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Honor — Fraternity — Justice

Ministry of Economy and Finance

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RAMS PROJECT

Rural Assessment and Manpower Surveys

Demographic
Projections

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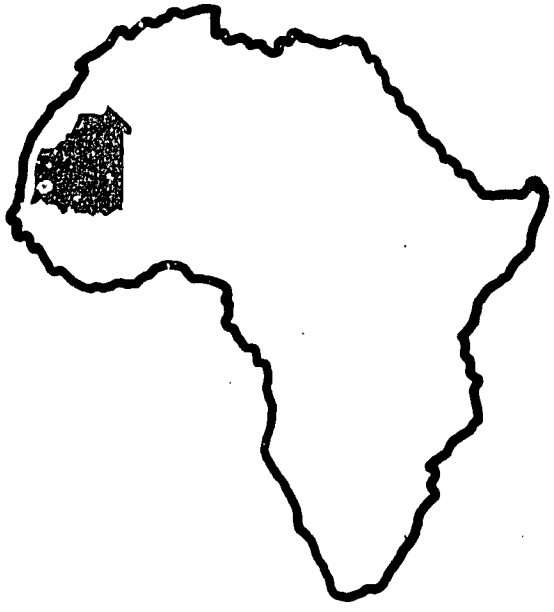

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Demography

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Abbreviations and Terms Used

1.	BCR	Bureau Central de Recensement, i.e., The National Census Bureau
2.	GRIM	Gouvernement de la République Islamique de la Mauritanie, i.e.,
	GIRM	Government of the Islamic Republic of Mauritania
3.	Guetna	Epoque de la récolte des dattes normalement en juillet et août, i.e., Period of date harvest, usually in July and August
4.	OMVS	Organisation de Mise en Valeur de la Vallée du Sénégal which corresponds to the Senegal River Basin Authority
5.	PMI	Protection Maternelle et Infantile which corresponds to Maternal and Child Health Center
6.	IGN	Institut Géographique National, i.e., National Geographic Institute.

FOREWORD

The purpose of the study on demographic projections is to analyze the perspectives of change in the population of Mauritania, based on the 1977 census data.

In view of this goal, the report analyses the principal data collected, particularly:

- global descriptives of the population of Mauritania/-- its dynamics nationally and by region
- the distribution of the nomadic and sedentary population by administrative region.

Based on the estimation of population growth rates which were derived from different hypostheses, projections of demographic growth have been determined for 1980, 1985, 1990, 1995 and the year 2000.

These projections take into account not only natural growth, but also the impact of the sedentarization of the nomads and inter-regional migration (including rural-urban migration), which will each profoundly affect the spatial distribution of the population of this country. The consultant has thus emphasized not only the degree of demographic growth of the two main categories of the population, nomadic and sedentary, to the year 2000, but also the regional shifts of these two categories of population.

Furthermore, statistical data on migration, ethnic groups and household size are presented in the report. Charts and tables are given to supplement the statistical information in the study.

A certain amount of information is missing from the report because certain segments of the census data were not available at the time of the consultant's field work.

The reader is asked to keep in mind that the report is not an exhaustive study of the demographic situation in Mauritania. This was not, in fact, the consultant's goal, which was limited to furnishing necessary information at the beginning of the project for other base-line studies included in the project.

Given these circumstances, it would seem desirable to enrich this study with data from the 1977 census that has not yet been processed as well as with the findings of the study on fertility rates, to be undertaken at the end of 1980, thus adding an important range of demographic data.

Chapter 1.

INTRODUCTION

1.1 The 1977 Census

Any current demographic analysis of Mauritania must rely on data from the 1977 census; therefore this report begins with notes on the census and a brief recapitulation of the most basic statistics which come from it[1].

1.1.1 Background

With assistance from the United Nations Development Programs (UNDP), the 1977 Census was carried out in three stages: a preliminary survey of the country to take stock of settlements for the preparation of comparable size census districts; an exhaustive survey of the sedentary population; and a sample survey of the nomadic population.

The actual census-taking was carried out over a period of four months, from December 1976 to March 1977[2].

The census questionnaires provided for the collection of data concerning residential status, most recent migration, ethnic group, literacy, skills and occupational status in addition to more basic

---

1 / The GIRM has not yet published any official census data thus all statistics reported here must be seen as provisional.

2 / Those interested in the methodology used in the 1977 census should consult GIRM, Bureau Central du Recensement de la Population, "Rapport Méthodologique, Section : Cartographie" (CIRCA 1978), and Pacou, Yves, "Le Recensement des Nomades mauritaniens" (Paris, 1979.)
It should be noted that the timing of the census was meant to accommodate academic vacations on the one hand (in the interior of the country, census personnel used in the enumeration of the sedentary population were primarily teachers and students), and on the other, to avoid the quetna, when many nomads are in transit on their way to familial oases they may visit for that one brief period during the year.

actuarial information. In addition, limited questions about fertility and mortality history were asked of nomads to allow eventual computation of birth rates, death rates, and fertility statistics within this group. (Nomads were also asked about intentions to sedentarize, frequency of transhumant activities, primary economic activity, and primary composition of herds. They were not asked questions concerning migration nor were they questioned about professional activities.)

1.1.2 Census Data Processing

UNDP personnel have been supervising a computerized tabulation of census results. Basically, four different files have been prepared :

(1) a village file, aggregating basic individual-level data derived from census forms and compiling village-level data gleaned from village leaders in the country's some 2,000 settlements;

(2) a nomad file, with tables constructed from data collected only among the nomadic portion of the population (including the only fertility and mortality information gathered);

(3) a sedentary file, with tables constructed from data collected only among the sedentary portion of the population (including the only skills and occupation-related data generated by the census);

(4) a total population file, basically a merger of the sedentary and nomad files when such was appropriate.

All of the computerized tabulations foreseen by the GIPM and UNDP advisors have recently been completed[1/]

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1 / The first set of tables produced under the supervision of UNDP personnel exploited all individual case sheets. Due to budgetary constraints, however, later tables were based on a 10 percent sample.

1.2 Basic Results

What appears will be the final census tally puts the total population resident in Mauritania in January 1977 at 1,339,7. A breakdown of this figure by administrative region and nomad/sedentary classification is provided in Table 1.2. It should be noted that the figures in this table exclude a Mauritanian nomadic population with camps beyond national boundaries at the time of the 1977 census--a population estimated at some 67,000. The numbers given in this table have been used as baseline data for reconstructing historical populations and projecting future populations. Attention is called to the fact that in some cases these figures differ considerably from early estimates and even from figures presented by the Mauritanian Bureau du Recensement's "Seconds résultats provisoires du recensement général de la population" published in April 1979[1/].

1/ This document contains summary statistics hand-tabulated from the 1977 census results. At present, it is the most reliable repository of demographic statistics for Mauritania.

TABLE 1.2

Baseline Data: Estimates of the Population Resident in Mauritania, January 1, 1977
(units: 000's persons)

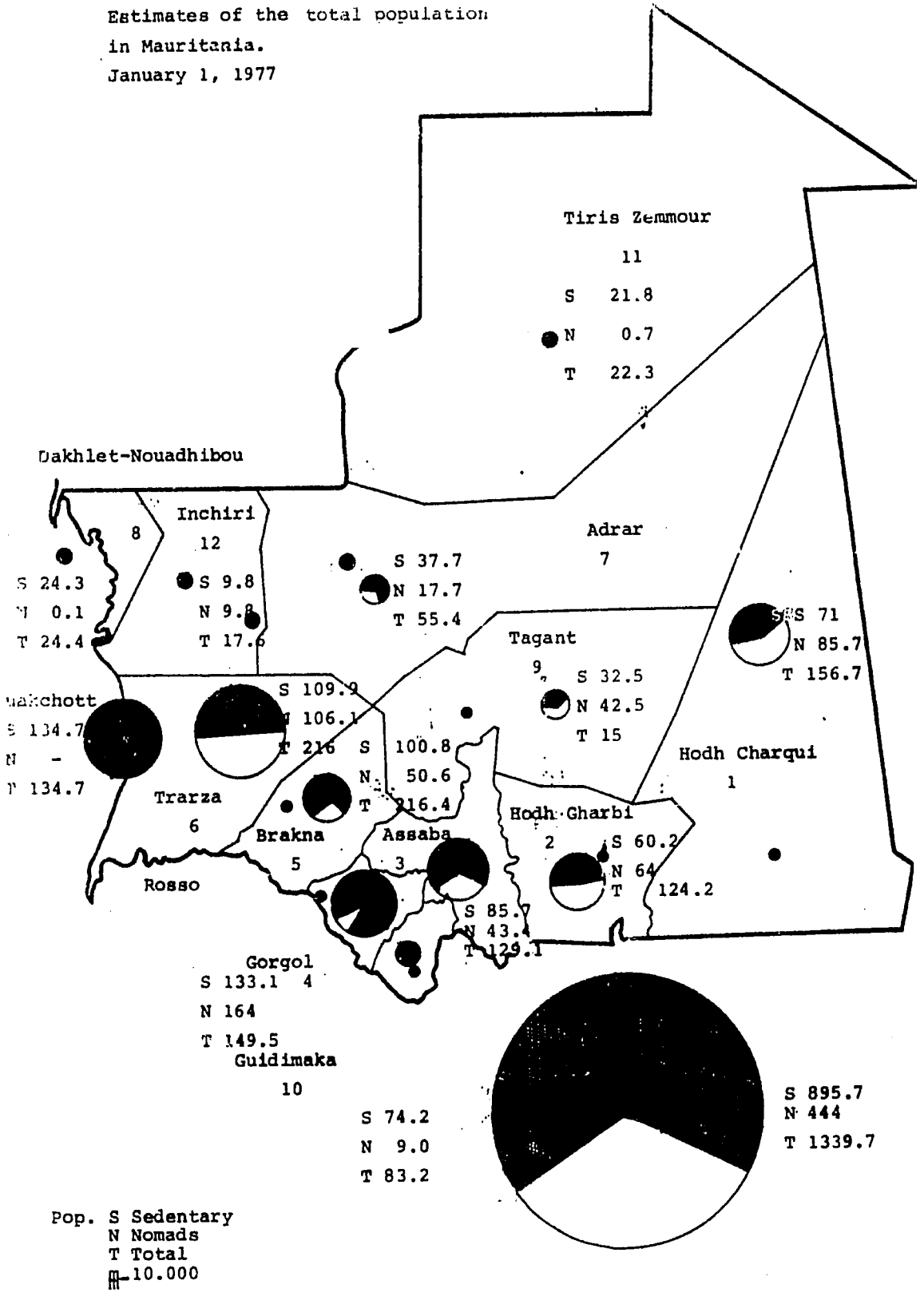
Administrative Region	POPULATION		
	Sedentary	Nomads	Total
NOUAKCHOTT	134.7	..	134.7
HODH ORIENTAL	71.0	85.7	156.7
HODH OCCIDENTAL	60.2	64.0	124.2
ASSABA	85.7	43.4	129.1
GORGOL	133.1	16.4	149.5
BRAKNA	100.8	50.6	151.4
TRARZA	109.9	106.1	216.0
ADRAR	37.7	17.7	55.4
NOUADHIBOU	24.3	0.1	24.4
TAGANT	32.5	42.5	75.0
GUIDIMAKA	74.2	9.0	83.2
TIRIS ZEMMOUR	21.8	0.7	22.5
INCHIRI	9.8	7.8	17.6
TOTAL	895.7	444.0	1339.7

SOURCE: G.I.R.M., unpublished census data

1.3 Reliability of the Census Data

On the whole, the 1977 census data are remarkably cohesive. The population broken down into five year age-groups looks for the most part as it should; sex-ratios are on the whole what one would expect than to be. Regional population statistics correspond roughly to data from the 1965 census; migration data in the 1977 census have allowed the reconstruction of historical populations which in some cases are remarkably well aligned with data points from the 1965 census. In general, the 1977 census is to be trusted. When details are examined, anomalies do surface, however. One should be wary of the fine-line data, including detailed age-breakdowns, detailed professional categories (especially when the number of individuals falling into these categories is small), and individual settlement data. Many of these data will not hold under close scrutiny, and users should not fail to take this into account.

Estimates of the total population
in Mauritania.
January 1, 1977



Pop. S Sedentary
N Nomads
T Total
10.000

Chapter 2

POPULATION PROJECTIONS

Understanding movements within the Mauritanian population and making projections about those movements in the future is a complex task. The Mauritanian population is--and has been in recent years--experiencing social and physical changes which have made it subject to a wide range of demographic upheavals. An adequate demographic analysis must take into account not only natural population growth rates, but also such historical events and social processes as the drought of 1968 and the early 1970's sedentarization of the nomadic population, inter-regional migration, rural-urban migration, and the current conflict in the Sahara.

2.1 Natural Increase

Calculating the natural annual increase of a population presumes that one has access to birth rates and death rates, which themselves depend upon reasonably accurate estimates of the population at mid-year and the absolute number of births and deaths during the year. These necessary bits of information are provided in some measure by the 1977 census, but unfortunately they suffer serious limitations. In the first place, birth rate and death rate information may be derived only for the nomadic portion of the population. (Similar information will be gathered from the sedentary population in 1980 in conjunction with the UN's World Fertility Survey.) Although this may not at first appear to be a handicap, in fact there are considerable demographic differences in the nomadic and sedentary populations--particularly as regards sex ratios--which could potentially distort birth rates and death rates. Further, the census of the nomads was not an exhaustive survey--but a sample one, and one that lasted not a few days but a few months. One would of course expect a greater margin of error in the results of this portion of the census.

2.1.1 Crude birth rate

Although the 1977 data are not entirely satisfactory, no better data exist[1/]. Extrapolation of responses from nomads allowed the GIRM Census Bureau to estimate that 21,248 children were born of nomadic families between the Aïd[2/] 1975 and the Aïd 1976. Ajusted to a yearly rate, this figure becomes 21,909[3/]. Based on the nomadic population estimated January 1977, the birth rate for 1976 is 49.2 births per 1000 nomads.

1/ As an alternative to census data, possibilities of using estimates provided by the GIRM Census Bureau, by the US Bureau of Census, or by the World Bank were investigated. Estimates vary considerably, however, and which estimate to use posed some problem. (See table below.)

Estimated Birth Rates

Source	Time Period	Rate per 1,000
US Bureau of Census	1976	43-46
World Bank	1965-1975	45
GIRM	1965	42
GIRM	1975	45-47
UN	1974	44-4

A second alternative was to consult with local authorities, notably directors of maternity clinics, to glean what local-level data there were. One trip to Boutilimit was very discouraging: the Centre pour la Protection Maternelle et Infantile (PMI) makes no pretense of keeping adequate records. In an unpublished document, we came across a reference to UN evaluations citing Rosso as the single Mauritanian city where close to 100 percent of one births are registered. Hoping to use the Rosso statistics at least as a check on the census data, we obtained from the Rosso prefecture the number of registered births for the calendar years 1976, 1977 and 1978. We also obtained monthly birth statistics for 1976 from the Rosso center. When we used those data and population estimates from the 1977 census to calculate birth rates, however, it became clear that something was amiss: the resulting rates ranged from 55 to 75, rates well above those noted anywhere in the world!! Undoubtedly, use of the PMI center and access to birth registries are not denied to non-residents of the city, and consequently their statistics are of little use for calculating birth rates for the city population.

2/ The Aïd is the most important holiday within the Islamic community.

3/ One year by the Arabic calendar is equal to 11.638 months.

2.1.2 Crude Death Rate

The corresponding death rate is as low as the birth rate is high--in fact, suspiciously low. The GIRM Census Bureau estimated 6,268 deaths between the two Aïds, which adjusted to a yearly figure yield a gross death rate of 14.5 per thousand (again, based on the population estimated January 1977).

2.1.3 Adjusted Death Rate

A birth rate of 49.2 per thousand is high, but believable. The death rate, however, is clearly understated, especially in light of 1965 census findings (27 per thousand) and estimates the UN offers: 26.6 for Mali, 22.8 for Senegal, and 22.7 for Mauritania. Further evidence of an underestimation of the death rate appears when one considers the age distribution observed in the census. If the observed death rate were accurate, one would expect to find a swelling of the lowest age category, 0-4 years, indicating a recent, dramatic reduction of infant mortality. This trend is simply not borne out by the data.

Trying to ferret out a more reasonable rate, we calculated age-and sex-specific death rates, but nowhere within the age distribution of the nomadic population were we able to obtain a series of steadily increasing death rates. Indeed, death rates from one age-group to another fluctuated rather wildly. We finally resorted, as the GIRM Census Bureau had done earlier, to adjusting the 22.7 death rate the UN had estimated as reasonable for the 65-70 period to account for current conditions. We, like the GIRM Census Bureau, settled on a death rate of 23 per thousand as plausible for the present period.

2.1.4 Adjusted Birth Rate

Adjusting the birth rate was considerably more satisfactory. We used several different sets of numbers to calculate the birth rate, including those taking into account sedentarization and discrepancies in age-group sex ratios in the nomadic population as well as those based on age-specific fertility. The results of these calculations

are assembled in Table 2.1.4 below. The exceptionally high rates reported in this table may lend credence to the 1965 census, which is commonly assumed to have underestimated the population. According to evaluations based on the result of the two censuses, the population grew an average 2.7 per cent annually from mid-1965 to January 1977. This rate has been seen as too high because the distribution of age does not show an inflation of the lower age groups as one would expect with a declining infant mortality rate--commonly used to account for a high overall growth rate. In fact, the observed growth rate may be high because the birth rate is exceptionally high and may have been grossly underestimated in the past. Such a possibility will be taken into account in the population rojections under assumptions of maximum growth. For the medium-range projections, however, we are reluctant to base calculations on birth rates which appear to be high compared to estimates for the past, especially given some of the peculiar circumstance that affected the enumeration of the nomadic population. Accordingly, we have elected to consider 4.7 per cent (calculation f below) as a conservative estimate of the current birth rate in Mauritania[1/]

1/ This rate appears even more conservative in light of the observed very low death rate for infants less than one year of age. If one assumes that the criterion of "birth between the last two Aïds" was strictly observed, admittedly a questionable assumption, then in all probability the number of births was even higher than that reported.

Table 2.1.4

Birth Rate Calculations by Different Criteria

Numerator desceiption	Denominator desceiption	Calculated Rate (per 1000)
(a) Sex ratio: 1.05, based on reported female births	Population mid-year, assuming overall growth rate of nomadic population 2.82 % pa (451,512)	45.5
(b) Sex ratio: 1.05, based on reported male births	Population mid-year, as in (a)	52.7
(c) Sex ratio: 1.05, based on average of (a) and (b) above	Population mid-year, as in (a)	49.1
(d) Sex ratio adjusted as in (a)	Restored male population (sex ratio among nomads assumed equal to sex ratio in total population) and population mid-year as in (a)	43.5
(e) Sex ratio adjusted as in (b)	Denominator as in (d)	50.3
(f) Sex ratio adjusted as in (c)	Denominator as in (d)	46.9
(g) Births by women 15-44 years of age	Females 15-44 years of age	50.6
(h) All births	Females 12-59 years of age	48.5

Table 2.1.5

Projections of Mauritania's Resident Population through 2000
(Unit: 000's of persons)

Year	Minimum Growth	Medium Growth			Maximum Growth
	I[a]	II[b]	III[c]	IV[d]	V[e]
1977	1339.7	1339.7	1339.7	1339.7	1339.7
1980	1434	1443	1451	1443	1464
1985	1607	1636	1662	1646	1697
1990	1800	1852	1900	1883	1967
1995	2017	2096	2171	2135	2281
2000	2260	2371	2480	2502	2644

a/ Under assumptions of a constant 2.3 per cent growth rate through 2000.

b/ Under assumptions of a constant 2.5 per cent growth rate through 2000.

c/ Under assumptions of a constant 2.7 per cent growth rate through 2000.

d/ Under assumptions of a growth rate increasing steadily from 2.5 in 1977 to an annual 3.0 per cent by 2000.

e/ Under assumptions of a constant 3.0 per cent growth rate through 2000.

2.1.5 Natural Population Growth

Natural population growth, the rate of birth minus the rate of death, thus becomes 2.5 per cent, for the current period. (This, as compared to 2.7 per cent estimated by the World Bank, 1.5 to 2.0 per cent by the US Census Bureau, and 2.4 per cent recently estimated by the GIRM Bureau of Census). What is expected to happen to this rate in the future? The answer, of course, depends on separate analyses of birth and death rates. It may be that the birth rate observed for 1976 was extraordinarily high, perhaps a response to what was perceived as the end of the drought. But assuming that the 1976 figures are representative, it is difficult to imagine that the birth rate will actually decline in the absence of birth control and, presumably, in the presence of gradually improving health conditions.

As for the death rate, one may safely assume that it can only decline in future years as health care improves. This decline in the death rate should affect primarily the infant death rate, i.e., the number of children who die between 0 and 1 year of age, thus swelling the base of the age pyramid.

Realistically, Mauritania should expect a minimum growth of 2.5 percent over the next twenty years, and it would not be unreasonable to expect that by 2000 growth should average 3 percent annually (See Table 2.1.5). Mauritania's resident population, thus, should number between 2.3 million and 2.6 million in the year 2000: that is, in the space of two decades, Mauritania's population will increase by more than one million people. The country's population is expected to double itself within 25 to 28 years.

2.2 Migration

Migration is normally an important element in the calculation of population growth. In Mauritania, where the geographic distribution of the population has shifted radically over the past fifteen years (see Table 2.2), migration must be one of the most critical components of a demographic analysis.

Table 2.2 Population Distributions, 1965 and 1977

Region	% of Total population in 1965 (N = 1,028,000)	% of Total Population in 1977 (N = 1,406,595)
00 Nouakchott	1.2	9.6
01 Hodh Oriental	16.4	14.6
02 Hodh Occidental	8.5	9.5
03 Assaba	9.8	9.3
04 Gorgol	8.0	10.7
05 Brakna	12.0	10.8
06 Trarza	19.4	15.4
07 Adrar	6.3	3.9
08 Nouadhibou	1.0	1.7
09 Tagant	7.3	5.3
10 Guidimaka	6.2	6.2
11 Tiris Zemmour	1.5	1.6
12 Inchiri	2.4	1.3

SOURCES: GIRM, unpublished census data and "Seconds résultats provisoires."

The impetus for most of the country's migratory upheavals was the drought of the 1970's. Demographers throughout the Sahel have noted that the drought's most severe demographic effects were upon migration rather than mortality rates or fertility[1/]. Centralized relief distribution may have been responsible for minimizing drought-related deaths, but it also contributed to a theretofore unknown population boom in urban or quasi-urban centers. Mauritania's urban population has more than quadrupled over the last fifteen years.

1/ cf., John C. Caldwell, "the Sahelian Drought and its Demographic Implications". (American Council on Education, OLC Paper n° 8, 1975).

At the time of the 1977 census, nearly half of the sedentary population had left their natal villages, and almost 25 percent were living in administrative regions other than that of their birth.

The label migration subsumes many different kinds of population movements: rural-urban migration, inter-regional exchange, international exchanges, and very often the sedentarization of nomads. Without sorting out these separate movements, any attempt to predict future demographic developments is hopeless. Fortunately, data generated by the 1977 census allows the volume of some of these separate movements to be assessed. Although the census made no attempt to estimate the number of Mauritanians living abroad, it does provide data allowing evaluation of sedentarization rates, inter-regional migration, and to some extent, rural-urban migration. National trends based on these data are discussed below.

2.2.1 Inter-regional Migration

Our analysis of inter-regional migration is based on three pieces of information obtained from the sedentarized population in the 1977 census: current place of residence, former place of residence (administrative region) and date of arrival in current place of residence (precise to the month if migration occurred in 1976, but otherwise precise to the calendar year).

Before turning to the analysis, the reader should be aware of two limitations inherent to the data. First, while the data ostensibly apply only to the sedentary population, much of the data actually relates to nomads recently sedentarized. Former nomads were to have reported the single area where they spent the most time as their last place of residence.) Secondly, individuals were questioned only about their most recent move, and thus we cannot evaluate the total volume of movements except for the calendar year 1976. (Presumably, some of the people who moved in 1976 had also moved in previous years; because there are no data on multiple moves, our estimates of migratory movement become less reliable as we move back in time.) These two problems place certain limitations upon the inferences to be made from data analyses, but even within those

constraints some interesting observations may be made.

The general trends may be established by examining movements for 1976 alone. As Table 2.2.1 indicates, Nouakchott is the country's great magnet, attracting residents from all areas, but primarily from the Trarza and the Brakna. Of all the remaining regions, only that of Nouadhibou appears to be exerting a strong pull on Mauritanians residing within national boundaries. This region drew in 2,500 individuals in 1976, about 20 percent of them from the Brakna, 15 percent from Nouakchott, and another 15 percent from the Adrar.

In 1976 almost two-thirds of those who by migrating changed region of residence were men, the bulk of them under thirty years old. (As might be expected, the proportion of women participating in migratory movements becomes greater as the distance becomes smaller, such that only 54 percent of those migrating within regions were men.) This tendency maintains its strength even when migratory movements to the North (a function of the Saharan Conflict) are discounted: undoubtedly a high proportion of the 12,000 young men 15-30 years old who changed their region of residence in 1976 did so in quest of employment.

Table 2.2.1 Summary of Inter-regional Migration Statistics, 1976
(Excluding international migratory flows)

	Region	Volume of In-Migration	Net Migration from Other Regions[1]	For Regions with net positive migration	
				Net migration as of Other Regions[2]	Primary source of inflow
00	Nouakchott	14,067	7704	6.6 %	Brakna, Trarza
01	Hodh Oriental	717	-167		
02	Hodh Occidental	742	-724		
03	Assaba	686	-1366		
04	Gorgol	1600	-1063		
05	Brakna	2076	-3221		
06	Trarza	1818	-3895		
07	Adrar	2115	208	0.7[3]	Nouakchott, Trarza
08	Nouadhibou	2376	1239	5.6	
09	Tagant	839	-444		
10	Guidimaka	550	-150		
11	Tiris Zemmour	1111	279		
12	Inchiri	662	-133	1.4	

1/ Net migration from other region is the balance of total inter-regional in migration minus inter-regional out migration.

2/ Some of this inflow is attributable to the Saharan conflict.

3/ Represents the balance of total inter-regional in-migration minus inter-regional out-migration.

2.2.2 International Migration

In 1977, as estimated 28,000 foreigners, most of them from Senegal and other West African countries, were residing in Mauritania. At present, there are no global figures to indicate the total number of Mauritanians living outside national boundaries, but the Senegalese National Demographic Study of 1970-71 estimated that some 23,000 Mauritanians were residing in Senegal alone, concentrating primarily in the Cap Vert and Fleuve areas 1/.

Mauritania's overall balance of in- and out-migration may well be negative. Sex ratios for the population resident in Mauritania in 1977 show a deficit of men aged 20-45. If estimates of a "normal" sex-ratio distribution are made (assuming a linear descent from early ages to old age), approximately 17,500 men aged 20-45 appear to be "missing." (See Chapter 4, Section 4.2.3.) This number may be a reflection of the Mauritanian population abroad .

But for Mauritania international migration is far more than a matter of counting foreigners present and Mauritanians absent. Responses to census items concerning former place of residence indicate that an average 2,000 to 3,000 Mauritanians come home each year to stay for at least two or three years. In order for such a flow to be possible, several thousand Mauritanians must also leave the country annually. Most of this movement, of course, centers upon the Fleuve region: 80 percent of the Mauritanians returning each year settle in the Fleuve area. Unfortunately, many other questions about this flow remain unanswered. Can we surmise that the major outflow also comes from the Fleuve areas? And can we assume that the Senegalese move just as readily as do their Mauritanian neighbors? What determines the length of stay abroad? Does the volume of in-migration (both incoming foreigners and returning Mauritanian émigrés) exceed the volume of out-migration, or vice versa?

1/ K.C. Zachariah and Julien Conde, Demographic Aspects of Migration in West Africa. World Bank Document, 1978, p. 99.

Subsequent studies envisioned by RAMS may provide answers to some of these questions, but in the interim we have had to assign some value to the variable international migration in our calculations of overall population growth. (Overall population growth is a function of natural population growth and net migration. Net positive inflow inflates the growth rate and net outflow deflates it.)As an immediate solution to the lack of reliable data, we have made the most neutral assumption possible: the migration status quo—whatever it was in 1977—has existed for some time and will be maintained through the end of the century. Throughout this report in all calculations involving international migration we have assumed that for every person, entering the country, (Mauritanian or foreign) one person leaves—making net international migration equal to zero. At the national level, this assumption makes natural increase the sole factor underlying national growth rates. At the regional level, growth becomes a function of natural increase and quantifiable inter-regional migration. In proportion to its volume, real net positive migration would increase these rates and real net negative migration would lower them.

2.2.3. Sedentarization of Nomads

Unquestionably, the greatest demographic change over the last decade has been the sedentarization of several hundred thousand nomads. Census-takers labeled 65 percent of the population as nomads in 1965; in 1977 only 36 percent fell into that category.

Because the meaning of the term nomad is not obvious and the process of sedentarization not well understood, we preface an elaboration of the data with a discussion of sedentarization—both as a qualitative, difficult-to-measure sociological phenomenon and operational concept used by census-takers.

Recent years have seen many changes in nomadism, but even in the past several variations were possible on the single theme. There were, first of all, nomadic Moors whose livelihood was derived almost exclusively from trade and whose way of life was symbolized by the caravan. These nomads traveled great distances across the Sahara, stopping for water at tribal wells but carrying most other provisions with them. Other nomadic Moors, particularly in the southwestern areas of the country, were primarily goat and sheep herders. They lived in easily displaceable tents and moved with their flocks in search of water and pasture land. They did return to the same areas and the same wells year after year, and sometimes their stay in one locality was of some duration—but their physical structures were temporary and they had no intention of staying put.

The nomadic Peulhs, grazing their cattle throughout the Fleuve area with no mind to international boundaries, provided a third variation. The Peulhs had well-defined territories to which they migrated as the seasons dictated, taking their portable huts with them. Some observers have been fooled by the apparent permanence of the peulh village. Even in 1965 the cyclical migration of the peulhs was ignored: all Peulhs were counted among the sedentary population.

The recent past has seen many modifications to these traditional patterns. The beginnings of a trend to sedentarize, or take up residence, can probably be traced to Independence or before: those who hoped to obtain a share of power within a new centralized political administration had to be close to the seat of that power. The real wave of sedentarization, however, came in response to the drought of the seventies. As pasturage became scarce and herds were decimated, many nomads settled around wells where their remaining animals would at least have a water supply. Others flocked to urban centers throughout the country in search of water and food. Many were never able to reconstitute their herds and thus remained in the settlement to derive a livelihood from commerce or artisanal work. Some others, less affected by the drought, recognized that changes were in the offing and came seeking schooling for their children and other social services. By now most of these individuals have become truly sedentarized. They may yet live in temporary structures, and they may make regular trips to relatives under their tents en brousse, but they recognize that the nomadic life is part of their past, not their future.

The dramatic cases of sedentarization does not always mean an abrupt exchange of one way of life for another. Sedentarization may simply happen, without being intentional: with herds now fairly small and encampments small because resources in the early 1970's would not support large entourages, a family group may no longer find it necessary to move away from a dependable well. As time goes on, a boutique or a school is built--and the encampment has become a "permanent" village.

For the sociologist, sedentarization may be a gradual process, a slow change in attitudes, but the census taker cannot measure attitudes. By 1975, the 1965 definition of nomad as any Moor not residing in an urban center had become clearly inappropriate, but some means of distinguishing nomads from sedentary peoples was nonetheless needed. The GIRM's BCE decided to recognize as nomad any person who spent more than six month each year in a locality devoid of permanent physical structures. Using this definition, census takers found some 445,000 nomads in 1977, as compared to 618,000 in 1965 (with figures adjusted to accommodate the 1977 definition).

A decay curve based on 1965 and 1976 data yields an average annual attrition of 2.82 percent (assuming an annual natural increase of 2.5 percent). Can future trends be extrapolated from these data? The 1977 census provides only one bit of data permitting a reliability check on this attrition rate. While it was impossible for the census takers to determine who would have been classified as nomads in years prior to the census—thereby reconstructing statistical history—they did ask the nomads about their intentions to sedentarize. Of the households sampled, 5.17 percent said they intended to settle within the coming year—as compared to an expected 5.19 percent based on the decay curve described above! The compatibility of these two figures is particularly reassuring in light of the fact that some of the 1965 figures are suspect at the regional level and non-existant for regional subdivisions.

Because the reliability of these figures at the national level was so strong, we examined them more closely at regional levels in an attempt to refine the attrition rate even further for use in population projections. Findings for individual regions are discussed in detail in the following chapter, but the average annual attrition rates expected 1980-2000 are presented in Table 2.2.3 below. The nomads' responses to census questions indicate that the rate of sedentarization will be highest in the Brakna, the Adrar and the Western Hodh. In sheer numbers, sedentarization will be greatest in the Hodhs, the Tagant, and the entire southwest. Based on sedentarization rates in each of the eleven administrative regions with notable nomadic populations, we anticipate that the number of nomads will decrease by an average 2.14 percent annually through 2000 (assuming a constant natural increase of 2.5 percent per annum). Readers are reminded, however that these figures correspond to census definitions and consequently may mask some important nuances, which will need to be explored in the field.

TABLE 2.2.3 Sedentarization of Nomads, 1980-2000

Region	Average Annual Growth Rates, 1980-2000[a]	% of the Population Sedentarizing Annually
01 Eastern Hodh	-1.0	3.4 %
02 Western Hodh	-3.9	6.2 %
03 Assaba	-1.1	3.5 %
04 Gorgol	-1.3	3.7 %
05 Brakna	-5.5	7.8 %[c]
06 Trarza	-1.2	3.6 %
07 Adrar	-3.6	5.9 %
08 Nouadhibou	-1.7[b]	4.1 %[b]
09 Tagant	-3.0	5.3 %[c]
10 Guidimaka	+2.0	0.5 %
11 Tiris Zemmour	-0.9	3.3 %
12 Inchiri	-0.9	3.3 %

a/ These rates subsume a 2.5% annual rate of natural increase. Negative rates (essentially all regions except Guidimaka) are discussed in the text as attrition rates.

b/ There are at present so few nomads living in Region 08 that the sedentarization of even one nomad per year makes the percentage relatively high.

c/ RAMS calculations, modified census data.

RAW DATA SOURCE: GIRM, unpublished census data (computer outputs).

2.2.4 Rural-Urban Migration and Urban Growth

Mauritania's urban population has been experiencing phenomenal growth, averaging 10 percent annually since 1961 to double itself every seven years. Nouakchott, of course, has led the race with an average annual gain of 23 percent, but the cities of Zouerate, Nouadhibou, and Rosso have also seen impressive growth--in terms of both percentage and absolute increase (see Table 2.2.4a). More than one-third of Mauritania's Sedentary population now lives in urban centers.

For most cities, the rapid growth has been anything but steady. Eleven of the sixteen cities which in 1975 had populations in excess of 5,000 actually lost in habitants from 1975 to 1977. The cities of Kiffa, Aioun, Boghe, and Akjoujt lost about one-fifth of their 1975 populations in the two years preceding the 1977 census. The common curve, steeply ascendant from 1961 to 1975 and then suddenly precipitous, makes projections of urban population growth very difficult. How can this pattern be explained? One supposes that during and immediately after the drought many nomads came to urban centers seeking water and food supplies, and that their flight from drought-affected pasturage areas was the primary cause of urban growth through the mid-seventies. (Unfortunately, we have no data to assess urban populations in the period immediately preceding the drought.) Perhaps the 1975-76 urban exodus was a response to better rainfall in rural areas. Or perhaps rural refugees used urban centers as a springboard.

TABLE 2.2.4[a/] Evolution of Urban Populations (by size in descending order, 1977)

City	Population			Average Annual Growth Rates	
	1977	1975	1961/62	61/62 - 75	75 - 77
Nouakchott	134,704	104,054	5807[a/]	23.8%	13.8%
Nouadhibou	21,930	22,962	5283[b/]	11.5%	-2.3%
Kaedi	20,707	19,766	9197	6.3%	2.4%
Zouerate[a/]	19,473	23,074	4659	12.9%	-8.1%
Rosso	16,510	19,544	4811[b/]	10.9%	-8.1%
Atar	16,180	18,897	9528	5.6%	-7.5%
Kiffa	10,266	16,729	4359	11.4%	-21.7%
Aioun	8,505	13,606	4877	8.6%	-20.9%
Akjoujt	8,042	13,004	2518	14.0%	-21.4%
Nema	7,938	9,236	3898	7.1%	-7.3%
Tidjikja	7,861	8,175	3661	6.6%	-1.9%
Boghe	7,836	11,620	5867[b/]	5.2%	-17.9%
Boutilimit	7,256	7,622	2774	8.4%	-2.4%
Selibaby	5,993	5,779	2737	6.2%	1.8%
Aleg	5,316	5,224	1360	11.4%	0.9%
Ttimbedra	5,302	..	1815	..	..
Total	303,819	299,292	76148[d/]	11.8%[c/]	-0.1%[c/]

a/ Zouerate, including F'Derick

b/ Designates cities where census was conducted in 1961. Other populations were enumerated in 1962.

c/ Calculation excludes Timbedra.

d/ Not an aritmetic total. For computation of total, populations of Boghe, Rosso, Nouadhibou, and Nouakchott were adjusted for comparability with 1962 figures. (See GIRM, BCR, Seconds Résultats Provisoires p. 24.)

SOURCES: GIRM, "Seconds Résultats Provisoires," Résultats Définitifs du Recensement en milieu Urbain, January 1975," and unpublished census data (computer cut out).

for eventual migration to Nouakchott. Presumably, temporary economic vitality brought about by road construction activity spared Aleg and Boutilimit the sudden decline from 1975 to 1977. Selibaby and Kaedi's relatively modest expansion from 1961 to 1975 was followed by a decline in growth rates but these two cities did not lose population over the 1975-76 period, either. Generally, agriculturalists were less affected by the drought than were pastoralists, and perhaps these two river towns simply had welcomed the same number of refugees as had towns to the North.

Our explanations seem plausible, but several questions merit further exploration. Which trend best represents the growth pattern of Mauritania's cities of the interior: the 1961-75 increase, or the 1975-77 decline? Why did people leave the cities of the interior between 1975 and 1977, and where did they go? To Nouakchott or back to smaller agglomerations or abroad? What will be the future growth patterns? Was 1961-75 growth indeed steady? Should Mauritanian cities prepare for ebb-and-tide growth in the future, bracing themselves against sudden influx and accompanying demand for urban services, to be followed by equally outflows?

Available data only hint on answers to these questions. We have used the census question regarding date of arrival at current place of residence to study some characteristics of urban newcomers. Unfortunately, there is no information about those who have left the cities (and thus net migration cannot be assessed), nor is there information about those who came first to a city in the interior and later moved to Nouakchott. Moreover, our data relate only to urban in-migrants of Mauritanian nationality. Nonetheless, some interesting observations can be made.

The in-migrants of the drought period--at least those who came and remained in the cities--were probably families. From 1969 to 1974, men and women came in near equal proportions to all cities but Atar, a military base, and the industrial towns of Nouadhibou and Zouerate (see Table 2.2.4b). By 1975, the picture had changed somewhat.

Whereas for the 1969-71 period the sex ratio for urban in-migrants outside of Nouakchott was 110 males per 100 females, in 1976 the ratio had risen to 151 males per 100 females. Part of this increase may have been due to military escalation (as in Atar), but part is probably attributable to a qualitative change in migratory patterns. Whereas during the drought period families came seeking refuge in the cities, the more recent pattern is for working-age men to come without their families, presumably seeking work. If inferences can be made on the basis of these data, then the future may see an absolute decline in urban migration while continuing to receive inflow into the labor force at current levels. Most of this trend, however, would concentrate in cities with some raison d'être. Economically obscure cities, such as Timbedra, Akjoujt, and Tidjikja, would watch a steady decline of their populations sex ratio.

In the absence of more complete data, we are reluctant to project the future of Mauritania's cities of the interior. (The single exception is Nouakchott, where data are relatively abundant. A discussion of projected growth for this city is included in the regional profiles of Chapter 3.) Sustained growth at 1961-75 rates would easily put all of Mauritania's sedentary population within its fifteen urban centers by the end of the century, but such a development is unlikely. More probable is an average annual increase of about five percent (or half the 1961-75 rate), with some cities growing very fast for a while but slowing down in subsequent, less economically active periods. At this rate, the Mauritanian urban population outside of Nouakchott that now claims some 20 percent of the sedentary population would number 325,000 in 1990 and 530,000 in 2000, when it would account for about 25 percent of the sedentary population. With Nouakchott included in the calculations, by 2000 52 percent of the sedentary population would be living in urban centers.

The primary characteristic of past expansion is extreme elasticity, and the most plausible development for most cities is a rached-like growth pattern, with important gains in some years followed by periods of very slow growth or even net loss. Within this pattern, cities with some economic vitality--Zouerate, Nouakchott, Nouadhibou, Kaedi, and

lately, Kiffa--will continue to experience high growth, expanding and contracting with economic dynamics. The steady stream of their in-migrants will be working-age men, 50 to 70 percent of them from rural areas. As many as 20 to 30 percent may come from Nouakchott. With developments along the Fleuve, Rosso and Boghe could also expand, as could Nema and Aioun with the completion of the trans-Mauritanian highway. Cities of the northern and north-central areas-- Akjoujt, Atar, and towns in the Tagant--can expect minimal growth.

TABLE 4b Sex Ratios within Migratory Inflows, 1969-1976

City a/	Total Inflow 1976	Sex Ratios within Inflows (males per 100 females)					Average Annual Inflow 1969-71
		1976	1975	1974	1972-73	1969-71	
Nema	629	194	179	123	96	88	315
Timbedra	250	77	87	99	86	63	211
Kiffa	416	99	97	93	80	67	199
Kaédi	1109	122	122	117	115	99	475
Aleg	336	173	199	132	139	94	232
Boghé	468	103	106	116	110	78	294
Boutilimit	299	93	98	99	86	81	329
Rosso	914	104	105	119	109	111	673
Atar	1165	316	302	125	124	146	570
Nouadhibou	1752	173	162	205	197	194	958
Tidjikja	362	106	102	100	107	91	227
Selibaby	317	114	109	149	120	102	132
Zouérat	1403	188	183	157	132	133	837
Akjoujt	237	150	..	..	..	..	..
Nouakchott	15,261	170	158	149	126	115	6088

a/ Data for Aioun is not available at this time.

Raw Data Source : GIRM, unpublished census data (computer output).

2.2.5 The Saharan Conflict

The Saharan conflict that engaged Mauritanian military forces for several years will also leave its mark on the country's demographic profile. Specifically, it is expected that war deaths will affect the age and sex distributions, with repercussions on the labor force. Absence from family due to war efforts will have had some effect on birth rates. And finally, the war has certainly affected the geographic distribution of the population for several years: Mauritania's withdrawal from Tiris el Gharbia has already had repercussions on various cities, and final resolution of the conflict could see a more marked exodus of military personnel from the North.

Although Mauritania is no longer engaged in the Saharan conflict, at this time official war statistics are not available. Therefore, this study makes use only of those statistics which surface through close examination of 1977 census data. These statistics may or may not correspond to official figures--they merely appear reasonable in light of other census satitstics. Those using the demographic projections contained in this study should be aware of the assumptions we have made about these figures and about other aspects of the Saharan conflict. They are the following:

1. There have been no deaths of Mauritanian residents attributable to the Saharan conflict. That is, for the period under consideration, the death rate in the North is presumed to be equal to that of the entire country, and the overall rate is presumed to be 2.2 percent. (A sizable number of military deaths in recent years could have important repercussions on both the current growth rate and upon the size of the labor force.)

2. The Saharan conflict has had no effect at all on the birth rate. Birth rates in conflict areas have <u>not</u> been discounted in consideration of military presence.

3. Regions with populations inflated due to military presence at the time of the census are presumed to be: The Adrar
Tiris Zemmour
Inchiri

4. Population projections for affected regions are based on trends established prior to 1975 (with adjustments made, in some cases, for escalation of mining activities).

5. Military presence (combined with mining activity) is calculated as the residual found when the 1977 population predicted by curves based on reconstructed historical populations (assuming 2.5 percent natural increase) is subtracted from the population observed in 1977. It should be noted that this residual probably reflects no more than overt military operations.

6. Mauritanian engagement was ended in 1979; we assume that the continuing conflict will be resolved sometime between 1980 and 1985.

7. The military personnel who inflated the population of Tiris el Gharbia in recent years are assumed to have returned to Nouakchott for permanent residence. An important part of the military forces elsewhere in the North at the time of the 1977 census presumably will number among the inhabitants of Nouakchott by 1985.

2.3. Summary and Conclusion

Mauritania's current population increase is estimated at 2.5 percent annually. A declining death rate could easily make this natural growth rate increase in the final years of the century, but a decline seems unlikely.

Beyond natural increase, the country has in recent years experienced a host of upheavals that have radically changed and will continue to change the country's demographic profile. Among them are drought-related urban growth, sedentarization of nomadic groups, inter-regional and international migration, and the conflict in the Sahara from which Mauritania has recently withdrawn. In this chapter we have discussed these various phenomena at the national level. In the following chapter we will explore their effects at more local levels.

Chapter 3
REGIONAL PROJECTIONS

In the projections of population growth at the national level reported in the preceding chapter, only natural increase could be taken into account. For projections at the regional level, where data are more complete, inter-regional movements were considered as well. The following pages contain perspectives on the future of Mauritanian regions with an eye to population dynamics throughout the country.

3.1. Methodological Notes

At the outset of this study, the only reliable data point available for most of Mauritania's twelve administrative regions and the District of Nouakchott was that provided by the 1977 census. The first task, thus, was to generate a series of historical data points. For the nomadic population, the census item concerning intentions to settle was used to determine a rate of sedentarization that would allow reconstructions of historical populations. To establish the sedentarized population for years prior to 1977, the partially restored film of history was run backwards, in each region removing a certain percentage of the population who in past years would have been considered nomadic and reassigning others to regions of former residence according to their responses to census items about inter-regional migration. Throughout, the calculations assumed a natural increase of 2.5 percent annually.

For each region, data points generated for 1969 through 1976 were added to the point provided by the 1977 census, and curves were fit to describe separate growth of the nomadic and sedentary populations. (Strenght of r, the product-moment correlation coefficient, was used to determine goodness of the curves' fit, except where strong qualitative evidence indicated the mathematical fit did not reflect demographic reality.) Nomadic and sedentary populations for a given year were then summed to establish growth paths for a region's total population. After all curves were constructed, we made the adjustments in regional curves necessary to reflect 2.5 percent annual increase at the national level.

Establishing these curves required a series of assumptions of which readers should be aware.

a) Birth and death rate data are not available for regional populations, and thus we have assumed that a 2.5 percent rate of natural increase is applicable nationwide. Our projections presume that natural population increase has been about 2.5 percent for at least the past ten years and that growth will continue at this constant rate through the end of the century. Readers are encouraged to compare figures discussed in the regional profiles with figures given in Appendix Tables D through I, showing anticipated regional populations under varying hypotheses about future natural growth.

b) Because we have no information about individuals who moved more than once over the 1969-77 period, we have had to assume that all such moves nullified each other. This assumption may have made population increases seem more constant than in fact they were.

c) Inter-regional migration data pertain only to individuals of Mauritanian nationality, and thus we have had to assume that the number of foreigners present in any given region has remained constant over the past ten years.

d) Net <u>international</u> migration of Mauritanians is assumed to be zero: for every Mauritanian entering a region from abroad, another is assumed to leave (see Chapter 2, Section 2.2.2.) This assumption, made necessary by the lack of data on international out-migration, affects most noticeably the regions along the Senegal River. Consequently, our discussion of these regions takes into account possible modifications of this assumption.

e) The only information about nomadic sedentarization is an item probing <u>intentions to settle</u>. As noted in Chapter 2, sedentarization is frequently unplanned. But because we have

no other quantitative data, we have had to assume that the expressed intentions are an accurate reflection of the actual sedentarization rate. (See Chapter 2, Section 2.2.3 for an elaboration of this assumption.)

f) "Mauritania withdrew from the Spanish Sahara conflict in August 1979. Consequently, the territory of Tiris el Gharbia, included in the 1977 Census, is not discussed here. Readers, however, should be aware that built into this analysis is an assumption that substantial numbers of Mauritanians living in Tiris el Gharbia returned to Mauritanian territory, notably Nouakchott, at the time of the peace treaty.

Readers should also note that there is an important difference between prediction and projection. The former takes into account anticipated future events; the latter is an extension of the past into the future. The regional profiles which ensue involve projections far more than predictions. With few exceptions, the size of future populations is seen as a function of past growth patterns. For two reasons, we have presented for most regions only the series of curves with the best mathematical fit. First, qualitative data describing population dynamics in given regions have been limited, and in the absence of more detailed information, we have chosen to make the safest forecast: that the future at least in the short run will be an extension of the past.

A second constraint has operated as well. By imposing a ceiling of 2.5 percent upon the rate of natural increase at the national level, growth patterns in every region become dependent upon increases in all the other regions. For any given year, the sum of the regional total population as defined by data points along the thirteen regional curves will represent a 2.5 percent increase over the sum of data points for the preceding year. By definition, changes in projections for any one region requires changes in the projections for any other region--and thus any simple change may require a long series of involved calculations. Consequently, in most cases we have preferred to present a single series of curves. We suggest to researchers considering individual regions that a margin of ±5 percent be calculated to determine minimum and maximum probable

population for any given year. For regions where the future seems sure to differ markedly from the past, we have presented alternative curves. However, except where specified values along these curves may not be substituted for values along the primary curves without violating assumptions of 2.5 percent natural increase at the national level.

3.2 Regional Profiles

This section contains profiles of Mauritania's twelve administrative regions and single district including discussions of anticipated developments within each region's nomadic and sedentary populations. For convenience of comparison, Appendix Tables A through C compile estimates and projections of growth in all of the regions.

3.2.1 The Eastern Hodh (Hodh Oriental)

The Eastern Hodh, located in Mauritania's southeast corner, has had one of the country's more stable populations. The Eastern Hodh in the past has lost only a relatively small proportion of its population to other regions each year, and should this trend continue, the region's population will reach 234,000 in 2000, growing an average 1.8 percent annually from its 1977 level of 157,000. (See Table 3.2.1 and corresponding Figure 3.2.1.)

Nomadic Population. The 1977 census estimated that nearly 86,000 nomads were encamped within the region's boundaries, establishing the Eastern Hodh as one of the few regions where the nomadic population exceeded the sedentary population. The predominance of nomads, however, is rapidly declining. In 1977, some 2,900 nomads (in 600 households) indicated their intentions to sedentarize within the following year. Some undoubtedly had been affected by drought-related herd loss. But social changes have had an impact on nomadism, too. The abolition of slavery has made it difficult for some nomads to maintain their way of life, and they have preferred to establish themselves in fixed settlements. Some have moved to towns, leaving one or two shepherds to watch their flocks.

In the past few years there has also been a tendency in this area for herds to become concentrated in the hands of a few owners, and some sedentarization can probably be attributed to this trend. Should future sedentarization actually take place at the indicated rate of 3.4 percent annually, the nomadic population will drop to 68,000 by 2000, despite an average annual natural increase of 2.5 percent. The highway to Nema will be completed by 1982, and if road construction in this region has the same impact that it has had in other areas, the Eastern Hodh's nomadic population could suffer further decline in the century's remaining two decades.

In addition to the nomads making camp within its borders, the Eastern Hodh had the most sizable population of Mauritanian nomads outside national borders at the time of the 1977 census. Because data allowing computation of a sedentarization rate are not available for this group while calculating projected population, we assumed that this group will experience little or no sedentarization and thus will grow at an average annual rate of 2.5 percent[1/]. Although this assumption was made necessary by the lack of data, it probably does not correspond to social reality. Half of the 1400 Mauritanians who came from elsewhere to join the Eastern Hodh's sedentary population in 1976 came from abroad. It seems likely that many of these were individuals exchanging a life of international nomadism to settle within Mauritanian borders. If such is indeed the case, by 2000, the nomads abroad may number considerably less than the 87,000 indicated in Figure 3.2.1.

1/ Perhaps more tenable is an assumption that sedentarization within this group will correspond to the overall national rate. This assumption, however, would have required further suppositions about eventual country of settlement. We have chosen to avoid those problems, tracing simply the natural evolution of this group.

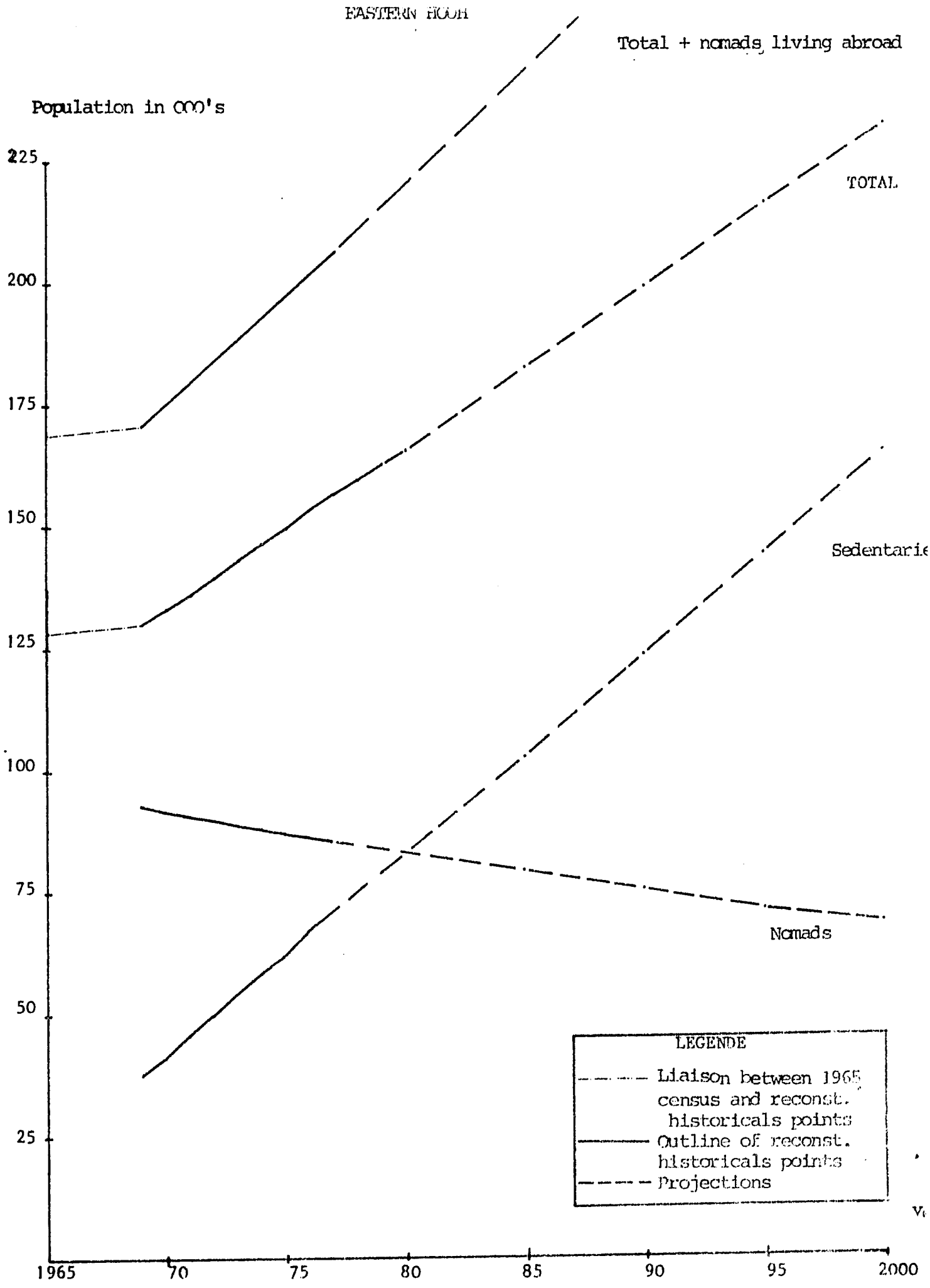
TABLE 3.2.1 POPULATION PROJECTIONS, REGION 01-EASTERN HODH[a]

	Population in 000's				Growth Rates (average annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	86	83	75	68	-1.0	-1.0	-1.0
Sedentary	71	83	125	166	4.2	2.9	3.5
Total	157	166	200	234	1.9	1.6	1.7

a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.

Figure 3.2.1

EASTERN HOOH



Sedentary Population. The Eastern Hodh's some 270 villages surveyed in 1977 housed a population of 71,000, and clearly the growth within the sedentary population is outstripping the rate of natural increase. Most of the region's villages[1/] had seen important increases in their population even since 1973; more than one-half of the villages located in 1977 were not even recognized as such by the makers of the Institut Geographique National: 200,000 topographic maps two decades before. Nema, the region's capital, had doubled its 1962 population to 8,000 by 1977. The rate of growth, estimated at five percent annually for the current period, will gradually decline, but the incremental increase will remain steady: 4,000 individuals are expected to join the region's sedentary population through 2000, when that portion of the total population will number 166,000.

This projected growth, however, could be sharply reduced in the event of natural disaster once the new Nema road begins to facilitate a flight to Nouakchott and cities along the way.

3.2.2 The Western Hodh (Hodh Occidental)

The Western Hodh, lying between the Assaba and the Eastern Hodh and sharing its southern border with Mali, has been growing somewhat less quickly than the assumed rate of natural increase. But a measure of central tendency does not adequately depict the region's growth patterns. Two opposing forces are vying to determine the demographic profile of the Western Hodh. On one hand, the region's sizable nomadic population is settling at a rate well above the national average: the sedentary population thus is growing quite rapidly. On the other hand, like regions to the west, the Western Hodh is subject to notable out-migration. Some nomads from neighboring regions may be coming to establish themselves as semi-nomads in the Western Hodh's relatively abundant grasslands, but the net balance remains negative. Out-migration by far exceeds in-migration.

Our growth curves show this second trend to dominate through the end of the century, when the region's total population should reach 191,000 (see Figure 3.2.2 and accompanying Table 3.2.2.)

1/ Fichier 1977: a village is considered as any grouping having one cement building.

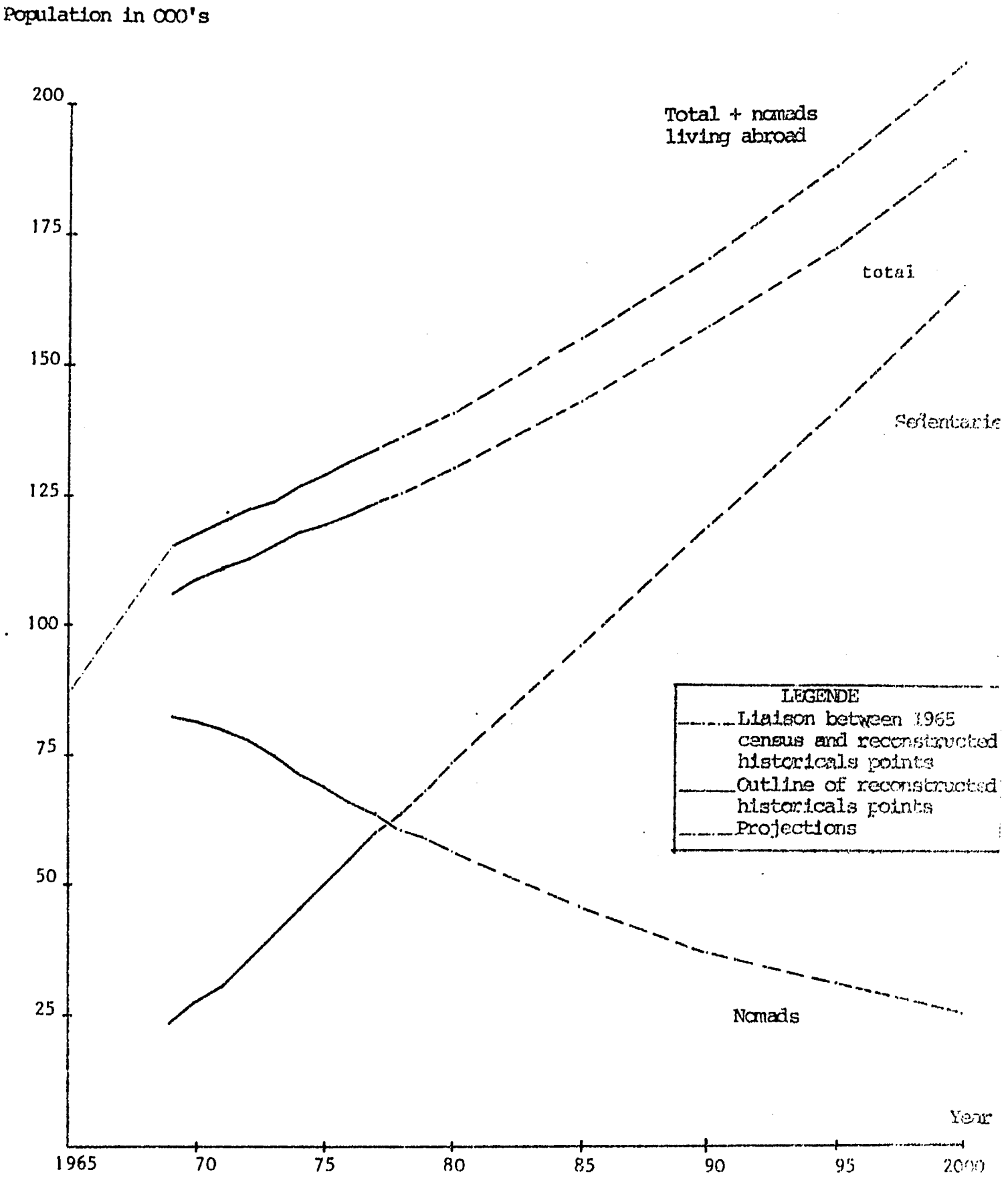
Readers should note that these projections do not anticipate changes resulting from the new trans-Mauritanian highway. Road construction has already begun inside the regional boundaries, but whether the highway when completed will encourage local economic growth (as it did in the Assaba) or simply facilitate the flight to Nouakchott is yet unknown. And unfortunately, not enough is known about the demographic effects of the road in other regions to warrant prediction in either direction. Our projections of 1.94 percent average annual growth through 2000 assume by default that the net push and pull effects of the road will be zero. Within the region, however, we can anticipate some changes, and these are discussed below.

TABLE 3.2.2 POPULATION PROJECTIONS, REGION 02-WESTERN HODH[a]

	Population in 000's				Growth Rates (average annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	64	57	38	26	-3.9	-3.9	-3.9
Sedentary	60	73	119	165	5.0	3.2	4.2
Total	124	130	157	191	1.9	1.9	1.9

a/ Under assumptions of 2.5 % annual natural increase, held constant through 2000.

WESTERN HODH



Nomadic Population. More than 6 percent of the Western Hodh's nomads sampled in 1977 indicated their intention to settle within the coming year. As in the Eastern Hodh, the longterm effects of the drought and changing social structures have coupled to make nomadic life untenable for many. Probably the more marginal members of large nomadic entourages are moving to Aïoun, the region's capital, or even Nouakchott. We suspect that small herders are simply establishing themselves around reliable wells. As the road construction extends eastwards, some nomads are already settling around the temporary wells dug by MENDES, the Brazilian firm building the road. Whether these communities will survive as such remains to be seen.

With the advent of the road, a re-distribution of the nomadic population seems inevitable. But the road's overall effects on nomadism are difficult to anticipate. The new highway may precipitate sedentarization, as it has in other areas, but it could also stimulate nomadism by facilitating the marketing of animals raised in the region's grassland. Again, in the absence of both qualitative and quantitative data, we have supposed that these two forces will have equal strength. Our projections of nomadic attrition are based exclusively on historical trends. By these trends, we anticipate that the nomadic population which numbered 64,000 in 1977 will have fallen to 26,000 by the end of the century.

In addition to these 64,000 nomads within regional borders, the Western Hodh in 1977 also claimed 10,000 nomads abroad, most of them in Mali. Again, the lack of data has obliged us to assume that this group is growing at the rate of 2.5 percent annually. But we would caution readers about the validity of this assumption. The Western Hodh's sedentary population receives a large part of its annual in-migration from abroad--much of it presumably from transhumant Peulhs returning from Mali to "settle" in the region. While we have not been able to take this into account in the curves shown in Figure 3.2.2, it seems likely nonetheless that some portion of the 17,000 nomads shown as being beyond national boundaries in 2000 will in fact have settled within the Western Hodh's boundaries.

Sedentary Population. The current rapid growth of the Western Hodh's sedentary population—about 7 percent annually—can be attributed to the settling of 1000 to 3000 nomads each year, and not to inflow from other regions. Much of the expansion is taking place in small agglomerations in the southern part of the region. Aioun's population has nearly doubled over the past fifteen years, but its growth rate has not been constant. According to census figures, the city suffered a 37 percent loss in population from 1975 to 1977 (with population declining from 14,000 to 9000), much of it to the benefit of Nouakchott. With the Nema road slated to pass through Aioun, the provincial capital should see some economic revitalization, and this most recent trend may be reversed.

A line provided the best fit for generated historical data points for Region 02, but if the road stimulates a self-sustaining economic growth in Aioun, the sedentary population may expand at a rate superior to the average annual 3.3 percent projected for the 1990-2000 period. On the other hand, if as a result of the new highway Aioun becomes an insignificant truck stop between Nema and Kiffa, the region's sedentary population could fall short of the 165,000 we project for 2000.

3.2.3 The Assaba

Prior to construction work on the trans-Mauritanian highway, Mauritania's third administrative region, the Assaba, was experiencing only minimal growth. The drought was somewhat less severe in this region than in others, but nonetheless the Assaba knew consistent net out-migration throughout the 1970's. The capital city of Kiffa lost almost 40 percent of its population from 1975 to 1977. At the time of the 1977 census, the Assaba's population numbered 129,000 and was growing at about 1.5 percent each year. Curve X_1 in Figure 3.2.3 (accompanied by Table 3.2.3) reflects the continuation of this trend into the future.

But is slow growth an accurate portrayal of the regional population dynamics? Reports subsequent to the 1977 census indicate that the new road is bringing an economic boom and corresponding population expansion. A paved road surface from Nouakchott to Kiffa

but not far beyond has made the regional capital a logical center for the distribution of goods to various points in the interior. Mauritanians have not been blind to this logic, and petits commerces thrive. By making Kiffa its headquarters in the interior, MENDES has only contributed to the Kiffa's new vitality. Outside of the city, rural folk have noted considerable runoff along the road and have begun to plant crops in new gardens, fueling the region's economic engine. For now, it seems, the region's economic future is relatively bright: if the momentum generated by the road construction is maintained, we predict that the region's population will begin to expand at increasingly faster rates. Such a development is represented by Curve X, showing growth in the current period at only 2.1 percent annually, increasing to 2.6 percent for the 1990-2000 period. This curve puts the 2000 population at 218,000.

TABLE 3.2.3 POPULATION PROJECTIONS, REGION 03: ASSARA[a]

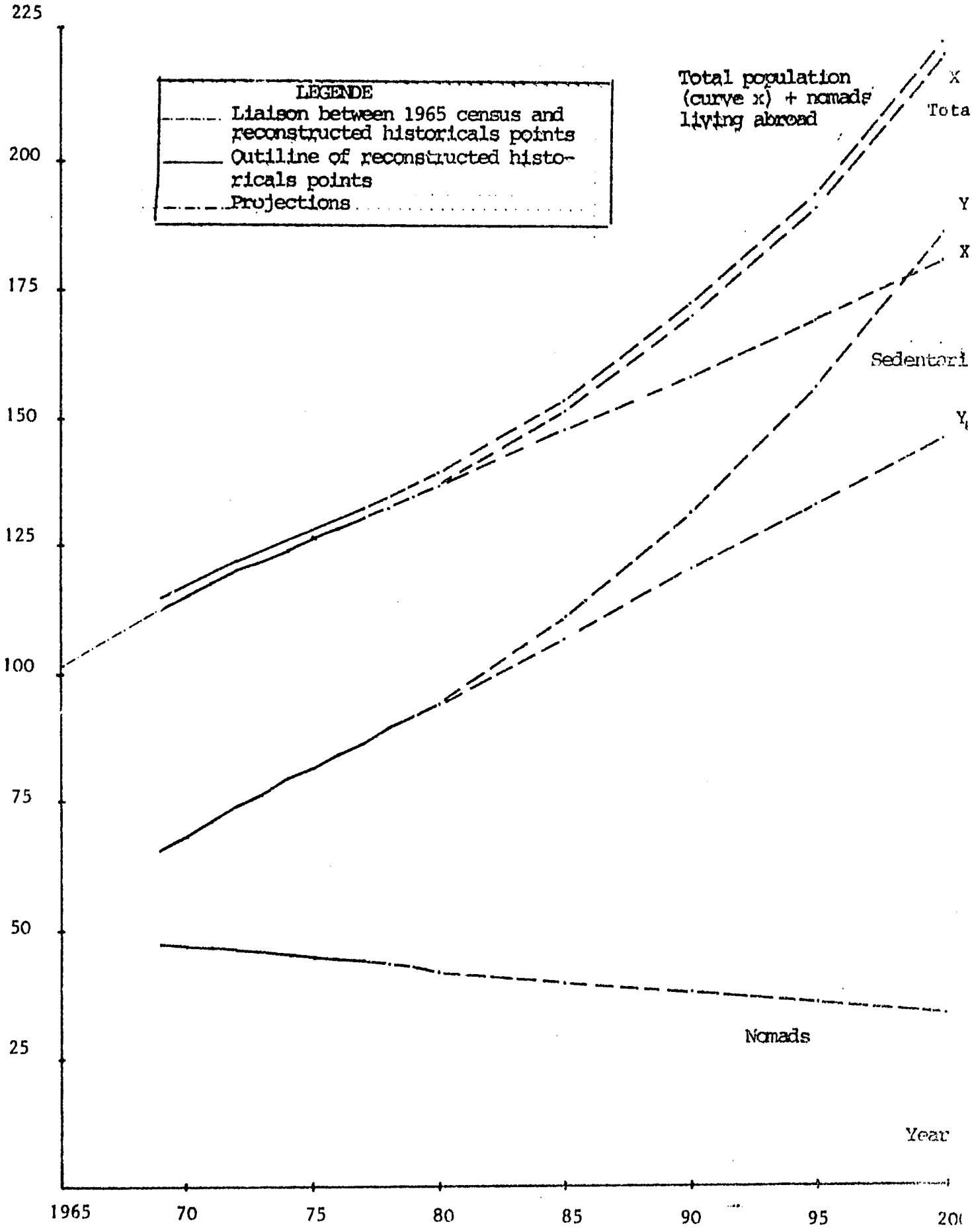
	Population in 000's				Growth Rates (Average annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	43	42	38	34	-1.1	-1.1	-1.1
Sedentary	86	94	130	184	3.3	3.5	3.4
Total	129	136	168	218	2.14	2.6	2.4

a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.

pulation in
0's

Figure 3.2.3.

ASSABA



Unable to determine which curve depicts probable developments more realistically, we have presented both series of curves. Indeed, the future may eventually locate itself on both curves. Should economic activity in the Assaba continue to boom, but only for a relatively short period of time, growth could drop from Curve X to Curve X_1. Values along Curve X have been used in Appendix Table A, but readers are alerted to the fact that for national-level analyses values along Curve X_1 may be substituted for values along Curve X without affecting national level natural increase so long as X_1 series are used to describe growth in the Gorgol and Guidimakha, too (see profiles for these two administrative regions, Sections 3.2.4 and 3.2.10).

Nomadic Population. In 1977, the Assaba's nomadic population within national boundaries was estimated at 43,000. Only 3.5 percent of these nomads, considerably less than in other parts of the country, indicated their intentions to sedentarize within the following year. The curve in Figure 3.3.3 depicting attrition of the nomadic population is based on this figure, but very likely the sedentarization rates have increased since the census was conducted. MENDES has sunk temporary wells along the new road, and many herders have come to take advantage of the abundant water supply. The legion encamments along the road may well become established villages. Projections of 1977 attrition place the nomadic population at 34,000 in 2000, but this number may dip as low as 25,000.

The Assaba's nomadic population outside national boundaries in 1977 was estimated at 1700. Figure 3.2.3 shows this population, for whom no sedentarization data are available, growing at 2.5 percent annually to 3000 in 2000.

Sedentary Population The new road has become the principal determinant of the shape of growth patterns for the sedentary population. Whereas in the pre-road period, the sedentary population was expanding at a rate only slightly higher than the rate of natural increase, the current trend points to a population boom (represented by Curve Y). Should this latest trend be sustained, the Assaba's

sedentary population should reach 184,000 in 2000; in no case should it be less than 145,000 (Curve Y_1).

3.2.4 The Gorgol

Residents of the Gorgol, the Assaba's neighbor to the west, were counted at 149,000 in 1977. But the dynamics of this region's population growth are particularly difficult to assess for several reasons. First, the past migratory flow involves international exchanges for which only half of the data (those relating to Mauritanians returning from abroad) are available. On the face of things, more people have been migrating to the Gorgol region than to any other area in Mauritania save Nouakchott. And much of this inflow seems to be labor-related: in 1976, for example, male in-migrants aged 15 to 39 outnumbered female in-migrants of the same age by more than 2 to 1. But a large proportion of the Gorgol's in-migrants (nearly 50 percent in 1976) came from abroad. Readers are reminded that due to the total lack of data concerning Mauritanian emigration, we built into our population projection calculations an assumption that for every Mauritanian returning to Mauritania from abroad, another Mauritanian would leave. Net international migration of Mauritanians was thus left at zero and the number of Mauritanians abroad was maintained at the 1977 status quo. (For the rationale behind this assumption, see Chapter 2, Section 2.2.2.) Without question, the Gorgol is the region most affected by this assumption. Despite the fact that overall, the Gorgol appears to have had very healthy in-migration, when adjustments for international exchange are made, that balance becomes negative. Thus whether or not the growth rate is seen to exceed the 2.5 percent rate of natural increase depends exlusively on assumptions concerning international exchange for which data are not available.

Secondly, the role of Kaedi, the Gorgol's capital and a major central river town is difficult to determine. From 1975 to 1977 Kaedi experienced a 2.4 percent growth, while nearly every other city of the interior lost [illegible] populations. Yet recent reports indicate economic stagnation in the city. Kaedi's slaughterhouse, which was to have introduced the modern sector, is functioning

well under capacity. Is Kaedi's population growth also on the wane?

Finally, problems in implementing the Gorgol Project, intended to develop agriculture on acreages irrigated by the harnassed waters of the Gorgol River, contributes to uncertainties about the region's future.

Readers are offered a choice of two curves to describe the region's total population growth. (See Figure 3.2.4 and Table 3.2.4.) Curve X is an extension of past growth (calculated respecting international exchange assumptions set forth in Chapter 2); values along this curve are included in Appendix Table A. Such a curve assumes at best the moderate success of the Gorgol project and growth falling well short of the rate of natural increase. Growing at about 1.6 percent annually, under these assumptions the region's total population should reach 217,000 in 2000.

Curve X_1 assumes that the future net migratory outflow, with international exchange considered, will more nearly equal zero. Such population growth would depend on the success of the Gorgol Project or some other economic development scheme or on a radical shift in patterns of international migration.

For national-level analyses, values along Curve X_1 may be substituted for values along Curve X without disturbing assumptions about national level natural increase so long as X_1 curve series are used for neigboring regions (the Assaba and Guidimakha) as well (see regional profiles, Sections 3.2.3 and 3.2.10).

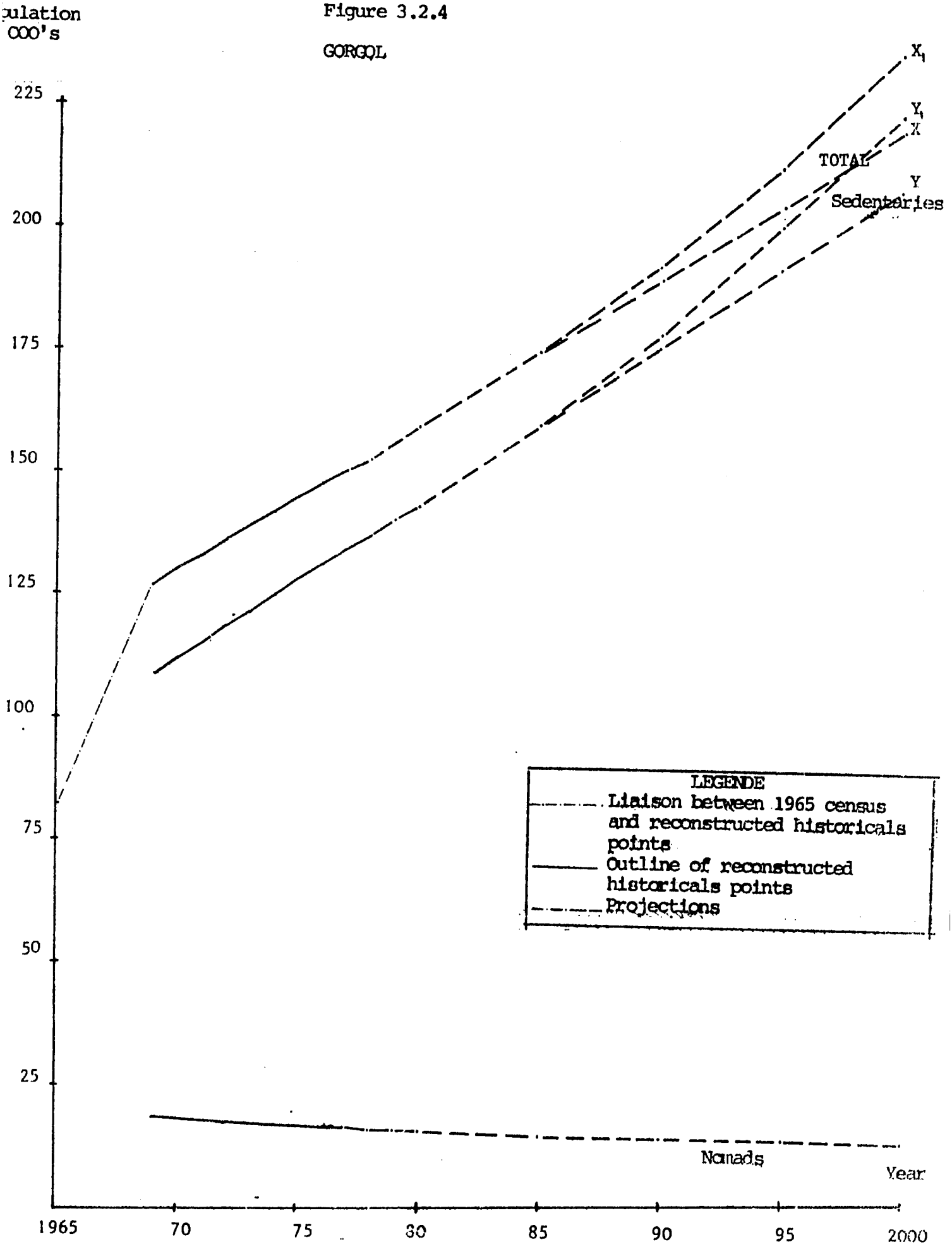
TABLE 3.2.4 POPULATION PROJECTIONS, REGION 04: GORGOL[a/]

	Population in 000's				Growth Rates (Average Annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	16	16	14	12	-1.3	-1.3	-1.3
Sedentary	133	142	174	205	2.1	1.7	1.9
Total	149	158	188	217	1.8	1.4	1.6

a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.

Figure 3.2.4

GORGOL



Nomadic Population Nomads of the Gorgol, settling at a rate somewhat less than the national rate of 5.2 percent, will have relatively little impact on the growth pattern of the region as a whole, for the simple reason that nomads in the Gorgol currently constitute only 10 percent of the population. Even settling at the rate of 3.7 percent each year (about 600 people per year for the current period, but less than 500 per year by 1990), the nomads will not make a noticeable contribution to the region's sedentary population. Nomads abroad were estimated at 800 in 1977; at a 2.5 percent growth rate, they will number 1400 in 2000. (Because of their numerical insignificance they are not represented in Figure 3.2.4.)

Sedentary Population Given the assumption of zero net international migration discussed above, the sedentary population of the Gorgol is not even expected to keep pace with natural increase. Growth should vary between an annual 1.7 percent (Curve Y) and 2.3 percent (Curve Y_1) through the end of the century depending on the success of development programs in retaining the population. The sedentary population in 2000 should number between 205,000 and 221,000.

3.2.5 The Brakna

Responding to drought conditions that have not abated since the early seventies, the people of the largely barren Brakna have been gradually abandoning their territory in the search for a more accommodating environment. In 1976, almost two-thirds of those who left went to Nouakchott. This trend has been noticeable since the early seventies, but there is no evidence that it is tapering off. If anything, it has been encouraged by the new road connecting Aleg, the provincial capital, to Nouakchott. When asked to provide information about their most recent move (in conjunction with the 1977 census), 1500 Mauritanians reported moving to Nouakchott from the Brakna in 1974; 2000 reported moving in 1975; and 3500 reported moving to the capital city in 1976--even while the road was being built and the area was experiencing a comparable boom. (These figures,

it should be noted, do not include those who moved to Nouakchott and later left.) The result of this exodus, dampened only slightly by scattered in-migration, is an overall growth about half that of natural increase. GIRM has plans to stimulate economic growth in this region--notably at Boghe--but unless this plan is an overwhelming success, for every two children born in the Brakna in coming years, one person will leave the region. But even with this anticipated exodus, the region's population is expected to increase by 40,000 people over the next twenty years (see Figure 3.2.5 and Table 3.2.5).

Nomadic Population Even more dramatic than exodus from the Brakna is the sedentarization process transpiring in the region. Almost 6000 (11 percent) of the 1977 population of 51,000 nomads indicated their intentions to sedentarize within a year. If reported intentions can be equated with actual sedentarization, then the rate of sedentarization in the Brakna in 1977 was almost twice as high as the national average and was by far the highest in the country.

It is unlikely that sedentarization has been taking place at this rate over an extended period: the region's population simply hasn't been that large! The Brakna was among the regions hardest hit by the drought. In many cases inadequate pasturage not only decimated existing herds but also destroyed any hopes of reconstituting them. Appropriate data are missing, but we suspect that the drought precipitated the rapid sedentarization reported in the 1977 census, and consequently, we have adjusted the curve depicting growth of the nomadic population to reflect a sudden burst in sedentarization in the mid-seventies. This sharp upswing will probably be followed by a gradual decline in the sedentarization rate about 6 percent in 1990 and 4 percent in 2000. The nomadic population, estimated at 38,000 in 1980, will have been reduced to about 12,000 by the end of the century.

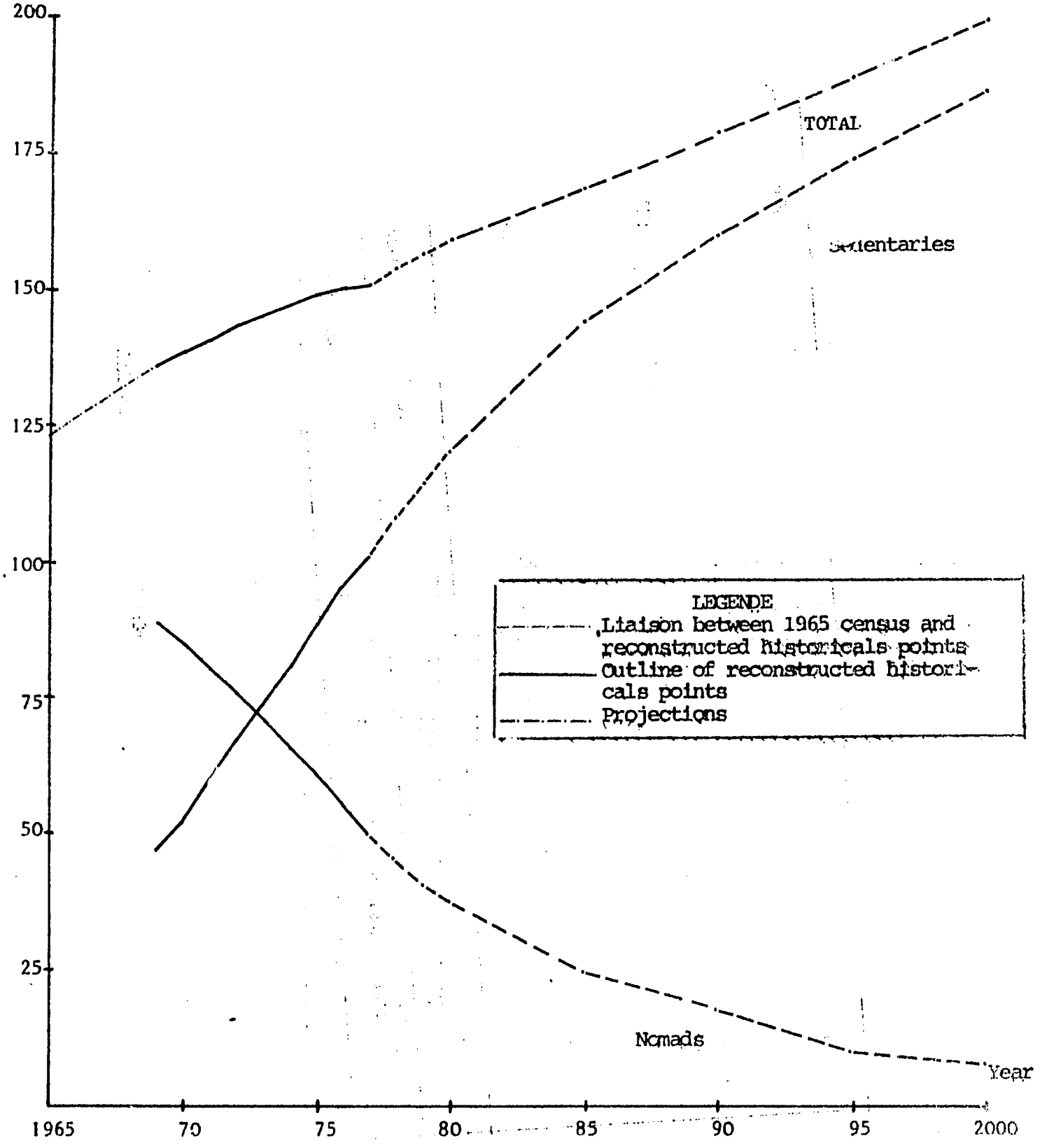
TABLE 3.2.5 POPULATION PROJECTIONS, REGION 05: BRAKNA

	Population in 000's				Growth Rates (Average Annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	51	38	18	12	-7.2	-4.0	-5.5
Sedentary	101	121	161	187	2.9	1.5	2.2
Total	151	159	179	199	1.2	1.1	1.1

Population
in 000's

Figure 3.2.5

BRAKNA



Sedentary Population While the nomadic population shrinks, the sedentary population is expected to expand very rapidly, for only a handful of the nomads who intended to sedentarize indicated a desire to move to the nation's capital. It seems likely that sedentarization is taking place in stages: a nomadic family settles first somewhere within the region and then may make the move to Nouakchott later. Meanwhile, smaller communities find their populations at least temporarily swollen.

The role of the region's two major towns, Aleg and Boghe, is ill-defined. As noted earlier, nearly all of Mauritania's cities lost population from 1975 to 1977. Boghe's lifeline was struck: that river town scheduled to receive important aid as a part of the OMVS project lost almost one-third of its population. Aleg, on the other hand, made slight population gains, but these should be attributed to preparatory work on the trans-Mauritanian highway. In 1979, officials in Aleg reported losses in population to the profit of Nouakchott. This is probably the trend that marks the future.

At present, we estimate sedentary population growth at more than 6 percent each year; by the mid-eighties, however, this rapid expansion should taper to about 3 percent, stabilizing at about 1.5 percent in the mid-nineties as the number of nomads settling each year diminishes. By 2000, though, the sedentary population is projected to have almost doubled its 1977 population of some 100,000.

3.2.6 The Trarza

Sure pasturelands that could support flocks of sheep and goats established the Trarza as Mauritania's most populous region many years ago. The long range devastation of the recent drought, which in this area transformed quasi-forests into dunes of sand, is now beginning to threaten this position. Although the Trarza will still harbor more people than any other region outside of Nouakchott in 2000, it has already begun to lose some of its lion's share of the population.

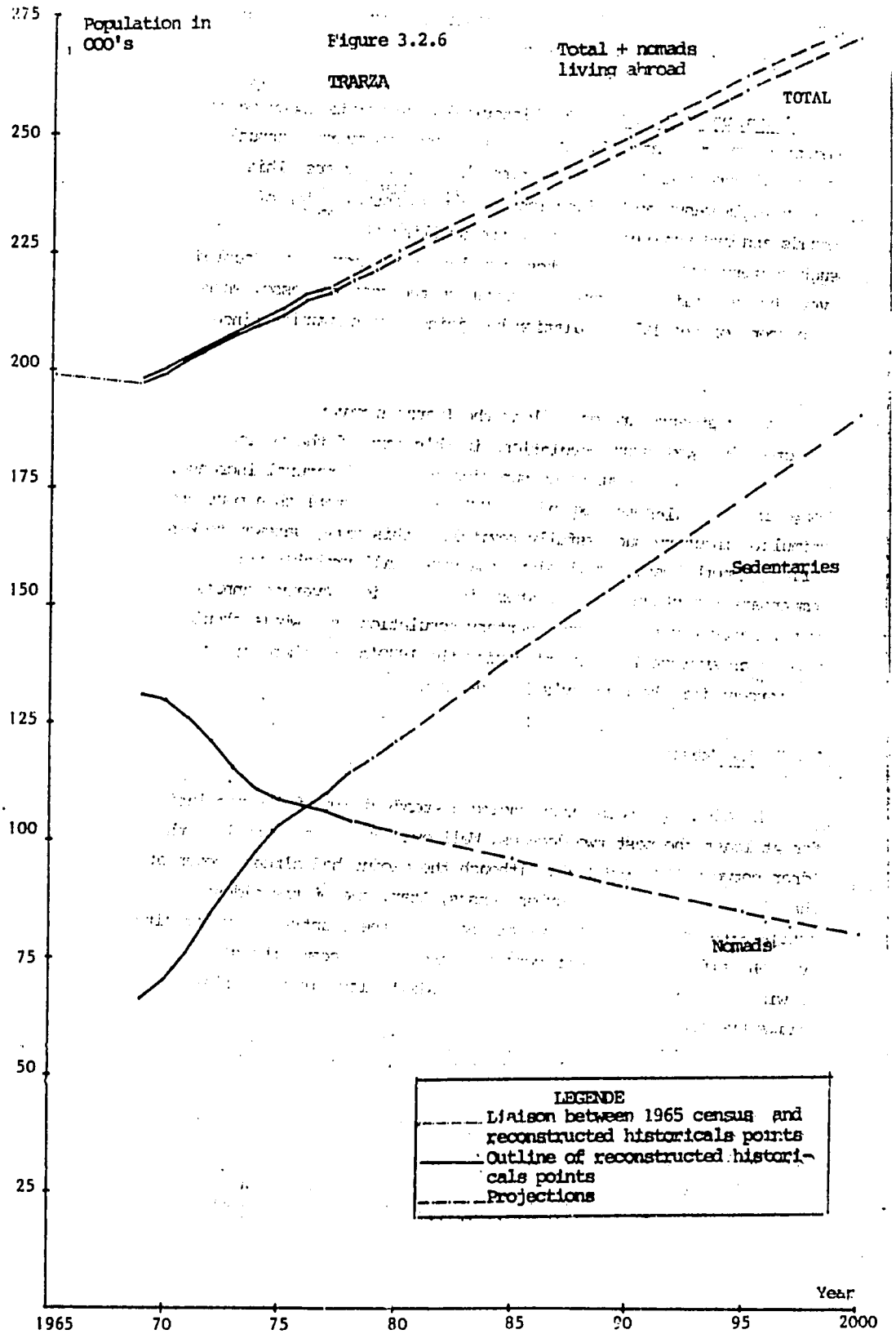
Like the Brakna area, the Trarza has been making regular contributions to the growth of Nouakchott: census figures show that between 2000 and 3000 people were moving to Nouakchott from the Trarza every year from 1973 to 1976. (Again, these numbers refer only to those who after moving remained in Nouakchott.) While the volume of migration may decline in future years, the basic trend has no end in sight. Because of the substantial out-migration, the projected growth for the Trarza over the 1980-2000 period is fixed at an average annual rate of 1.0 percent (see Table 3.2.6 and Figure 3.2.6).

Nomadic Population In 1977 the nomads of the Trarza--alone constituting almost one-fourth of the entire country's nomadic population--appeared more reluctant to settle than most other nomads throughout the country. Assuming that all nomads reported their intentions honestly, the relatively modest sedentarization rate may be an indication that response to the drought and the roads to Rosso and Aleg have already peaked. (Generated historical data points have been adjusted to reflect such a trend.) For those who survived the drought, easy access to Nouakchott and to some extent Rosso makes it possible for nomadic families to contribute one or two family members to the workaday world of the city without having to abandon the nomadic way of life. Proximity of the capital means that men may practice commerce or perhaps even semi-professional work during the week, return to the brousse for weekends, and sustain their families even when the land will not. We anticipate that sedentarization in the Trarza will proceed at about 3.6 percent annually over the next

TABLE 3.2.6 POPULATION PROJECTIONS, REGION 06: TRABZA[a]

	Population in 000's				Growth Rates (Average Annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	106	102	91	81	-1.2	-1.2	-1.2
Sedentary	110	122	157	190	2.6	1.9	2.2
Total	216	224	248	271	1.0	0.9	1.0

a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.


Population in 000's
Figure 3.2.6
TRARZA
Total + nomads living abroad
TOTAL
Sedentaries
Nomads
275
250
225
200
175
150
125
100
75
50
25
LEGENDE
Liaison between 1965 census and reconstructed historicals points
Outline of reconstructed historicals points
Projections
Year
1965
70
75
80
85
90
95
2000

twenty years. Even so, the nomadic population will actually increase their share of the national nomadic population from about 25 percent in 1980 to almost 30 percent in 2000.

Sedentary Population. The historical data points shown on the sedentary growth curve (Figure 3.2.6) reflect an average annual growth of more than 6 percent during the last ten years. This growth is in many ways a function of past sedentarization of nomads and can readily be seen in the swelling of such centers as Boutilimit, whose population has more than doubled over the past fifteen years, or Tingan on the road to Rosso, where 54 percent of the 1977 population had joined the community since 1973.

As investments are made along the Trarza's river edge, it is expected that sedentary populations in this part of the region will continue to grow at rates superior to that of natural increase. Rosso in particular may expand if OMVS plans to establish a port and stimulate industry successfully revitalize this city, gateway to West Africa. Nonetheless, growth along the river will probably not compensate for stagnation elsewhere in the region. Average annual growth rates for the Trarza sedentary population as a whole should slow to an average 2.6 percent during the 1980's and then dip to 1.9 percent for the century's last decade.

3.2.7 The Adrar

The Adrar has been experiencing a steady drain of its population for at least the past two decades. Well over 5000 residents left the Adrar between 1974 and 1977. Although the exodus had already begun at the time of the 1961-62 urban census, Atar, one of the oldest settlements in Mauritania, as at that time the country's largest city. Over the fifteen-year inter-census period, Atar became the slowest growing city and slipped from first to sixth place in the ranking of cities by size.

As shown in Figure 3.2.7 and Table 3.2.7, the pattern of growth in the Adrar experienced a sharp upswing in 1975, breaking the trend of minimal growth. Escalation of military operations in the area during the years of conflict in the Sahara is probably responsible for the increase; it does not reflect a longterm change in growth patterns. In fact, although the net negative migration balance was reduced considerably over the 1975-76 period--presumably through the inflow of military personnel, the rate of out-migration was not noticeably affected. It is expected that by 1985 the Adrar will have settled once again into the growth pattern established more than a decade ago to increase at the very slow rate of 0.1 percent per annum to a population of 57,000 in 2000.

Nomadic Population. Survival for the nomads of the bleak, pasture-poor Adrar has always depended on staying attuned to variations in precipitation, but sparse, sporadic rainfall over the last decade has made their way of life especially difficult to maintain. At the time of the 1977 census, 5.6 percent of the nomads in the Adrar reported their intentions to sedentarize during the coming year. (And of these, 48 percent were planning to make Nouakchott their new home--a percentage much higher than that observed in any other region.) Should sedentarization continue at this rate, the nomadic population will have shrunk to 8,000 by the year 2000.

Sedentary Population. The sedentary population saw steep increases in size during the 1975-76 period, probably due to military build up in the North. Between 1980 and 1985 this trend is expected to taper off, and during the last two decades of the century growth of the sedentary population should average 0.9 percent annually. Barring some unforeseen development project, the Adrar will continue to sustain massive out-migration and will not be recompensed by substantial in-migration. Growth will come almost exclusively from the sedentarization of those nomads who settle themselves, however temporarily, in the region's 85 communities.

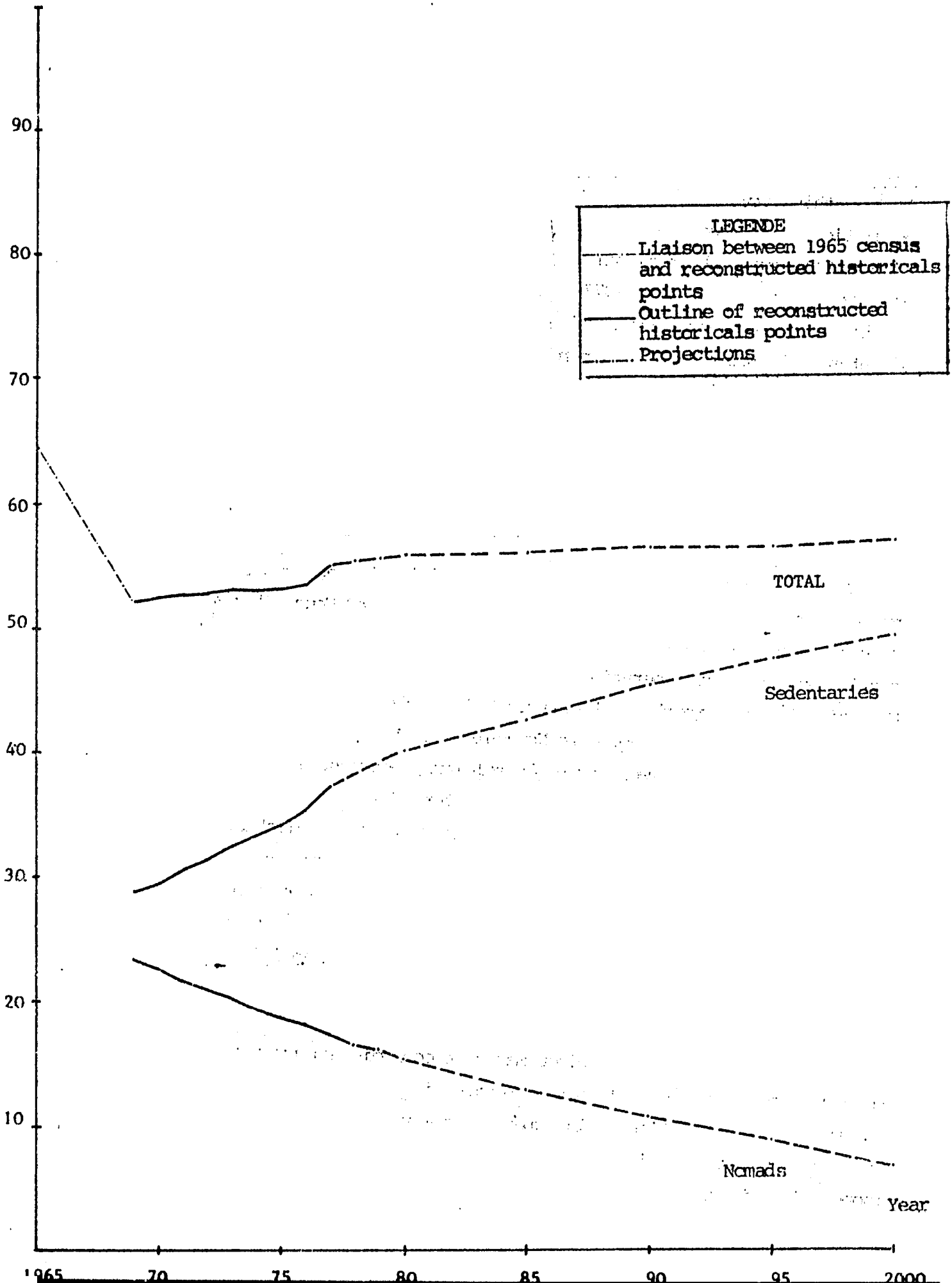
TABLE 3.2.7 POPULATION PROJECTIONS, REGION 07: ADRAR[a/]

	Population in 000's				Growth Rates (Average Annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	18	16	11	8	-3.6	-3.6	-3.6
Sedentary	38	40	45	49	1.2	0.9	1.0
Total	55	56	56	57	-		0.1

a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.

Figure 3.2.7

ATAR



3.2.8 Nouadhibou

Building a growth curve for the eighth administrative region is essentially a matter of projecting the growth of Nouadhibou, for in 1977 this city alone accounted for 90 percent of the region's population. There are presently only a handful of non-military settlements beyond the regional capital, and the area has virtually no nomadic population. (The 1977 census estimated some 100 nomads in this area, but even several of them expressed intentions to sedentarize.) Assuredly, the future of Region 08 will depend upon the future of Nouadhibou.

Historical data points indicate a curve projecting growth at 6.9 percent annually through the end of the century (see Table 3.2.8 and Curve X on Figure 3.2.8).

An exponential curve best describes Nouadhibou's past growth, but how long will such population expansion continue? Nouadhibou does not appear to be in good economic health now: many of the city's industries are operating well under capacity. Much of Nouadhibou's past growth can be attributed to labor migration. Of the some 2500 people who moved to Nouadhibou in 1976, 1000 were men aged 15 to 40. Some were probably soldiers, but most undoubtedly came looking for work in the industrial center. How long will migration to Nouadhibou be sustained when jobs are not available? A comparison of data from the 1975 and 1977 censuses shows an actual population loss over the two year interim. This attrition does not indicate a new trend, for there is no evidence of a current mass exodus from Nouadhibou, but it may forecast a substantial decline in the city's growth.

On the other hand, Nouadhibou may gain economic momentum with the development of the Guelb mining project in nearby Tiris Zemmour, and the city's population could expand at a more rapid pace than in the past. Instrumental in this possible expansion could be the as yet inoperative oil refinery and steel works.

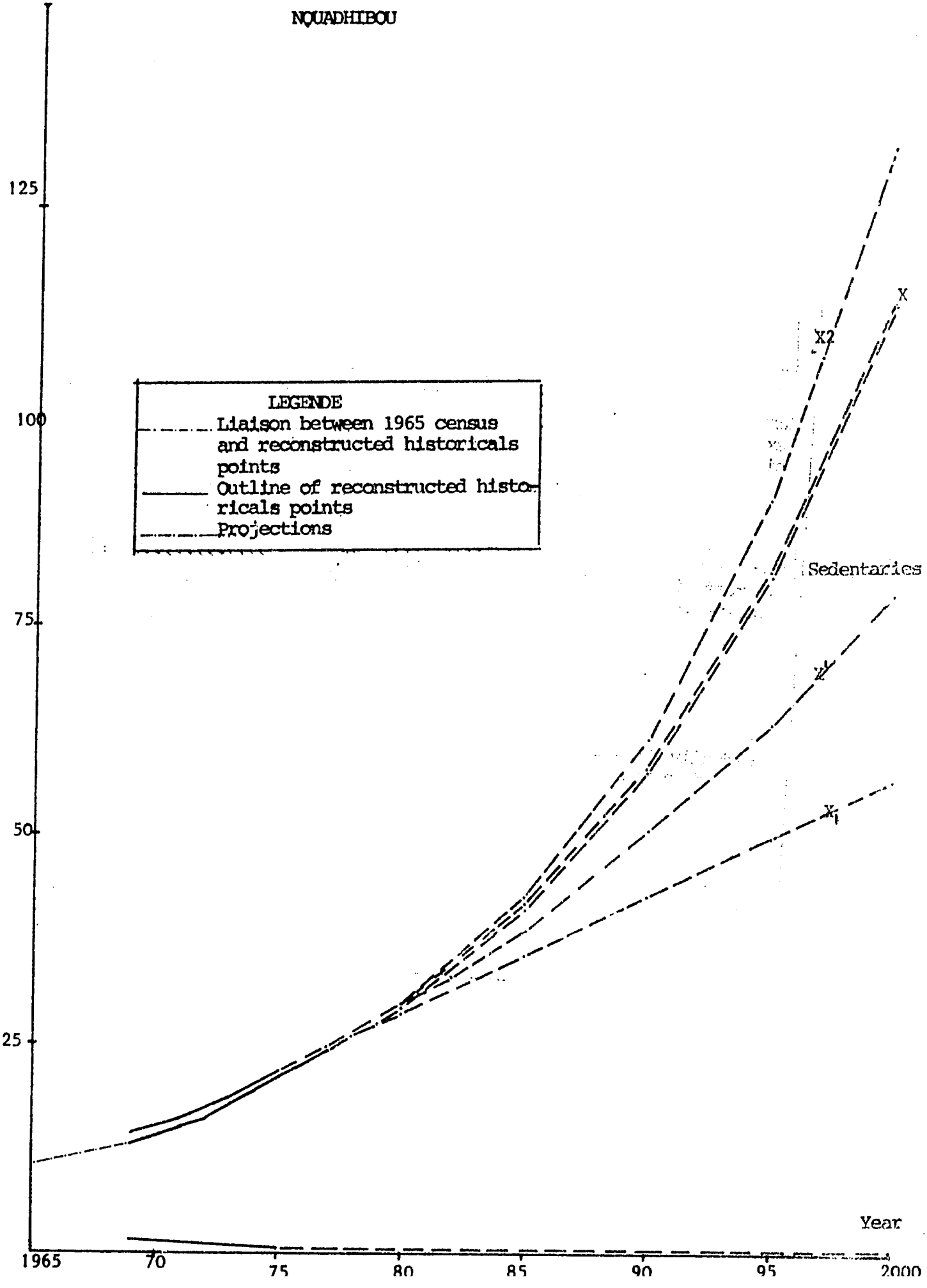
TABLE 3.2.8 NOUADHIBOU: Projections of the Total Population Under Different Hypotheses (in 000's)

Conditions	Population Projections		
	1980	1990	2000
Curve X -extension of historical trend	30	58	114
Curve X_1 -increase in constant increments	29	43	56
Curve X' -gradually decreasing rate of growth	30	51	79
Curve X_2 -gradually increasing rate of growth	30	62	113

Population
in 000's

Figure 3.2.8

NOUADHIBOU



Given these uncertainties, we have provided in addition to the principle projections (Curve X) a series of curves representing alternative developments within the region. Readers are reminded that for the purposes of national level analysis values along these auxiliary curves may not be substituted for the numbers in Appendix Tables A through C without corresponding adjustments in other regions.

3.2.9 The Tagant

The Tagant has seen some of Mauritania's most dramatic demographic changes over the past two decades. In the not-so-distant past, the Tagant was a pasturage area hosting primarily nomadic populations. With the exception of Tidjikja and Tikjit and a few scattered villages (some of them oases), there were very few settlements in the Tagant. In the last twenty years that picture has changed radically. More than half of the settlements noted in the 1975 census did not exist when the IGN 1:200,000 topographic maps were drawn in the 1950's. Several small agglomerations were even established between the 1975 preliminary census and the actual census conducted in December 1976.

The region's overall growth is being shaped by sedentarizing nomads. Some of the Tagant's nomads are settling in the region; others are leaving the area for various destinations, but primarily Nouakchott. The Tagant has known substantial out-migration in recent years, undoubtedly in response to the severe drought of the early 1970's. With rainfall remaining sparse and the network of relatives and acquaintances in the nation's cities becoming ever better established, the region's total population will continue to grow at a rate well below the 2.5 percent annual natural increase (see Table 3.2.9 and Figure 3.2.9).

Nomadic Population. In 1977, nomads in the Tagant expressed intentions to sedentarize at one of the highest rates in the country. Almost 8 percent of the 43,000 nomads who spend most of their time in the Tagant indicated they would settle within the following year. Is this high rate indicative of a longterm trend? At this rate of sedentarization, nomads in the Tagant would number 12,000 by 2000

(as compared to 43,000 in 1977). This suggests an attrition rate among the nomads in the Tagant that would be more dramatic than the attrition projected for the Brakna. This does not seem realistic.

A downward adjustment of the sedentarization rate was clearly warranted, but how much to adjust the curve would depend on the cause of the observed steep sedentarization rate. In other regions, road construction, proximity to a major city, economic activity, and drought conditions have precipitated rapid sedentarization. At the time of the 1977 census, the Tagant was not benefiting from economic developments, and its expanse was traversed with great difficulty, even by four wheel drive vehicles. Sedentarization was primarily due to the drought. Three years later, there is yet no road envisioned for the region. There has been talk of a large irrigation project, which might eventually have the effect of encouraging some nomads to sedentarize, but for now this project remains tentative. In the short run, at least, poor rainfall and accompanying economic hardship will continue to be the principal determinants of sedentarization. We have thus assumed for our projections that the most massive response to the drought occurred in the mid-seventies, after the most severe years of deprivation, and that since that time the very high rate of sedentarization has been gradually declining. While the 1977 census indicates an annual attrition rate of 5.2 percent, (subsuming 2.5 percent natural increase) we have constructed the decay curve to reflect a current annual rate of 3.3 percent, becoming 2 percent annually toward the end of the century.

Sedentary Population. The sedentary population of the Tagant is scattered among some 70 settlements, among them the two rather sizable towns of Moudjeria and Tidjikja. Current growth is a steep 8.3 percent per annum, an immediate reflection of the sedentarization phenomenon. Most of this growth is probably concentrating in small, newly established villages. By 2000 growth of the region's sedentary population should have dropped to between 2 and 2.5 percent annual increase, with population in that year close to 82,000.

TABLE 3.2.9 POPULATION PROJECTIONS, REGION 09: TAGANT[a/]

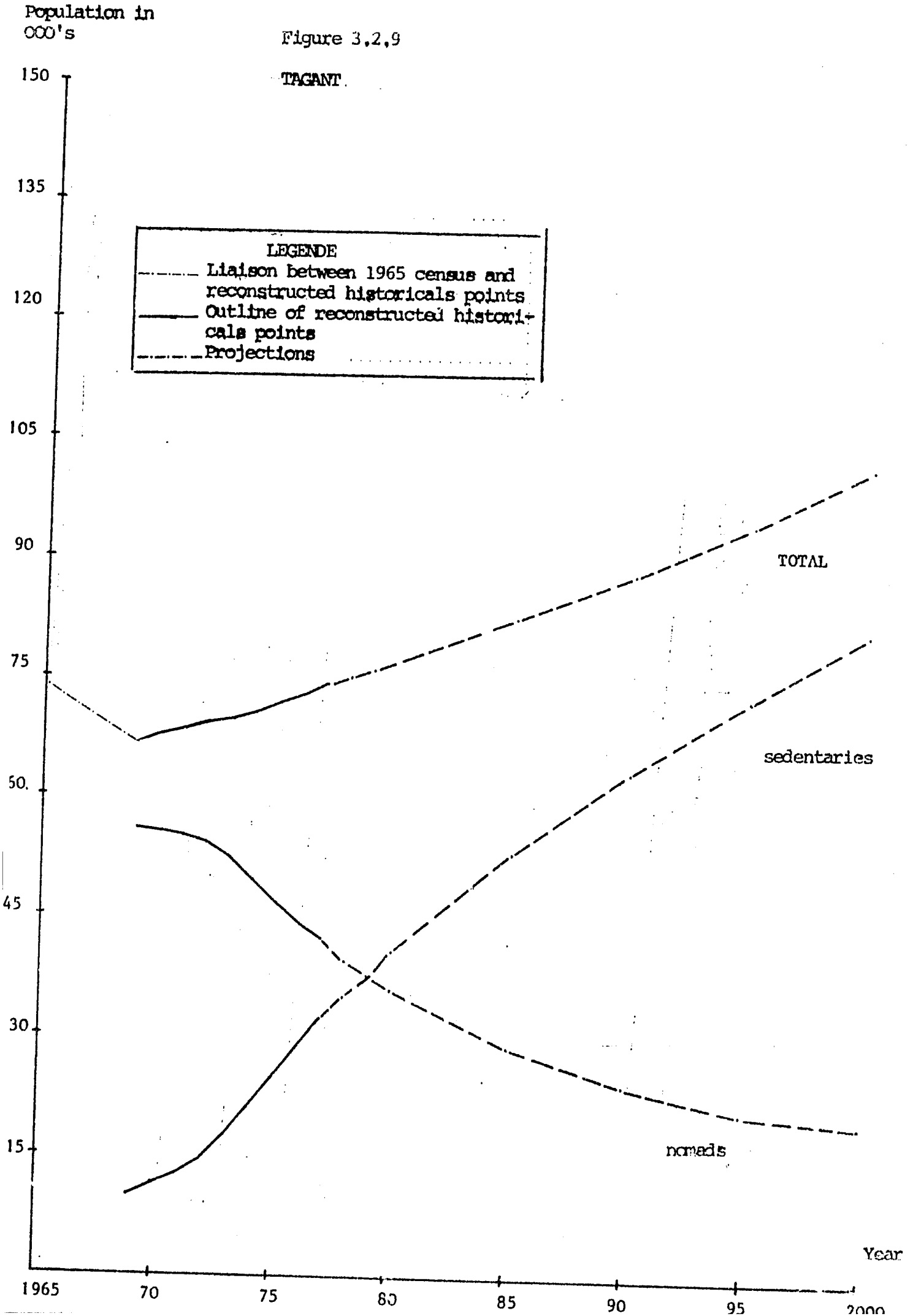
	Population in 000's				Growth Rates (Average Annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	43+	37	25	20	-3.9	-2.2	-3.0
Sedentary	33+	41	64	82	4.6	2.5	3.5
Total	75+	78	89	102	1.3	1.4	1.4

a/ Under assumptions fo 2.5% annual natural increase, held constant through 2000.

\+ Discrepancy in total due to roundring.

Figure 3,2,9

TAGANT



3.2.10 Guidimakha

Guidimakha, geographically Mauritania's smallest administrative region outside of Nouakchott, is one of the few regions where net in-migration has been positive over several years. The area is seen to have development potential, and undoubtedly much of the inflow can be attributed to labor migration. Of the regions in the interior, Guidimakha now has one of the highest per capita densities, and despite relatively favorable conditions, it is doubtful that the region can or will sustain continued expansion in excess of the rate of natural increase.

Two curves depict alternative developments for the region (see Figure 3.2.10 and Table 3.2.10). Curve X, used to derive projections in Appendix Table A shows growth at gradually decreasing rates, implicitly assuming that environmental constraints will gradually limit growth. Curve X_1, on the other hand, reflects expansion at about 2.7 percent through the end of the century and assumes continued excess in-migration. For national-level analyses, values along curve X_1 may be substituted for value along Curve X without violating assumptions about national-level natural increase so long as X_1 series values are used for the neighboring regions of the Assaba and the Gorgol (see regional profiles in sections 3.2.3 and 3.2.4).

Nomadic Population. Guidimakha was the single administrative region where no nomads reported intentions to sedentarize. Consequently, only the Guidimakha should show increases in their numbers over the next twenty years. However, it is unlikly that the widespread sedentarization phenomenon will leave Guidimakha completely untouched. In fact, 15 percent of the nomads sampled in the region already considered themselves "fixed," though in absence of permanent physical structures required by the census definition of sedentary they were duly classified as nomadic. Transhumant Peulhs, defying those census definitions, follow their herds but also maintain a pied-à-terre; sedentarization for such nomads may be an even less precise act than for nomads in other areas. In the future, many of those nomads will undoubtedly erect the building or two necessary to make their encampments "permanent" and change their status from nomad

to sedentary. With this inevitability in mind, we have constructed the growth curve to show some minimal sedentarization--about 0.5 percent annually--and a growth rate only slightly inferior to that of natural population increase.

Guidimakha's total population also includes some 4000 nomads abroad. By 2000, this group--expanding at an assumed rate of 2.5 percent each year--should number almost 7000.

Sedentary Population. In the absence of notable nomadic sedentarization, expansion of the settled population beyond the rate of natural increase must be due to in-migration. As noted above, Guidimakha has known a steady net positive in-migration for several years. Guidimakha has a number of her sons abroad--many of them Soninke workers in France--and a tightening of immigration policies in foreign countries could buoy future in-migration. (Returning Soninke have been unusually faithful to their native region, generally preferring Guidimakha to Nouakchott and other areas.) Continued high in-migration is reflected in Curve Y_1, showing growth at 2.8 percent annually through 2000, when the population would reach 139,000.

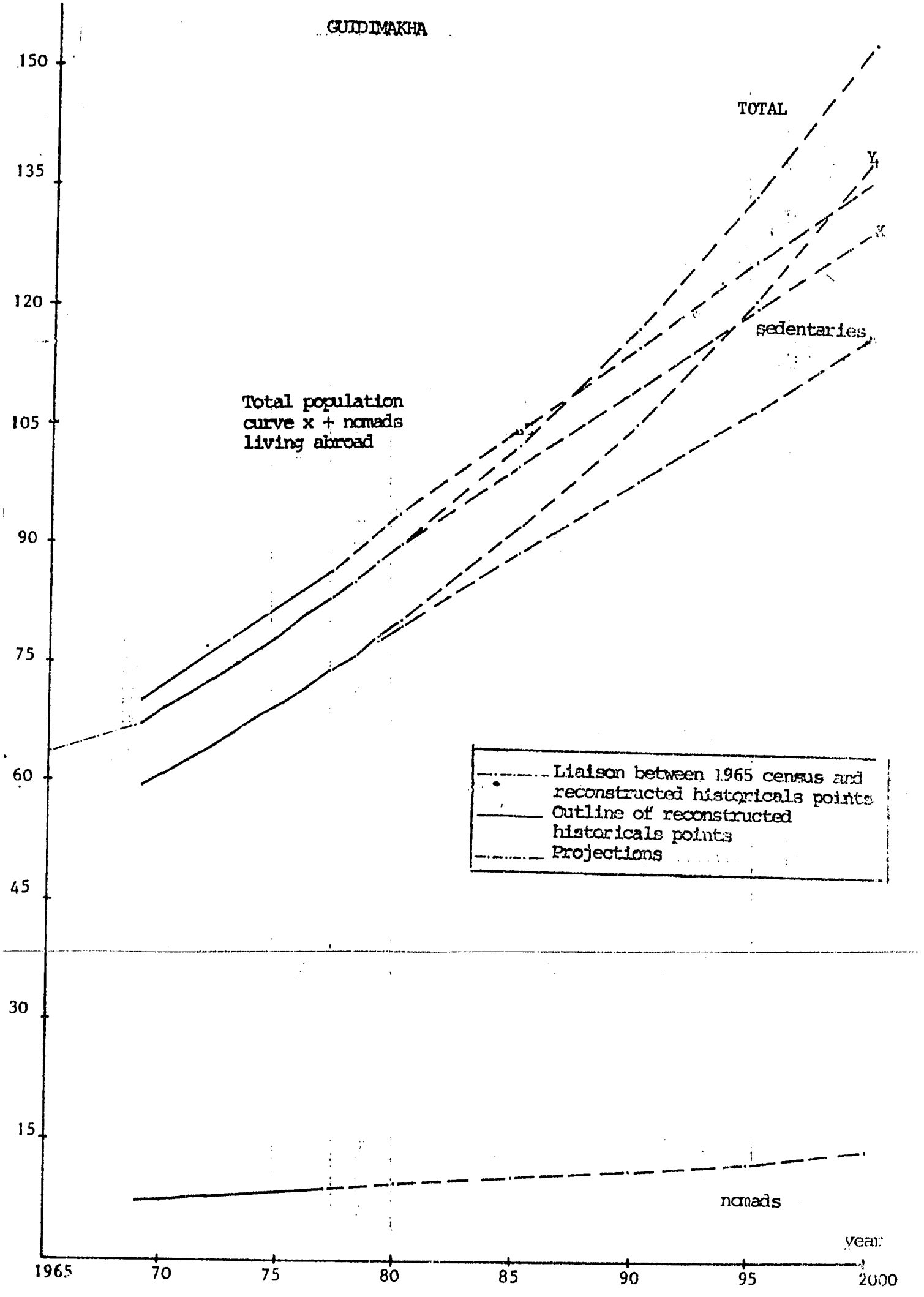
Alternatively and perhaps more realistically, Curve Y represents growth at a rate gradually descending below that of natural increase. Such a curve, putting the sedentary population at only 116,000 in 2000, assumes that Guidimakha's attraction for in-migrants will decrease rather than increase in future years.

Selibaby was one of three cities of the interior to gain population from 1975 to 1977, but even so, growth was quite modest. Recent reports do not indicate a boom in the provincial capital, and consequently future growth seems most likely to spread itself evenly among the region's numerous agglomerations.

TABLE 3.2.10 POPULATION PROJECTIONS, REGION 10: GUIDIMAKHA[a]

	Population in 000's				Growth Rates (Average Annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	9	10	12	14	2.0	2.0	2.0
Sedentary	74	80	98	116	2.1	1.7	1.9
Total	83	90	110	130	2.0	1.7	1.9

a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.


GUIDIMAKHA
150
135
120
105
90
75
60
45
30
15
TOTAL
Y
X
sedentaries
Total population
curve x + nomads
living abroad
Liaison between 1965 census and reconstructed historicals points
Outline of reconstructed historicals points
Projections
nomads
year
1965
70
75
80
85
90
95
2000

3.2.11 Tiris Zemmour

Tiris Zemmour, a northern province relatively rich in minerals, has boomed over the last decade. In the seven years from 1970 to 1977, the region's total population grew an average 6 percent annually. Both mining activities and the Saharan conflict have played critical roles in the development of growth patterns. Final resolution of the war (that is, a definitive redistribution of military personnel) and the fate of the planned Guelb project will most certainly affect future growth. The principal total population curve (curve X) in Figure 3.2.11 and the numbers in Table 3.2.11a are based on the line fitting best the created historical data points. Implicit in these projections is an assumption that the net combined effect of the resolution of the war and the Guelb project when implemented will be to encourage a steady net inflow of about 500 individuals per year in the present period and near future. This inflow should diminish to less than 100 per year towards the end of the century. But it must be repeated: population trends in the North depend on both military and mining dynamics, and the future may take one of many different shapes depending on these factors. Possible alternative developments are discussed below in the section pertaining to the sedentary population.

Nomadic Population. See Section 3.2.12.

Sedentary Population. Tiris Zemmour's three major settlements--Zouerate, F'Derick, and Bir Moghrein--have been notably affected by either the war or by mining activities. Between one-third and one-half of the 1977 population in each of these three towns had become residents after 1973. The military represented more than one-third of Bir Moghrein's population.

Dependent as it is on the military and mining, the future holds many questions for the region. If the Guelb project develops on schedule, and if the military population in the region is not dramatically reduced, the population is expected to develop as indicated by Curve Y in Figure 3.2.11.

TABLE 3.2.11a POPULATION PROJECTIONS, REGION 11: TIRIS ZEMOUR[a/]

	Population in 000's				Growth Rates (Average Annual %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	1	1	1	1	-0.9	-0.9	-0.9
Sedentary	22	25	36	46	3.7	2.5	3.1
Total	23	26	37	47	3.6	2.4	3.0

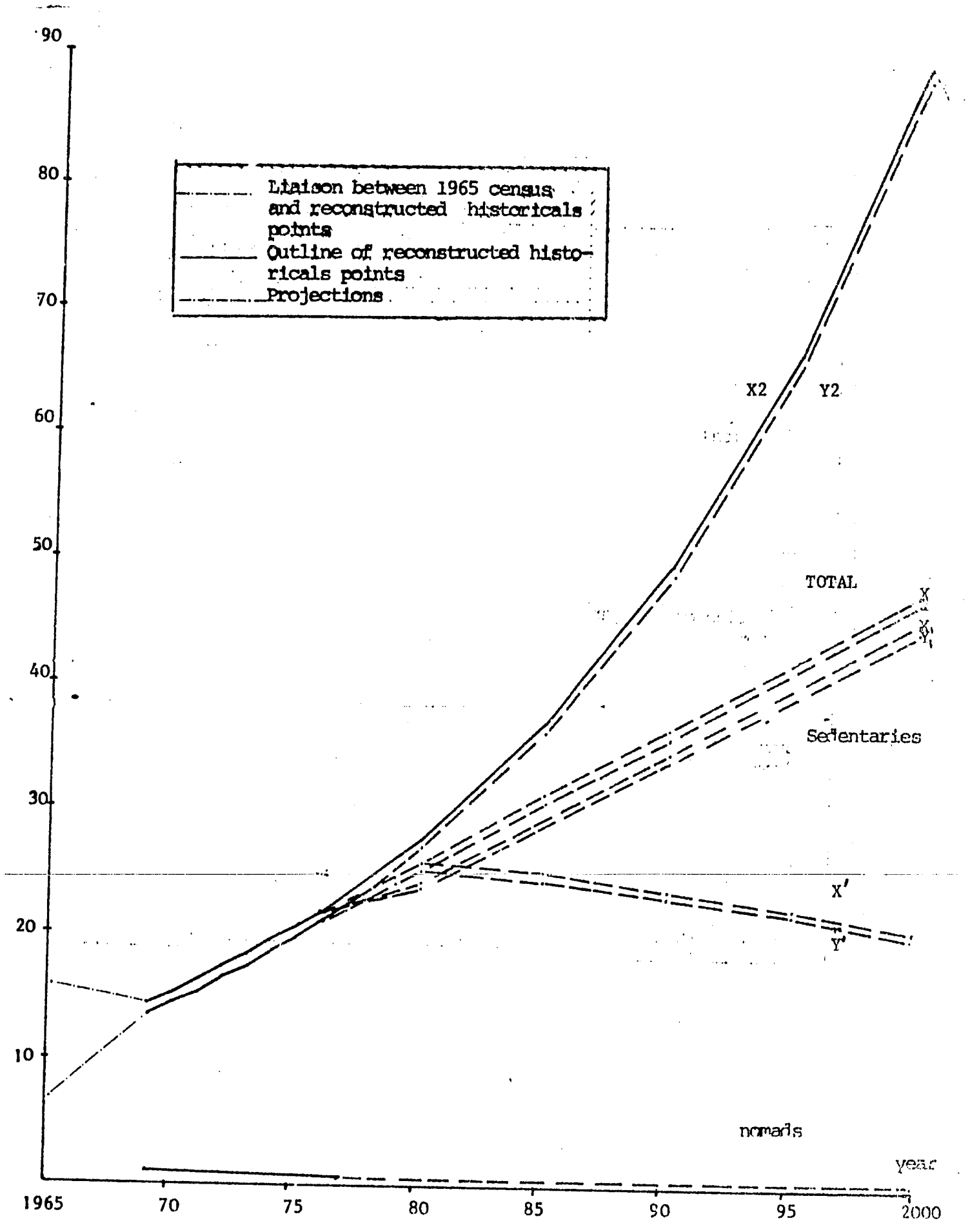
a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.

TABLE 3.2.11b TIRIS ZEMMOUR: Projections of the Sedentary Population Under Different Hypotheses (in 000's)

	Population Projections		
	1980	1990	2000
Curve Y -extension of historical trend	25	36	46
Curve Y_1 -one-time substantial reduction of military presence (before 1980)	23	34	44
Curve Y' -dramatic decline	25	23	21
Curve Y_2 -exponential growth at 6.1 percent	27	49	88

Figure 3.2.11

TIRIS ZEMMOUR



Should the Guelb project fold or should military personnel be withdrawn in important numbers, the region's growth will be severely stunted. Curve Y, traces a possible path indicating one-time substantial reduction of military presence (see Table 3.2.11b)[1/]. Curve Y', showing dramatic reduction in population, might well describe the population in the event of near-future gradual shutdown of mining operations in Zouerate--a likely development only should the Guelb project fail at the outset.

A final alternative scenario, graphically depicted by Curve Y, assumes exponential growth of the sedentary population at an average 6.1 percent per year through 2000. With perhaps some downward modification of the rate toward the end of the century, this scenario might well unfold. The now funded Guelb project will undoubtedly attract migrating labor, both domestic and foreign, and overwhelmingly high unemployment rates in Nouakchott could certainly drive the unemployed northwards at a rate far beyond that warranted by the anticipated Guelb mining operations. The medium-range projections (Table 3.2.11a) show a sedentary population of 46,000 in Tiris Zemmour in 2000, but the sedentary population in that year may find itself anywhere from a minimum of 21,000 to a maximum of 89,000.

3.2.12 Inchiri

Inchiri's achievement of an overall growth rate of very nearly zero (see Table 3.2.12a) is a reflection of the region's economic stagnation and continual out-migration and not of a decline in fertility. The provincial capital of Akjoujt knew a boom in the early 1970's when its copper mine, producing between 20 and 25 thousand tons of copper (metal equivalent) annually employed several hundred workers. As reserves were exhausted and mining activity gradually came to a halt (in 1978), most of the mining personnel left the region. Meanwhile, a steady out-migration, massive for the Inchiri population numbering only 18,000 in 1977, was never abated. In the boom years of 1973 and 1974, at least 1413 individuals left the Inchiri, many of them for Nouakchott. With mining activity now ceased,

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1/ Military presence has been inferred from census statistics. Official figures are not available.

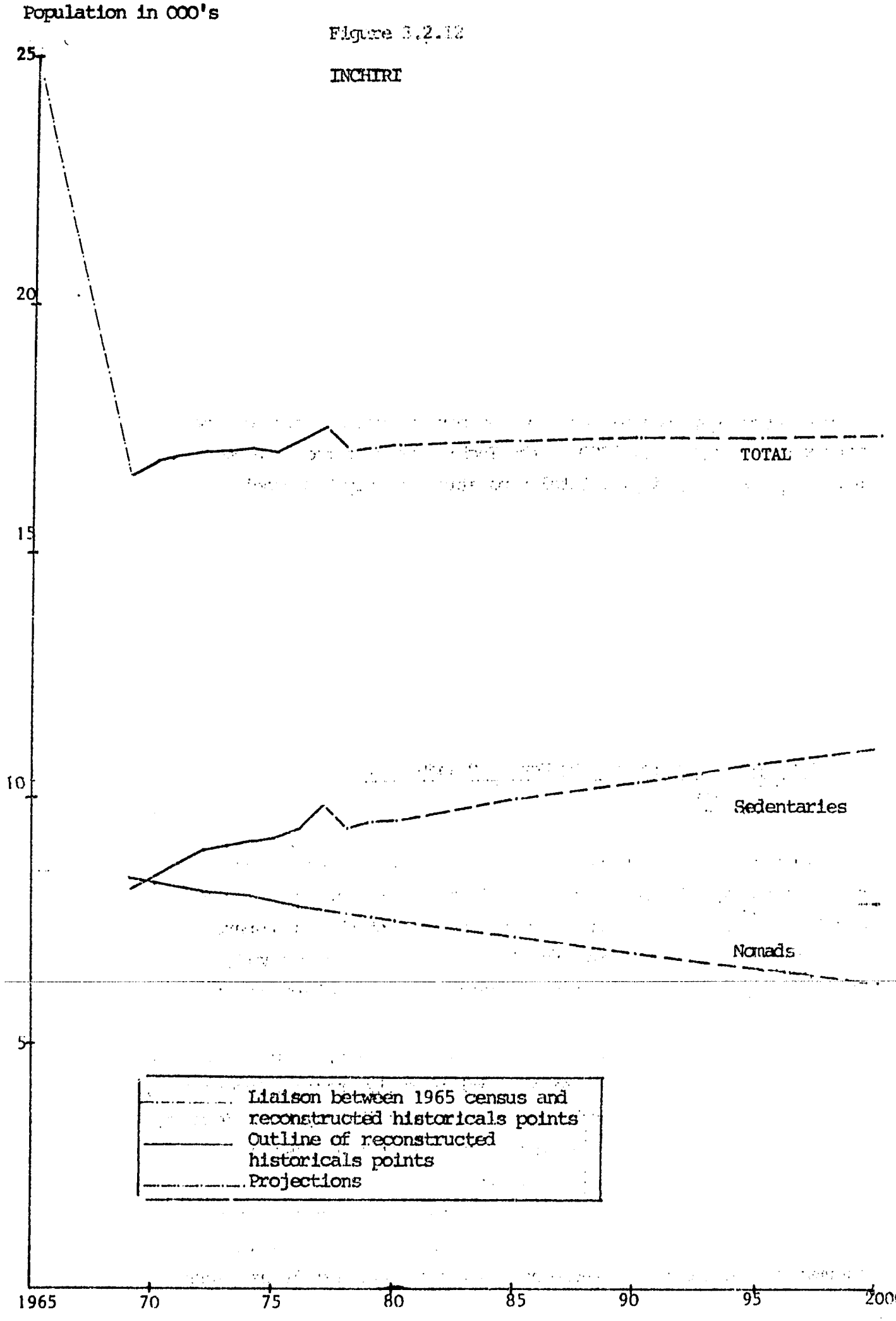
TABLE 3.2.12a POPULATION PROJECTIONS, REGION 12: INCHIRI[a/]

	Population in 000's				Growth Rate (Average %)		
	1977	1980	1990	2000	1980-1990	1990-2000	1980-2000
Nomadic	8	7	7	6	-0.9	-0.9	-0.9
Sedentary	10	10	10	11	0.8	0.7	0.7
Total	18	17	17	17	0.1	0.1	0.1

a/ Under assumptions of 2.5% annual natural increase, held constant through 2000.

Figure 3.2.12

INCHIRI



this trend will no longer be disguised.

Readers comparing this discussion with the graphic display of the region's growth (Figure 3.2.12) will be puzzled by the sharp peak and sudden descent portraying growth from 1975 to 1978. Data points from 1975 to 1977 are derived from the census: presumably the sudden increases are from military reinforcements placed along the region's northern border and slight augmentation of mining personnel in preparation for the shutdown. The projection of a descent from 1977 to 1978 should perhaps be spread over two years, but it is intended to represent labor exodus at the mine's closing. Growth curves were calculated from the base of data points for the more stable periods. By 2000 the Inchiri is expected to have seen a net increase in its total population of only 250 people beyond its estimated 1980 level of 17,200.

Readers may also note the sharp discrepancy between the 1965 census estimates and our recreated historical data points. Sampling procedures used in the 1965 census were especially tenuous for the northern provinces, and in this case resulted in a probable overestimation of about 5000 people.

Nomadic Population of the North (Nouadhibou, Tiris Zemmour, and Inchiri).

Nomads of the North have long been dependent on camels and camel-facilitated trade: 90 percent of their herds are composed of camels or camels in combination with other livestock (as compared to 30 percent in the southern provinces). Because they normally travel great distances in search of pasturage, maintaining camps in the southern reaches of the area during the winter months and heading north toward Morocco during the drier season, it is difficult to fix them in any single administrative region. Accordingly, the nomads of the three northern provinces--Nouadhibou, Tiris Zemmour, and Inchiri--are treated as a single group in this discussion.

The 1977 census estimated that less than 10,000 nomads spend at least half of their time in the North. (Table 3.2.12b presents an estimated distribution of these nomads for current and future years,

TABLE 3.2.12b Nomadic Population of the North: Projections Through 2000.

Region	Projections		
	1980	1990	2000
08 Nouadhibou	70	60	50
11 Tiris Zemmour	700	650	600
12 Inchiri	7400	6900	6400

3.2.13 Nouakchott

A place of refuge for those for whom rural life has become untenable, Nouakchott has been growing at phenomenal rate since its establishment as the nation's capital in 1960. In twenty years it has metamorphized from a nondescript village of 2000 inhabitants into a patchwork, sprawling town of 173,000 that is coming to know a plethora of urban problems, but because regional samples were small, these numbers cannot be seen as statistically reliable. The war in the Sahara probably disrupted nomadic life somewhat, but it has also undoubtedly spurred some lucrative trade. In fact, assured demand for supplies which must be carried impressibe distances over difficult terrain may explain the relatively low 3.3 percent annual sedentarization among this group. Should sedentarization continue at this rate through the end of the century, these nomads will still number about 8,000 in 2000.

Sedentarization is modest, but where it occurs it means an abrupt transition from nomadism to the ways of the city, for harsh conditions in the North will not permit a scattered sedentary population. Of the 322 nomads who expressed an intention to sedentarize in 1977, 306 indicated they would go to some city other then Nouakchott--a city unnamed in census data compilations, but presumably Zouerate.

Sedentary Population. Growth in the sedentary population is projected at a modest average annual rate of about 0.7 percent over the 1980-2000 period, and it will concentrate primarily in the town of Akjoujt. The agricultural use of water originally intended for the now defunct copper mine may become responsible for a noticeable revitalization of Akjoujt, diverting the flow of Inchiri residents from its now established path to Nouakchott. The exodus the region has known in recent years might thus be restrained, but the foreseeable future does not contain a reversal of the established trend of out-migration. Projections in Table 3.2.12a show a sedentary population of only 11,000 for the year 2000. Even should agricultural development in Akjoujt manage to reduce the out-migration stream by half, Inchiri's sedentary population will not exceed 12,000 in that year.

The growth of Nouakchott can be explained only in terms of the population dynamics in other parts of the country. Nouakchott undoubtedly has appeal for many individuals in upper cadres, for it is the country's administrative center, but it has a negligible industrial base and employment opportunities are rare. The "urban pull" rationale—heightened demand for labor, availability of urban services, and simply the attraction of city lights—explains very little of the city's past rapid expansion. Prices in Nouakchott soar, labor demands is low, services are inadequate, and big city appeal is limited, for Nouakchott is far more the overgrown small town than the metropolitan center.

A "rural push" explanation makes more sense. Since the late sixties Mauritania's most populous areas have known drought conditions, and urban centers throughout the country saw at least temporary swelling of their population as nomads whose herds had been decimated fled to where was at least hope of survival. Nouakchott, however, was more than a simple place of refuge. The city became a distribution center first for international relief and later for highly valued urban terrains. Speculators stood by, and many fortunes were made in the local real estate market: lucky indeed was the squatter who suddenly found himself owner of urban property which could readily be sold or rented.

The flight to Nouakchott was certainly encouraged by governmental giveaway programs, and it was enormously facilitated by the completion of the first 200 kilometers of the trans-Mauritanian highway in the late 1970's. About 15,000 people came to settle in Nouakchott in 1976, and we anticipate that close to 10,000 people will make their way to the capital city each year through the end of the century. Some will come as households, perhaps bringing herds to sell or maintain in reduced numbers in the city's outskirts. More common now, though, seems to be the migratory drift of individuals unencumbered by their families. A Nouakchott family with assured income knows that one by one relatives from the country's interior will come to share their abode. And nothing limits the in-migration to relatives. Upper-caste Maures are often asked by relatives

in rural areas to give harbor to a stray child whose own parents were not able to support him; others find complete strangers temporarily joining the ranks of their domestic staff in exchange for a meal which cannot be refused.

How long the migratory flow will continue at its present rate cannot be determined. Urban unemployment is currently estimated at about 25 percent. Under-employment is substantial as well. It seems likely that at some point the urban employed will refuse to accept responsibility for unemployed relatives who would seek their fortune in th[illegible]y. And two or three successive years of good rainfall migh[illegible]me of the urban destitute joining relatives in rural areas o[illegible]king at least seasonal employment in agricultural activities.

Curve X, our primary curve showing population increases at gradually declining rates through 2000, has been constructed as a function of anticipated rends in the twelve other regions (see Figure 3.2.13 and accompanying Table 3.2.13). Barring radical changes in the interior that could alternatively divert or spur the flow of in-migration, Nouakchott in 1995 will have nearly doubled its present population of 172,000. By 2000, the population will have reached well over 500,000, increasing an average 5.2 percent annually during the last decade of the century.

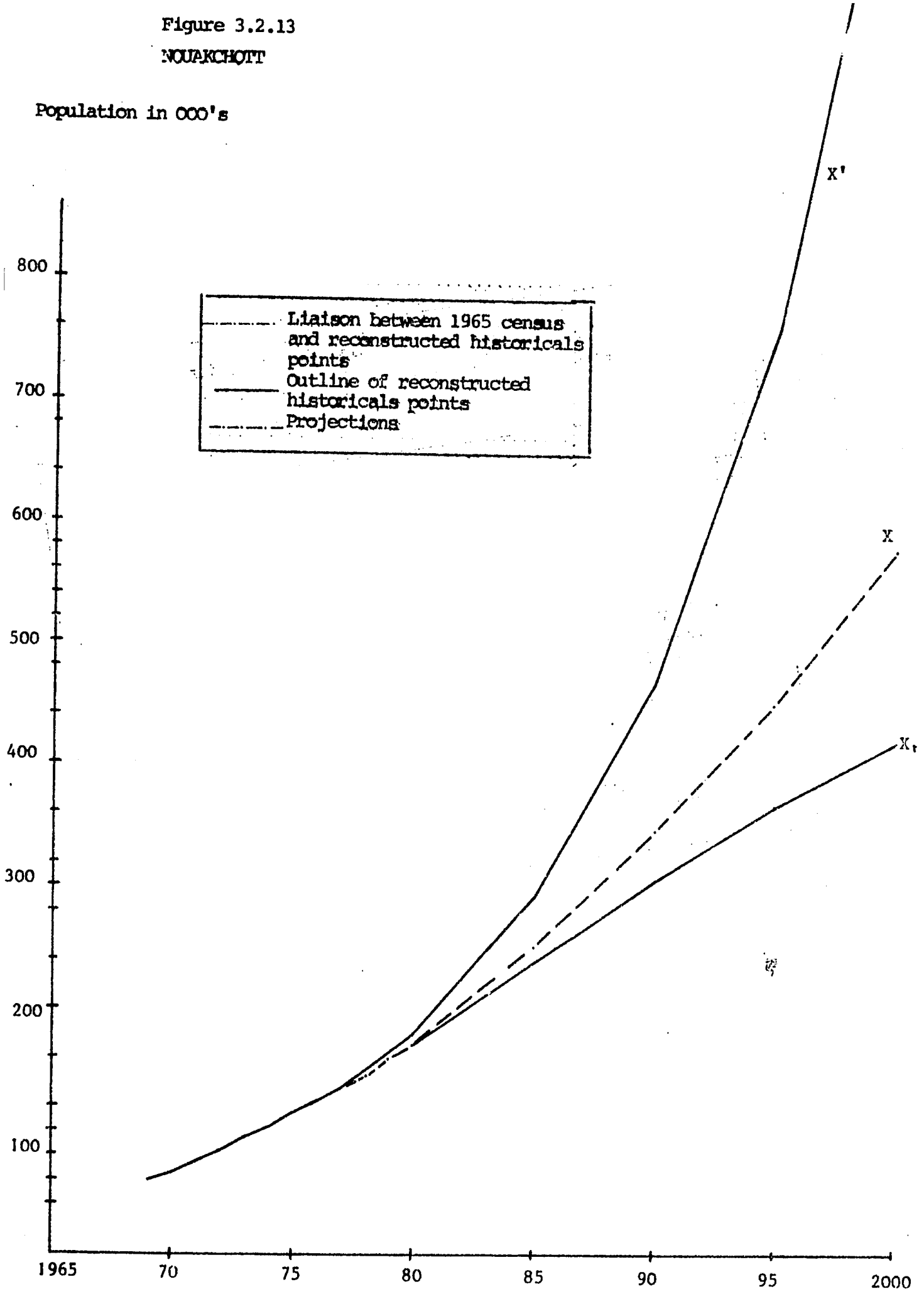
Even such modest predictions, however, risk overestimating the population. Nouakchott's economic foundation is anything but solid and the multitude of marginal businesses that have been built on it grows ever more precarious. Even if the whole structure doesn't one day come tumbling down, at some point those who wished to tack on their own shop or profit from someone else's will perceive that opportunities in Nouakchott are no better than opportunities in the interior. In constructing Curve X_1, we have supposed that such a trend will begin by 1985 and gradually strengthen through the end of the century, when Nouakchott's population would grow at little more than the hypothesized average annual 2.5 percent natural increase. This curve reflects minimum growth conditions for Nouakchott

TABLE 3.2.13 NOUAKCHOTT: Population Projections Under Different Hypotheses (in 000's)

Conditions	Population Projections		
	1980	1990	2000
Curve X -gradually declining rates of increase	173	345	574
Curve X_1 -minimum growth conditions (gradual) decline to 2.8 percent)	172	303	418
Curve X' -exponential growth at 10 percent	179	465	1,206

Figure 3.2.13

NOUAKCHOTT



through 2000[1/].

On the other hand, deteriorating rural conditions and corresponding improvements in Nouakchott could encourage further urban expansion. Moreover, the completion of the trans-Mauritania highway could have effects beyond those we have indicated, and present high growth rates could persist. The GIRM Census Bureau estimates that the population has grown at an average annual rate of 10 percent since 1977, and should expansion continue at this rate, population in 2000 would reach 1.2 million--or almost 60 percent of the country's sedentary population in that year.

1/ This hypothesis cannot but imply that such a trend would bring about dramatic social and economic upheavals. Indeed, the existing social and administrative infrastructures of the city would never be able to keep up with this pace of growth and a growing lack of satisfaction may well direct people to settle in areas of different attraction, for example, along the newly constructed roads, as intermediary and even final stages of sedentarization. This still makes it possible for them to be in relatively close contact with urban services.

3.3 Regional Profiles: Summary and Conclusion

3.3.1 A Comparison of Regional Growth Patterns

A quick glance at Table 3.3.1, assembling growth rates presented separately in the regional profiles, is instructive. Rapid growth characterizes only the three administrative regions with some claim to a modern economy: Nouakchott, Nouadhibou[1/], and Tiris Zemmour (Zouerate). Every other region, with the possible exception of the Assaba, is forecast to experience net out-migration over the next ten years and probably through the end of the century. The Adrar and Inchiri will lose relatively more population that any other regions.

Dramatic changes will have transpired within some regions, by the end of this decade. Settling nomads in the Hodhs, the Assaba and the Tagant are expected to boost those regions' sedentary population's growth to levels well above that of natural increase. Further study of settlement patterns in these regions is necessary if planners are to anticipate adequately the upcoming changes in the demand for services.

1/ In view of Nouadhibou's apparent population loss from 1975 to 1977, further studies of the city's current growth dynamics are warranted. Prudence demands that population growth rates be verified before investment in social infrastructure is made in this town, isolated as it is from the Mauritanian heartland.

TABLE 3.3.1 Average Annual Growth Rates by Region, 1980-1990 and 1990-2000 (in %)

Region	Total Regional Population		Sedentary Population	
	1980-1990	1990-2000	1980-1990	1990-2000
00 Nouakchott	7.12	5.22	7.12	5.22
01 Easter Hodh	1.86	1.58	4.18	2.88
02 Western Hodh	1.91	1.98	5.01	3.32
03 Assaba	2.14	2.64	3.30	3.54
04 Gorgol	1.75	1.44	2.05	1.65
05 Brakna	1.19	1.06	2.90	1.51
06 Trarza	1.02	0.89	2.55	1.93
07 Adrar	0.09	0.09	1.18	0.86
08 Nouadhibou	6.95	6.95	6.95	6.95
09 Tagant	1.33	1.37	4.55	2.51
10 Guidimakha	2.03	1.68	2.05	1.78
11 Tiris Zemmour	3.59	2.42	3.71	2.48
12 Inchiri	0.07	0.07	0.76	0.66

3.3.2 Changing Geographic Distribution of the Population

3.3.2.1 Population Density

Projected regional population densities are shown in Table 3.3.2.1. Because much of Mauritania is desert wasteland, a ratio of population to total land surface can be misleading. One readily sees that regions to the south have the highest population outside of Nouakchott, but in the absence of an estimate of inhabitable land surface, only a few more telling statements can be made.

First among these is that, barring expansion of the city's boundaries, Nouakchott's per capita land space will suffer a threefold reduction, from 0.0007 km^2, over the next twenty years. Space accommodating 1400 individuals in 1980 will be expected to shelter 4800 individuals in 2000.

Secondly, density in the more fertile areas of the South will be increasing. If one supposes that regional populations are concentrated in relatively fertile areas and that at present most inhabitable land is occupied, then by 2000 the current human charge upon the land in most of Mauritania's greener areas will have at least doubled. The expansion of inhabitable land through important irrigation projects may alleviate this increased burden somewhat, but any increased density will be accompanied by growing demand for fixed natural resoures (e.g., wood for charcoal), guaranteeing future strains.

TABLE 3.3.2.1 Projections of Population Density, by Administrative Regions

Region	Land Surface (Km^2)	Estimated/Projected Density (Population per km^2)			
		1977	1980	1990	2000
00 Nouakchott	120.0	1122.5	1441.7	2875.0	4783.3
01 Eastern Hodh	182.7	0.4	0.5	0.7	0.9
02 Western Hodh	53.4	1.1	1.4	2.2	3.1
03 Assaba	36.6	2.3	2.6	3.6	5.0
04 Gorgol	13.6	9.8	10.4	12.8	15.1
05 Brakna	33.0	3.1	3.7	[illegible].9	5.7
06 Trarza	67.8	1.6	1.8	2.3	2.8
07 Adrar	215.3	0.2	0.2	0.2	0.2
08 Nouadhibou	22.3	1.1	1.3	2.6	5.1
09 Tagant	95.2	0.3	0.4	0.7	0.9
10 Guidimakha	10.3	7.2	7.8	9.5	11.3
11 Tiris Zemmour	252.9	0.9	1.0	1.4	1.8
12 Inchiri	46.8	0.2	0.2	0.2	0.2

a/ From GIRM, Bureau Central de Recensement, "Seconds Résultats Provisoires," p. 22

3.3.2.2 Population Distribution by Agro-Ecological Zones

Populous parts of the Mauritanian territory can be divided into five agro-ecological zones and a sixth special zone consisting of the country's few moderately industrial urban centers (see Table 3.3.2.2a). Zone 1 delineates the alluvial valley of the Senegal River extending westward is Zone 2, including savannah lands and characterized by rainfed agriculture and livestock production. Zones 3 and 4 appear intermittently on a map of the country, and often overlap. Respectively, they are characterized by the practice of recessional agriculture facilitated by dams and the oases cultivation of date palms. Zone 5 accounts for most of Mauritania's least productive land, supporting only land-extensive pastoralism. A final residual category, though not properly an "agro-ecological zone," identifies four modern urban centers: Nouakchott, Nouadhibou, Akjoujt and the Zouerate-F'Derick complex. (See Baseline Study I for a complete description of these zones.)

Population analyses by agro-ecological zones have proven difficult because census data did not always lend themselves neatly to zonal classification. Our most satisfactory solution was to use information available from the village file to code Mauritanian settlements village by village according to agricultural practices employed. Where zones overlapped--primarily between Zones 3 and 4--codes were assigned according to the predominant agricultural activity. Thus oases where date palm cultivation is secondary to recessional agriculture were assigned to Zone 3 (recessional agriculture), and vice versa. Readers should be aware that while these two zones identify distinct agro-ecological modes, they often are complementary systems which on the basic of 1977 census data alone cannot be differentiated easily. Consequently, analysts making further use of the data presented here may prefer to collapse these two zones.

A second caveat should be attached here. As might have been expected, the raw village file data did not always correspond to baseline data used throughout this report, derived exclusively from the individual file data. Relevant village file data, thus, were adjusted for consonance with those individual file data, presumable without gross distortions.

Table 3.3.3.2 :

Descriptive Table of Agro-Ecological Zones

Zone Number	Name	Activities Determining Choice of Zone	Physical Limits	Other Major Activities
1	Senegal River Valley	Recessional agriculture in "walo", irrigation. Complementary cultivations of "dieri"	Alluvial valley of the River	Livestock production Fishing
2	Rain-fed agriculture	Generalised practise of rain-fed cultivations. Millet predominant	Stretches northward from isohyet 450 mm, occasionally reading isohyet 350 mm.	Livestock production (transhumant and nomadic) is the principal activity
3	Recessional agriculture of wadis	Various agricultural dams, mostly of traditional type where recessional agriculture is practised in the area behind the dams (chiefly sorghum)	Impervious rocky substrations; high lands, "rags", physical limits absent in very sandy areas	Livestock production (transhumant and nomadic) is the principal activity
4	Date-palm plantations (oasis)	Practice of date-palms cultivation	The average temperature is above 28°C. Presence of alluvial acquifers. Date-palm plantation mainly in elevated areas	Livestock production is secondary. Various secondary cultivations: cereals, vegetable production
5	Pastoral	Raising of camels, goats, sheep and cows	The rainfall pattern, pasturelands and water points are the major constraints on livestock production	The extensive livestock production is practically the only activity. According to rainfall patterns, small areas of temporary rain-fed agriculture appear

The adjusted data reveal the current population distribution depicted in the left panel of Figure 3.3.2.2. The two chiefly pastoral zones, Zones 2 and 5, still represent the majority of the population, tho 16 percent of the population is to be found in the more "modern" urban environments.

The eventual transformation of this distribution, of course, depends upon inter-zonal dynamics. In the absence of firm data regarding inter-zonal migration, several assumptions have guided this analysis of zonal dynamics and underly the population projections by agro-ecological zones presented in Table 3.3.2.2b. These assumptions depend in large part upon the discussion of regional profiles presented earlier in this chapter.

Zone 1. The Senegal River valley currently loses many of its people to international emigration and migration toward cities in other zones. Nonetheless, it is one of the more economically viable areas and its growth is presumed to be keeping up with the rate of natural increase. Our projections include a supposition that investment projects along the river's edge will attract additional population to this zone by the end of the century. The failure of these projects might mean that in 2000 the urban population would be increased by an additional 12,000 people.

Zone 2. The population of Zone 2 is now about one-third nomadic and two-thirds sedentary, and thus the consideration of sedentarization patterns for projecting population development in this zone is most important. Presumably, settling nomads in this area are those whose lifestyles are most likely to evolve from nomadism to transhumance. Analyses here assume that the nomadic component of this zone will shrink to about 15 percent by 2000, but most of these nomads will "settle" (or will begin practicing semi-nomadism) without changing zones.

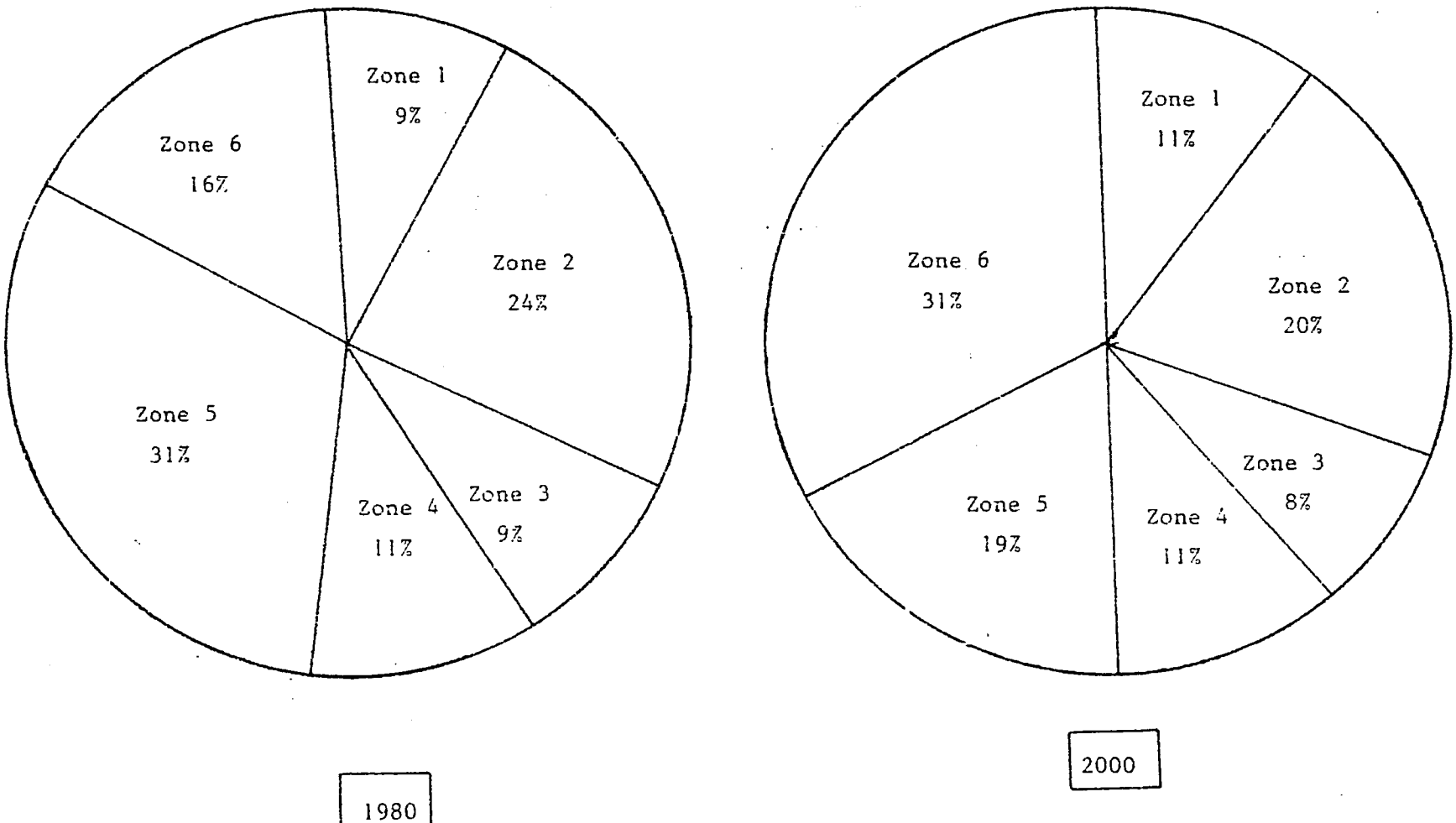


Figure 3.3.2.2.--Population Distribution by Agro-Ecological Zones, 1980 and 2000.

Table 3.3.2.2b Population Estimates and Projections by Agro-Ecological Zones, Assuming Constant Natural Increase of 2.5% Annually (in 000's)

Agro-Ecological Zone	Population			
	Estimates		Projections	
	1977	1980	1990	2000
Zone 1 - River	125	136	182	257
Zone 2 - Rainfed Agriculture	315	342	416	463
Zone 3 - Recessional Agriculture (Wadis)	111	122	155	181
Zone 4 - Oases	134	153	210	270
Zone 5 - Pastoralism	470	453	441	457
Zone 6 - Modern Urban	185	237	448	743
TOTAL	1340	1443	1852	2371

Source: RAMS calculations

Current growth is largely a function of the southward movement of nomads and semi-nomads in search of greener pastures. This trend should be encouraged by the current road construction.

Figures presented here reflect a supposition that eventually the completed road--now without the advantages provided by the temporary MENDES watering holes--will serve to siphon westward the more economically marginal elements.

Zone 3. The areas identified by inland recessional agriculture now represent--and should continue to represent--Mauritania's least populated agro-ecological zone. Although some nomads will eventually settle in these areas, drought conditions have increased risks associated with the practice of recessional agriculture and thus have made life in this zone yet more tenuous.

Zone 4. Oases are reportedly experiencing a period of growth. Moors have long maintained date palms in these areas, and as drought conditions have made pastoralism less viable, such pieds-à-terre are becoming more important for subsistence. Our figures reflect a continuation of this trend.

Zone 5. Almost 70 percent of the population in this relatively barren zone is currently nomadic; consequently, this region will be affected more than any other by the continuing trend of sedentarization. By the end of the century, less than half of this zone's population will be nomadic. It is expected that some settlements along the interior roads will increase in population, as have Boutilimit and Tingan in recent years, but conditions in this zone, adverse to all activity but extensive pastoralism, warrant the assumption that most sedentarizing nomads from this area will settle in other agro-ecological zones. (Specifically, most of

the settling nomads in the Trarza and the Brakna are expected to move either to nearby expanding centers or toward Nouakchott; settling nomads in the Tagant are expected to establish themselves, at least initially, either in oases or in the wadi areas. The numbers in Table 3.3.2.2b reflect a combination of these two trends (growth of a few settlements and zonal out-migration of nomads). According to the projection of these two trends, only near 2000 will the diminishing number of settling nomads allow this area to know a gain in population.

Zone 6. The Mauritanian urban sector, now growing at about 9 percent annually, is expected to expand at about 5 percent during the century's last decade. For discussion of specific urban centers, readers are referred to the regional profiles above.

With these assumptions in mind, the zonal distribution of the population appears to be undergoing important changes. The right panel of Figure 3.3.2.2 shows that by 2000 urban living (Zone 6) will have made rapid gains on the modal pastoral life (Zones 2 and 5). Only the tentative signs of a positive growth rate in Zone 5 from 1990-2000--itself dependent upon the accuracy of our predictions about nomadic sedentarization--gives any indication that this process may stabilize near the end of the century.

Chapter 4

MAURITANIAN SOCIAL STRUCTURES: A STATISTICAL PROFILE

4.1 Introduction

The 1977 census makes available important data concerning social characteristics of the Mauritanian population, including:

- population distributions by age-groups and gender;
- household size and marital status;
- professional qualifications;
- professional activity (including herding activity for nomads);
- literacy;
- level of education;
- sociological data concerning the nomadic life style (size of encampment, distance traveled, and so forth).

The raw data have recently been processed, but unfortunately not in time for consideration by RAMS in this study[1/]. Because only limited analysis was possible, this chapter is primarily as recapitulation of basic census data intended to serve as a basis for further investigation by other RAMS and other researchers.

4.2 Population Distribution by Gender and Age

The simplest way to study population structure by age and gender is to construct an "age pyramid." A stable population having sustained no demographic trauma (such as war or sudden immigration) should be characterized by gradually declining numbers in each successive age group from young to old. Demographic response to unusual events should be reflected by abberations in the pyramid's form.

1/ Readers should note that the Census Office Bureau is currently undertaking some of the necessary analysis.

Our age pyramid based on Mauritania's total resident population (including resident foreigners) is presented in Figure 4.2. To adjust anomalies resulting from over-reporting of births in years of historical significance,[1/] we have constructed the pyramid by five-year age groups. Care should be taken in reading the pyramid: the horizontal scale refers to the number of persons of each age, not of each five-year age-group.

4.2.1 The 0-4 Age Group

One anomaly surfaces immediately: the 0-4 year age-group is only slightly larger than that of the 5-9 year age-group for males and is even smaller than the 5-9 age-group for females. This reduction of the lowest age cohorts becomes even more noticeable when single years are considered (see Figure 4.2.1). A sizable indentation—representing fewer births or at least fewer survivals of children born in 1974 and 1975 than in previous years—appears in the 1-2 and 2-3 year cohorts. Several explanations are plausible:

1) Many Mauritanians do not know their children's ages, and it is possible that there is a general tendency to assign babies to the 0-1 category and to claim that small children are older than in fact they are. Moreover, the unusually high ratio of males to females could be due to under-reporting of female children. Many African age pyramids show similar indentations, a fact which lends credence to this hypothesis.

2) The indentations may reflect unusually high infant mortality in years immediately following the drought (most severe in 1972-73). While it is possible that the adverse effects culminated in poor health and subsequent death of children born in years after the drought, the survival of a large percentage of the children born during or immediately after the worst years casts doubt upon this hypothesis.

1/ The tendency to report ages or year of birth in numbers ending in 0 or 5 is noted worldwide. We have used standard methods to adjust the data.

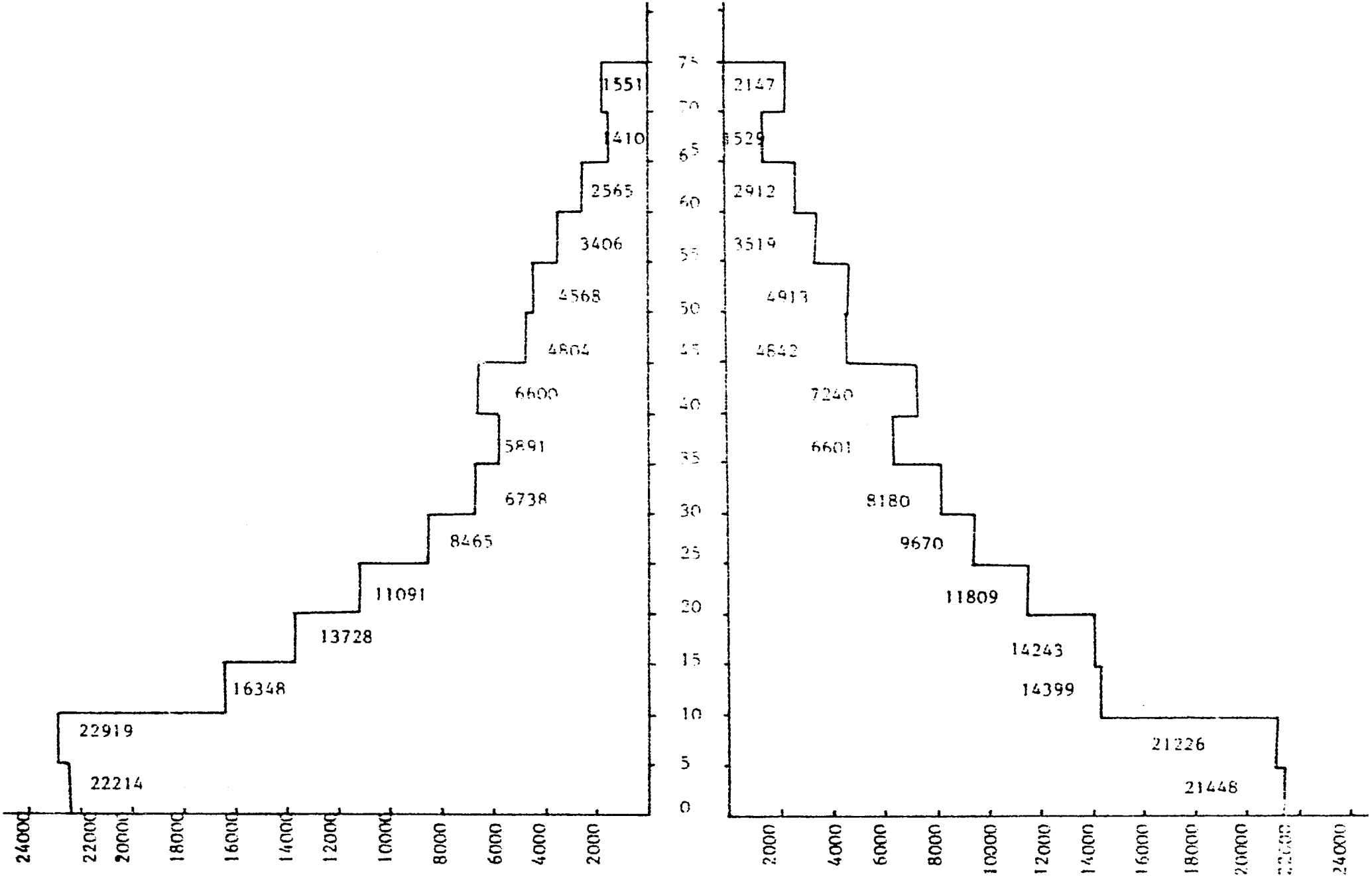


Figure n° 4.2.3a Age pyramid of the total population resident

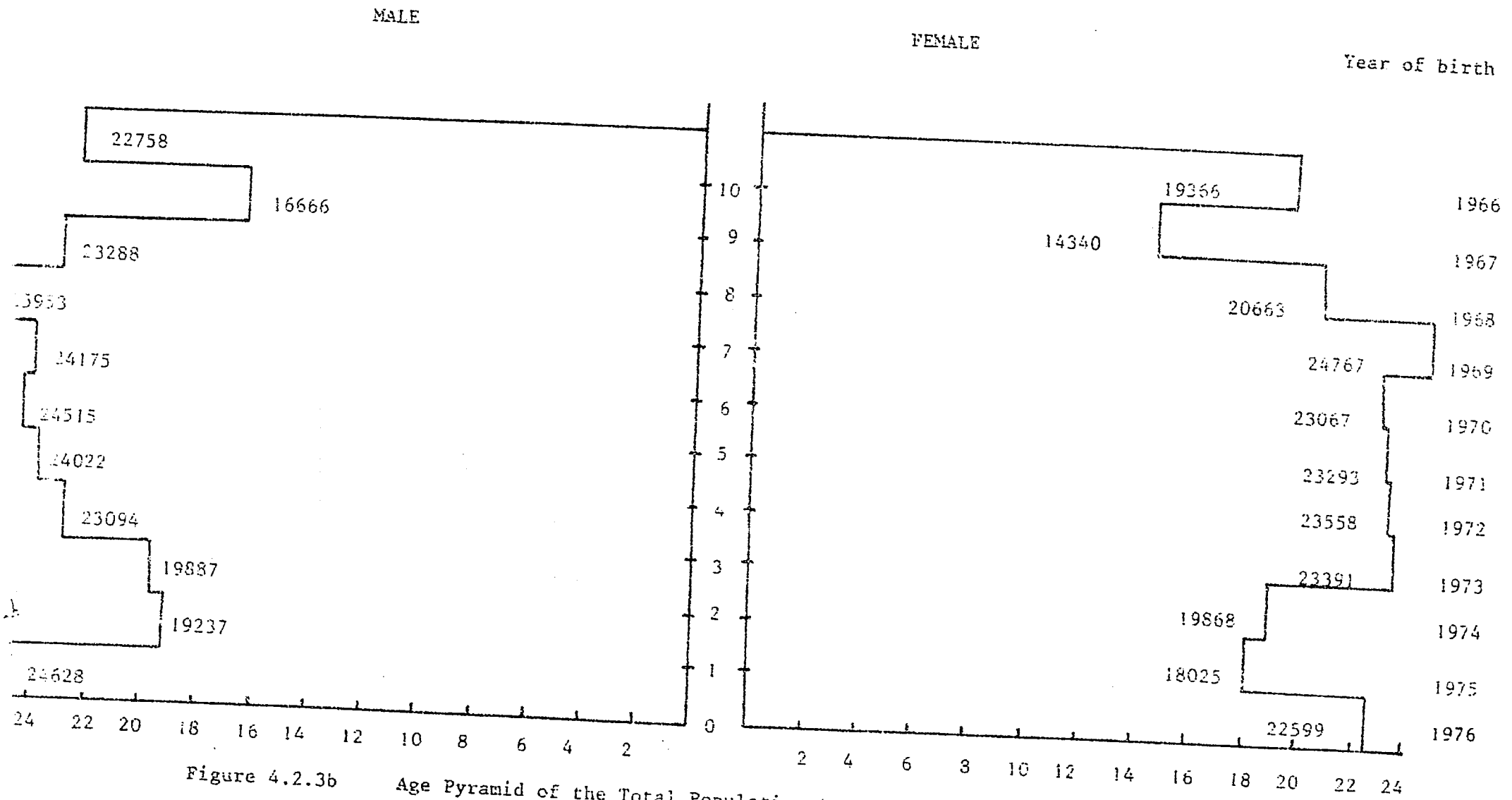


Figure 4.2.3b Age Pyramid of the Total Population Aged 0 - 10 Years Resident in Mauritania, 1 January 1977

3) More likely is the hypothesis that the indentation mirrors a delayed reaction to the drought . Demographers are now proposing that drought may have such an effect on fertility (as opposed to infant mortality). In a longitudinal study of Niger women, Faulkingham found that fewer children were born in 1974 and the first half of 1975 than in any other period from 1969 to the end of 1975.

4) Without contradicting any of these hypotheses, it can be argued that the 0-1 age group in the nomadic population (and consequently in the total population) is inflated. In conjunction with fertility questions, nomads were asked the number of children born between Aïd 1975 and Aïd 1976. Where control over census interviewers was not adequate, some of the children born between Aïd 1975 and January 1, 1976, may have been counted among those born in 1976. The number of children during this period was too small to hold such errors accountable for the indentation, though to the extent they occurred they are certainly contributing factors.

Unfortunately, we have no data upon which to make a choice among these hypotheses, but as the anomaly bears important implications for the evolution of the school-aged population and eventually the labor force, it deserves further attention. Field researchers may find some clues as they examine differences between nomadic and sedentary populations. The indentation is more marked among nomads than among the sedentary population, and it may be instructive to determine through field research to what extent this is due to nomads' being more uncertain about ages than are sedentary people (particularly in urban centers) and to what extent it might be attributable to drought conditions most severe among nomads, who would have been the last to benefit from international relief.

4.2.2 Sex-Ratios

A second anomaly appears in the 25-40 year age-groups, and is best understood in terms of sex-ratios, the number of males for every 100 females. As shown in Table 4.2.3, the sex-ratio declines through age 40, then jumps at age 40 to remain high until the decline begins again at age 60. In a stable population, one expects a ratio of about

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1/ Ralph H. Faulkingham, "Where the Lifeboat Ethic Breaks Down," Human Nature (October, 1978), pp. 31-39.

TABLE 4.2.3 Sex Ratios for the Total Resident Population (Males per 100 Females)

Age Group	Observed Sex Ratio
0-4	104
5-9	108
10-14	114
15-19	96
20-24	94
25-29	88
30-34	82
35-39	89
40-44	91
45-49	99
50-54	93
55-59	97
60-64	88
65-69	92
70-74	72

SOURCE: GIRM, unpublished census data (computer output).

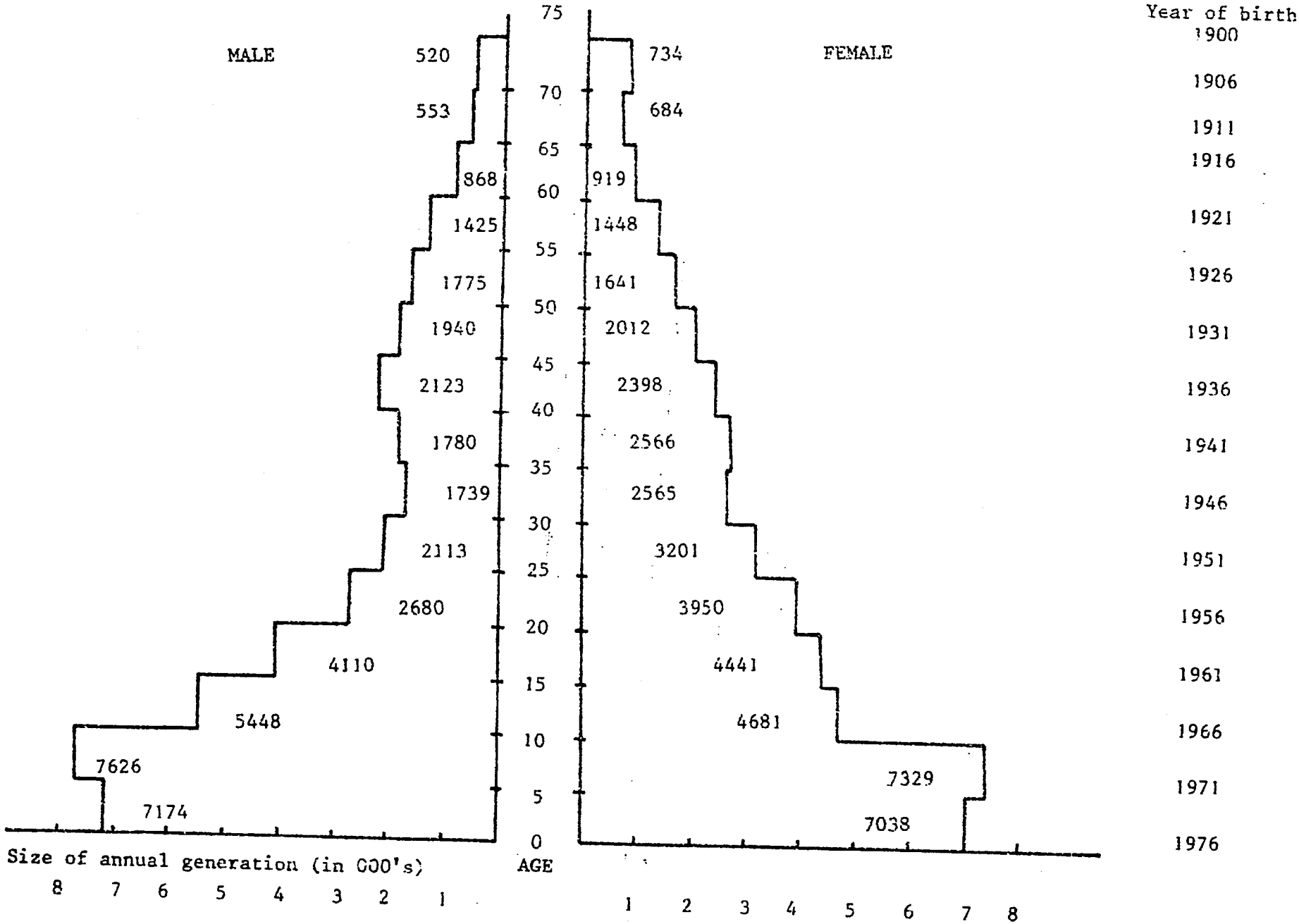


Figure 4.2.3c Age Pyramid of the Nomadic Population Resident in Mauritania, 1 January 1977 (in 5-year age groups)

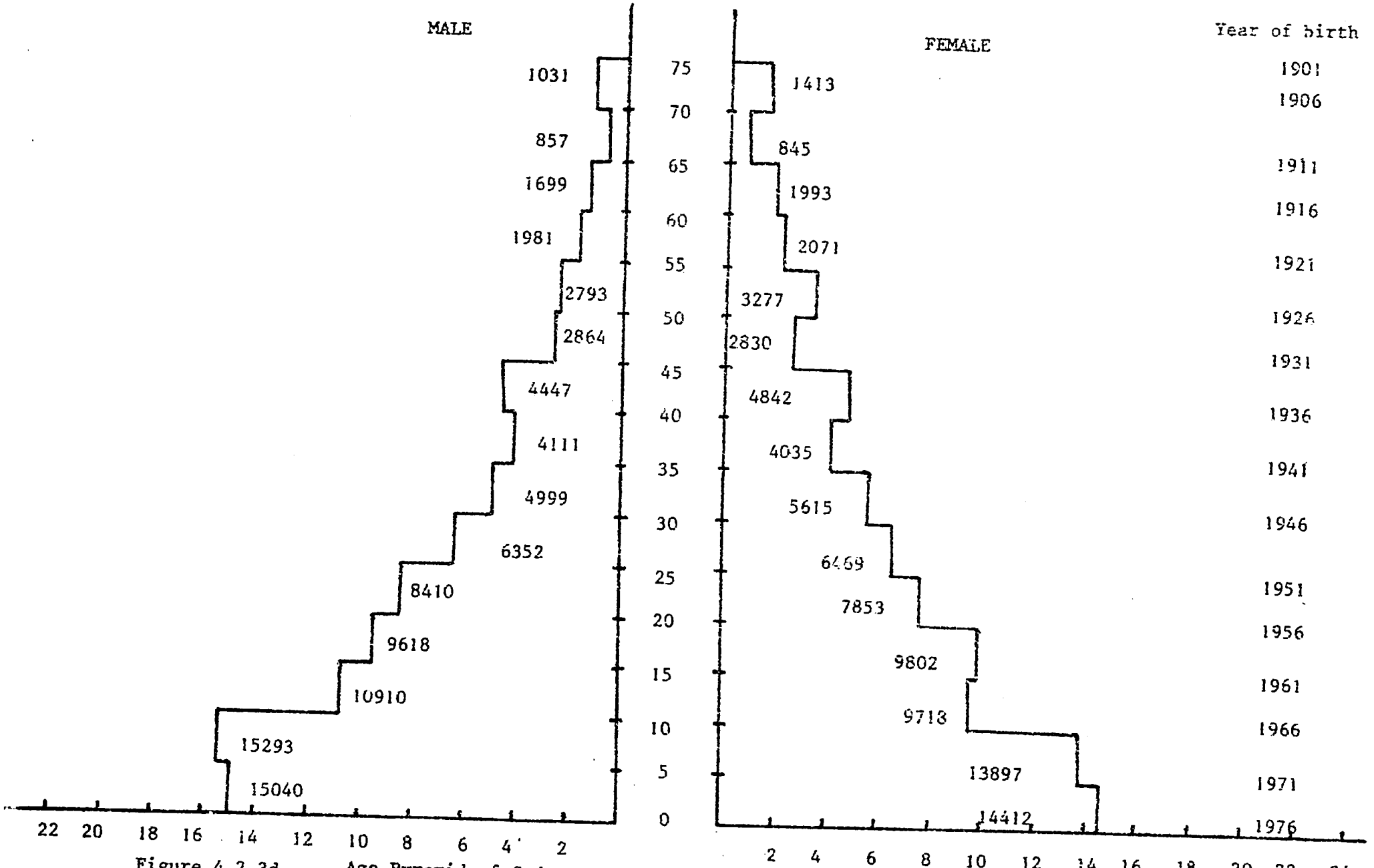


Figure 4.2.3d Age Pyramid of Sedentary Population Resident in Mauritania

1 January 1977 (in 5-years age groups)

4.3.1 The Average Household

Manually tabulated census results show that an average Mauritanian household includes 5.5 individuals. Sedentary families have an average of 5.9 members, while nomads have an average 4.8 members. That sedentary households should be larger than nomadic households is to some extent a function of definition. A lodging in the city may be comprised of several rooms and thus may house several adults, while a single nomadic rarely houses more than two adults. But some of the size difference may be due to an evolution of social structures among nomads. We have already noted that several thousand nomadic men appear to be missing and have speculated that many of these men are employed or are seeking employment in Nouakchott to support their families in rural areas. In support of our hypothesis, the 1977 census shows that household size among nomads is smallest in the Trarza, where access to Nouakchott is easiest and where thus this phenomenon should be the most noticeable.

4.3.2 Less Obvious Family Structures

Arithmetic means often mask intriguing variations and even certain major trends can become lost. The statistics reported above, for example, have limited use for information regarding the number of children a given couple may have. Divorce bears no social stigma among any of the Mauritanian ethnic groups, and many individuals marry several times. While general statistics about frequency of divorce and remarriage are not available, census figures do indicate that 11 percent of all nomadic women and 18 percent of all nomadic women over 50 are divorced. Children born of marriages terminating in divorce are often confided to the woman's parents, and thus household members cannot be used as a reflection of family size (that is, descendence).

Pending results from the UN's 1980 Mauritanian Fertility Survey, one must depend upon responses from nomads for indications of national fertility rates. 1977 census figures show that on the

105 at birth, declining thereafter (to about 90 in the very oldest age groups). In the Mauritanian pyramid, there are clearly some missing men. Some portion of these men may have been war casualities, but the vast majority are undoubtedly at least temporary emigrants working abroad. Comparison with age pyramids separately constructed for the nomadic and sedentary populations (Figures 4.2.3a and 4.2.3b) shows that most of the effect in the total population comes from missing nomadic men. Among nomads, the indentation is noticeable from ages 20 to 44. More than 15,000 men aged 20 to 44 are needed to restore the male nomadic population (i.e., to make the sex-ratio of males to counted females fit a steady decline). Many of these missing men are undoubtedly engaged in commerce, either in domestic urban centers or in Senegal. What becomes of these men and of the women who are left behind should be of interest to both labor planner and sociologist studying changing social and economic roles.

4.3 Family Structures

The intrecacies of the Mauritanian social system (s) led census takers to devote seven pages of the census manual to defining the term household and to instructing interviewers as to who would be included in and who would be excluded from the count. For the reader's reference, definitions and instructions are summarized below.

Household: A household is defined as a group of people who live together (in particular, who sleep in the same lodging) and generally meet social and economic needs together.

To be included in the count as a member of the household was:

- generally, any member of the nuclear family
- servants attached to and dependent upon the family
- the household head, normally absent but spending at least one month each year with the household.

To be excluded from the count:

- household servants maintaining separate households
- family members--aside from the household head--who normally live in another place (e.g., lycee pensionnaire, military, or a family member gone to seek work in the city).

To be included tabulations of actual household size:

- all family members present who had slept in the household lodging the previous night
- all visitors who had slept in the household lodging the previous night.

average, a woman at the end of childbearing years will have given birth to five children, about three of whom will have survived. A women who is still married at the end of childbearing years will on the average have given birth to six children, which at the same survival rate would leave four alive (see Apendix Table N).

4.4 Additional Information

Various constraints have intervened to make further analysis of sociological data impossible at this time. Readers are advised, however, that additional information is available in different forms. To facilitate further research and analysis, we have provided an appendix of several tables based on census data not discussed in our text (Appendix Tables J through P). RAMS and other researchers are also urged to consult the following documents/data sources:

a) GIRM, Bureau de Recensement, Seconds Résultats Provisoires

This document was prepared in 1979 the data it contains are based on manual tabulations and samples drawn from the census population. In most cases numbers given in this report will need to be updated using BCR computer output, overall the changes will be small.

In addition to subjects discussed in our text, the Seconds Résultats Provisoires contains information on population density, literacy, level of education, and the nomadic ways of life.

b) Complete List of 1977 Census Tables.

This photo-copied list presents the layouts of all the tables recommended by UNDP advisors and envisioned by the BCR. Census questionnaires and coding manuals, also available through the RAMS statistician, will shed light on the data bits used to construct these tables.

c) BCR's Computer Tabulation of Census Data.

All of the tables noted in the list of tables (item b above) have now been completed. The GIRM's Office of Statistics has only one copy of the computer output, but it is available for consultation at the BCR.

d) Computer Tabulation of Census Data

Some of the tables completed during the summer of 1979 were provided for RAMS. They were arranged in three binders according to whether the data exploited came from the nomadic file, the sedentary file, or a merger of the two. Most of the data presented in this Baseline Study were derived from these tables. Researchers should note that RAMS has a complete set of table displaying nomadic population data and that much of this data has not been exploited.

e) Village File (Fichier Village).

Available in RAMS Documentation Center.

The GIPM has also made available to RAMS a copy of the village fichier, listing actuarial data for each of Mauritania's 2.343 settlements.

f) 1965-1966 Census (Sample Survey) Data.

This census was based on a sample rather than a full enumeration, and several errors have surfaced, notably a general underestimation of the population. Nonetheless, the data analysis is complete, and for some purposes the information provided may be used to supplement 1977 census. For some issues, such as those concerning population dynamics within ethnic groups, it may be the only source of detailed data.

Chapter 5

CONCLUSION

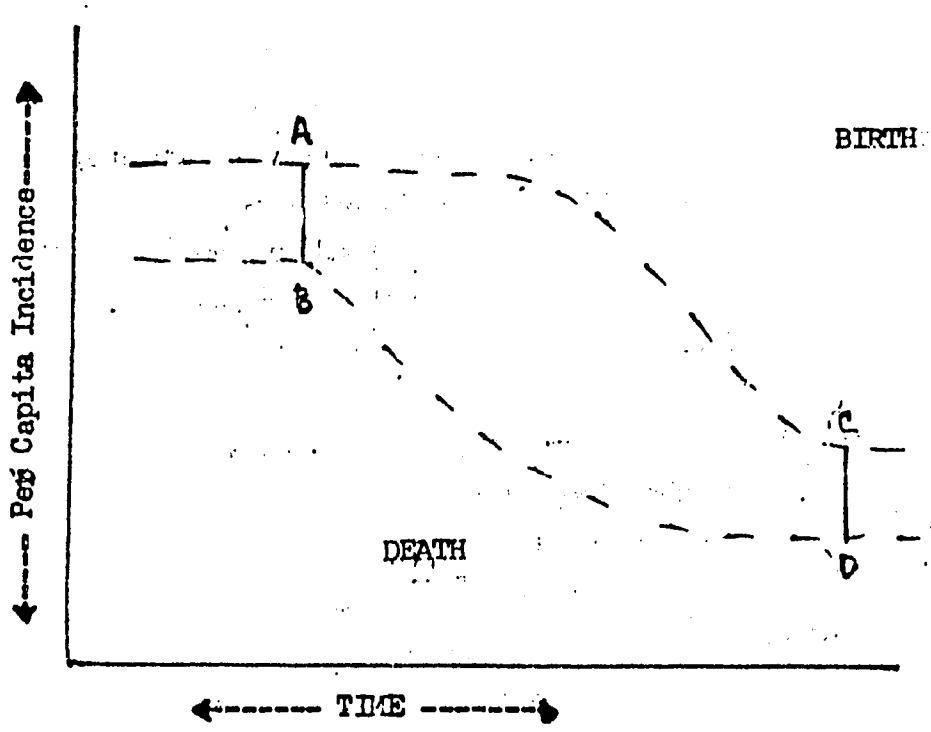
The drought, the recent Saharan conflict, international and inter-regional migration, the sedentarization and urbanization phenomena, and changing social and economic structures combine to make an analysis of Mauritanian population dynamics very complex. Each of these phenomena will contribute to the shape of Mauritania's demographic profile in future years, but three trends are of signal importance to planners, and these are discussed below.

5.1 Natural Population Increase

In Chapter 2, the basis for calculating an annual natural population increase of 2.5 percent was developed. What does this rate mean now and what are future developments likely to be? Compared to her African neighbors, Mauritania has an about average rate of natural increase. Calculations relayed in the text of this report treat this rate as a constant, but whether or not the rate will remain stable is subject to debate.

Historically, there has usually been a lag before any decrease in the death rate is matched by a decrease in the birth rate. Thus, health care advances have the immediate effect of increasing natural population growth by lowering the death rate while a high rate of birth is sustained. After some time, ostensibly, couples of childbearing age see that the survival rate of their children will be much higher than in the past and take steps to limit births—thereby returning the natural increase to near status quo. Such a progression is depicted in Figure 5.2 below. Line segments AB and CD in this figure indicate indentical rates of natural increase (the difference between birth and death rates), but as can readily be seen, the population at AB faces a far different future than does the population at CD. Is Mauritania, with a 2.5 percent rate of natural increase, at the apogee of its growth? Or does more rapid expansion lie ahead?

Figure 5.2. Historical Development of Population Growth Rate



Readers will recall that census data allow the computation of natural increase only on the basis of responses from the nomadic population—where data were least reliable. These raw data indicate a very high birth rate and a relatively modest death rate for the current period. The birth rate in this analysis was accepted as is, but the death rate was seen as artificially low because no swelling of the youngest age cohorts, as should have been evident had the death rate been decreasing, was detected in the nomadic age pyramid. (See Chapter 2, sections 2.1.3 and 2.1.4.) The 2.5 percent rate of natural increase discussed in Chapter 2 rests on a high rate of birth and a high rate of death.

This analysis suggest that line segment AB describes Mauritania in the present period. Rural health care in particular should improve over coming years, bringing death rates down. If this picture is accurate, Mauritania's population will grow ever more rapidly for several years. The demand on limited resources will augment beyond current rates, and even greater numbers of the country's more able citizens will seek greener pastures—both figuratively and literally—abroad.

An important caveat must be attached here. The data underlying this analysis can be and have been otherwise interpreted, and although ultimately the question posed above is an empirical one, all of the relevant data are not yet in. The UNDP's Mauritanian Fertility Survey will be conducted late in 1980, and its results should remove much conjecture. Meanwhile, readers are reminded that the projections of 2.5 percent natural growth used throughout this report are conservative ones; researchers using data presented in this report as input in their own reports should not fail to allow for alternative, higher rates of growth as presented in Appendix Tables D through I.

5.2. Urbanization and Growth of Nouakchott

A second key variable in Mauritanian demographic dynamics, the phenomenon of urbanization merits the scrutiny of Mauritanian planners. From January 1975 to January 1977, after a decade of expansion at heady

rates, twelve of Mauritania's fifteen urban centers lost important populations. Who were the people who left? Why did they leave, and where did they go? Is this sudden decline a "normal" pattern for Mauritania?

Attention should be paid to such questions for different answers imply radically different futures for the country's urban centers. A return of former nomads from the city to the rural areas might signal an attachment to a way of life that should not be overlooked; if on the other hand, those who left the cities of the interior were looking for work in Nouakchott or abroad, Mauritanian planners would be wise to examine labor and employment policies.

Similarly, if a ratchet-pattern of sudden growth with equally sudden attrition exemplifies a long term pattern, then planners investing scarce resources should consider minimum as well as maximum population. And if, as seems likely in at least some towns, whole families make the original move to the city but only the women and children remain, planners should decide whether potential employment programs should be designed to encourage these women to work or their men to remain in the cities.

The continued growth of Nouakchott poses the greatest demographic dilemma. We have forecast relatively modest growth of about 6 percent through the end of the century, when Nouakchott's population will still reach more than 500,000. But we have also assumed that Nouakchott has grown for negative reasons, that Nouakchott's expansion is a function of rural stagnation. Already there are some indications that explanations of the city's growth are changing. Some people continue to come because rural life has become untenable, but there are others now who come seeking urban services--schooling, medicine unavailable in rural areas, dental care, or administrative jobs. Should this "urban pull" gather momentum, Nouakchott's population could reach 1.2 million by 2000. Mauritanian planners urgently need to assess the physical limits to Nouakchott's growth (particularly in terms of water supply), determine the desirable future of the capital city, and establish policies designed to create that future.

5.3 Sedentarization

The "sedentarization" of half of the country's nomads over the last fifteen years constitutes a third important trend. As indicated in Chapter 2, the extent of the sedentarization phenomenon depends upon definitions, and a dichotomous distinction between sedentary and nomadic may no longer be satisfactory. Of the "nomads" counted in 1977, 4 percent had not moved their camps during the preceding year. And by census definition five new villages in the Tagant appeared over the 1975-77 inter-census period, though none of their residents had arrived since 1973!

Some nomads have made a radical shift, trading nomadism for the life of Nouakchott. But in other areas nomads whose herds have been decimated (or whose former providers can no longer afford a large entourage) are settling near tribal wells, sometimes taking up a life of semi-nomadism.

Projections presented in this report indicate that by 2000, nomads will represent only 12 percent of the nation's population (compared to an estimated 28 percent in 1980). The projections, however, are derived from relatively tenuous data and definitions which may no longer be appropriate. Much needed is a study spelling out the dynamics of sedentarization--identifying the reasons why nomads choose to settle, and the determinants of a choice to engage in semi-nomadic pastoralism rather than make the radical move to the city. Perhaps even more needed is an assessment of the economic viability of semi-nomadism, for the success of this compromise between nomadism and sedentary life will have great import not only for the growth of Mauritanian towns and the demand for social services, but will also affect the quality and quantity of demands placed on Mauritania's deteriorating environment.

APPENDIX

Included in this appendix are tables which supplement the text itself, but which are not discussed in it. The tables included are for the most part immediately derived from computer tabulations of the Mauritanian census of 1977.

For additional tables, see either the computer output itself or the GIRM'S provisional analysis of census data (GIRM, Bureau Central du Recensement de la Population, Seconds Résultats Provisoires du Recensement Général de la Population. Circa April 1979).

Appendix Table A . Estimations and Projections of the Total Population Resident in Mauritania, by Administrative Region and Under Assumption of Constant 2.5% Annual Natural Increase a/

ADMINISTRATIVE REGION		POPULATION IN 000's					
		ESTIMATIONS		PROJECTIONS			
		1977 b/	1980 c/	1985 c/	1990 c/	1995 c/	2000 c/
00	Nouakchott	134.7	173	254	345	451	574
01	Hodh Oriental	156.7	166	183	200	217	234
02	Hodh Occidental	124.2	130	143	157	174	191
03	Assaba	129.1	136	150	168	190	218
04	Gorgol	149.5	158	173	188	203	217
05	Brakna	151.4	159	169	179	189	199
06	Trarza	216.0	224	235	246	259	271
07	Adrar	55.4	56	56	56	56	57
08	Nouadhibou	24.4	30	42	58	82	114
09	Tagant	75.0	78	83	89	96	102
10	Guidimaka	83.2	90	100	110	120	130
11	Tiris Zemmour	22.5	26	31	37	42	47
12	Inchiri	17.6	17	17	17	17	17
	Total	1339.7	1443	1636	1852	2096	2371

a/Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia

b/Source : GIRM, unpublished census data (computer output).

c/Source : RAMS calculation

Appendix Table B . Estimations and Projections of the Sedentary Population Resident in Mauritania, by Administrative Region Under Assumption of Constant 2.5% Annual Natural Increase a/

ADMINISTRATIVE REGION	POPULATION IN 000's					
	ESTIMATIONS		PROJECTIONS			
	1977 b/	1980 c/	1985 c/	1990 c/	1995 c/	2000 c/
00 Nouakchott	134.7	173	25[illegible]	345	451	57[illegible]
01 Hodh Oriental	71.0	83	104	125	145	166
02 Hodh Occidental	60.2	73	96	119	142	165
03 Assaba	85.7	94	110	130	154	184
04 Gorgol	133.1	142	158	174	190	205
05 Brakna	100.8	121	144	161	174	187
06 Trarza	109.9	122	139	157	174	190
07 Adrar	37.7	40	43	45	47	49
08 Nouadhibou	24.3	30	42	58	82	114
09 Tagant	32.5	41	54	64	74	82
10 Guidimaka	74.2	80	89	98	107	116
11 Tiris Zemmour	21.8	25	30	35	41	45
12 Inchiri	9.8	10	10	10	11	11
Total	895.7	1034	1273	1522	1792	2089

a/Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia.

b/SOURCE : GIRM, unpublished census data (computer output)

c/SOURCE : RAMS calculations.

Appendix Table C. Estimations and Projections of the Nomadic Population Resident in Mauritania, by Administrative Region and Under Assumption of Constant 2.5% Annual Natural Increase[a/]

ADMINISTRATIVE REGION	POPULATION IN 000's					
	ESTIMATIONS	PROJECTIONS				
	1977[b/]	1980[c/]	1985[c/]	1990[c/]	1995[c/]	2000[c/]
00 Nouakchott	"	"	"	"	"	"
01 Hodh Oriental	85.7	83	79	75	72	68
02 Hodh Occidental	64.0	57	47	38	32	26
03 Assaba	43.4	42	40	38	36	34
04 Gorgol	16.4	16	15	14	13	12
05 Brakna	50.6	38	25	18	15	12
06 Trarza	106.1	102	96	91	85	81
07 Adrar	17.7	16	13	11	9	8
08 Nouadhibou	0.1	"	"	"	"	"
09 Tagant	42.5	37	29	25	22	20
10 Guidimaka	9.0	10	11	12	13	14
11 Tiris Zemmour	0.7	1	1	1	1	1
12 Inchiri	7.8	7	7	7	6	6
Total	440.0	409	363	330	304	282

a/ Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia.

b/ SOURCE : GIRM, unpublished census data (computer output).

c/ SOURCE : RAMS calculations.

Appendix Table D. Estimations and Projections of the Total Population Resident in Mauritania, by Administrative Region and Under Assumption of Constant 2.7% Annual Natural Increase[a/]

	ADMINISTRATIVE REGION	POPULATION IN 000's					
		ESTIMATIONS		PROJECTIONS			
		1977[b/]	1980[c/]	1985[c/]	1990[c/]	1995[c/]	2000[c/]
00	Nouakchott	134.7	174	258	354	467	601
01	Hodh Oriental	156.7	167	186	205	225	245
02	Hodh Occidental	124.2	131	145	161	180	200
03	Assaba	129.1	137	152	172	196	228
04	Gorgol	149.5	159	176	193	210	227
05	Brakna	151.4	160	172	184	196	208
06	Trarza	216.0	225	239	254	268	283
07	Adrar	55.4	56	57	57	58	59
08	Nouadhibou	24.4	30	43	60	85	119
09	Tagant	75.0	78	84	91	100	107
10	Guidimaka	83.2	91	101	113	124	136
11	Tiris Zemmour	22.5	26	32	39	44	49
12	Inchiri	17.6	17	17	17	18	18
	Total	1339.7	1451	1662	1900	2171	2480

a/ Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia.

b/ SOURCE : GIRM, unpublished census data (computer output).

c/ SOURCE : RAMS calculation.

Appendix Table E. Estimations and Projections of the Sedentary Population Residen in Mauritania, by Administrative Region and Under Assumption of Constant 2.7% Annual Natural Increase[a]

	ADMINISTRATIVE REGION	POPULATION IN 000's					
		ESTIMATIONS		PROJECTIONS			
		1977[b]	1980[c]	1985[c]	1990[c]	1995[c]	2000[c]
00	Nouakchott	134.7	174	258	354	467	601
01	Hodh Oriental	71.0	83	106	128	150	174
02	Hodh Occidental	60.2	74	97	122	147	173
03	Assaba	85.7	95	112	133	159	192
04	Gorgol	133.1	143	161	179	197	214
05	Brakna	100.8	122	146	165	180	195
06	Trarza	109.9	122	141	161	180	199
07	Adrar	37.7	40	44	46	49	51
08	Nouadhibou	24.3	30	43	60	85	119
09	Tagant	32.5	41	54	65	77	86
10	Guidimaka	74.2	81	90	101	111	121
11	Tiris Zemmour	21.8	25	31	38	43	48
12	Inchiri	9.8	10	10	10	11	12
	Total	895.7	1040	1293	1562	1856	2185

a/ Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia.

b/ SOURCE : GERM, unpublished census data (computer output).

c/ SOURCE : RAMS calculations.

Appendix Table F. Estimations and Projections of the Nomadic Population Resident in Mauritania, by Administrative Region and Under Assumption of Constant 2.7% Annual Natural Increase a/

ADMINISTRATIVE REGION	POPULATION IN 000's					
	ESTIMATIONS		PROJECTIONS			
	1977 b/	1980 c/	1985 c/	1990 c/	1995 c/	2000 c/
00 Nouakchott	-	-	-	-	-	-
01 Hodh Oriental	85.7	84	80	77	75	71
02 Hodh Occidental	64.0	57	48	39	33	27
03 Assaba	43.4	42	40	39	37	36
04 Gorgol	16.4	16	15	14	13	13
05 Brakna	50.6	38	26	19	16	13
06 Trarza	106.1	103	98	93	88	84
07 Adrar	17.7	16	13	11	9	8
08 Nouadhibou	0.1	-	-	-	-	-
09 Tagant	42.5	37	30	26	23	21
10 Guidimaka	9.0	10	11	12	13	15
11 Tiris Zemmour	0.7	1	1	1	1	1
12 Inchiri	7.8	7	7	7	7	6
Total	444.0	411	369	338	315	295

a/Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia.

b/SOURCE : GIRM, unpublished census data (computer output).

c/SOURCE : RAMS calculations.

Appendix Table G. Estimations and Projections of the Total Population Resident in Mauritania, by Administrative Region and Under Assumption of Gradually Increasing (2.5 - 3.0% Annually)a/ Population Growth

ADMINISTRATIVE REGION	POPULATION IN 000's					
	ESTIMATIONS		PROJECTIONS			
	1977 b/	1980 c/	1985 c/	1990 c/	1995 c/	2000 c/
00 Nouakchott	134.7	175	256	351	466	606
01 Hodh Oriental	156.7	166	184	203	224	247
02 Hodh Occidental	124.2	130	144	160	180	202
03 Assaba	129.1	136	151	171	196	230
04 Gorgol	149.5	158	174	191	210	229
05 Brakna	151.4	159	170	182	195	210
06 Trarza	216.0	224	236	252	268	286
07 Adrar	55.5	56	57	57	58	60
08 Nouadhibou	24.4	30	42	59	85	120
09 Tagant	75.0	78	84	90	99	108
10 Guidimaka	83.2	90	100	112	124	137
11 Tiris Zemmour	22.5	26	31	38	43	49
12 Inchiri	17.6	17	17	17	17	18
Total	1339.7	1443	1646	1883	2165	2502

a/Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia.

b/SOURCE : GIRM, unpublished census data (computer output),

c/SOURCE : RAMS calculations.

Appendix Table H. Estimations and Projections of the Sedentary Population Residen in Mauritania, by Administrative Region and Under Assumption of Gradually Increasing Natural Population Growth (2.5 - 3.0% Annually)[a]

	ADMINISTRATIVE REGION	POPULATION IN 000's					
		ESTIMATIONS		PROJECTIONS			
		1977[b]	1980[a]	1985[c]	1990[c]	1995[c]	2000[c]
0	Nouakchott	134.7	173	256	351	466	606
1	Hodh Oriental	71.0	83	105	127	150	175
2	Hodh Occidental	60.2	73	97	121	147	174
3	Assaba	85.7	94	111	132	159	194
4	Gorgol	133.1	142	159	177	196	216
5	Brakna	100.8	121	145	164	180	197
6	Trarza	109.9	122	140	159	180	201
7	Adrar	37.7	40	43	46	49	52
8	Nouadhibou	24.3	30	42	59	85	120
9	Tagant	32.5	41	54	65	76	87
10	Guidimaka	74.2	80	89	100	111	122
11	Tiris Zemmour	21.8	25	30	37	42	48
12	Inchiri	9.8	10	10	10	11	12
	Total	895.7	1034	1281	1548	1852	2204

a/ Excludes nomadic population abroad and formerly heldterritory of Tiris el Gharbia.

b/ SOURCE : CTRM, unpublished census data (computer output).

c/ SOURCE : RAMS calculations.

Appendix Table I. Estimations and Projections of the Nomadic Population Resident in Mauritania, by Administrative Region and Under Assumption of Gradually Increasing Natural Population Growth (2.5 - 3.0% Annually)[a]

	ADMINISTRATIVE REGION	POPULATION IN 000's					
		ESTIMATIONS		PROJECTIONS			
		1977[b]	1980[c]	1985[c]	1990[c]	1995[c]	2000[c]
00	Nouakchott	"	"	"	"	"	"
01	Hodh Oriental	85.7	83	79	76	74	72
02	Hodh Occidental	64.0	57	47	39	33	28
03	Assaba	43.4	42	40	39	37	36
04	Gorgol	16.4	16	15	14	14	13
05	Brakna	50.6	38	25	18	15	13
06	Trarza	106.1	102	96	93	88	85
07	Adrar	17.7	16	14	11	9	8
08	Nouadhibou	0.1	"	"	"	"	"
09	Tagant	42.5	37	30	25	23	21
10	Guidimaka	9.0	10	11	12	13	15
11	Tiris Zemmour	0.7	1	1	1	1	1
12	Inchiri	7.8	7	7	7	6	6
	Total	444.0	409	365	335	313	298

a/ Excludes nomadic population abroad and formerly held territory of Tiris el Gharbia.

b/ SOURCE : CNRM, unpublished census data (computer output).

c/ SOURCE : RAMS calculations.

Appendix Table J. Projected Population Distribution by Age and Gender at Five-Year Intervals[a/]
Total Male Population Resident in Mauritania

Age Groups	Observed Population	Population Projections		
	1977	1982	1987	1992
15-19	68,642	80,326	110,744	101,376
20-24	55,453	66,864	78,245	107,875
25-29	42,326	53,722	64,777	75,803
30-34	33,690	40,941	51,965	62,658
35-39	29,453	32,490	39,483	50,115
40-44	32,998	28,215	31,125	37,824
45-49	24,020	31,239	26,711	29,466
50-54	22,842	22.324	29,033	24,825
55-59	17,029	20,660	20,192	26,260
60-64	12,834	14,777	17,920	17,522

a/ Projection calculations were based on survival rates obtained from UN model life tables, level 60, which corresponds to our hypothesized 2.2 percent death rate in 1977. These projections do not take into account international migratory movements.

SOURCE OF RAW DATA : GIRM, unpublished census data (computer output).

APPENDIX TABLE K. Projected Population Distribution by Age and Gender at Five-Year Intervals [a]
Total Female Population Resident in Mauritania

Age Groups	Observed Population	Population Projections		
	1977	1982	1987	1992
15-19	71,213	70,691	102,417	97,104
20-24	59,013	69,397	66,888	99,805
25-29	48,348	57,207	67,135	66,780
30-34	40,899	46,772	55,342	64,946
35-39	33,004	39,484	45,154	53,427
40-44	36,202	37,756	37,991	43,447
45-49	24,208	34,594	30,346	36,305
50-54	24,567	22,845	32,647	28,638
55-59	17,593	22,729	21,136	30,205
60-64	14,559	15,744	20,340	18,915

[a] Projection calculations were based on survival rates obtained from UN model life tables, level 60, which corresponds to our hypothesized 2.2 percent death rate in 1977. These projections do not take into account international migratory movements.

SOURCE OF RAW DATA : GIRM, unpublished census data (computer output).

APPENDIX TABLE L. Rural and Urban Resident Population

(in 000's)

Administrative Region	Type of Residence				Total Regional Population
	Urban	Rural			
		Sedentary	Nomadic	Total	
00	134,7				134,7
01	13,2	57,8	85,7	143,5	156,7
02	8,5	51,7	64,0	115,7	124,2
03	10,2	75,5	43,4	118,9	129,1
04	20,7	112,4	16,4	128,8	149,5
05	13,2	87,6	50,6	138,2	151,4
06	23,8	86,1	106,1	192,2	216,0
07	16,2	21,5	17,7	39,2	55,4
08	21,9	2,4	0,1	2,5	24,4
09	7,9	24,6	42,5	67,1	75,0
10	6,0	68,2	9,0	77,2	83,2
11	19,5	2,3	0,7	3,0	22,5
12	8,0	1,8	7,8	9,6	17,6
Total	303,8	591,7	445	1035,9	1339,7

SOURCE: GIRM, unpublished census data.

APPENDIX TABLE M. Marital Status of Nomadic Women (by Percentage Within Bracket)[a]

Marital Status	AGE BRACKETS					
	12 - 19-Yrs (n - 35,700)	20 - 29 Yrs (n - 35,800)	30 - 39-Yrs (n - 25,700)	40 - 49 Yrs (n - 22,000)	50 Yrs and older (n - 32,300)	All Women (n-151.500)
Single	77,2 %	24,2 %	6,0 %	4,5 %	4,2 %	26,5 %
Married	19,2 %	62,1 %	75,5 %	67,8 %	30,7 %	48,4 %
Widowed	0,4 %	2,2 %	5,8 %	14,1 %	47,6 %	13,8 %
Divorced	3,2 %	11,6 %	12,7 %	13,6 %	17,6 %	11,4 %

[a] Percentages in columns may not add to 100 due to rounding

RAW DATA SOURCE : GIRM, unpublished census data (computer output).

APPENDIX TABLE N. Live Births Among Nomadic Women Between Aïd 1975 and Aïd 1976

Age Brackets, Nomadic Women	Live Births Reported			Sex Ratio Live Births	Observed Fertility Rate (Per 10,000 Women)
	M	F	Total		
12 - 19 years (n - 35,700)	1,100	850	1,950	1,29	546
20 - 29 years (n - 35,800)	5,450	4,300	9,750	1,27	2 723
30 - 39 years (n - 25,700)	3,850	3,100	6,950	1,24	2 704
40 - 49 years (n - 22,000)	1,050	1,400	2,450	0,75	1 114
50 years and older (n - 32,300)	100	50	150	2,00	46
All women 12 years and older (n - 151,500)	11,550	9,700	21,250	1,19	1 403

SOURCE : GIRM, unpublished census data (computer output).

APENDIX TABLE o Literacy and Levels of Education within the Active Sedentary Population[a], in percentages[b].

	ADMINISTRATIVE REGION														Total Active Populat.
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	
n =	51,9	26	19,7	31,5	35,7	27,3	31,5	11,5	10,4	10,9	28,2	7,6	3,1	6,5	301,4
Illiterate	55.3%	85.0%	87.1%	88.4%	89.7%	86.6%	76.0%	60.3%	52.2%	85.9%	91.9%	52.5%	71.6%	50.6%	77.0 %
Literate, but Without Education	0.6%	..	0.1%	0.1%	0.2%	0.1%	0.3%	0.6%	0.7%	0.1%	0.5%	0.5%	0.4%	1.7%	0.3 %
Traditional Koranic Education	18.7%	10.9%	9.7%	9.8%	5.9%	9.2%	15.8%	23.6%	18.8%	9.4%	5.5%	17.5%	11.0%	20.7%	12.4 %
Elementary Education	13.8%	3.0%	1.9%	1.0%	2.9%	2.7%	5.1%	11.6%	15.3%	3.0%	1.6%	20.5%	9.6%	21.0%	6.3 %
Secondary Education Cycle 1	5.3%	0.3%	0.7%	0.3%	0.4%	0.6%	1.5%	1.7%	7.8%	0.4%	0.2%	5.5%	3.1%	3.5%	1.9 %
Secondary Education II and Superior Level	3.9%	0.2%	0.3%	0.1%	0.2%	0.2%	0.5%	0.5%	4.3%	0.2%	0.1%	1.9%	1.5%	1.2%	1.1 %
Technical and Professional Level	2.5%	0.5%	0.4%	0.2%	0.6%	0.6%	0.8%	1.8%	0.9%	0.9%	0.2%	1.4%	2.8%	1.3%	1.0 %

a/ Includes both employed and unemployed members of the labor force.

b/ Columns may not add to 100 due to rounding.

RAW DATA SOURCE : GRIM, unpublished census data.

n = Number of persons by region in thousands.

APPENDIX TABLE P. Economic Activity of Nomadic Households by Gender of Household Head

Type of Economic Activity	Gender of Household Head		Total Households
	M	F	
Primarily Agriculture	21,000	6,900	27,900
- - - -Of Which Exclusively Agriculture	4,200	1,800	6,000
Primarily Herding	60,700	19,200	79,900
Of Which Exclusively Herding	39,900	13,400	53,300
Primarily Artisanal Activity	1,100	800	1,900
Of Which Exclusively Artisanal Activity	400	400	800
Primarily Commerce	3,800	1,200	5,000
Of Which Exclusively Commerce	500	500	1,000
Some Other Single Activity	600	800	1,400
No Reported Activity	400	1,200	1,600
Households with Single Activity	45,600	16,900	62,500
Households with Two Activities	21,400	6,200	27,600
Total Households	67,400	24,300	91,700

SOURCE: GIRM, unpublished census data (computer output).