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RAPID-LANDSAT Analysis of Urbanization and Demographic Change in the Governorates of Egypt

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RAPID-LANDSAT ANALYSIS OF URBANIZATION AND DEMOGRAPHIC CHANGE IN THE GOVERNORATES OF EGYPT

CONTENTS

	Page
Introduction	1
Population Growth, Urbanization and the Loss of Agricultural Land 1972-1982	2
LANDSAT Land Use Classification and Analysis Techniques	9
The Effects of Population Factors on Social and Economic Development in Beheira	11
Demographic Change and Population Program Implementation: Diversity Among the Governorates	18

INTRODUCTION

The effects of population growth on development are well recognized by Egyptian leaders. A special analysis of this subject was prepared by The Futures Group as part of U.S. AID sponsored assistance to the Government of Egypt.* This analysis was presented to President Mubarak in January 1982. It described the effects of population growth on Egypt's ability to attain its major development goals. A special focus of the analysis was the relationship among population growth, urbanization and agricultural land.

That analysis has now been expanded to examine two topics in greater detail: the loss of agricultural land to spreading urban areas and the variation in population-related factors among the governorates of Egypt. The study of agricultural land has been based on analyses by IRIS International of data collected by LANDSAT, a U.S. earth-orbiting satellite that provides information on earth resources. The governorate-level analyses have been prepared jointly by The Futures Group and the Egyptian Population and Family Planning Board.

The presentation will begin with a look at the information available from LANDSAT about the loss of agricultural land in the past. Next a description of the LANDSAT technology will be presented along projections of future urban growth. An in-depth look at population growth in Beheira will comprise the third section. Finally, the presentation will conclude with a comparative analysis of population factors by governate.

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*Egypt: The Effects of Population Factors on Social and Economic Development, The Futures Group, May 1983.

POPULATION GROWTH, URBANIZATION AND THE LOSS OF AGRICULTURAL LAND 1972-1982

The cultivated area of the Nile Valley amounts today to about 6 million feddans. During the last 30 years efforts to reclaim lands from the desert have added about 900,000 feddans, but only half of this new land is in even marginal production today. During the same period about 700,000 feddans were lost to spreading urbanization. The first part of this presentation will use information from new satellite technology to examine the relationship between population growth and the loss of agricultural land.

The first LANDSAT satellite was launched in 1972, so this analysis will be limited to the change in agricultural land from 1972 to 1982. The LANDSAT path over Cairo includes the Nile Valley and the Southern Delta area shown in the first slide.

Slide 1: Map of the Southern Delta Area Captured by LANDSAT

The brown rectangle indicates the area we will be examining.

Slide 2: Landcover 1972--Southern Delta Region

We are not going to look at the LANDSAT data directly but at an analysis of the data. The analysis can provide a wide range of information that is useful for the management of resources. For today, we will see an analysis of land use showing agriculture, urban areas, water and desert.

This first slide shows the Southern Delta region as it was in 1972. Since this is the first slide let me guide you through the features. The green color represents agricultural areas. The blue is water. Cairo and other urban areas are in red. The

desert is tan. I am sure you all recognize Cairo, Giza, the Nile, etc. (Here the lecturer points out a few of the landscape features.) We have retained the same colors throughout the presentation.

The area covered by this slide is 2¼ million feddans. More than 60 percent, the green, is in agriculture. This represents 1.4 million feddans or about ¼ of the total agricultural land in Egypt. Less than 6 percent is urban.

Slide 3: Landcover 1982/Land-use Change - Southern Delta Region

In this slide data from 1972, 1976 and 1982 are all included. The red shows the urban areas in 1972. The yellow represents the additional land required for urban uses between 1972 and 1976. The white represents additional urban land needed between 1976 and 1982. The green is the area in agriculture in 1982. The growth of Cairo dominates the scene.

By 1982, the urban areas had expanded to nearly 50 percent larger than in 1976. As you can see considerable urban expansion occurred in agricultural areas in the northern part of this region, but most of the expansion occurred in desert areas around Cairo and Giza. Thus the loss of agricultural land was not nearly as large as it would have been if much of the expansion had not occurred in the desert areas. The area devoted to agriculture actually increased by about 2 percent. Although agricultural land was lost to spreading urban areas, enough additional land was reclaimed from the desert to compensate. Unfortunately the reclaimed land is not as productive as the lands lost, so there is a net loss of agricultural productivity.

Slide 4: Map of Cairo, Giza and Qalyubiyah Governorates

Slide 5: Landcover Cairo/Giza/Qalyubiyah Governorates 1972

In this next series of slides we will shift away from the larger scene to smaller areas. This first slide is of the governorates making up the Greater Cairo area: Cairo, Giza and Qalyubiyah. The area covered is 480,000 feddans. The colors, as before, are green for agriculture, red for urban, blue for water and tan for desert.

The Greater Cairo area bisected by the Nile is easily recognizable. In 1972 urban uses occupied 15 percent of the area.

Slide 6: Landcover Cairo/Giza/Qalyubiyah - 1972/1976/1982

The next slide is exactly the same area in 1982. The yellow depicts the increase in urban areas from 1972 to 1976 and the white is the urban growth from 1976 to 1982. As you can see, the urban area has grown considerably. The increase between 1972 and 1982 was more than 100 percent over the 1972 area. About 1/3 of the increase, 28,000 feddans, was a diversion of agricultural land to urban uses. During this period Greater Cairo expanded in size from about 7.4 million people to 9 million.

Now let's take a closer look at the area showing the most rapid urban expansion, Greater Cairo.

Slide 7: Landcover Change - 10 Kilometer Radius Around Center of Greater Cairo

This slide shows the land-use change around Greater Cairo. Many familiar features of Cairo can be seen here: Zamalek, the road to the pyramids, and the expansion in Heliopolis. The area represents a circle 20 kilometers across and represents 78,000 feddans. In 1972, 42 percent of the area was urbanized. By 1982, two-thirds had been urbanized. As you can see, much of the expansion took place in desert areas near Heliopolis, but significant growth also took place in the agricultural areas of Giza.

Slide 7A: Landcover Change - Giza Governorate

The non-desert area of the Giza Governorate around Greater Cairo is nearly 140,000 feddans. In 1972 urban uses were less than 25 eprcent. By 1982 the urban area was 70 percent higher than in 1972.

Slide 8: Map of Gharbiyah Governorate

In the case of the greater Cairo area much of the urban expansion could occur in desert areas. For areas entirely within the delta area, however, this is not possible. All urban expansion takes place in the agricultural land. The next slides examine this relationship in more detail.

Slide 9: Gharbiyah Governorate

Gharbiyah is one of the more agricultural governorates. While most recognize the extent of change in Greater Cairo, few have realized the extent of urbanization in this predominantly agricultural area. In 1972, less than 4 percent of the area was urban (shown by red); most of the balance, nearly 95 percent, was in agriculture. The yellow areas show the extent of urban growth between 1972 and 1976. In this four-year period the area in urban uses had increased by more than 60 percent. Between 1976 and 1982 urban uses, shown in white, increased by an additional 40 percent. The result is that land devoted to urban uses has nearly doubled in this governorate. All this expansion has been on land previously devoted to agriculture. Thus about 14,000 feddans of agricultural land were lost in Gharbiyah, half as much as were lost in the Cairo-Giza-Qalyubiyah area, even though the population is only one-quarter as large.

Slide 9A: General Area Around Tanta

Tanta is a large city in the midst of an agricultural area. This slide shows a square of 140,000 feddans. The urban areas in red are joined by the extensive highway network. Route 1 and route 43 stand out clearly. In 1972 the area was over 95 percent agricultural. The urban areas more than doubled by 1982. As the slide shows, each of the small settlements existing in 1972 (shown in red) is surrounded by new urban growth from 1972-1976 (yellow) and 1976-1982 (white).

Slide 10: Areas Within a Radius of 10 Kilometers of Tanta

This slide focuses on the area directly around Tanta. The 76,000 feddans were over 90 percent agricultural in 1972. Between 1972 and 1982, the urban areas increased by over two-and-one-half times. The entire increase represented a loss of agricultural land.

Slide 11: Map of Minufiyah Governorate

Finally, let us look at the entire governorate of Minufiyah.

Slide 12: Minufiyah Governorate

The Minufiyah Governorate contains approximately 360,000 feddans. In 1972, the land area was approximately 95 percent agriculture and 5 percent urban (red). The urbanization between 1972 and 1976, yellow, and 1976 and 1982, white, has resulted in more than doubling of the land used for urban purposes. The loss has been all at the expense of agricultural lands.

Let me try to put these numbers in perspective. Minufiyah Governorate contains about 6 percent of the agricultural land in Egypt. Between 1972 and 1982 about 20,000 feddans were lost to urbanization. To replace that land through land reclamation projects would cost L. E. 40 million (at L.E. 2000 per feddan) and take

10 to 20 years. Since reclaimed land is usually not as productive as existing land the cost to replace the lost production could be 2 to 3 times as high.

The lost production might also be replaced through imports. If it were planted in wheat, the lost production would amount to about 26,000 tons per year (at 1.3 tons per feddan). At $200 per metric ton the import cost would amount to $5.2 million per year.

The lost production might also be replaced through higher yields on the remaining land. An increase in yield of 0.5 percent per year would be required to make up the loss. Although yields have increased much faster than this during the period after completion of the Aswan High Dam, they have been stagnant in recent years. Yield increases of 2-2½ percent will be required just to meet population growth (even more would be needed to meet increased consumption per capita). Thus an additional increase of 0.5 percent to replace lost agricultural land would be difficult indeed to achieve.

Minufiyah is a fairly typical case. The loss of 2,000 feddans per year is slightly less than the average loss rate for Egypt as a whole (based on its proportion of the total agricultural land). Extrapolating to all of Egypt indicates that replacing the land lost to spreading urbanization could cost over L.E.100-200 million per year in land reclamation projects or alternatively an additional import bill increasing by L.E. 90 million each year, accumulating to LE 5,000 million in just 10 years.

Slide 12A: Shibin-El-Kom - 10 Kilometer Radius

The area represented in this scene of Shibin-El-Kom is over 76,000 feddans. The urban area represented less than 4 percent of the land area in 1972. By 1982 the urban area had doubled.

Conclusion

The use of LANDSAT has provided us a chance to examine the change in land areas over a decade. While we have all recognized that the cities and rural areas are changing, this study shows how areas around the smaller cities have doubled over a single decade. Where the urban expansion has been at the cost of agricultural areas, the country has lost an important resource, the land that has supported Egypt for centuries. The impact of population growth on agricultural land has severely affected Egypt's development programs. It has nullified the gains that were expected from the land reclamation projects and caused the replacement of fertile valley soil with less-productive desert lands. The drain on resources to replace this loss through new lands, imports or increased yields has jeopardized development efforts in other areas. Of course, the expanding urban areas not only mean the loss of agricultural land but also require additional development resources to provide urban services.

The analysis illustrates the serious impact of rapid population growth and urbanization on Egypt, but it also illustrates diversity in the manifestation of the impact in different governorates. We shall examine this diversity in more detail later with a series of displays that compare all of the governorates of Egypt in terms of several key measures of demographic change and population program implementation. First, however, let us turn to a demonstration of the equipment used to process raw LANDSAT data into the kinds of displays that you have just viewed.

LANDSAT LAND USE CLASSIFICATION AND ANALYSIS TECHNIQUES

LANDSAT has been an important contribution to the peaceful use of space. It is available for use by all countries. The slides that you will see today are based on LANDSAT data. Some of the data used were received from the satellite by the United States; the balance was collected by the LANDSAT facility in Italy.

Once every 18 days, early in the morning, the LANDSAT satellite passes over Egypt starting in the north and proceeding south. It takes six successive days to cover the area of Egypt from the east to the western borders. Each day the satellite collects information on a strip of land 185 kilometers wide. The data that were used for the presentation today are from the path that passed directly over Cairo.

LANDSAT collects data by recording the sun's energy as it is reflected from surface features of the earth through the use of Multispectral Sensors (MSS). This results in a picture of land covers and land use that can be enhanced and color coded. Each individual picture element or pixel corresponds to 1 feddan resolution within total individual square images/pictures of 185 by 185 kilometers. These images are recorded from a distance of more than 900 kilometers above the earth's surface.

LANDSAT travels in a sun synchronous orbit, making 14 trips around the earth each day. This permits it to provide coverage of nearly the earth's entire land surface every 18 days. LANDSAT data are the numeric values of the relative reflectance of the sun's energy from a given land cover. Excessive cloud cover interferes with the satellite's ability to collect data.

Four channels on the electromagnetic spectrum (green, red and two near infrared bands) are covered by the LANDSAT sensors, so each pixel (individual picture element) has four numbers associated with it. A desert area would reflect high amounts of energy, perhaps 55 on a scale of 0 to 64, while shaded areas would reflect very little energy, perhaps 18. The numbers can be read from a computer tape to produce a film image or a digital classification. Each group of similar pixels (those having similar values in the four channels) becomes an individual map category or class. This begins the process of classification that was used to prepare the charts described in the first part of this presentation.

* * * Presentation of LANDSAT Analysis Equipment * * *

Conference participants may view the LANDSAT equipment in a nearby room.

THE EFFECTS OF POPULATION FACTORS ON SOCIAL AND ECONOMIC DEVELOPMENT IN BEHEIRA

For the final part of this presentation, I would like to present some information about the effects of population growth in the future. Such an analysis was prepared for all of Egypt two years ago and was shown to many Egyptian leaders at that time. A similar analysis has been prepared for the Beheira Governorate by the Population Family Planning Board and The Futures Group.

Let us begin with some demographic background for Beheira.

Chart 1: Birth Rates, Death Rates and Rate of Natural Increase

The first line shows the crude birth rate, the number of births per 1,000 people in the population. Unfortunately, we only have data for a relatively short period, 1966 to 1981. During this time the birth rate declined somewhat from the level of 42 in 1966 to about 36 in the early 1970s, but has apparently increased since then to above 40.

The next line shows the death rate. It has declined steadily over this period. The difference between births and deaths is the rate of natural increase. Due to a steadily declining death rate and a high, fluctuating birth rate, the natural growth rate of the population has remained high, around 2.4 to 2.7 percent per year.

In the future, death rates will probably continue to decline. If the birth rate does not also begin a steady decline, the rate of population growth will remain high and even increase.

Chart 2: Momentum of Population Growth

The next chart shows a population pyramid for Beheira in 1980. Each horizontal bar represents the size of the population in a particular five-year age cohort. The bottom three bars are colored orange. They represent the child population, those below the age of 15. As you can see, Beheira has a large percentage of its population in this young age group; 42 percent are under 15. This compares to a country that has experienced lower rates of population growth, which would have about 25 percent of its population in this young age group.

The size of this group has important implications for future population growth. In the next 20 years this large group will be moving into its prime years for forming families and having babies. It is so numerous that even if each family had only 2 children instead of the 5½ average at present, the number of babies born would far outnumber deaths to older people. Thus, the population would continue to grow for at least 40 years, until the large group moves entirely out of its reproductive years.

Chart 3: Fertility Assumptions

In order to look into the future, we have prepared three projections of population growth. All three assume that life expectancy continues to increase, going from 56 years today to 68 years by 2010. This graph shows the three fertility assumptions. The high fertility projection, A, shown in orange, assumes a slow decline in the total fertility rate from 5.6 children per woman today to 5 by 2000. The two reduced growth projections assume a more rapid decline to 3 by 2000 for projection B, and replacement level, about 2 children per woman, by 2000 for projection C.

Chart 4: Total Population

This chart shows how each of the fertility assumptions would affect population growth in the future. With continued high fertility, the population of Beheira would grow from 2.7 million in 1980 to 5.9 million by 2010, an increase of 120 percent. With fertility reduced to 3 children per family by 2001 the population would grow to 4.6 million by 2010, 1.3 million less than with high fertility. With fertility declining to replacement level, the population would grow to 4.2 million in that year.

Now let us use these three projections to see how different rates of population growth would affect social and economic development in Beheira.

Chart 5: Labor Force and Child Dependents

There are several important impacts of population on labor force and employment. This chart depicts the growth of the labor force from 1980 to 2010 under the high fertility and 3 children per family projections. As you can see, there is very little difference in the size of the labor force under the two projections. This is because all the people who will enter the labor force in the next 15-20 years are already born.

When we look at the dependent population, however, we do see a big difference. The bars on the bottom of the chart represent the children under the age of 15 dependent on the labor force for support. Today there is slightly less than one worker for every child who needs to be supported. With high fertility continued, that ratio will remain about the same by 2010.

With a reduction in fertility, however, the number of children who need to be supported will not grow as quickly as the labor force. By 2010, there would be almost 2 workers for each child to be supported.

Chart 6: New Job Requirements

The next chart looks at the number of new jobs required each year to provide employment for young people entering the labor force. Today about 30,000 new jobs are required each year. The number will not rise much in the next 10 years because of the drop in the birth rate in the early 1970s. With continued high fertility, it will begin rising again by 1995, reaching 60,000 new jobs required each year by 2010. With reduced fertility the number would rise slightly but not exceed 40,000. The lower requirements for job creation would allow more efforts to be put into reducing the current backlog of underemployed workers and improving the productivity of workers at all levels.

Chart 7: Primary School Enrollment

Free education and training are available to each Egyptian citizen. The goal is to achieve 100 percent primary enrollment. In Beheira the primary enrollment rate is about 60 percent. If this rate continues into the future, the number of school children will more than double with continued high fertility, from 280,000 today to 580,000 by 2010. Even with this increase in enrollments the number of children not enrolled in school would increase from 185,000 today to 350,000 by 2010.

With a reduction in fertility to 3 children per family by 2000, the number of school-age children would rise more slowly, reaching only 530,000 by 2010. Thus, with reduced fertility all children could be enrolled in school for about the same expenditure that would be required to enroll only 60 percent with continued high fertility.

Chart 8: Infant Mortality and Birth Order

A major objective of the Government is to provide adequate health care to the population. Rapid population growth works against this in two ways. First, the increasing number of people that need health services can strain the resources available. Second, high fertility is itself a factor in high infant and maternal morbidity and mortality rates. The infant mortality rate in Beheira is about 63. This is somewhat lower than for all of Egypt but still very high compared to an industrialized country where the rate is only about 12.

This chart shows international data relating the level of infant mortality to birth order. Mortality is often higher for the first child since the mother is often very young. For the second and third children infant mortality rates are generally much lower. They begin rising again with the birth of the fourth, fifth and sixth children. In Beheira, where the average woman has 5 to 6 children, this high fertility contributes directly to the high infant mortality rates.

Chart 9: Arable Land Lost and Reclaimed

We have seen LANDSAT analyses of the change in agricultural land in many areas in Egypt. Let us look now at the change in Beheira, one of the governorates where the land reclamation effort has been concentrated.

According to the Ministry of Agriculture, there were 60,000 feddans of arable land in 1980. During that year an additional 20,000 were reclaimed. Unfortunately, at the same time 10,000 feddans were lost.

In 1981, there were originally 70,000 feddans. Thirty thousand were reclaimed and 20,000 were lost, leading to a net addition of 10,000 feddans in both 1980 and 1981.

The loss of agricultural land to urbanization has greatly reduced the gains made by the land reclamation effort. Since the new land is usually not as

productive as the old land that is lost, there may be a net loss in productivity in spite of the enormous investment in land reclamation.

Chart 10: Housing Conditions in 1976

The land that is being lost is used for buildings and highways to service the expanding urban population. The urban areas have been growing so fast that it has been hard to provide adequate services in the cities. In 1976, almost half of the urban population of Beheira was without an internal water supply and almost one-third did not have electricity.

Chart 11: Growth of Damanhour

The growth of Damanhour illustrates the future problems in providing services for the expanding urban population. Today Damanhour is a city of about 200,000. With continued high fertility it will grow to over 700,000 by 2010. Slower rates of population growth would mean an increase to only 500,000 to 550,000.

Conclusion

The rapid growth in the population of Beheira and all of Egypt poses serious problems for future development. A reduction in the rate of population growth can alleviate many of these problems. In some cases the beneficial impacts of a reduction in population growth are long-term, 10-30 years, as in the case of labor force, agriculture and urban growth. In others the effects occur in a much shorter time period; infant and maternal health are affected immediately; school enrollments are affected in 6-7 years; child dependency rates are affected in 5-10 years.

Due to the built-in momentum of population growth, the process of reducing the growth rate of the population is a lengthy one. Each 5-year delay in implementing an effective policy will add an additional 12 million people to the eventual population of Egypt.

Egypt has begun the effort to reduce fertility and has many important programs already in place. An increased emphasis in this vital effort from national and governorate-level leaders is needed to ensure the success of the programs. The result will increase the positive impacts of Egypt's social and economic development programs and contribute to a better life for all Egyptians in the future.

DEMOGRAPHIC CHANGE AND POPULATION PROGRAM IMPLEMENTATION: DIVERSITY AMONG THE GOVERNORATES

The next section of this presentation discusses population factors in Egypt by comparing information for the governorates. It illustrates the considerable diversity among the governorates with respect to many factors.

Slide 1: Population Growth in Egypt 1882-1982

Egypt's total population has grown from about 7.9 million persons in 1882 to 45 million in 1982. After a 50 year period of relatively gradual growth, the rate of increase has sharpened considerably since the 1940s. Egypt ranks as the 19th most populous country in the world.

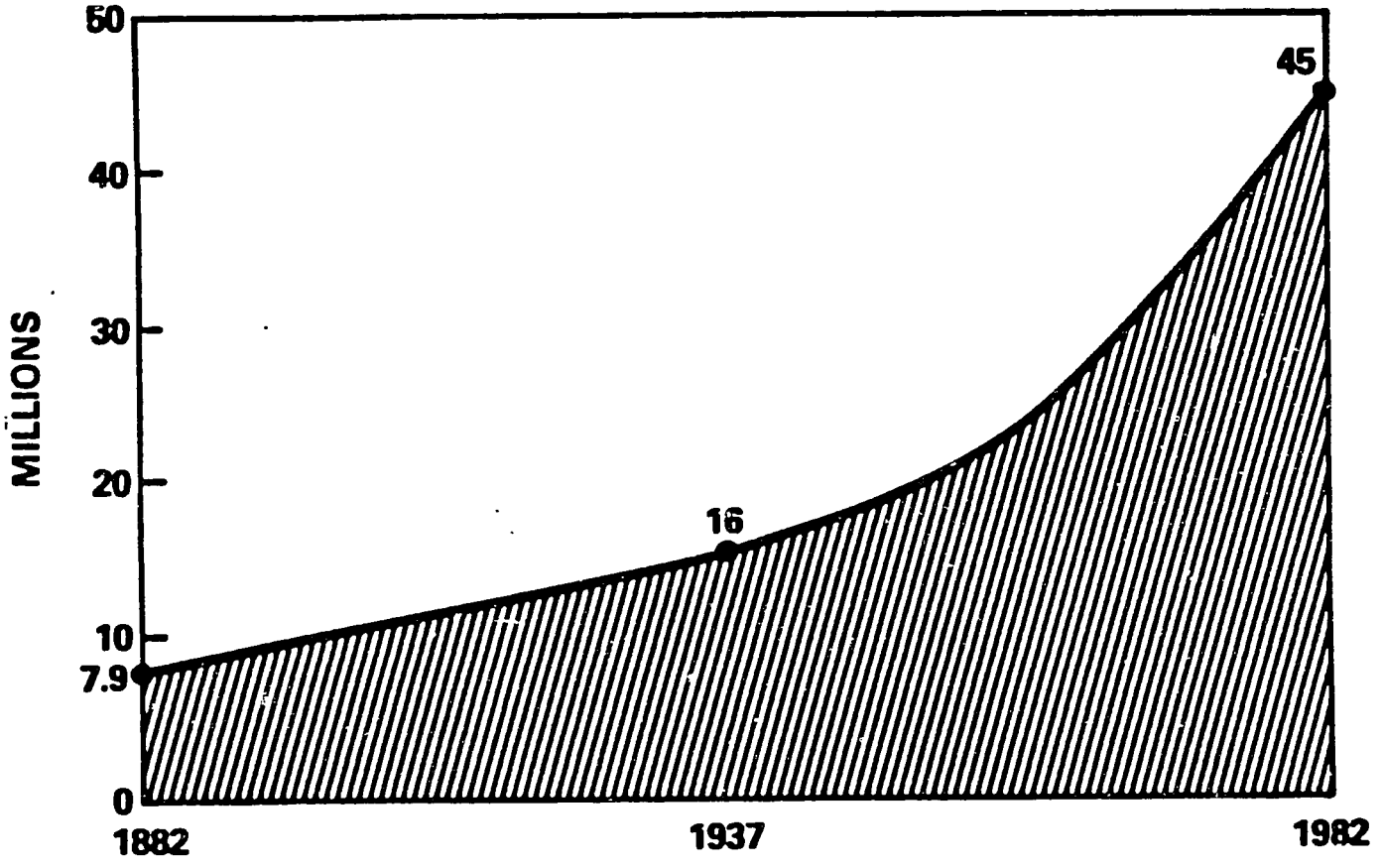
Slide 2: Population by Governorate

With nearly 6 million inhabitants in 1982, Cairo is the most populous governorate by nearly two to one. It is also larger than 92 countries around the world. Of the other urban governorates, Alexandria is the next highest with nearly three million inhabitants, and Suez is the smallest. Among the governorates of lower Egypt, Dakahlia is the largest with just over three million inhabitants, while Ismailia is the least populous. In upper Egypt, Giza has the largest population approaching three million, and Aswan is the least populous. The frontier governorates are of course the least populous in the country.

Slide 3: Population Density by Governorate

Cairo, not surprisingly, has the highest population density of any governorate by far with an average of nearly 27,000 persons per square kilometer. Qalyoubia

EGYPT
Population Growth 1882-1982

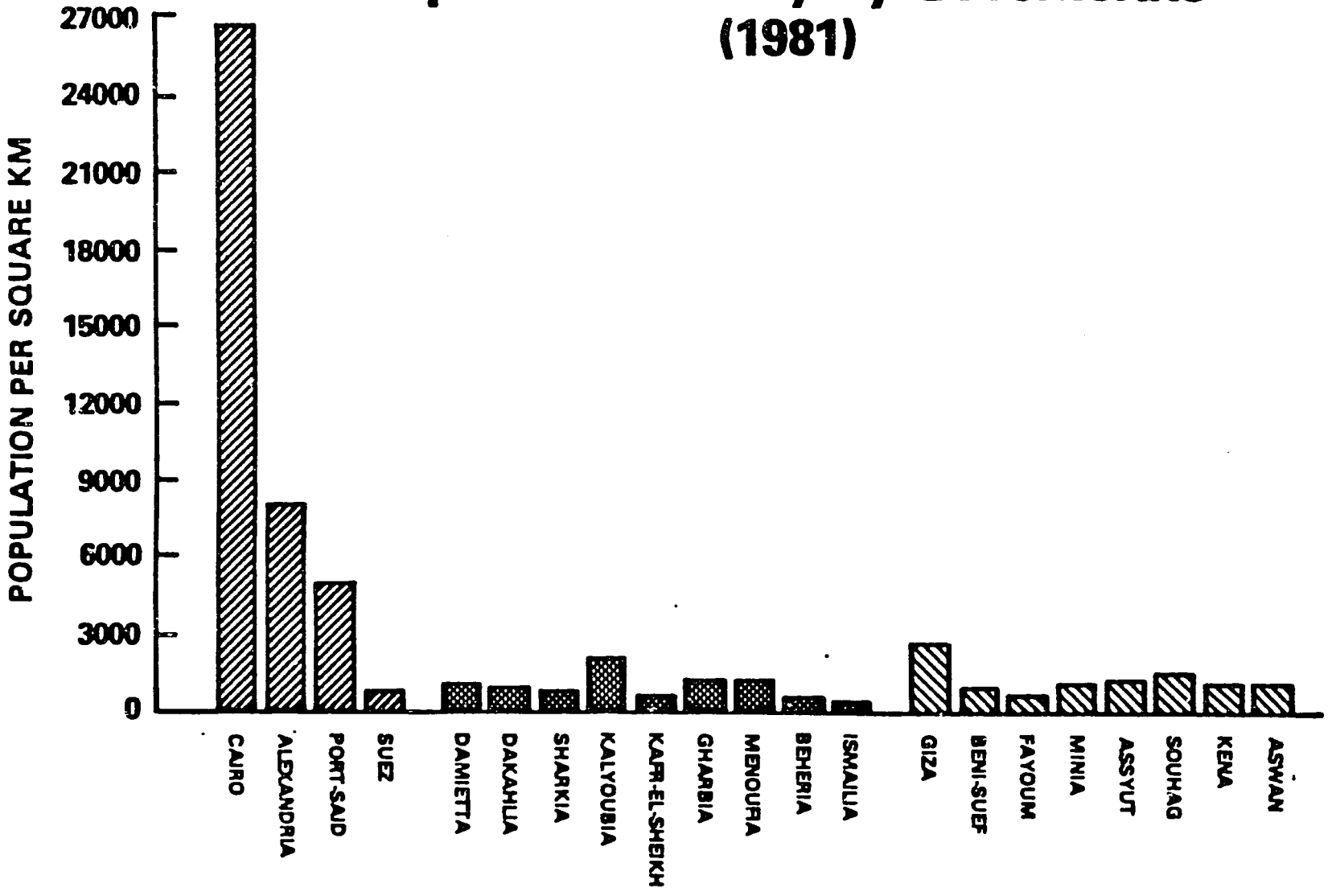


EGYPT

Population By Governorate (1982)

EGYPT

Population Density By Governorate (1981)



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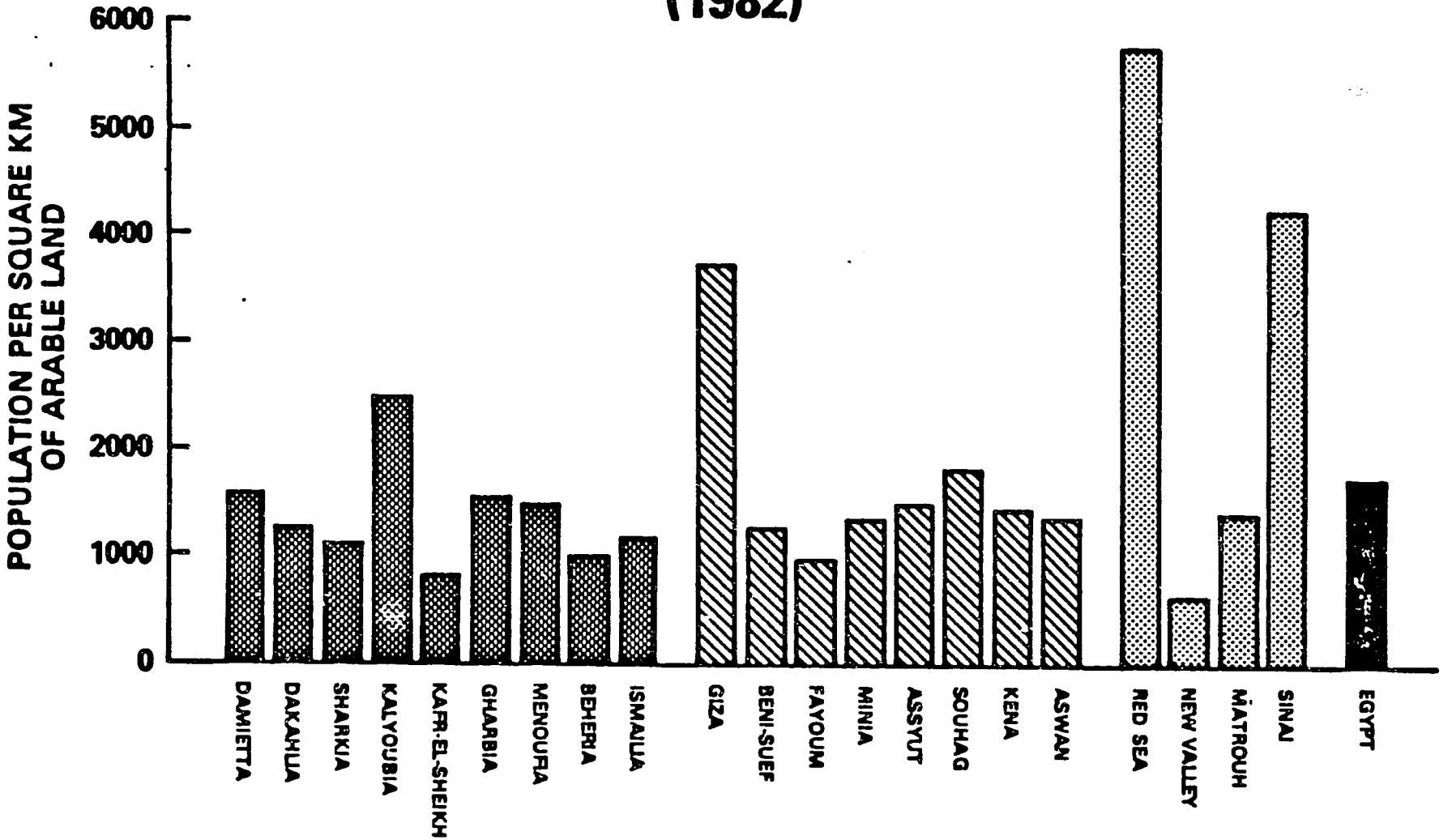
Population Density and Arable Land By Governorate (1982)



and Giza have the highest densities in lower and upper Egypt respectively. Ismailia and Fayoum are the least dense of the two regions, but the frontier governorates obviously have far lower densities.

Slide 4: Population Growth Rates by Governorate 1966-1976

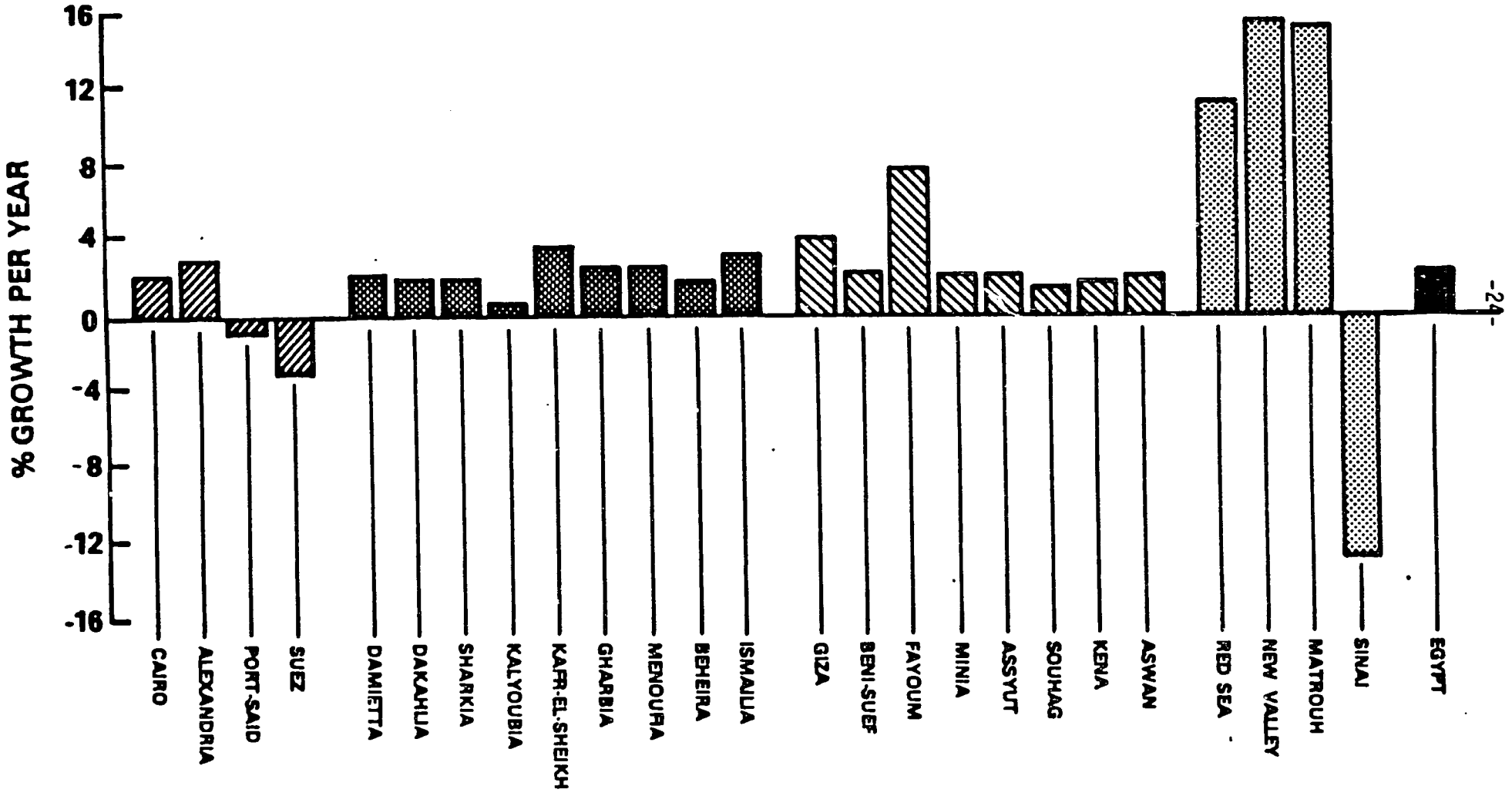
The population of Egypt is growing at 2½-3 percent per year. Annual population growth rates, based on the period from 1966 to 1976, vary extensively among governorates. The greatest growth rates are in the frontier governorates. The negative figures for Suez, Sinai and Port Said were true for the period 1966 to 1976, but if we had more recent data we would see a much different picture. All the governorates of lower and upper Egypt have positive annual population growth rates. Kafr-El-Sheikh with a growth rate of nearly 4 percent and Fayoum with a rate approaching 8 percent are the highest in each case, while Qalyoubia and Souhag enjoy the lowest growth rates for each region. The largest contributions to the growth of the countries come from the most populous governorates: Cairo, Alexandria, Dakahlia, Sharkiya, Beheira and Giza.

Slide 5: Internal Migration by Governorate

Internal migration patterns have clearly contributed significantly to the population growth of several governorates, particularly the urban ones. This chart displays the percentage of total in- and out-migration accounted for by each governorate. By far the largest migration into a governorate was experienced by Cairo which accounted for an average of 17 percent of the total. Giza follows Cairo with nearly 14 percent of the total. Note that the predominant flow has been out of the rural governorates and into the urban ones. This reflects not only the attraction of urban life and the hope for better jobs but also the increasing pressure on agricultural land to support the growing rural population.

EGYPT

Population Growth Rates By Governorate (1966-1976)



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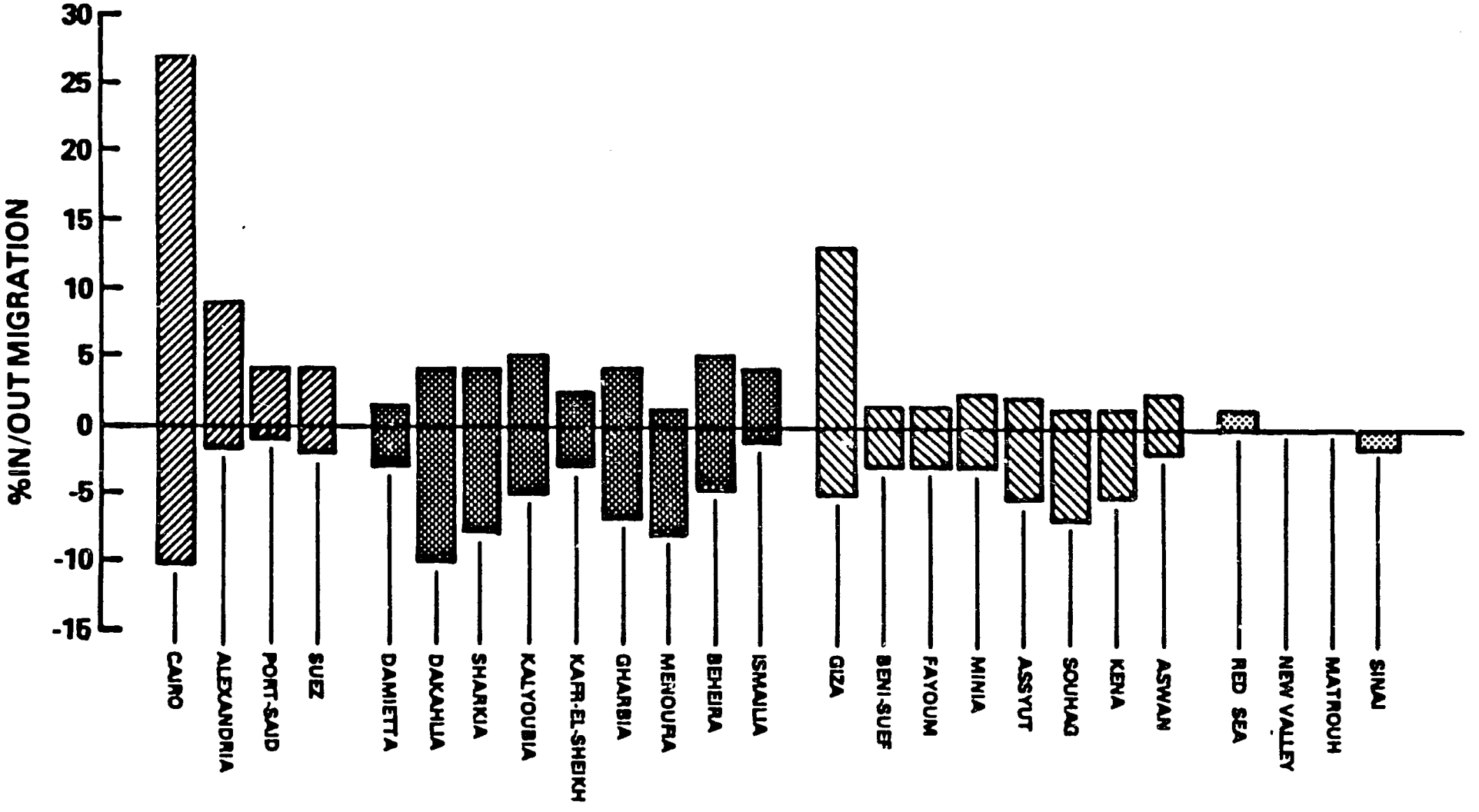
Internal Migration By Governorate (Before Nov, 1976)



Slide 6: Crude Birth Rates by Governorate

Egypt's population growth rate has remained high because the death rate has dropped substantially while the birth rate remains high. For the country it is 35-40 births per thousand people. Fayoum is the governorate with the highest crude birth rate in Egypt--in excess of 50 births per thousand. Cairo and Alexandria apparently have the lowest crude birth rates, both at about 35 births per thousand, but there are no data available on the rates in the frontier governorates.

Slide 7: Percentage Change in CBR by Governorate (1963-1980)

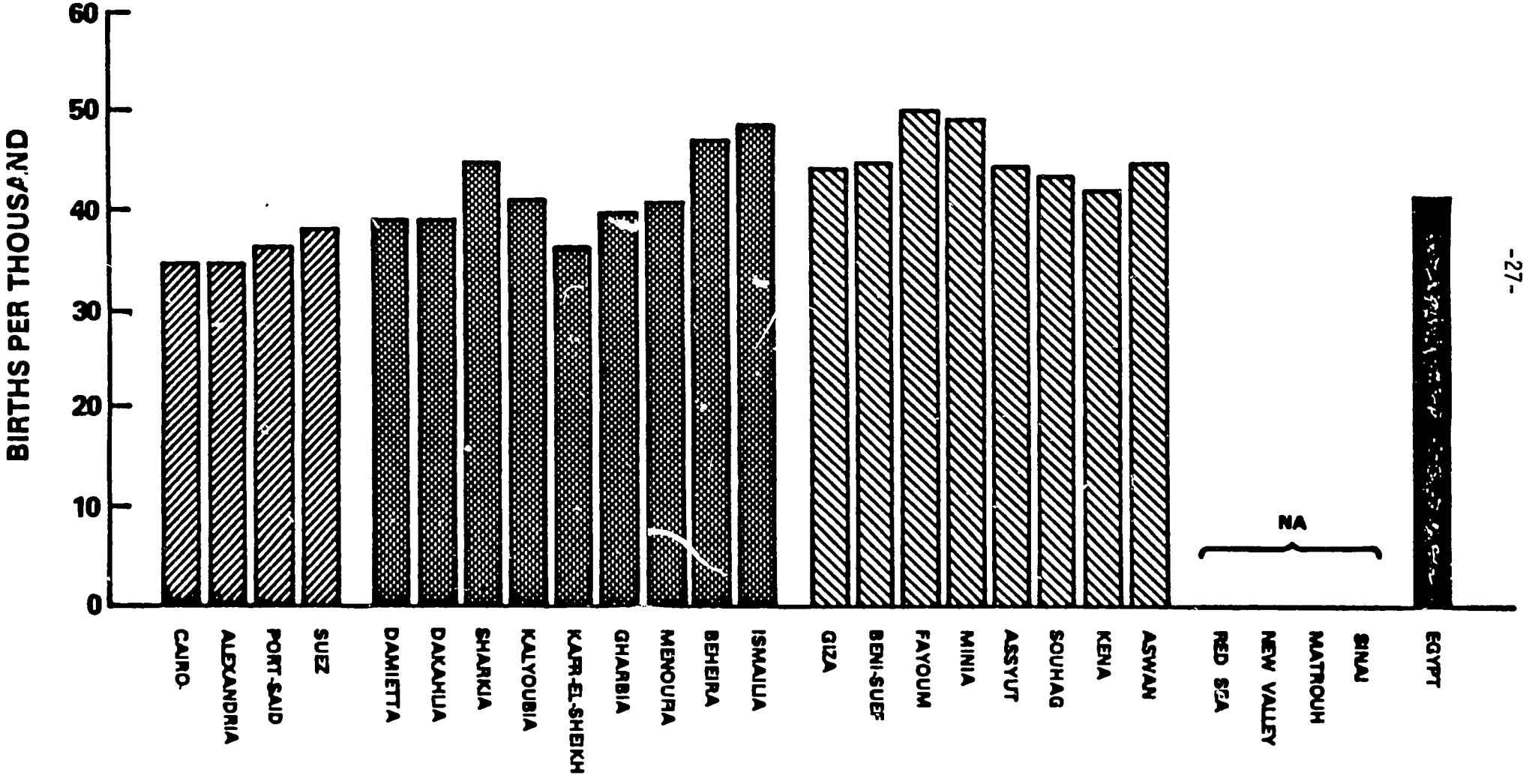
For the entire country, the birth rate declined from about 43 in 1963 to 36 by the early 1970s. However, by 1980 it had increased to about 41. Although birth rates are declining in the urbanized areas of lower Egypt this is not the case throughout the country. Suez has experienced the largest decline--nearly 30 percent--in crude birth over the period 1963 to 1980, but Cairo's CBR decline exceeds 22 percent. In upper Egypt the birth rate is still increasing with Minia at the top of the list with an increase in excess of 25 percent.

Slide 8: Contraceptive Use and Crude Birth Rates (Country Comparisons)

This slide presents national comparisons of data on the percentage of married women aged 15 to 49 using contraceptives in terms of the crude birth rates for those countries. Most of this data is for 1980. As you can see, the countries tend to fall close to the diagonal line that clearly suggests a relationship between high contraceptive use and low birth rates. Like Pakistan, Egypt's relatively high crude birth rate is related to the relatively low percentage of women using contraceptives. In order to achieve a reduction in Egypt's high fertility rate of about 5½ children per woman, on average, to a level of 3 or 2 children per family it will be necessary to increase contraceptive user rates to 60-75 percent.

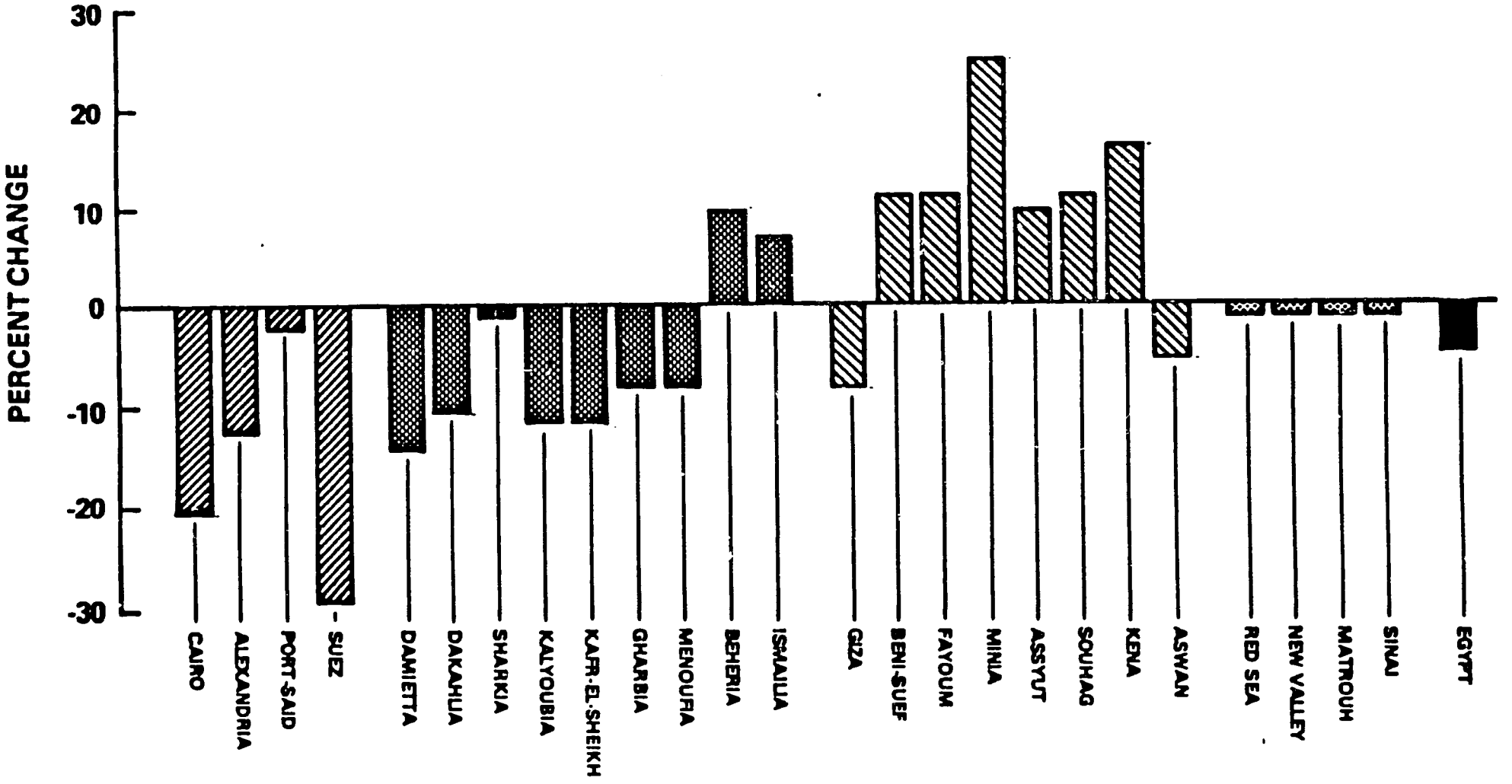
EGYPT

Crude Birth Rates By Governorate (1980)

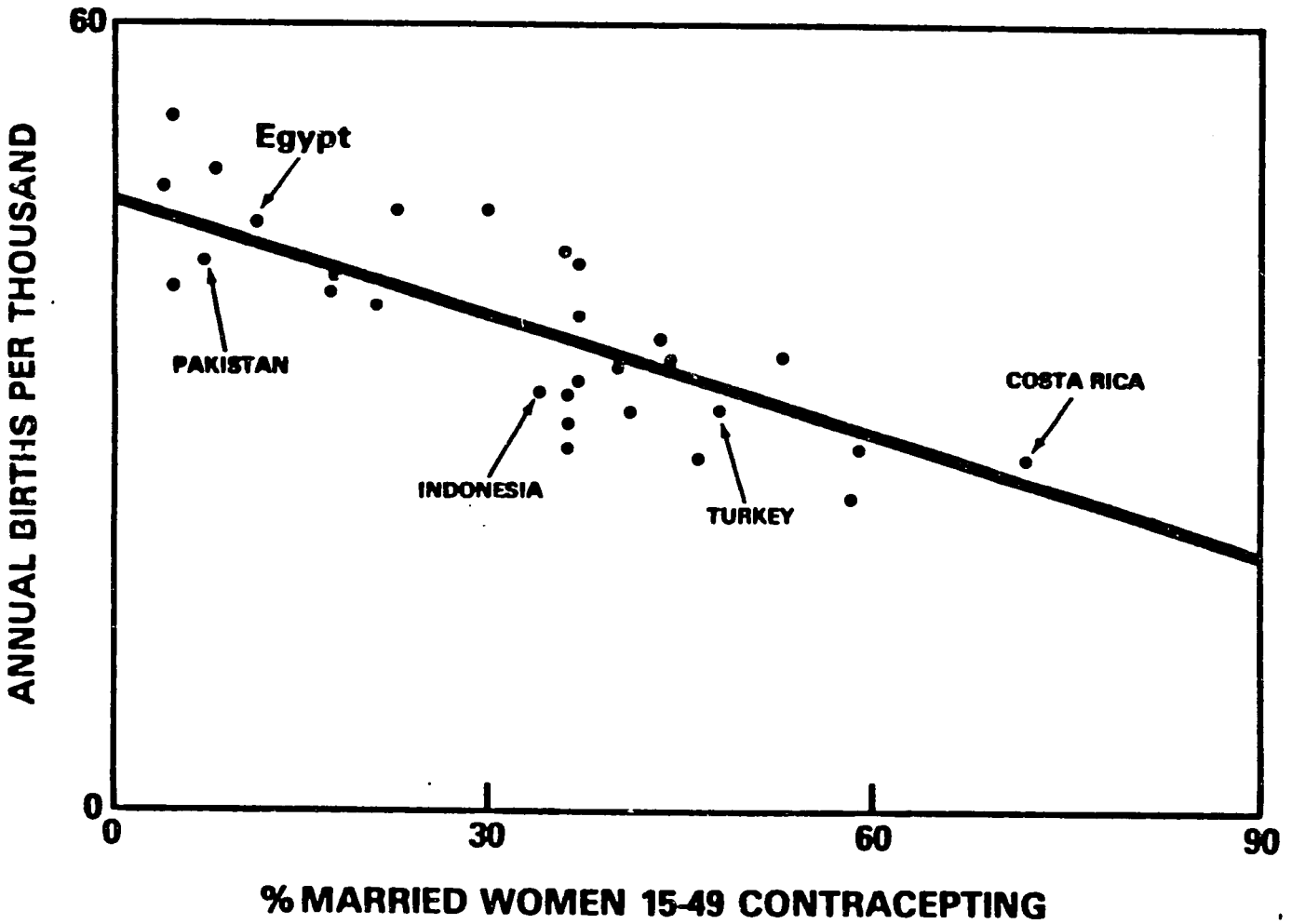


EGYPT

% Change In CBR By Governorate (1963-1980)



Contraceptive Use and Crude Birth Rates



Slide 9: Contraceptive Use and Crude Birth Rates by Governorate

This display suggests that the same kind of relationship exists for the individual governorates of Egypt. Souhag and Fayoum have the lowest percentages of women aged 15 to 44 using contraceptives and have correspondingly high crude birth rates. Suez and Cairo, in contrast, have much higher contraceptive use and far lower crude birth rates.

Slide 10: Contraceptive Use by Governorate

This display compares the governorates in terms of the percentage of females using contraceptives. Cairo, at 30 percent, clearly has the highest figure. Alexandria at just over 20 percent has the lowest rate of urban governorates. Dakhalia, Giza and Red Sea have the highest rates for lower Egypt, upper Egypt and frontier governorates respectively. In order to achieve even a 3-child family average the user rate in Cairo would have to double. In other governorates it must increase by 3-5 times to reach this level. Clearly, much progress needs to be made in the urban governorates and in lower Egypt but an even greater task remains in upper Egypt.

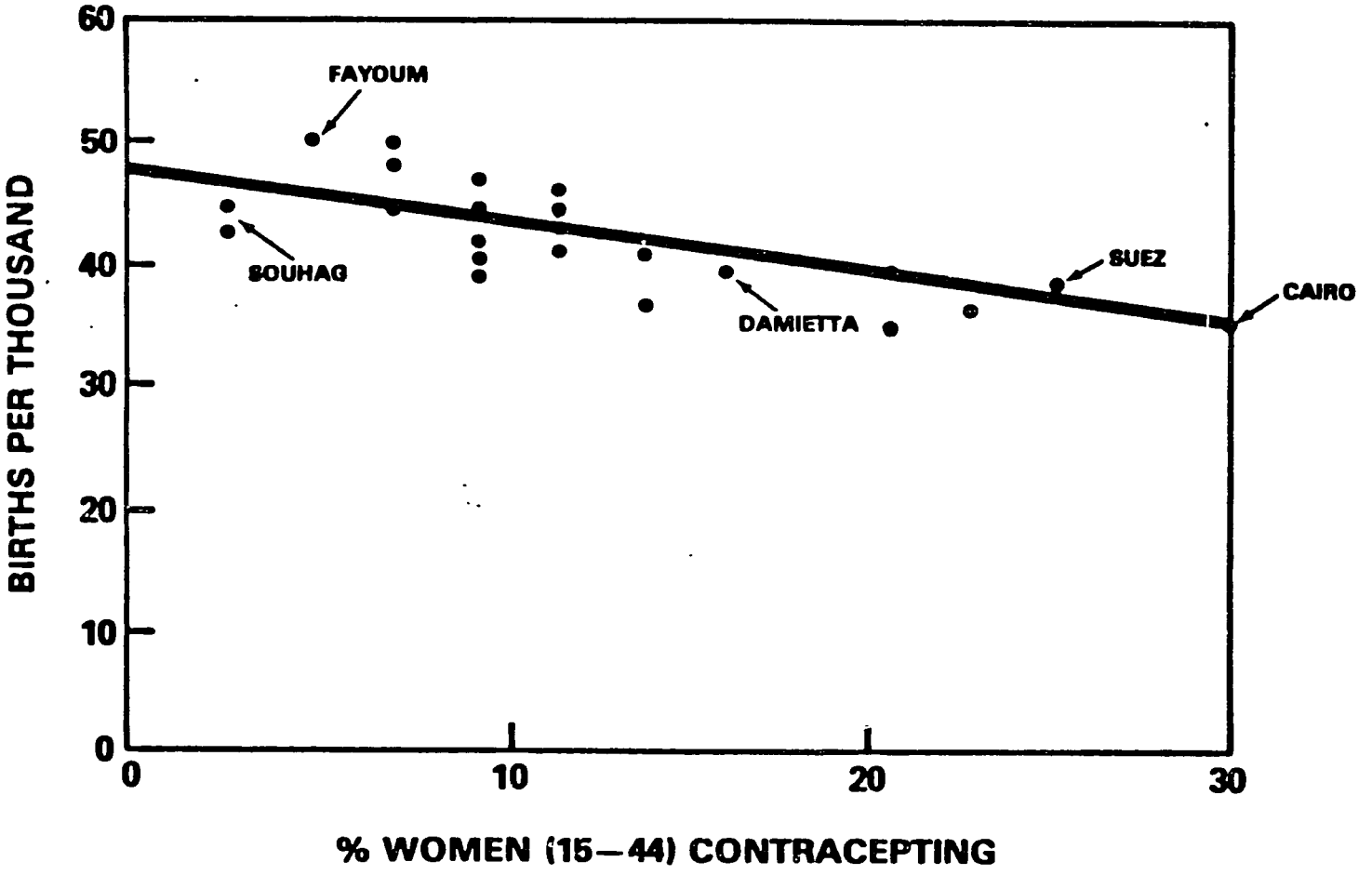
Slide 11: Primary Enrollment Rate by Governorate

Turning to social sectors for a moment, this display compares the governorates in terms of primary education enrollment rates. Again, considerable diversity is evident. Suez enjoys the highest rate of the urban governorates, while Damietta and Fayoum lead the lower and upper Egypt governorates respectively. The lowest rates by far occur in the frontier governorates.

Slide 12: Comparative Infant Mortality Rates

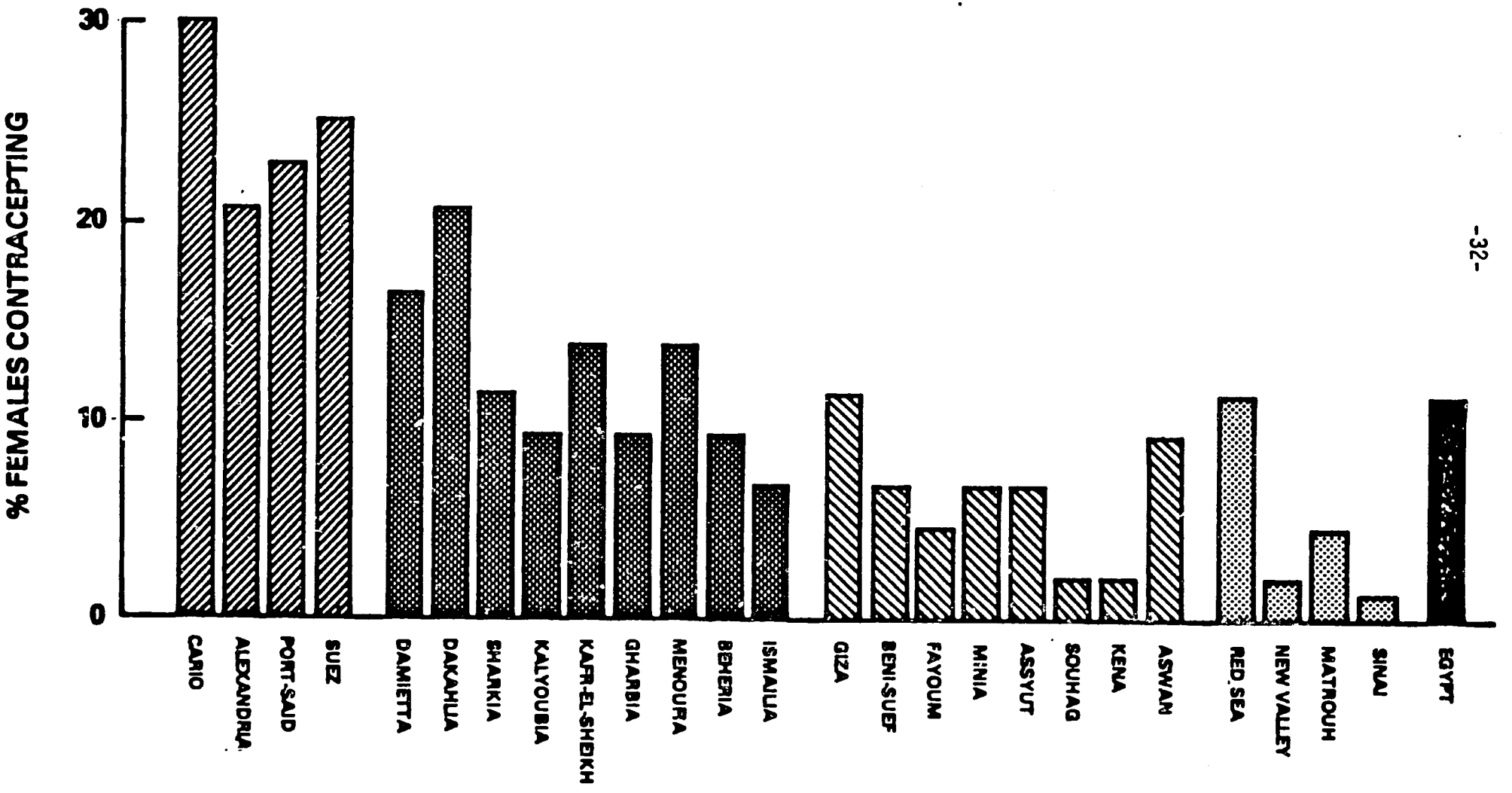
We do not have data on infant mortality rates by governorate but the next slide compares Egypt with the rest of the world. This slide shows Egypt's rate at

EGYPT
CBR vs. Contraception By Governorate



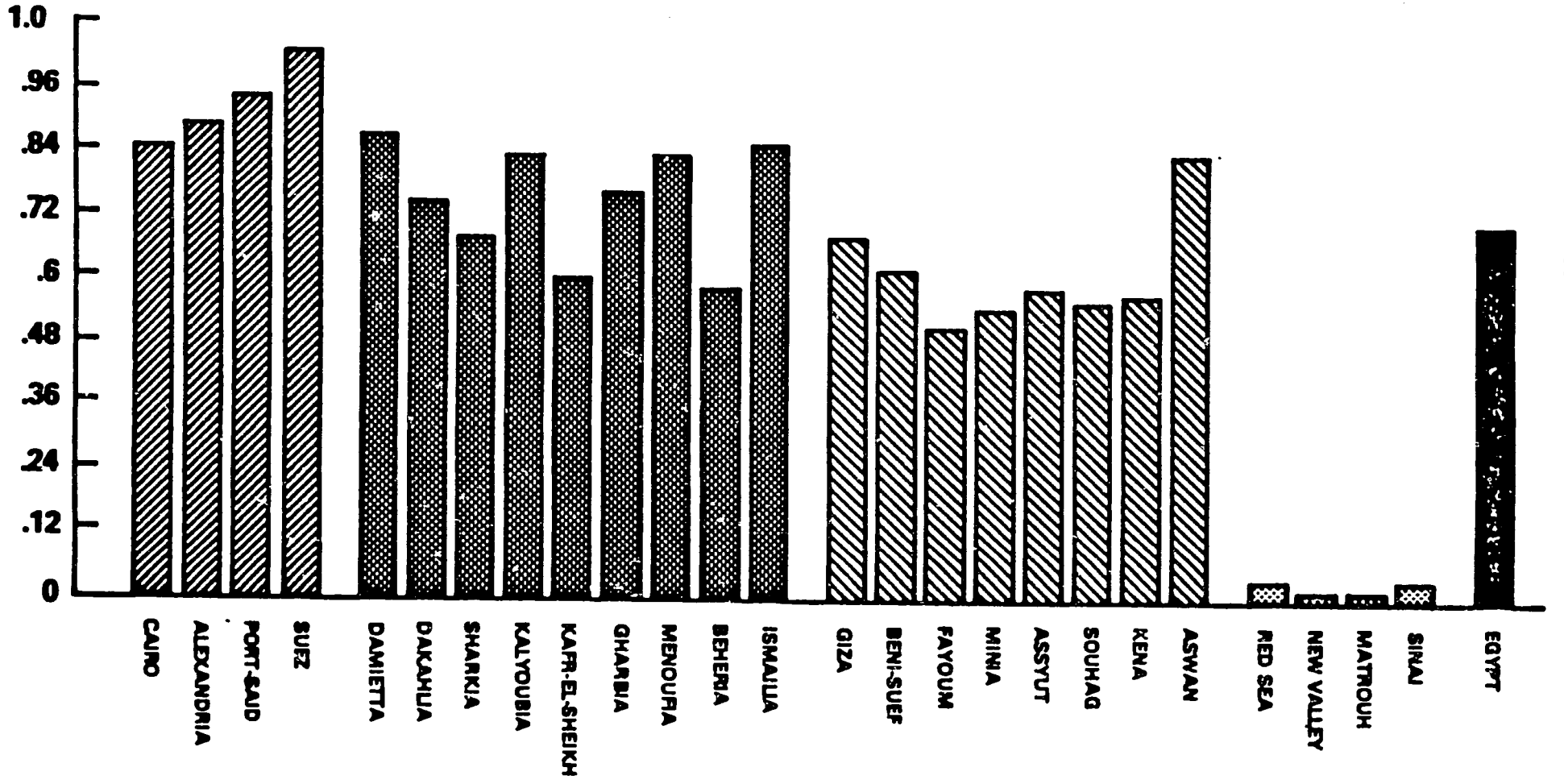
EGYPT

Contraceptive Use By Governorate, (1981)



EGYPT

Primary Enrollment Rate By Governorate



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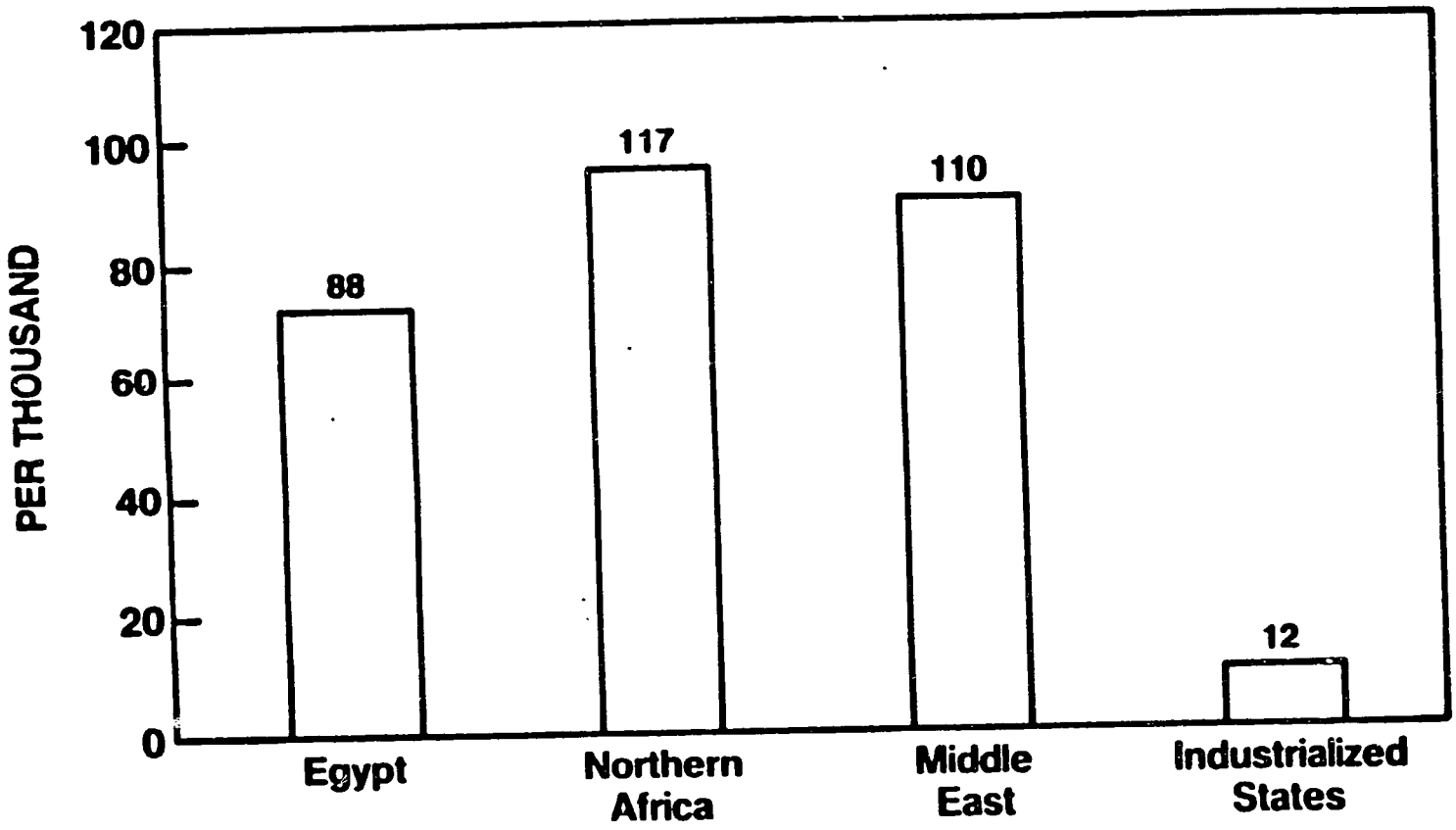
Comparative Infant Mortality Rates



88 per thousand. That means that out of every 1000 babies born, 88 will die before reaching their first birthday. Some recent studies have indicated that the rate for Egypt may actually be much higher than shown here, in the range of 110-120 per thousand. This would put Egypt at a comparable level with the countries of Northern Africa and the Middle East but much higher than the industrial countries, which, taken as a group, average 12 per thousand.

Conclusion

Clearly, progress has been made in reducing population growth rates and improving the quality of life through reduced death rates, reduced infant mortality rates and increased educational enrollment rates. However, as we have seen, a tremendous task is still ahead to achieve better results in the future. Much of the progress that has been made has been in Cairo and the other urban areas of lower Egypt. Upper Egypt has been less fortunate in benefitting from past development. These are broad generalizations. There exist individual governorates that do not follow the general pattern. As future development efforts are undertaken to reduce population growth and encourage social and economic development, it is important to design efforts to meet the specific needs of each governorate and to monitor progress at the governorate level. The future development of Egypt depends on achieving success in these efforts within each individual governorate.