for projecting the contents of the microcomputer screen for the whole class to see; cost and availability have so far precluded this possibility.

It bears mentioning that in all the workshops, there was great heterogeneity among the machines, which although all fully "compatible", varied with respect to both physical characteristics and manufacturer. This caused a few problems, none insurmountable. First, some of the machines were faster giving certain groups an advantage in that some of the tasks were finished more quickly. However, since most time was spent in preparation and interpretation, rather than actually running programs, this factor did not play a significant role. In addition, the fact that some machines did not have hard disk meant that certain groups had to manipulate diskettes which proved to be only a minor inconvenience. In these cases, several groups had to share one machine. Different ways of loading the microcomputer at the beginning did not seem to pose too many difficulties.

3/p ne | It was not always possible to arrange to have one printer for each microcomputer. This, however, did not pose a great deal of problems and groups sharing the same printer were able to synchronize their runs in such a way as to have adequate access to the printer.

For all workshops we were fortunate enough to be able to organize the class in well-lit and airy class-rooms. Given the amount of time participants spend in front of microcomputers and given the extensive amount of material to be absorbed, we felt it paramount that optimum environmental conditions prevail. Smoking was prohibited. The only environmental problem was noise since, with much of the workshop being carried out by group interaction, it was inevitable that there was constant, and at times heated, discussion. Separating the groups by means of physical partitions is one possible solution but expensive and not conducive to a cooperative atmosphere of free exchange of ideas in the classroom. In addition, this would have complicated the teaching process given the physical set-up of size of the

classrooms.

The microcomputer was introduced the very first day and from then on its use was almost continuous. The workshop is arranged around major themes such as fertility, mortality, projections, etc. In each case there is a theoretical presentation followed by the description of a practical research problem. This problem is in turn investigated by means of various programs prepared in advance and run on the microcomputer.

There was great concern before the first workshop was offered to minimize the mechanical aspects of the workshop, in particular the exercises on the microcomputer. We went to great lengths to prepare before hand as much as possible programs, datasets, and even instructions so that participants could concentrate on the substantive aspects of the problems and not become bogged down with mechanical details. Granted, this does not provide the novice with a very realistic experience of working with the microcomputer but, given the time limitations, there is not much choice.

On the other hand, we also wanted to avoid leaving the impression that the microcomputer together with any particular program is simply a black box into which anything can be thrown and the resulting output accepted without criticism. Participants were repeatedly exhorted to carefully prepare their input and to review the output equally as carefully. In addition, it was stressed that a substantive knowledge of the contents of the program ~~is~~ more important than a mechanical knowledge of how to run it. The knowledge of the program need not include the programming aspects but it should at least include a good familiarity with the substantive methodology applied.

With particular reference to the use of microcomputers, an interesting lesson was learned. The first time the workshop was offered, some of the instructors prepared in advance all the microcomputer instructions, distributed them to participants as handouts, and displayed them using the overhead projector. This created a major problem since overzealous participants surged ahead and within a very short time chaos prevailed as each group found itself with distinct problems found at different steps in the exercise. Since that first experience, at least until the participants are familiar with the particular software in question, the instructions are written one by one on the blackboard and only when all groups have successfully completed that instruction, is the next instruction displayed. Once participants have become reasonably familiar with the software they are given leeway to proceed at their own pace and, indeed, to select the instructions they deem necessary.

Since the workshop is relatively short given the amount of material presented, it was considered of utmost importance that

X all programs and datasets be loaded and tested in all machines a priori. Some data sets contained as many as 10,000 records to impress upon participants the tremendous potential of the microcomputer in terms of speed and accuracy with which even complicated operations could be performed. However, it was considered important not to burden the participants with complicated datasets so only the necessary variables and records were included. An effort was made to expose participants to different types of datasets, at least from the point of view of content and unit of observation. For example, for the first workshop one dataset consisted of data about countries of the world, another about families, and a third about individuals. At the end of the workshop, each participant was given several diskettes with copies of all datasets used and those programs not copyright protected.

With respect to the programs run, participants are exposed to an operating system, a word processor, a statistical package, a spread-sheet based system, a projection program written in FORTRAN, and two socioeconomic modeling systems. Of course, each program has its particular idiosyncracies and presents particular problems from the instructor's point of view. In general it was found that the best strategy was to pre-test all runs to foresee any problems that might crop up during the workshop. Execution time was seldom a problem even with large datasets. Only in the extreme case of a slow microcomputer with no hard disk and no coprocessor, did runs have to be cut short. In many, if not all, cases, output had to be printed in order to permit analysis by the group.

It was found that a critical spirit was essential in determining which software was most appropriate for each module of the workshop. In certain cases, for practical reasons, programs which were less than ideal had to be used. With time it is hoped that the workshop will develop a repertoire of software more closely related to the type of exercises carried out during the workshop.

Probably the most important message to be conveyed in the workshop's microcomputer module was that for every unit of time spent at the machine, at least double should be spent in preparation and interpretation. Participants were encouraged to spend sufficient time understanding the problem and translating it in quantitative terms before even considering the issue of running the appropriate program on the microcomputer. Likewise, participants were obliged to peruse the results and analyse the output before submitting more runs. The message to be transmitted was that sessions at the microcomputer should be quite mechanical with little intellectual content. The preparation and analysis steps should be where the important decisions and discoveries are made. The microcomputer, used wisely, can be a priceless tool, but it is never more than that,

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a tool to be used to achieve an intellectual end.

5. Microcomputers in the classroom - an evaluation

The workshop operates under several limitations. The first is time. It is not feasible to expect 20 professionals to leave their offices for much more than a few weeks. Consequently a large amount of material has to be crammed into those several weeks, be ~~it~~^{it} two or four. With particular reference to microcomputers, the problem is that one can count on heterogeneity in the group with respect to knowledge of, and experience with, microcomputers. Participants with little of both are often left behind and through their lack of familiarity with the microcomputer, do not adequately assimilate the other modules of the workshop.

At least two solutions have been proposed for this problem. The first is a pre-course training session. This would be offered on the week-end since the workshop usually starts on a Monday and participants arrive on the preceding week-end. The second solution is to make sure that, when the class is divided into working groups, each group contains at least one person who is familiar with microcomputers. The disadvantage of this solution is that the rest of the group become followers and do not always learn, but rather they simply observe and follow the work of the leader.

Another practical limitation that the workshop must contend with is the limited number of machines and the compatibility between machines. For the two workshops offered in San José, there were 7 microcomputers available and 6 printers. This resulted in about 3 participants per microcomputer, a number that turned out to work very well. The exercises were very appropriate for resolution by groups and, whereas from a pedagogic point of view, it might have been ideal to have only one participant per microcomputer, there is a great deal of benefit to be gained from having participants work in groups. More work is done more quickly and participants benefit from the mutual exchange of ideas.

Execution time is a factor that must be considered in designing such a workshop, especially since, for example, a non-trivial statistical analysis of a large dataset may take an unacceptably long time. At the San José workshops, all machines had hard disks and mathematical coprocessors. We would recommend that this level of microcomputer capabilities be present in all workshops.

A problem that such a workshop must face is that, inevitably, certain groups will work faster than others. For such cases, additional work should be kept in reserve. In fact this should

be done in general since it is not always possible to predict how long each task will take and cases may arise in which the whole class finishes early. The other solution to adopt is to use the faster groups as "guinea pigs" to find out what problems the participants are likely to encounter and then to use this information to assist the slower groups.

From formal evaluations, informal discussions, and simple observation of reactions, it is clear that this workshop presents a great deal of material in the time allocated for the course. Participants leave somewhat shell-shocked and it is highly likely that some do not succeed in assimilating most of what was thrown at them. Several proposals have been suggested in order to counter this problem. First, participants have to be warned in advance that the workshop is intensive and that they will be expected to work evenings and week-ends if they want to benefit maximally from the workshop. Secondly, it has been proposed that future workshops concentrate on one substantive topic, for example, aging of the population. This way datasets and theoretical presentations can be more homogeneous and the participant has less material to absorb, all the while using the tools currently used, including the microcomputer. Participants can also be expected to be more homogeneous.

Furthermore, it will be recommended that future versions of this workshop be regional, rather than national. Participants have to be removed from their professional and familial responsibilities in order to concentrate entirely on the workshop. In addition, it is our experience that participants at regional workshops are better prepared and able to absorb in such a short time the amount of material presented. Most likely this is due to the larger resource pool from which they are drawn.

It is therefore our recommendation that this workshop be considered as suitable for participants who are relatively advanced in their knowledge of, and training in, at least some of the topics included in the workshop. A careful screening process should precede each workshop to ensure that only appropriate participants are accepted.

Finally, we found the national course harder to plan and to monitor. This proved especially difficult with respect to the microcomputer since we were not on site to oversee the preparation. Also, all microcomputers at our office have the necessary capacity to handle all the programs whereas in the case of the Honduras workshop, at times we had to work with very few machines, since only those with the necessary capacity could be used.

However, in spite of all precautions, one must be realistic and recognize the practical limitations of such an activity. As has already been stated, the workshop's minimal goal is to whet the

average participant's appetite by exposing individuals to various quantitative techniques and by convincing them that these techniques and the microcomputer can assist them in their planning activities. The workshop cannot possibly make the participants fluent, much less expert, in any one of the techniques and this is not the workshop's goal. But if the door is opened a crack maybe some of the participants will leave with the wherewithal to push it open wider.

Concerning the question of follow-up, there is an argument that there does not seem to be much point in preparing participants who do not have access to microcomputers and therefore cannot apply in practice the techniques taught in the workshop. The participants have to practice in order to fully assimilate what was presented in the workshop and a microcomputer is necessary in order for the workshop to have any important effect on how planners carry out their tasks.

On the other hand, this workshop in many ways is breaking new ground and is helping to create an atmosphere in which offices without access to microcomputers are motivated to change their working habits radically. For too long, the collection and access to important data have been in the hands of an elite few who happen to possess the particular techniques and tools to dominate this market. The arrival of the microcomputer is helping to "democratize" access to these data. It is hoped that this workshop will motivate participants without microcomputers to pressure their superiors to acquire sufficient machines to permit professionals to benefit from their tremendous advantages.

A seemingly innocuous issue arises every time the workshop is offered and as yet no satisfactory solution has been found. Participants would like most of all to take home with them copies of all the programs. However, in many cases, especially for statistical packages this is impossible since they are copy protected and purchasing sufficient copies for all participants is prohibitively expensive. Many distributors have been contacted but in all cases the cost of obtaining 20 copies, not to mention for several workshops, has proven to be outside the financial possibilities of the workshop. The only recommendation that is offered the participants is that they write directly to the distributor to purchase a copy of the program.

After having offered the workshop three times, twice in-house and once in Honduras, it has become apparent that the constant presence of a computer expert is not a luxury but a necessity that must be programmed into the budget. No matter how well prepared the instructor, it is almost a certainty that problems will occur that require an expert. Often, though not always, these problems are trivial and their solutions even more so but only for a computer expert. Furthermore, these petty obstacles left unsolved can potentially jeopardize the successful

completion of the workshop. In addition, such a resource has the responsibility of installing all the machines, ensuring their maintenance and operationability, and helping the instructors prepare and test their programs and datasets.

After every one of the three workshops, participants filled out a form evaluating the instructors and indicating both positive and negative aspects of the course. In all cases the results are very reassuring and the participants leave very satisfied with the end product. The principal complaint is the amount of material in the short period of time, an issue already touched upon above.

After the last workshop in Honduras, participants were given a surprise quiz at the end of the third week on the topics of projections and a simple modeling system. The quiz was anonymous and was used only to provide some feedback as to how much the participants were assimilating. The results were less than satisfactory in that the participants did not always understand the workings of the microcomputer and the various programs that they had run that week. For example, they confused the function of the projections program with that of the word processor used to prepare the input control file for the program.

It should be emphasized, before these results are interpreted too literally, that the Honduras workshop was at the national level and the students were drawn from a far smaller pool than the one that provided participants to the two San José regional workshops. Students at the Honduras workshop were less well prepared in their overall knowledge of, and exposure to, microcomputers. Possibly, in the future, special attention should be paid to how well prepared the participants are likely to be.

There are, however, a few lessons to be learned from the results of this quiz. Efforts must be made in the future to structure the workshop more carefully to ensure that new microcomputer concepts are clearly and slowly explained so that there exist no misconceptions. Thought might be given to scheduling more time for such clarifications, time which should be planned in advance as an integral part of the workshop.

But it is equally important that participants accept the responsibility for not losing the forest for the trees. It might be advisable to make a point of stressing this point repeatedly at future versions of the workshop. It is one thing, an easy thing, to follow the instructions provided but one must also make an effort to understand why each step is being performed and what is the overall objective of the individual instructions. Working with microcomputers it is very easy to commit the error of becoming so engrossed with picayune details that one forgets that the aim of the microcomputer is, for example, to help measure

quantitatively the relationship between fertility and education.

Once again, the aim of the workshop is to train participants in the use of the microcomputer in planning and not to develop microcomputer expertise. The microcomputer is a tool to be used to achieve an end; its use as a tool per se is of little interest in this workshop.

6. Conclusion

It seems to us that these kinds of activities are going to become ever more frequent and widespread in the near future. Whereas our workshop is only a modest contribution in this direction we feel we have touched a nerve and that the tremendously positive response both before and after the workshops reassures us that we are on the right track. Clearly there is room for improvement. In future activities it is expected that the workshop can touch on new models currently being developed, in particular sectorial models, on more powerful statistical techniques, and on new microcomputer-programming developments such as systems to handle census data for small areas.

APPENDIX: WORKSHOP OUTLINE

TIME	WEEK1: MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00	INAUGURATION	SOCIOECONOMIC	SOCIOECONOMIC	SOCIOECONOMIC	MIGRATION/EMPLOYMENT
8:30	WELCOME (ILO-PREALC, UNDP-UNFPA, CELADE)	DETERMINANTS OF FERTILITY	DETERMINANTS OF MORTALITY	DETERMINANTS OF MORTALITY (CONT.)	(CONT.)
9:30	INTRODUCTION	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----
9:45	INSTRUCTORS/PARTICIPANT	STATISTICAL ANALYSIS	STATISTICAL ANALYSIS		EXERCISE IN
10:00	-----COFFEE-----	EXERCISE IN	EXERCISE IN		MIGRATION/EMPLOYMENT
10:30	INTRODUCTION	FERTILITY	MORTALITY		(CONT.)
	POPULATION AND DEVELOPMENT			ANALYSIS/CONCLUSIONS	
11:30					
13:00	USE OF MICROCOMPUTERS AN INTRODUCTION	EXERCISE IN FERTILITY (CONT.)	EXERCISE IN MORTALITY (CONT.)	SOCIOECONOMIC DETERMINANTS OF MIGRATION/EMPLOYMENT	
14:45	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----
15:00	STATISTICAL ANALYSIS AN INTRODUCTION			STATISTICAL ANALYSIS EXERCISE IN MIGRATION/EMPLOYMENT	
16:00		ANALYSIS/CONCLUSIONS	ANALYSIS/CONCLUSIONS		ANALYSIS/CONCLUSIONS
16:30					

TIME	WEEK2: MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00	SPATIAL DISTRIBUTION AND REGIONAL PLANNING	POPULATION PROJECTIONS	CONSEQUENCES OF POPULATION DYNAMICS THE RAPID MODEL	DEMO-ECONOMIC MODELS AN INTRODUCTION	EXERCISE BASED ON THE BACHUE-INTERNATIONAL MODEL (CONT.)
9:30	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----
9:45	EXERCISE IN SPATIAL DISTRIBUTION	PROJECTION EXERCISE	EXERCISE BASED ON THE RAPID MODEL	EXERCISE BASED ON THE BACHUE-INTERNATIONAL MODEL	
11:30					
13:00	EXERCISE IN SPATIAL DISTRIBUTION	PROJECTION EXERCISE (CONT.)	EXERCISE BASED ON THE RAPID MODEL	EXERCISE BASED ON THE BACHUE-INTERNATIONAL	ANALYSIS/CONCLUSIONS
	(CONT.)		(CONT.)	MODEL (CONT.)	
14:45	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----	-----COFFEE-----
15:00		ANALYSIS/CONCLUSIONS			TERMINATION EVALUATION
15:45		PROJECTIONS: PRACTICE AND PERSPECTIVES	ANALYSIS/CONCLUSIONS		
16:00	ANALYSIS/CONCLUSIONS				FREE
16:30					