THE REPUBLIC OF THE GAMBIA

POPULATION AND HOUSING CENSUS, 1993

REPORT ON

POST ENUMERATION SURVEY

CENTRAL STATISTICS DEPARTMENT
MINISTRY OF FINANCE AND ECONOMIC AFFAIRS

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CONTENTS

PREFACE

In a large-scale exercise like the census, it is almost inevitable that some inaccuracies will arise from deficiencies and errors in coverage and response. This report contains the results of a Post Enumeration Survey (PES) conducted on a sample basis soon after the 1993 Population and Housing Census of The Gambia. A brief description of the organisation of the survey has also been included in the report. The main objective of the PES is to quantify likely omission or duplication in enumeration and to measure response errors of certain selected characteristics. The PES also serves the important purpose of providing feedback regarding census operational matters, which would be helpful in improving future census operations. It should, however, be mentioned here that the PES results will not be used to correct the census figures.

The Divisional Census Officers who were in charge of the PES in their respective areas worked very hard during the Survey. The Supervisors and Enumerators appointed for conducting the survey did their job well. The staff of Demography Section, Mr. Sedia Bayo, Senior Statistician and Mr. Alhagi Ali D. Ceesay, Principal Statistician assisted me in organising the field work, matching operations, supervision and tabulation. Mr N. Rama Rao, U.N. Census Adviser ably co-ordinated the entire PES work. My thanks are due to all of them.

Banjul, The Gambia   Alieu S. M. Ndow
February, 1994   Director of Statistics

CHAPTER 1

INTRODUCTION

For the first time, a Post Enumeration survey (PES) was conducted in The Gambia in 1993 soon after the census enumeration, to evaluate the 1993 census. It was conducted in selected Enumeration Areas.

1.1 Objectives

The main objective of the PES was to estimate the magnitude of both positive (i.e over count) and negative (i.e under-count) coverage errors. Over count included erroneous enumeration of persons who were not present on census night (April 15, 1993), listing of persons who died before census night, counting of persons more than once or recording names of fictitious persons. Under-count, on the other hand, included omission of individual persons in enumerated households as well as omission during enumeration of households themselves and consequently persons in those households.

The other objective of the PES was to provide indicators of quality of selected characteristics collected in the census. The selected characteristics included age, nationality, literacy, school attendance and highest grade in school/institution attended. As regards the second objective, PES enumerators independently collected the selected information in the same manner as was done in the census. The PES is only intended to provide an idea of errors in census count and not to adjust the census results.

1.2 Organisation of the PES

As an accurate recall of persons present in households on census night is of basic importance for the evaluation of a *defacto* census coverage, the PES was conducted closely following the census during the second fortnight of May 1993. It commenced within three weeks from the date of completion of the census enumeration. All census enumeration records were brought to the Record Room of the Central Statistics Department before the PES commenced. The list of selected E.As was kept confidential and was made known to the PES staff concerned only when they were deployed to the field. The calendar for PES is given in Appendix - 1.

The universe covered was the household population as at the time of the 1993 census enumeration. This definition excluded from the scope of the PES, inmates of institutions like hotels, hospitals, prisons etc. and floating population like outdoor sleepers and transients.

There were three distinct stages of operation in the PES as mentioned below:-

(i)   Listing and enumeration of persons in all households in all compounds falling within the allotted Enumeration Area (E.A.).

(ii)   Desk matching of particulars collected during listing with those contained in the corresponding census schedule, Form A (Household Particulars)

(iii) Field reconciliation of particulars regarding individuals who were not matched in PES forms and census forms concerned.

The sample of EAs for PES was a one-stage random sample selected systematically from the 1593 EA's carved out for the 1993 census. Since at the time of organising PES there was no definite rural-urban classification, sample was not selected separately for rural and urban areas. Taking into account the available resources, especially in terms of manpower for conducting the survey, a sample size of 25 E.As at national level was fixed.

The Divisional Census Officers were first trained for conducting the survey. PES enumerators were selected by the Divisional Census Officers from the best among enumerators. Supervisors were selected from District Census Officers/Headquarters staff who had a background of the census operations.

The sample size of 25 E.As at the national level was allocated among the eight Local Government Areas proportional to their population. From the list of E.As, the sample E.As were selected on the basis of circular systematic sampling. The number of sample E.As falling within each Local Government Area is given in Appendix - 2.

Emphasis was laid on making PES as independent as possible, operationally, from the main census. The following measures were adopted to ensure this:-

(i)   PES enumerators had no access to information obtained in the census in their respective areas.

(ii)   Care was taken in the choice of enumerators and their training.

(iii) The location of the selected 25 E.As for PES was not disclosed to the census field staff before hand.

(iv)   PES did not begin until all census enumeration records were collected from the Divisional Census Offices and arranged in the Record Room in the Central Statistics Department.

Three Forms called PES Part 1, PES Part 2 and PES Part 3 were used during the survey. These are reproduced in Appendices 3 to 5. PES Part 1 was used for initial listing, PES Part 2 was filled in during field reconciliation after Desk matching in the office and PES Part 3 was used for reconciliation of errors, if any, in respect of particulars regarding age, nationality, literacy and full-time education. The instructions issued to the field staff for the conduct of the survey are reproduced in Appendix - 6 so as to give the reader an idea of the concepts used and the procedure followed in filling the forms.

Each PES enumerator was provided with the E.A. map concerned. The quality of field work was controlled by arranging close field supervision. Apart from specially trained supervisors, work was supervised by Divisional Census Officers and Officers from the Demography Section.

The purpose of the matching operation was to classify each person listed in the PES and the census according to whether he or she was correctly enumerated in the census (a matched person) or tentatively missed in the census (a PES unmatched with the census). This required a person by person match between PES and the census records. For this operation matching rules were provided to the staff (Appendix - 7). For the tentatively missed person, verification was made as to whether the person was actually present or not in the household on census night. Owing to confusion of reported names and sometimes relationship to the head of household, between the census and PES, some persons were initially misclassified as missed when, in fact, they could have actually been matched. For estimation of error the dual estimation procedure was adopted as may be seen from Appendix 8. The definitions of completion rate, missed rate, erroneously enumerated rate and net error rate are given in this appendix.

CHAPTER - 2

COVERAGE ERROR

The main coverage estimates for the 1993 Census of The Gambia are summarised in Table 2.1. The completion rate for The Gambia as a whole was 96.39%. The erroneously enumerated rate was 0.90%.

Missed persons mainly belonged to households that were enumerated in the census, there being a negligible number of omission of whole households in the census. This may be due to the fact that the compounds were distinctly identified and numbered before the census-taking and the enumerator covered in the census all households in each of the compounds.

The number of erroneously enumerated persons resulted from counting persons in a household on census night when they were not actually present in that household. This error included usual members who were either temporarily or permanently living away from the household, either within the country or outside the country, persons who had died immediately before the census etc. The next most frequent type of error was the listing of untraceable persons by the enumerator. The duplication of persons by a given census enumerator either within the same household or within the same E.A. was minimal among "erroneously enumerated" persons.

2.1   Age-Sex Differentials in the Coverage Error

The main coverage errors as estimated by the PES and given in Table 2.1 were further disaggregated by age groups and sex. These are presented in Tables 2.2, 2.3, and 2.4, for missed rates, erroneously enumerated rates and net error rates respectively.

Table 2.4 gives the net error rates in the census enumeration which are obtained by subtracting erroneously enumerated rates from the missed rates. The differential in the net error rates of males and females as a whole, is not so marked. However, the net error rate among females (2.89%) is slightly higher than that among males (2.52%). Missed rates and erroneously enumerated rates are both more among males than females. Age differentials are pronounced both among males and females. In both sexes the net-error rate is highest among children in the age group 0-4. The net error rate among female children in this age group (4.31) is slightly higher than the corresponding rate among male children (4.23). One of the reasons for this high net error rate among children in the age group 0-4 could be omission to report considerable number of these children in the census.

The net error rate is higher among males than females in the age groups 5-9, 20-29, and 50-59. It is the least in the age group 60+ both in the case of males and females. The level of erroneous enumeration among males is the highest in the age group 20-29 and fairly high in the age groups 10-19 and 30-39. Among females this is the highest in the age group 5-9.

2.2   Sampling and Non - Sampling Errors

The Percentage Relative Standard Error (PRSE) is given by [%v(r) /r] x 100, where v(r) is the variance of the sample estimate of the net error rate 'r'. The PRSE of the net error rate estimate of 2.7 per cent for the combined male and female population works out to 4.81. It is 4.77 for the net error rate estimate of 2.52 for males and 5.03 for the net error rate estimate (2.89) of females. The PRSEs are within acceptable limits as these are around 5 per cent only.

Coverage estimates are also affected considerably by different types of non-sampling errors. It was necessary to control non-sampling errors so that the estimates may not be distorted by the introduction of bias.

Two main sources of non-sampling errors for which special emphasis for control was placed in the 1993 Census PES relate to (i) the independence between PES operations and the main census operations and (ii) the PES - Census matching operation.

The several procedures adopted for maintaining a high degree of independence between PES and main census operations have already been mentioned in Chapter 1.   Coupled with this was the special emphasis laid on PES training and field supervision so that the data collected in the field would be of acceptable quality. In developing the matching procedure, emphasis was laid on keeping the levels of two types of matching errors namely, erroneous matches and erroneous non-matches, as small as possible. The matching rules provided uniformity in matching and generally helped to reduce both types of matching errors. Tight supervision was organised for the matching operations.   Other measures taken to reduce the erroneous non-matches were: independent matching, intensive search procedures, special attention to names in the PES and field reconciliation of non-matches using PES Part 3. The independent matching operations influenced the estimate considerably since some persons were changed from non-match status to match status. The field reconciliation also helped in detecting in-movers and those who fall in out-of-scope category.

Table 2.1:   Estimates of 1993 Census Coverage

Type of Estimate	Rate (in percentage)
Completion Rate	96.39
Missed Rate	3.61
Erroneously Enumerated Rate	0.90
Net Error Rate	2.71

Table 2.2: **Missed Rates of 1993 Census by Age Group and Sex**

Age Group	Persons	Males	Females
0-4	4.82	4.62	5.04
5-9	3.44	3.27	3.64
10-19	3.50	3.27	3.74
20-29	3.91	4.98	3.05
30-39	3.19	3.43	3.00
40-49	3.18	2.65	3.76
50-59	3.35	3.53	3.16
60+	1.99	1.75	2.22
All Ages	3.61	3.63	3.59

Table 2.3: **Erroneously Enumerated Rates of 1993 Census by Age Group and Sex**

Age Group	Persons	Males	Females
0-4	0.56	0.39	0.73
5-9	0.99	0.49	1.57
10-19	1.28	1.69	0.83
20-29	1.44	2.24	0.76
30-39	0.87	1.66	0.20
40-49	0.36	0.53	0.19
50-59	0.16	0.30	-
60+	0.12	0.25	-
All Ages	0.90	1.11	0.70

Table 2.4:   Net Error Rates of 1993 Census by Age Group and Sex

Age Group	Persons	Males	Females
0-4	4.26	4.23	4.31
5-9	2.45	2.78	2.07
10-19	2.22	1.58	2.91
20-29	2.47	2.74	2.29
30-39	2.32	1.77	2.80
40-49	2.82	2.12	3.57
50-59	3.19	3.23	3.16
60+	1.87	1.50	2.22
All Ages	2.71	2.52	2.89

CHAPTER - 3

CONTENT ERROR

3.1 Levels of Agreement

Content Error in the census was measured by the degree of agreement in reporting between the original census enumeration and the independent re-interview by PES enumerator for a set of matched persons. Low levels of agreement would indicate a high degree of response variability while high levels of agreement would point to a low degree of response variability. Thus, level of agreement between the recorded response of the census enumerator and PES enumerator should give indications of the stability or quality of information for the selected items covered by the PES. This study was confined to a sub-sample of five E.As out of 25 E.As selected for PES. The levels of agreement noted for the selected items are given in Table 3.1.

Table 3.1

Level of Agreement for Selected Items

Item	Level of Agreement Between Census and PES [*] (Percentage)
Age	77.3
Literacy	89.7
School Attendance	84.7
Highest Grade in School/Institution Attended	88.2
Nationality	85.6

* Excluding "Not Stated" Category

There was no systematic bias associated with either the group of census enumerators or the PES enumerators in respect of the above items. Age reporting was the item with the highest response variability. One of the main reasons for this is that many respondents, especially those who are illiterate, are not normally aware of their ages in completed years. In the case of school attendance one possible reason for the wide difference in response could be that adults who had not attended school for more than one or two years in their early years gave varying replies like "never attended school" in the census and "attended school in the past" in the PES and vice versa. Sometimes the interpretation of the term "school" was also different especially in the case of informal schools (e.g. Dara). As for nationality, some of the foreign nationals, especially those from neighbouring countries tend to return as "Gambians" in the absence of detailed probe.

3.2 Response Variance in Age Reporting

Age being an important demographic characteristic, it would be useful to know the response variance among age groups. This is furnished below:-

Table 3.2

Response Variance of Age

Reported Five Year Age Group	Levels of Agreement (%)
0-4	90
5-9	83
10-14	81
15-19	77
20-24	75
25-29	73
30-34	70
35-39	70
40-44	72
45-49	71
50-54	65
55-59	67
60-64	69

It may be noted that as age increases, the level of agreement generally decreases. Table 3.3 provides a comparison of reporting age by census enumerator and PES enumerator for matched persons. The level of agreement between PES and Census is the sum of diagonal entries.

Table 3.3

Comparison of Reporting of Census Enumerator and PES Enumerator for Matched Persons
Age by Five-year Age Groups - 77% Agreement

Age, as Reported by PES Enumerator	Age, as Reported by Census Enumerator													
	Total (%)	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60+
Total (%)	100	13.2	14.7	10.5	9.8	9.8	8.8	7.4	6.0	5.5	4.0	3.4	2.2	4.7
0-4	13.3	12.0	1.2	0.1	*										
5-9	14.4	1.1	12.1	0.9	0.3	*			*					
10-14	10.7	*	1.2	8.5	0.9	0.1	*	*						*
15-19	9.5	0.1	0.1	0.9	7.4	0.5	0.4	0.1	*					
20-24	9.3			0.1	0.6	7.4	0.9	0.2	*	0.1				*
25-29	9.8	*			0.4	1.4	6.5	0.9	0.5	0.1	*		*	*
30-34	7.5				0.2	0.3	0.7	5.1	0.6	0.4	0.1	*	*	0.1
35-39	6.1		0.1	*		0.1	0.2	0.9	4.3	0.2	0.1	0.1		0.1
40-44	6.0	*				*	0.1	0.2	0.3	4.0	0.4	0.5	0.1	0.4
45-49	3.9						*		0.1	0.3	2.9	0.2	0.2	0.2
50-54	3.7							*	0.2	0.3	0.3	2.3	0.2	0.4
55-59	1.9								*		0.1	0.1	1.5	0.2
60+	3.9										0.1	0.1	0.2	0.2	3.3

* Less than 0.1%

CHAPTER - 4

SUMMARY AND CONCLUSIONS

In general, the PES successfully achieved its objective. Through its findings, the PES has succeeded in evaluating the enumeration of the 1993 Population and Housing Census of The Gambia. Further, it has given an insight into the potential sources of under-count and errors in the head count, which would go a long way in planning future population censuses in The Gambia.

For the first time, the PES was undertaken in The Gambia. It has proved to be a cost-effective, and simple means of direct evaluation of census. This exercise should be continued in future censuses also.

As is the case with any field operation based on sampling, PES is subject to both sampling and non-sampling errors. While sampling errors could be minimised through selection of sample of optimum size and design, the non-sampling errors could be controlled by taking a variety of measures before the PES is undertaken. Non-sampling errors relate to independence between the PES operation and the census operation and Desk matching of PES and census records. Organisation of proper training and field supervision of the PES work could reduce non-sampling errors considerably.

The timing of the 1993 PES field survey and the three-stage operation, ensured independence between the census and PES. Training and field supervision were implemented methodically. Desk matching was supervised closely.

The major component of the error in the census is the incomplete count of household members. There was no case of omission of households as such. Erroneous enumeration or enumeration of persons not actually present in the household or enumeration of fictitious persons can occur in a *defacto* census. The estimated erroneous enumeration rate is, however only 0.90% in the 1993 Census of The Gambia.

Quality of enumeration as revealed by the level of response variance varies with the characteristics enumerated in the census. Quality of age reporting in the census has to improve and this is the case with most of the developing countries.

Judged by the degree of net coverage error (-2.71%) and response variance of selected characteristics as estimated by PES, it could be said that the 1993 Population and Housing Census of The Gambia has been conducted satisfactorily both in terms of coverage and quality.

APPENDIX - 1

1993 Population and Housing Census of The Gambia

Calendar for Post Enumeration Survey

Srl. No.	Items of Work	Period
1.	Training of D.C.O's	10/5/93 and 11/5/93
2.	Training of Enumerators and Supervisors	14/5/93 to 16/5/93
3.	Field Work - Re-listing	17/5/93 to 20/5/93
4.	Desk Matching	22/5/93 to 24/5/93
5.	Field Reconciliation	26/5/93 to 28/5/93
6.	Submission of filled - in Records to Headquarters	29/5/93

APPENDIX - 2

No. of E.As Selected for P.E.S.

NAME OF LOCAL GOVERNMENT AREA	No. OF ENUMERATION AREAS
Banjul	1
Kanifing	5
Brikama	5
Mansakonko	2
Kerewan	4
Kuntaur	2
Georgetown	2
Basse	4
TOTAL	25

Appendix 3 to follow questionaires15 to 17

Appendix 4 to follow questionnaires 18 to 19

Appendix 4 to follow questionnaires 20 to 21

Appendix 6 to follow pages 23 to 26

Appendix 7 to follow pages 27 to 28

Appendix 8 to follow pages 29 to 30