

Agency for International Development  
Washington, D.C. 20523

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NOV 29 1990

MEMORANDUM

TO: See Distribution

FROM: S&T/POP/P&E, Ellen H. Starbird *ehs*

SUBJECT: Evaluation of O Segundo Brasil (OSB) Subproject with  
RAPID III

Attached is a copy of my evaluation of the population/environment model developed by O Segundo Brasil under a subcontract with The Futures Group (Futures), as part of the RAPID III project. The evaluation was undertaken in Rio at the request of USAID/Brasilia, which funded the \$95,000 buy-in, over the period August 27-31, 1990.

The model combines population/environment/urbanization issues as they relate to the Rio de Janeiro area. Presentations of the model have not reached the desired policy-level audience and the model could have been applied more effectively to a more interesting urban setting.

The evaluation recommends limited additional funding of OSB to complete documentation of the model and perhaps to train others in its use. It also suggests some lessons learned from the collaboration between Futures and OSB.

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**EVALUATION OF POPULATION/ENVIRONMENT MODEL  
DEVELOPED BY O SEGUNDO BRASIL**

**Executive Summary**

The purpose of the current evaluation is to assess the population/environment model developed by O Segundo Brasil (OSB) under a subcontract with The Futures Group (Futures) as part of the RAPID III project.

OSB has developed a model that combines population/environment/urbanization issues as they relate to the Rio de Janeiro area. Rio is not the most interesting application of such a model (fertility and immigration are low) and the policy prescription - the need for integrated population and environment policies - is lost to the viewer. An application to Sao Paulo would have been more effective.

OSB has made presentations for technical staff of a number of Brazilian organizations but has not been successful at reaching high-level policy makers. In addition, the presentation is not sufficiently polished to have much of an impact on policy makers.

Recommendations on the basis of the evaluation are:

- o Insist that OSB prepare a technical document based on the model that is acceptable to Futures and S&T/POP. Futures should pay for the preparation of the document out of core project funds.
- o Request that OSB incorporate data for Sao Paulo into the model and fund Futures to provide training in presentation design and technique to OSB staff in anticipation of perhaps presenting the model at the U.N. Conference on Environment and Development to be held in Brazil in 1992.
- o Fund OSB to train technical staff of other Brazilian organizations (e.g., FEEMA, the environmental organization for the state of Rio) in the use of the model and then work with these organizations in the future.

The evaluation also suggests a number of lessons to be learned from the collaboration between Futures and OSB.

- o Incorporation of environmental variables is a departure from standard demographic modelling and even well-established demographic research organizations may require significant technical assistance and oversight in the elaboration of the model.
- o "Special issue" models such as the population/environment model require more continuous "selling" than the more traditional RAPID models.
- o To facilitate accountability, all modifications to the scope of work should be included in a contract amendment.

## INTRODUCTION

The purpose of the current evaluation is to assess the population/environment model developed by O Segundo Brasil (OSB) under a subcontract with The Futures Group (Futures). (The scope of work for the evaluation is attached as Appendix A.) The subcontract is a fixed-price, level of effort agreement for a two-year project (7/1/88-6/30/90) funded through a \$95,000 USAID/Brasilia buy-in to the Resources for the Awareness of Population Impacts on Development (RAPID III) project.

The RAPID project is designed to raise awareness among high-level policy makers of the role of population in the development process. A number of different kinds of models are available through the RAPID III project, among them presentation models and interactive models. The presentation models are advocacy tools that make use of microcomputer technology to present data in graphic form. These are "hard-wired", meaning that variable values cannot be changed on the spot. The interactive models are models in a more technical sense; individual variable values can be modified at will and a new scenario generated during the presentation. Models of population-development interactions are developed in close collaboration with host-country institutions and presented using microcomputer graphics technology. Training in presentation techniques is provided by RAPID staff.

The RAPID III project includes the development of "special issue" models, including population and environment. At the time that the subcontract with OSB was initiated, Futures modelling efforts in the area of population and the environment were in their infancy. The model was designed to show general relationships, but was not a rigorous analytical tool.

OSB, with Manoel Costa as its Director General, was established in 1983 with funding from RAPID II. The objective of OSB is to promote and disseminate studies on the relationship of population and national development in Brazil. To this end, OSB holds seminars, workshops, and symposia for politicians, social scientists, and community and business leaders. These meetings provide a forum for the open discussion of population/development issues.

Under RAPID II, OSB developed RAPID presentations for a number of Brazilian states. These presentations were used in a series of seminars for national, state, and municipal leaders to inform them of the impacts of rapid population growth in Brazil. OSB also commissioned a number of technical papers dealing with all aspects of population growth. These were edited and distributed widely. The ability of Manoel Costa to conduct demographic research and to organize, motivate, and interest others contributed to successful collaboration between Futures and OSB under RAPID II. This previous collaboration was the primary rationale for continuing to work with OSB under RAPID III.

#### CONTRACT REQUIREMENTS

The OSB subproject under RAPID III focuses on two areas where population growth is perceived to have a significant influence in Brazil: the environment and urbanization. A third task, evaluation of family planning programs, was deleted from the subcontract. Project deliverables include a detailed workplan, four progress reports, and a final report.

The subcontract between Futures and OSB requires OSB to adapt the RAPID/Population and Environment Model to the specific situation of Brazil and, in particular, to illustrate the effects of population change on specific impact zones, such as the Amazon region, the Northeast, Sao Paulo, etc. Studies by other environmental groups in Brazil are to be consulted to determine the primary areas of interest. The results of the model are to be presented to policy makers at all levels.

The urbanization model is intended to emphasize comparisons of key urban areas within and across regions. The focus is on needs for urban services, such as transportation, housing, electricity, water, and employment. These statistics are to be compared with rates of growth of urban populations, rates of migration, and contrasts with overall growth patterns.

For each model, OSB is expected to produce a short pamphlet and a more detailed technical document. OSB is also expected to disseminate the findings of these models through seminars and workshops. The contract calls for one seminar on environment and urbanization and an unspecified number of workshops for high-level policy makers.

#### BACKGROUND

The OSB subproject started off slowly. Progress reports submitted to Futures by OSB suggest that it was difficult to find local researchers who had addressed population/environment issues and who could serve as advisors to the project. The first technical assistance visit, by John Stover of the RAPID III staff, took place in February 1989. During that visit, a detailed outline of the population and environment presentation was developed. Concurrently, Howard Hellman, the AID representative in Brasilia, was trying to organize a committee of mayors, which would have been a logical audience for such a presentation. As a result, the initial modelling activities focussed on population/environment interactions as they relate to urbanization. Although the idea of a committee of mayors did not progress beyond the conceptual stage, OSB's modelling work has remained focussed on a combined population/environment/urbanization model.

According to correspondence from OSB to Futures, the expected outputs had changed by May 1989. Evaluation of family planning programs was dropped from the workplan and the contract term was extended by one year to June 30, 1990. It was agreed that OSB would concentrate on the development of a population/ environment model for Brazil; hold at least four workshops before March 31, 1990; and address the question of the environment, even if it

could not be related directly to population policy. An amendment to the subcontract (which was not signed until February 1990) reflects only the deletion of the family planning evaluation component of the project and the one-year extension.

In August 1989, OSB organized a two-day symposium on "Population, the Environment, and Quality of Life." Various technicians from different backgrounds (law, sociology, demography, engineering, history, etc.) were invited to prepare and present papers. Approximately 20 people attended the symposium. Discussion centered on the need to integrate environmental and other social indicators of quality of life, and on the relationship between environmental and demographic processes. It was also suggested that OSB pursue the development of an index of quality of life that could be adapted and applied to the various parts of the country. The thirteen invited papers were published as a book, the first of its kind in Brazil. Some of these essays suggested variables that could be introduced into the population/environment model and provided data for the application of the model to Rio (e.g., the proportion of the population living in slums).

#### DATA INPUTS TO THE MODEL

The model has six sections:

- o an overview of the demographic situation in Brazil as a whole, including regional variation in birth and death rate trends, comparisons of urban and rural population growth rates, deforestation in the Amazon, and the growth of slums around Rio de Janeiro;
- o an overview of the demographic situation in Rio de Janeiro, including projections to the year 2020;
- o sources and types of pollution, including residential and industrial pollutants and emissions from cars and buses, and the diseases associated with these pollutants;
- o projections for growth in the economy (size of the labor force, dependency ratios, demand for jobs, energy consumption) through 2020 with and without migration and under different fertility assumptions;
- o urban growth scenarios (demand for housing and vehicles projected to 2020, with and without migration and compared to the situation in New York; quantity of garbage, increase in sulfur dioxide emissions from 1979-85, water consumption, and the availability of piped water); and
- o proposals for action, including descriptions of the relationship between uncontrolled population growth, environmental degradation, and declines in quality of life; the need for increased awareness of these interconnections; and the importance of the development of integrated policies to address them.

Demographic data for the model come from the 1980 national census and the 1986 household survey. Data on pollution in urban areas come from FEEMA, a government environmental organization for the State of Rio de Janeiro, and various departments of social services (sanitation, transportation, electric, etc.). The model also includes information on deforestation in Amazonia over the period 1970-1988, which comes from a 1988 World Bank publication. Although currently only data for the Rio de Janeiro metropolitan area are included, the model can be adapted to the situation in any other area of the country, subject to the availability of data. Demographic data for all five regions of the country are already on hand at OSB. Data on urbanization and levels of pollutants in other regions are less accessible. In addition, some of the data are available only for a single year or were collected only irregularly by the responsible institution. (See list of variables in Appendix B.)

The lack of recent data is one of the serious problems faced by OSB in designing a "correct" projection model. However, the model is as accurate a representation of the population/urbanization/environment relationships as is possible with the data at hand and, as an awareness-raising tool, the model is sufficiently accurate. The model is not intended as a planning tool; rather, it is illustrative. The intention is to contribute to an increased understanding of the interrelationships between population dynamics (fertility and migration) and environmental degradation in urban areas. The relationships are strong enough that these points can be made even in the absence of recent data.

The projections made in the model are based only on demographic change. Except for comparisons to New York, they assume no change in use ratios (e.g., number of cars per household) or technological advancement. However, all the variable values can be changed so that different scenarios can be presented.

The model developed does focus on "needs for urban services, transportation, housing, electricity and water, employment, and others", comparing these with rates of urban population growth and migration, as called for in the contract. Levels of pollution associated with the different urban services are incorporated to demonstrate the environmental impact of urbanization. In addition, the model compares fertility and mortality rates for different regions of the country. It also shows the progressive deforestation of the Amazon region, but does not make the connection between population growth and this deforestation. The graphics are interesting and thought-provoking. The final graphic, which shows the linkages between population dynamics, environmental degradation, and quality of life, is an excellent summary of the issues.

#### MODEL PRESENTATIONS

The model, at various stages of development, has been presented to four groups. The first of these presentations was to members of the national association of industry (SESI) attending a conference in Brasilia in early 1990. The other three presentations took

place in the first three weeks of August 1990 in Rio de Janeiro. Presentations were made for technicians from the Brazilian Institute for Geography and Statistics (IBEG) and the State Secretariat for Education, technicians from FEEMA, and representatives from the environmental secretariat of the office of the Mayor of Rio de Janeiro. These presentations were used as opportunities to get feedback from technicians before finalizing the model. The A.I.D. representative in Brasilia has not seen the model.

According to OSB staff, reaction to the model has been generally favorable. It is quite effective as an awareness-raising tool in some settings, in that it generates discussion of population/environment interactions. It is not a detailed planning model, however, and technicians often find it too superficial. Even among technicians, though, it has generated discussion - an important precursor to policy development.

The final model was presented at a reception on August 30, 1990, in connection with the publication of the papers that had been presented at the symposium in August 1989. The event was attended by approximately 100 people, primarily academicians and technicians, but also including representatives of politicians currently in office and of candidates in the upcoming election, as well as the print media.

The presentation suffered greatly from the lack of a public address system. In fact, little, if any, of the explanation could be heard beyond the second row of the audience. Another drawback is that OSB does not have access to a Kodak projector, which would display the graphics in color. In addition, the presentation did not address policy issues in an explicit manner. For example, the final graphic in the model (which summarizes the linkages between population, environment, and quality of life) was not presented. Nor was the screen describing the need for increased awareness and integrated policies.

The audience members were clearly impressed with the technology and were interested in how the model could be adapted for their needs (e.g., in education). Some requested that the model be shown to others in their respective organizations. The policy message, however, was lost.

#### CONTRIBUTION OF THE MODEL TO POLICY DIALOGUE

Although the model can be applied to any urban area, the current application focusses on the Rio de Janeiro metropolitan area. Rio was chosen for two main reasons: data for the area are available and reasonably accurate, and OSB expected to promote the model primarily in the Rio area. In my view, the second reason is not particularly compelling; it was not the intention of the contract that the model be presented only in the Rio area and data for Sao Paulo, for instance, are available.

The policy recommendations included in the model presentation are not specific. The lack of specificity is, perhaps in part, a consequence of choosing to apply the model to the Rio metropolitan area. Fertility is relatively low (TFR = 2.3) and migration to the Rio area is not as striking as to some other urban areas, such as Sao Paulo, for example. The situation in Rio does not lead directly to the conclusion that population policy would be an effective intervention. Had the model been applied in Sao Paulo, where fertility is higher and migration and pollution are more serious problems, the basis for concluding that population policies are relevant would be clearer and the presentation more effective.

To date, the presentations have not reached the appropriate policy-making audience. Manoel Costa sees this as the next step and hopes that funding will be available for further dissemination. It is clear from the contract, however, that such dissemination was included in the current scope of work. Closer collaboration between OSB, Futures, and USAID/Brasilia might have resulted in the selection of more appropriate audiences for the presentation.

A third issue is that the presentation in its current form is not sufficiently polished to capture the interest of policy makers. Assistance from Futures in choosing which graphics to present and how to structure the presentation, as well as training in presentation techniques, would have contributed greatly to a more effective presentation.

#### PROGRESS ON CONTRACT DELIVERABLES

A technical document (the book) and a chart have been produced to accompany the presentation. However, the book is not a technical document based on the model, which is what the contract requirement is generally interpreted to mean. This required document is intended to enable technicians to understand how the model works, what variables it uses, and the values of the variables. The lack of such a document is a serious failure on the part of OSB. The value of the book, however, should not be overlooked. The symposium at which the contributors presented their papers provided an excellent opportunity for an exchange of information and expertise. The suggestion of devising an index of quality of life that includes environmental variables is particularly provocative. (Such an index would have been an interesting addition to the model.) The book provides a ready reference for those interested in population, environment, and quality of life in Brazil.

Due to various factors outside the control of OSB, the chart is not yet available. Disagreements between OSB and the printer over payment continue and it is unlikely that the chart will be available in the near future. The only copy of the chart was given to the printer; thus, it was not possible to evaluate its appropriateness or usefulness.

With regard to contract deliverables, the final report for the subproject has just recently been submitted to Futures. The technical document described in the contract has not been prepared, although it was supposed to be part of the third deliverable for which OSB has already been paid. OSB has not been paid for the final deliverable, which is supposed to include "all final, published documents." Final payment (\$5000), therefore, can theoretically be withheld until the technical document is submitted. However, OSB now has no money to cover the production of the document. Futures should not have paid the third tranche of money in the absence of the required deliverables and, therefore, should now pay for OSB to develop and publish the technical document out of core project funds.

With regard to outputs, it was understood by all parties that the population and environment model and the urbanization model were to be combined into a single model. However, this was not reflected in the amendments to the subcontract and it is unclear whether other elements of the original subcontract (e.g., the comparison of key urban areas within and across regions) were also implicitly modified.

#### TECHNICAL ASSISTANCE FROM FUTURES

OSB feels that it has received excellent technical assistance from Futures, and in particular from John Stover. However, had that assistance been provided earlier in the project, less time might have been lost. Collaboration with Manoel Costa under RAPID II confirmed that he is a very capable demographer. He also sees, and is interested in, the connections between population dynamics and progress in other sectors. On the basis of this previous collaboration, Futures assumed that relatively little technical assistance and oversight would be needed under RAPID III. With hindsight, this decision appears to have been premature, as they acknowledge. In addition, the message communicated to the Mission was that the OSB activity was a low priority for Futures staff. Closer supervision of the progress of the model should have been provided, particularly after it was clear that USAID/Brasilia was concerned.

#### COMMUNICATION BETWEEN OSB, FUTURES, AND USAID/BRASILIA

It would also have helped, I believe, to have provided USAID/Brasilia with more background information about the RAPID project and, in particular, about the population/environment component of RAPID III. The Mission was encouraged by LAC/DR to accept the project, without, I believe, a clear understanding of what they were buying. At the time the subcontract was signed, Futures population/environment modelling was in its infancy. The model available was illustrative, not interactive, and intended for awareness-raising. USAID/Brasilia thought they were getting a technical, "state-of-the-art" model. Partly as a result, they are dissatisfied with the illustrative model that has been produced.

Lack of open communication between OSB and USAID/Brasilia contributed to this dissatisfaction. USAID/Brasilia has not received a copy of the book produced by OSB; the Mission was not consulted regarding the choice of Rio as a focus for the model or regarding appropriate audiences for the presentations; Mission staff have never seen the presentation. OSB, for its part, does not feel that it received good guidance from the Mission regarding what the Mission wanted from the model. It appears, again with hindsight, that Futures could have played an important role as liaison between OSB and USAID/Brasilia.

#### LESSONS LEARNED

Based on collaboration with OSB under RAPID II, Futures felt that OSB was sufficiently technically competent and experienced that it did not require intensive oversight. Incorporation of environmental variables into the model, however, was a new twist on the demographic modelling OSB had done in the past and the staff would have benefitted from more guidance earlier on in adapting the demographic model to include those data.

OSB also would have benefitted greatly from training in advocacy. The organization has excellent demographic skills but could have used more technical assistance in presentation techniques. This training and practice in designing and making presentations would have contributed greatly to the success of the project. RAPID project staff need to be more sensitive to the importance of this component of skills transfer in the future.

Evaluation of OSB's performance under the subcontract was complicated because some revisions of the scope of work were not incorporated into amendments to the contract. While it seems clear that everyone agreed to the revisions, it is difficult to hold anyone accountable for activities that are not included in the contract.

The evaluation suggests a number of lessons to be learned from the collaboration between Futures and OSB:

- o Incorporation of environmental variables is a departure from standard demographic modelling and even well-established demographic research organizations may require significant technical assistance and oversight in the elaboration of the model.
- o "Special issue" models such as the population/environment model require more continuous "selling" than the more traditional RAPID models.
- o To facilitate accountability, all modifications to the scope of work should be included in a contract amendment.

**CONCLUSIONS AND RECOMMENDATIONS REGARDING FURTHER INVESTMENT IN OSB AND IN THE MODEL**

The Futures subcontract with OSB has not been one of RAPID III's most successful collaborative efforts. The population/environment/urbanization model developed has the potential to be an effective awareness-raising tool. However, presentations to date have not attracted the desired audience and have had little, if any, impact on policy dialogue.

It would be extremely unfortunate to have the model go unused given the \$95,000 invested to date. Without further investment, it is unlikely that OSB will continue to work with the model. In addition, other organizations will not be able to work effectively with the model without a technical document as a guide. At the very least, OSB should be funded by Futures, as described above, to produce the technical guide. Additional limited funding from S&T/POP to incorporate data from Sao Paulo and to train OSB staff to train others to use the model is also warranted.

The following recommendations are based on the findings of the evaluation.

1. Insist that OSB prepare a technical document based on the model that is acceptable to Futures and to S&T/POP. Futures should pay for the preparation of the document out of core project funds.
2. Request that OSB adapt the model to a more interesting urban setting, such as Sao Paulo, and to consider presenting the revised model at the U.N.-sponsored Conference on Environment and Development to be held in Brazil in 1992. The conference would provide an excellent opportunity to reach high-level policy makers from a number of countries. Funding for training in presentation techniques is imperative if such a presentation is to be effective.
3. Fund OSB to train others to use the model. OSB has been very successful in reaching the technical staff of a variety of Brazilian organizations (FEEMA, industry groups, the environmental secretariat of the Mayor of Rio). These organizations may have better access to the policy makers themselves than OSB has had to date. This option is likely to require ongoing funding of technical assistance for these other institutions once the technology is transferred to them.

## Appendix A

### Scope of Work for O Segundo Brasil Evaluation

#### Activity to be evaluated

The activity to be evaluated is the performance of O Segundo Brasil (OSB) under contract no. 5600.41.SB01, a subcontract for population policy analysis between OSB and The Futures Group (Futures), relating to Futures' contract no. DPE-3046-Z-00-7069-00 with the US Agency for International Development (A.I.D.). This is a fixed price level of effort agreement for a two-year project (7/1/88-6/30/90) funded through a \$95,000 USAID/Brasilia buy-in to the Resources for the Awareness of Population Impacts on Development (RAPID III) project.

#### Purpose of the evaluation

The objective of the subproject was to develop a model showing the relationships between population and the environment in Brazil. The purpose of the evaluation is to assess the performance of OSB under the subcontract and the utility of the model. Among the key issues to be addressed are:

- o Was the modelling effort successful?
- o Are the data used in the model sufficient to permit interactive dialogue with policy makers throughout Brazil?
- o Has OSB's work contributed to increased awareness of population issues among high-level government leaders in Brazil and to policy dialogue on such issues?

The evaluation findings and recommendations will be used by USAID/Brasilia in determining the nature of further investment in the model.

#### Background

The RAPID project, in its third 5-year phase, is designed to raise awareness among high-level government leaders of the impacts of population growth on development. Models of population-development interactions are developed in close collaboration with host-country institutions. Training in presentation techniques is provided for host-country nationals. Presentations based on microcomputer graphics are the primary method of dissemination. Increasingly, RAPID has moved away from traditional models of population-development interactions in the areas of education, health, and employment to "special issue" areas, such as the environment and child survival.

The OSB subproject with RAPID III focuses on two areas where population growth is perceived to have significant influence in Brazil: the environment and urbanization. (A third task, evaluation of family planning programs, was deleted from the subcontract under modification no. 2).

Population and Environment: The contract requires OSB to adapt the RAPID/Population and Environment Model to the specific situation in Brazil and in particular to illustrate the effects of population change on environmental degradation. Emphasis is placed on specific impact zones, such as the Amazon region, Northeast, Sao Paulo, etc.

Urbanization: The presentation model on population growth and urbanization is intended to emphasize comparisons of key urban areas within and across regions. The focus is on needs for urban services, transportation, housing, electricity, water, employment, and others. These statistics will be compared with rates of growth of urban populations, rates of migration, and contrasts with overall growth patterns.

For each model, OSB agreed to develop written materials and documentation to accompany the presentations. These were to be in the form of a) a short pamphlet for distribution to a variety of audiences and b) a detailed technical document to be made available to specialized audiences. The contract calls for one seminar on environment and urbanization for high-level policy makers. An unspecified number of workshops for policy makers are also mentioned in the contract.

Specific deliverables cited in the contract are a detailed workplan, four progress reports, and a final report.

#### Progress to date

To date, OSB, with limited help from John Stover of Futures, has produced a microcomputer model that combines the environment-urbanization-population issues described above. The model has been presented as a "work-in-progress" to a variety of Brazilian audiences. A collection of essays on population and the environment has also been published in Portuguese.

#### Statement of Work

The evaluation will address the following questions:

1. Are actual OSB outputs (models and presentations) and deliverables (progress and final reports) in line with those required by the contract?

2. Does the model produced accurately portray the population-environment-urbanization relationships as they exist in Brazil?
3. How much and what kind of technical assistance and oversight has OSB received from Futures and USAID/Brasilia? Has it been sufficient? Are there additional technical assistance needs? Can OSB continue such work independent of Futures?
4. Has the information produced been disseminated to the desired audience, that is, to high-level policy makers and with what impact or effect?
5. What has been the overall contribution of this effort to increased awareness of population issues?
6. What are additional needs? Does the model developed warrant further investment?

To the extent possible, the evaluation will provide answers to these questions, conclusions based on the findings, and recommendations based on an assessment of the results of the evaluation exercise. It will also document any lessons learned that may emerge from the analysis.

#### Evaluation team composition

Ellen Starbird, an economist with S&T/POP/PDD, will evaluate the OSB subproject. Ms. Starbird has an M.A. in Development Economics, four years experience in the population field, and speaks Spanish. She has overseas work experience in Latin America and Asia.

#### Methods and procedures

Ms. Starbird will view the microcomputer presentations designed by OSB, review all project documents (OSB-Futures subcontract, progress and final reports produced by OSB, written materials and documentation to support the presentation models), meet with project staff at Futures, USAID/Brasilia, and OSB, and, if possible, with policymakers or others who have participated in seminars or workshops. OSB will provide a list of attendees at in-country seminars and workshops.

Meetings with Futures staff will take place in Washington prior to departure for Brazil. The in-country portion of the evaluation will be conducted in Rio de Janeiro in late August 1990 for a period of five working days. Joanne Jones will come to Rio for the first day to meet with Ms. Starbird and to provide introductions. The Mission will coordinate with OSB to ensure

that OSB staff and project documents are available once the timing of the evaluation is set. Follow-up contact with Futures, OSB, and the Mission will take place as needed to finalize the evaluation report.

Reporting requirements

The evaluation report will follow AID's required format and include an executive summary, project identification data sheet, table of contents, body of the report, and appendices. A draft of the report in English will be submitted to Futures, LAC/DR, USAID/Brasilia, and OSB for comment within two weeks of Ms. Starbird's return to the United States. Futures, LAC/DR, USAID/Brasilia, and OSB will then have two weeks to respond. The final report in English will be available within one week after that date. Ms. Starbird is not responsible for translation of the report into other languages.

Logistic arrangements

Ms. Starbird will make her own international and in-country travel arrangements. USAID/Brasilia will assist with hotel reservations and OSB will assist with arranging interviews, preferably in person, with end-users. No office space or secretarial assistance is required.

Budget

Ms. Starbird's expenses (travel and per diem) will be covered by central S&T/POP funding.

Appendix B

Variables Used in the Population/Environment/Urbanization Model

For all of Brazil:

Crude birth and death rates, by region, 1940-1980  
Rates of population growth, by urban and rural areas, 1940-1980  
Urbanization rate, 1940-1980  
Number of cities with more than 100,000 inhabitants, 1900-1980  
Area of the Amazon that has been cleared, 1970-1980

For the Rio de Janeiro metropolitan area only:

Estimated population, 1990  
Crude birth and death rates, 1940-1980  
Estimated total fertility rate, 1990  
Estimated life expectancy, 1990  
Estimated migration, 1990  
Energy consumption, 1988  
Estimated number of households, 1990  
Cars per household, 1988  
People per bus, 1988  
Sulfer dioxide concentration in the air, 1976-1980  
Tons of garbage per household, 1988  
Water consumption per person, 1988  
Number of households with potable water, electricity, sewage  
systems, 1985  
Growth of slums, 1950-1980

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