

# National Census Report

## 1994 FSM Census of Population and Housing



*June 1996*

*Office of Planning and Statistics  
Division of Statistics  
National Government  
Federated States of Micronesia*

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### PRESIDENT'S MESSAGE

It is with great pleasure that I endorse the FSM National Census Report for the 1994 Population and Housing Census. This comprehensive report is the first of its kind in the FSM and would be very useful to fill the information gap required in the national, state, and community development plans and management.

The census result will serve in great length in our daily efforts of developing our domestic resources in a manner that would create jobs for our growing labor force and improve the living standards of our people. It will also serve as a bench mark information for public and private sector in coordinating and integrating essential social services to our growing population, while protecting our fragile environment. I therefore encourage everyone to utilize the results presented in this document for efficient and effective services.

I would like to take this opportunity to acknowledge my utmost gratitude for the technical and financial support for our 1994 FSM Census project by the United States Government, the United Nations, and the South Pacific Commission.

I certainly would also like to acknowledge the state and the national governments participation in general and the Office of Planning and Statistics in particular for making the 1994 Census a success.

Bailey Olter  
President



# OFFICE OF PLANNING & STATISTICS

NATIONAL GOVERNMENT  
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## National Planner's Message

The use of reliable and accurate data cannot be overstated in the course of planning, management and administration. The 1994 FSM Census data provide a wide range of useful information on the size, structure, distribution, and socio-economic characteristics of the population. The impact of population change on the economy is highly diverse and significant. Consumer demand, labor supply, availability of job, housing needs, provision of health and education, urban services, the environment and a variety of other socio-economic phenomenon are all influenced by the size and characteristics of the population. It would be timely, therefore among other things, the leaders in the FSM consider the overall development effort in relation to population changes in the FSM. The rate of development should at least commensurate with the population growth.

In this regard, I am confident that planners, policy makers, leaders, researchers, etc. would find this report as a useful source of population related information in the FSM. I therefore urge everyone to utilize the 1994 census results as a tool in the daily process of decision making.

The 1994 FSM Population and Housing Census was a joint effort between the National and State governments as well as the international organizations. The financial support of the U.S. Bureau of Census, Office of Territorial and International Affairs (OTIA), the United Nation Fund for Population Activities (UNFPA) are gratefully acknowledged.

It is also appropriate to acknowledge the individuals who provided technical assistance for the successful implementation of the 1994 FSM Census. Without their cooperation, it would have been very difficult to have produced this 1994 FSM National Census Report.

From the U.S. Bureau of Census, Dr. Michael J. Levin assisted in almost all phases of the project. Dr. Levin's support during the data processing and reviewing of this report is specifically recognized. Mr. Fabian Sanchez, who was the regional advisor stationed in Washington, D.C. was very helpful during the planning, preparation of fieldwork, and data processing. Mr. Thomas Ondra, the resident advisor, provided assistance in the implementation of the census. Ms. Mary Mahy joined the staff as a consultant, and assisted the staff in the analysis and preparation of this report.

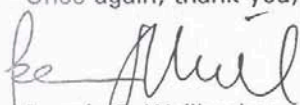


From the UN organizations, Mr. Laurie Lewis, regional advisor from the UNFPA Country Support Team (CST), participated in almost all phases of the project. Dr. William House, also regional advisor from the UNFPA CST, participated in the preparation of the economic chapters during the review process of this report. Dr. Faysal Abdel-Gadir, the Regional Director for the UNFPA provided valuable advice during his visits to the FSM. From the South Pacific Commission, Dr. Gerald Haberkorn and his staff, Dr. Noor Khalidi and Ms. Vilimaina Rakaseta provided valuable support at the various stages of this project. Mr. Kassahun Deneke Mekuria, a United Nations Volunteer provided by UNFPA was also a resident advisor who assisted the local staff throughout the implementation of the project and the preparation of this report.

The Office of Planning and Statistics is also grateful for the support given by the previous National Planners: Mr. John A. Mangefel, during the initiation of the census project; Mr. Marcelino Actouka, during the organization and implementation processes; and Mr. Del Pangelinan, during the actual enumeration and the early stages of the data processing.

My special appreciation to the Census Advisory Committee (CAC) and the Census Technical Group (CTG) members for their participation in the decision making and monitoring process of the project. And finally, I extend my appreciation to the staff members at the National Division of Statistics and the State Statistical staff who worked on this project.

Once again, thank you, kamagar, kinisou, kalahngan, and kulo to you all.



Bermin F. Weilbacher  
National Planner,  
FSM Office of Planning and Statistics

## Preface

The influence of the size, the distribution and the characteristics of the population in the planning and development process for the Federated States of Micronesia (FSM), a small island nation with a total land area of only 270.6 square miles, need to be a pre-cautionary issue in the nation's daily operations. To understand the population structure and its trends is important in daily planning, decision and policy formulation process for the purpose of sustainable development. For the FSM governments to effectively monitor for specific needs of different population groups, the planners, decision and policy makers must have a clear picture of the demographic composition of the population and its distribution. This is because specific population group at a specific place has different demands on different type of services.

The previous censuses of the FSM were conducted in 1985, 1986, 1987 and 1989 for the states of Pohnpei, Kosrae, Yap and Chuuk, respectively. As these censuses differed in scope and definition, it was difficult to generate statistical information needed for the nation. The beginning of this Census project was then started during the early part of 1991 by the preparation of the project document proposal and soliciting of support both national and state governments in the FSM and also from international organizations. The initial work was started with the idea of conducting an FSM Housing Census in 1994 and then in the following year, 1995, an FSM Population Census, at one point in time. However, because of the cost involved in this kind of project, especially in the FSM, it was later decided to combine both into one big project at one point in time, so-called 1994 FSM Population and Housing Census (here after referred as the 1994 FSM Census) project. The 1994 FSM Census project is the first of its kind to be organized and conducted at one point in time since the FSM was established on May 10, 1979.

Staff members from the U.S. Bureau of Census (USBC), United Nations Department for Economic and Social Development (UNDESD) and the South Pacific Commission (SPC) paid visits to FSM to start the preparation work of the project with the national Office of Planning and Statistics in 1992 and later on conducted a census planning workshop to outline what were needed to be carried out at the different phases of the 1994 FSM Census project. The Federated Development Authority (FDA) composed of the President of FSM and the four state governors endorsed the idea of conducting the 1994 FSM census project at one point in time during its meeting in January, 1993.

This first FSM-Wide census project was jointly funded by the United States Department of Commerce, the United States Department of Interior, the United Nations Fund for Population Activities (UNFPA) and the FSM Government. The United States Congress appropriated \$750,000 on April 10, 1991 for the USBC to provide technical assistance and training to the FSM staff members primarily in the area of census project organization and implementation. The contribution of the United States Department of Interior provided funding in the amount of \$500,000. The UNFPA provided \$280,520 in cash contribution besides the costs of short term consultants from the beginning to the analytical report writing phase. The FSM Government appropriated an amount of \$479,480 (\$321,480, Pubic Law No.7-124 and \$158,000, Pubic Law No.8-150). The in-kind contribution by the national government and each state government and

each state government and also UNFPA/CST and the SPC demographic section are in various amount.

The long term and short term training were provided to the staff who were to be involved in the census project at both national and state governments and also workshops were conducted locally to prepare for the execution of each phase/task of the project. Funds for two (2) long term (one year) trainings were provided by UNFPA contribution to the project for one fellowship on computer applications and data processing and the other fellowship on census and survey methods. Both fellowships were given at International Statistical Programs Center (ISPC) of the USBC starting the Fall of 1992. A member of each state's statistical staff also attended a three (3) months training course on demonstration survey at USBC starting May, 1993. The fund used for the participants on that course was provided by the USBC.

A letter of agreement (LOA) between the FSM Government, the UNFPA, and the USBC was developed to set forth the conditions under which the 1994 FSM Census project was to be conducted. The LOA spelled out the roles of various donors and the FSM National Office of Planning and Statistics, and the governments of the four states of the FSM. A Census Advisor Committee (CAC) and a Census Technical Group (CTG) were also established to assist and oversee the project needs to ensure the census project run smoothly. The CAC and CTG groups comprised of officials from the national and four state governments.

The USBC provided fund for a long term Census Advisor for one and half (1 1/2) years to provide training and technical advice on concepts and procedure of the census operation and on data processing. The UNFPA provided a United Nation Volunteer (UNV) for the census project for three (3) years. The UNV worked with the project from the beginning until October, 1996. The Office of Insular Affairs' contribution to the project provided a six (6) months contract, October, 1995 to March, 1996 to a demographer for the analysis stage of the project. The USBC, UNFPA, and the SPC also provided short term advisors in each field of the census operation during the preparation to the analytical and report writing stages of the project to assist monitor and provide technical backstopping to the local staff.

The actual enumeration was conducted from September 19 to October 7, 1994. The field staff consisted of two (2) field supervisors in Chuuk State and 10, 42, 31 and 5 Crew Leaders and 63, 175, 123 and 20 enumerators for the state of Yap, Chuuk, Pohnpei and Kosrae, respectively. Those with good field work record were hired for the processability review coding and keying operation. There were forty (40) editors and coders recruited to edit and code the remaining variables not done during the preliminary process. The preliminary census counts were prepared and published in December, 1994. During the data processing operation, thirty editors and coders were retained and trained as computer operators. Text tables were designed and prepared for five (5) analytical reports; one for each state and a consolidated one to cover the entire FSM. The National Census Office (NCO) staff coordinated the write-up of the census analytical reports for the FSM and each state and the experts from USBC, UNFPA and SPC reviewed and made comments on the reports. It was agreed that the State Census Reports (SCR) will basically adopt the format used in the National Census Report (NCR) but detailed to the municipality level for consistency and comparison purposes.

It is beneficial to identify individuals who were directly involved and dedicated their efforts from the preparation stage to the analytical report writing of the 1994 FSM Census project. From the local resources designated to be responsible for the subject census project, Mrs. Rosina Edwin as the FSM Census Coordinator was responsible for coordinating the implementation of the census project. She also took part in the data processing and report preparation. Mr. Joston Edmond was designated as the assistant Census Coordinator to work very closely with the FSM Census Coordinator. Mr. Edmond was awarded the fellowship on Survey and Census Method provided by the UNFPA contribution to the project. During the analysis stage he was responsible for consolidating of the text tables. Mr. Tilson Kephass was awarded the other fellowship provided by UNFPA to study Computer Application and Data Processing. Mr. Kephass was responsible for programming and supervising the data processing and production of the tables. The other two (2) staff members who were designated to work on the census project were Mrs. Maggie Asugar and Ms. Itoire Amond. Both Mrs. Asugar and Ms. Amond worked very closely with the project from the implementation stage to the processing stage. All the five (5) local individuals identified above are permanent staff members of the national Division of Statistics. Among all the temporary staff members who worked on the census project at different stages of the operation, only two (2) of them worked until the completion of the analytical report writing and publication stages. They are Ms. Brihmer Johnson and Mr. Hudson Abraham. Ms. Johnson was involved in the analytical report writing while Mr. Abraham was responsible for administrative work of the project. The four State Census Coordinators, namely Mr. Severino Sebastian for Chuuk State, Mr. Stoney Taulung for Kosrae State, Mr. Eneriko Suldan for Pohnpei State and Mr. Leo Chiengyen for Yap State worked very closely with the national census staff from the beginning of the project to the end. All the individual identified above gained valuable experience from different operation stages of the project and all the applications to monitor and process the census operation project.

The 1994 FSM census project provided a wealth of information needed to monitor and evaluate the performance of the FSM economy. Such a project can only be conducted one time in so many years. In the future, when the FSM governments decide to conduct another census, there would be less need for overseas technical advisors because of the experience acquired by the permanent local staff involved in the whole operation of the project, if none of them will leave the statistical services of the FSM.

The national Division of Statistics wishes to express its appreciation to everyone who contributed to the 1994 FSM Census project. By its virtue, this NCR should excite a wider awareness of fundamental population and sustainable development issues concerned in the FSM developmental process and efforts.

Timothy Semuda  
Chief of Statistics



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## SYMBOLS

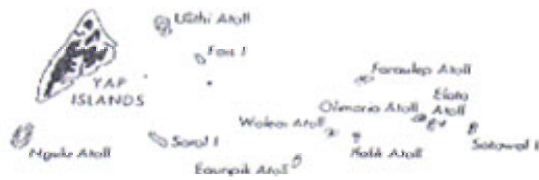
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to less than 0.1

.Three dots "..." mean not applicable, or information suppressed for  
reasons of confidentiality

.NA means not available



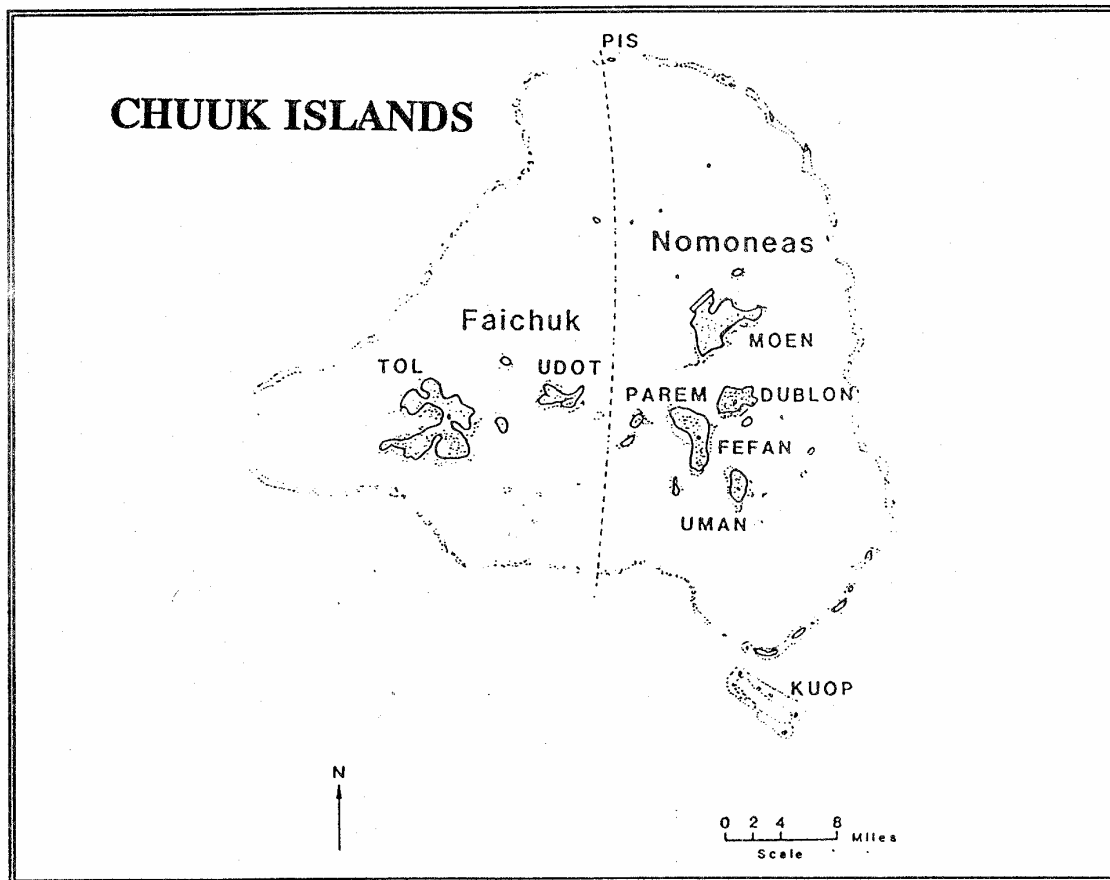
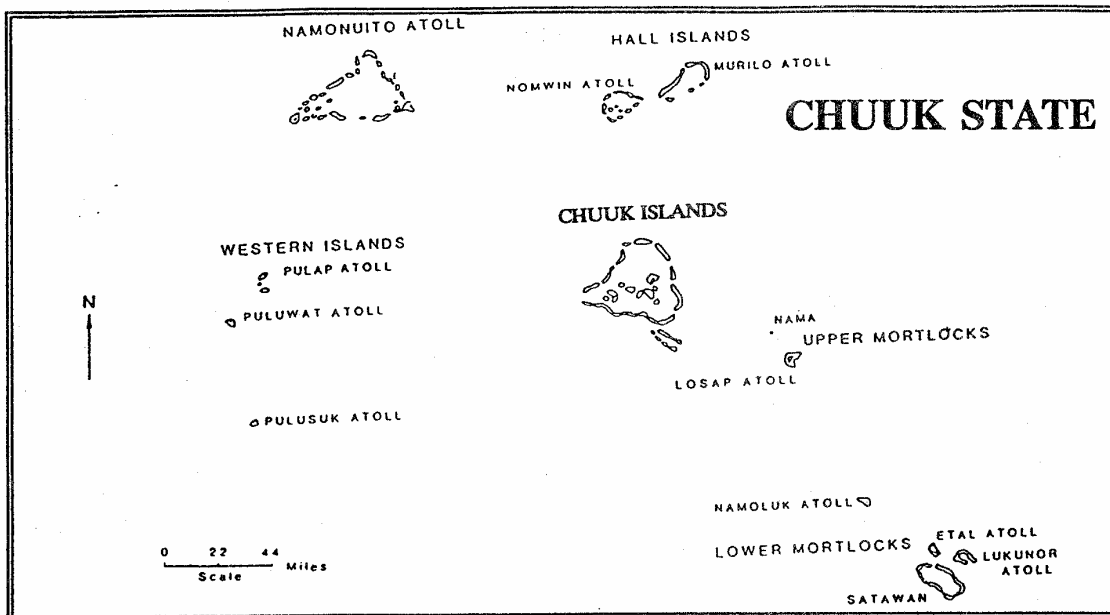
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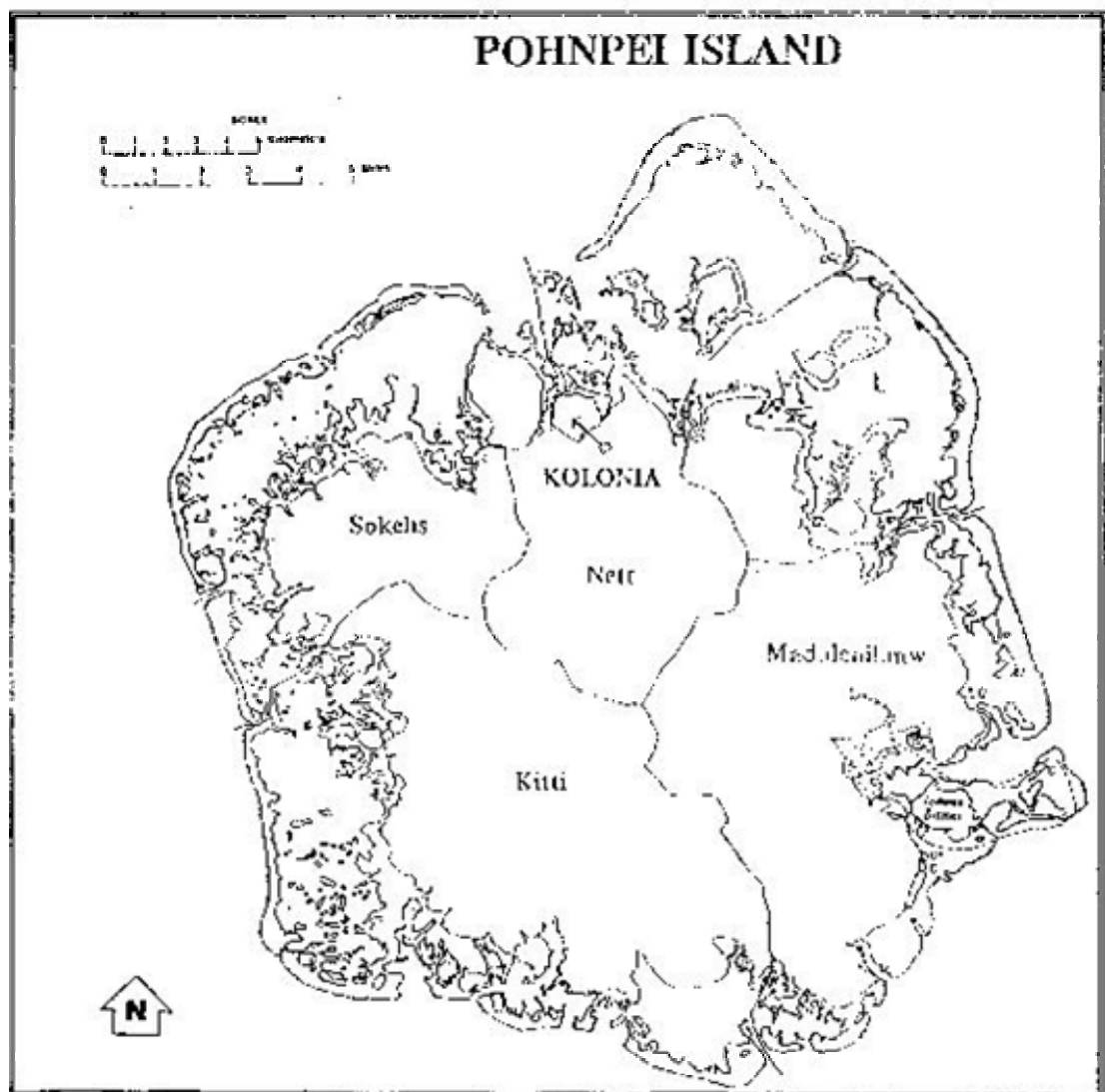
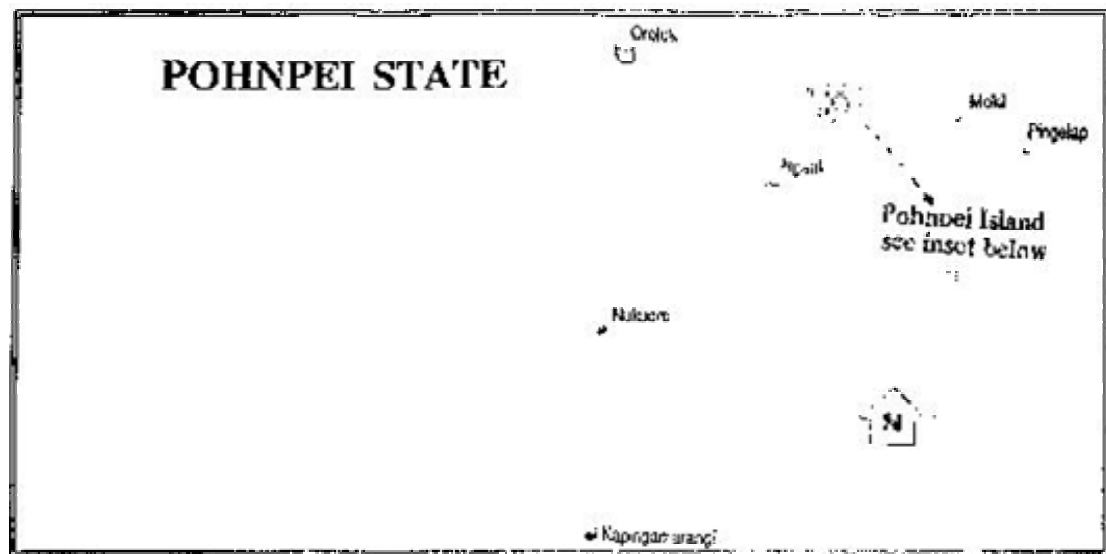


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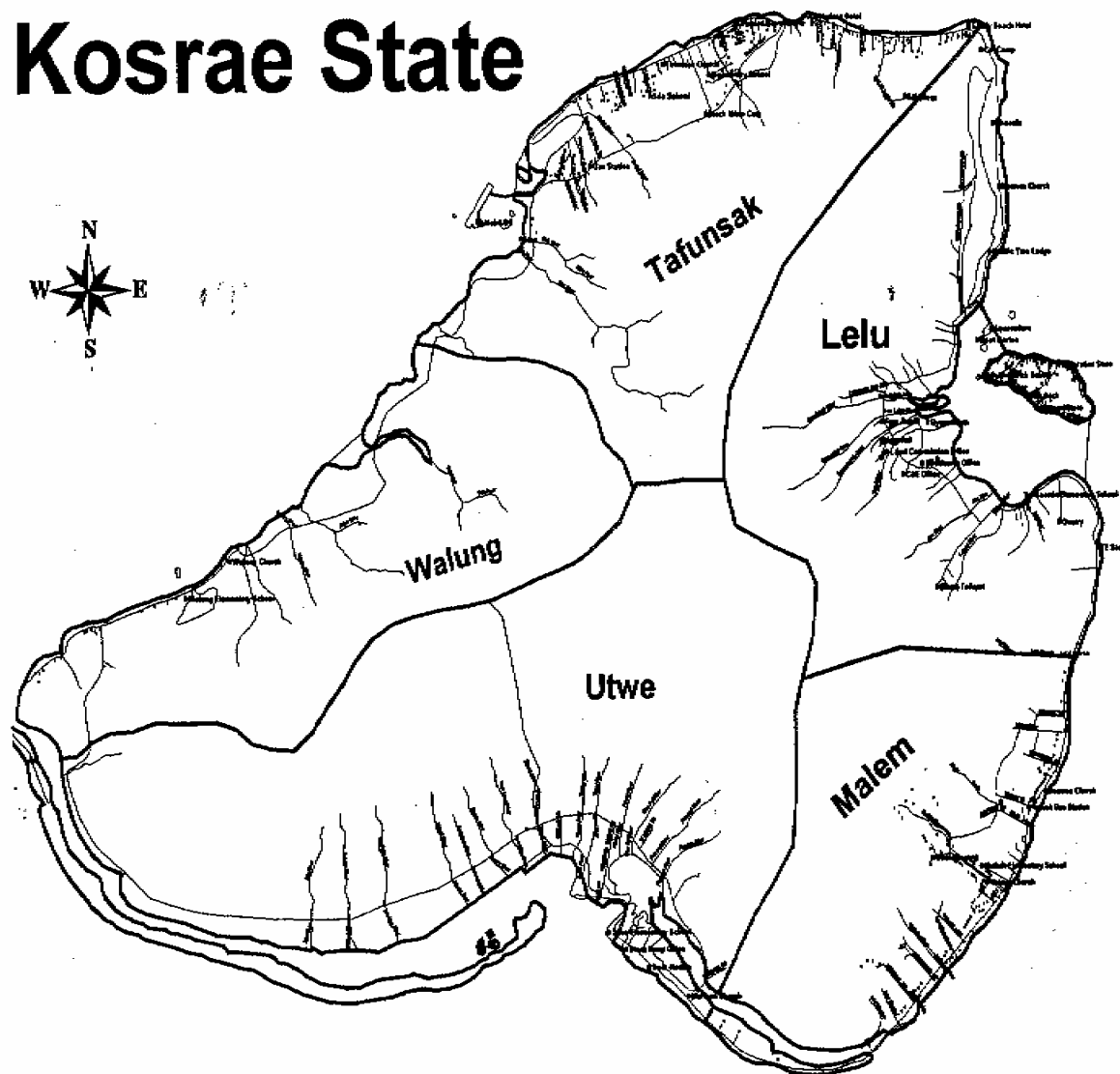
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# Kosrae State



## EXECUTIVE SUMMARY

This report presents the 1994 FSM census data, along with historical data from recent censuses. Information on the population's demographic, social, economic and housing conditions are briefly summarized. Apart from the obvious use of the report in planning, policy formulation, and in administration processes, the data presented in the report can also serve as a benchmark information in monitoring and evaluation activities.

The following paragraphs present a few of the major facts about the resident population of the FSM. These are only a few of the main outcomes and should not be viewed as the only information available.

### ***Demographic Characteristics***

*Population size and projections.* The population of the FSM increased from about 62,300 in 1973 to 105,506 in 1994. The population by state, in 1994 was 11,178 in Yap, 53,319 in Chuuk, 33,692 in Pohnpei and 7,317 in Kosrae. The population grew by about 2.6 percent per year from 1973 to the mid 80's and by about 1.9 percent per year since the mid 1980's. If this growth continues at the current rate, the population will double in about 35 years. Using an assumption of moderately declining fertility and declining migration, the population of the FSM is projected to reach about 115,000 by the year 2000 and 154,300 by the year 2014.

*Population density.* The population density (persons per square mile) in the FSM in 1994 was about 389 persons per square mile (243 in Yap, 1,088 in Chuuk, 255 Pohnpei and 170 in Kosrae). The corresponding density in the FSM in 1973 was just 231 persons per square mile.

*Median Age.* The median age - the age at which half of the population is younger and half older - in the FSM in 1994 was 17.8 years, an increase of about 1.2 years from the 16.6 years in 1973. The median age suggests that the FSM had one of the youngest populations in the Pacific Island nations.

*Sex Ratio.* Most human populations have slightly more male than female births. As the population ages, the difference decreases because of higher male mortality. The sex ratio (number of males per 100 females) for the FSM in 1994 was about 105 (about 99 in Yap, 105 in Chuuk and Pohnpei, and about 108 in Kosrae). The sex ratio in the FSM remained constant through out the two decades preceding the 1994 census. The sex ratio was also similar to most Pacific nations.

*Households.* The total number of households increased from about 9,670 in 1973 to over 15,230 in 1994. By state, the total number of households reached about 1,930 in Yap, 7,040 in Chuuk, 5,300 in Pohnpei and about 960 in Kosrae. The average number of persons per household in the FSM decreased only slightly from about 7.2 in 1973 to about 6.8 in 1994. Persons per household in 1994 was 5.5 in Yap, 7.5 in Chuuk, 6.3 in Pohnpei, and 7.2 in Kosrae.

*Marital status.* Adults in the FSM increasingly delay marriage. The average age at first marriage in the FSM increased from about 22.8 years in 1973 to about 25.4 years in 1994. The proportion of married population decreased from about 61 percent in 1973 to about 54 percent in 1994. In 1994 proportions married were highest in Kosrae (58 percent) and Pohnpei (57 percent) and lowest in Yap (51 percent) and Chuuk (52 percent).

*Fertility.* Fertility decreased in the FSM in the two decades before the 1994 census. The crude birth rate decreased from around 49 per 1,000 in 1973 to about 31 per 1,000 in 1994. Likewise, the total fertility rate

decreased from just over 8.2 children per women in 1973 to about 4.7 children per women in 1994. The rate at which fertility declined in the states was not uniform. The TFR in 1994 varied from a low 3.7 in Yap to 4.2 in Kosrae, 4.3 in Pohnpei and to 5.6 in Chuuk. The results suggest that the use of family planning services, female educational attainment and female participation in the labor force contributed to the differences in the level and pattern of fertility.

*Mortality.* With the introduction of modern health care, mortality continued to decrease, resulting in longer life and lower infant, childhood and maternal mortality. Nevertheless, census data suggest that these improvements might have slowed down during the mid 1980's. For the FSM, the 1994 census indirectly estimated an Infant Mortality Rate (IMR) of 46 per thousand and a life expectancy at birth of 65.2 years.

*Birthplace.* About 97 percent of FSM residents in 1994 were born in the FSM. The remaining 3 percent constituted the immigrants to the FSM. The largest proportion of foreign born individuals came from Asia. The proportion of foreign born was highest in Yap and Kosrae (about 7 percent each) and lowest in Chuuk (less than 2 percent) and Pohnpei (about 4 percent).

*Residence 5 years before the census.* The population's residence 5 years before the census shows the level and pattern of short-term migration. Among the 1994 residents aged 5 years and over, slightly over two percent lived outside of the FSM during 1989 (6 percent for Kosrae, 5 percent for Yap, 3 percent for Pohnpei and 1 percent for Chuuk). The result further provided an estimation of inter-state migration per year (about 1 per thousand net out migration for Yap and Chuuk, about 2 per thousand net in migration for Pohnpei and about 3 per thousand net outmigration for Kosrae). While Pohnpei experienced a net gain, all others had net loss in the total number of the resident population.

*Residents abroad.* The emigration rate for the FSM was estimated to be about 10 per thousand per year (8 per thousand for Yap, 12 per thousand for Chuuk and about 6 per thousand for Pohnpei and Kosrae). Using the 1994 census results on family members residing abroad and results of surveys of Micronesians in Guam and CNMI, crude estimates for FSM nationals abroad were about 15,000 (1,700 for Yap, 8,400 for Chuuk, 3,700 for Pohnpei and 1,200 for Kosrae).

### ***Social Characteristics***

*Religion.* Protestant and Roman Catholic were the two major religions in the FSM. The Protestant religion dominated in Kosrae (about 90 percent) while the Roman Catholic dominated in Yap (about 84 percent). In Pohnpei and Chuuk the proportion of Roman Catholic (about 53 percent) was also higher than that of the Protestant (about 44 percent). Other religions constituted less than 3 percent.

*Ethnicity and Language Spoken at Home.* About 97 percent of FSM residents had native ethnicity. The FSM had 6 major native ethnic groups. Over 96 percent reported a local language as their most commonly used language. English was reported by over 38 percent as their second most commonly used language.

*School Enrollment.* As the population of the FSM increased, the number of persons attending school in the nation also increased from about 19,000 in 1973 to about 35,000 in 1994. About 9 percent of the enrollment at primary and 12 percent of those in high school were in private schools. Enrollment reached its peak at the ages of 9 and 10. Drop-out rates were quite high throughout the FSM starting from the age of 15 years.

*Educational Attainment.* In the FSM in 1994, nearly half of all persons 25 years old and over were high school graduates, up from 1 in every 4 in 1980. The proportion of the population with no schooling decreased from about 25 percent in 1980 to about 15 percent in 1994.

### ***Economic Characteristics***

*Labor Force Participation.* Labor force participation was compiled based on the current economic activity (that is, economic activities during a seven day reference period). The overall labor force participation rate of persons 15 years and over during the week before the census in the FSM in 1994 was about 44 percent, up by about 18 percentage points since 1980. The male participation rate (57 percent) was nearly twice that of females (30 percent). The unemployment rate in the FSM in 1994, based on UN classification, was 16.2 percent. By state, unemployment was 9.9 percent for Yap, 19.9 percent for Chuuk, 14.6 percent for Pohnpei and 15.1 percent for Kosrae.

*Subsistence.* Out of about 22,000 employed persons in 1994, about 7,400 persons ( that is, nearly 34 percent) were engaged in agricultural, fishery or related activities. About 20 percent were engaged in market oriented agricultural, fishery, or related activities while the remaining 80 percent were in pure subsistence (did subsistence for household consumption only and did not sell).

*Industry and Occupation.* The formal work force in the FSM in 1994 was about 19,000 (over a 100 percent increase from 1980). About 16 percent of the employed persons 15 years and over in the FSM were managerial and professional workers. Technicians and associate professionals (about 17 percent) and administrative support ( about 16 percent) were also reported as major occupations. Skilled agricultural and fishery workers constituted about 7 percent of all experienced workers.

*Class of Worker.* The percentage share of private workers in the FSM in 1994 was almost the same as that of the public sector. The majority of males were employed in the public sector while the majority of females were employed in the private sector.

*Household Income.* Out of the 15,230 households in the FSM in 1994, about 11,230 reported some cash income during 1993. The median household income was about \$4,700. The mean household income was higher at \$8,700. The median income of individuals was about \$2,600. By state, median household income varied from about \$2, 450 in Chuuk to about \$7,500 in Pohnpei.

*Housing.* The total number of housing units increased from about 11,600 in 1980 to over 16,600 in 1994. About 91 percent of all housing units were reported occupied during both 1980 and 1994 censuses. The number of housing units with 5 or more rooms increased from about 8 percent in 1980 to about 19 percent in 1994. Housing conditions in the FSM improved over the two decade. More than half of all housing units were built between 1985 and 1994. In 1994, about 51 percent of the housing units had electricity compared to 28 percent in 1980. About 44 percent of all housing units had piped water as compared to about 6 percent in 1980. Similarly, of all housing units in 1994, over 46 percent had flush toilet and about 34 percent had bathtubs, compared to about 6 percent with flush toilet and about 14 percent with bathtubs in 1980.

Lastly, a set of basic tables are presented at the end of the report. A set of detail tables are also available in a separate publication. Each state also produced a similar report with tables focussing on the individual state. The state reports and tables provide a breakdown on data by municipality. These serve as a basic source of data on the FSM's population and housing characteristics.

## **CHAPTER 1 INTRODUCTION**

The creation of the independent and sovereign nation of the Federated States of Micronesia (FSM) under the Compact of Free Association with the United States caused a growing need for social and economic development planning. Consequently social, economic, and demographic data were needed by both the government and private sectors. Furthermore, as in most developing countries, administrators and planners in the FSM, in their quest for social and economic development often contend with incomplete or unavailable information when it is needed. The 1994 FSM Census was thus conducted as part of the overall effort to provide current and updated information required for planning and administrative purposes. This report presents basic analysis of the 1994 FSM Census data.

This chapter locates FSM geographically and presents a brief history and the population distribution of the FSM in selected census years, along with some background to the 1994 FSM Census. Chapter 2 presents population change and structure. Chapter 3 presents the household and marital status. Chapters 4 to 6 discuss population dynamics (fertility, mortality, and migration) of the FSM. Chapters 7 to 11 provide the basic analysis for social and economic characteristics. Chapter 12 presents a summary of population estimates and population projections for the next 20 years. Chapter 13 discusses the housing characteristics. And chapter 14 deals with emigration. A separate publication presenting detailed tabulations of the 1994 FSM Census results has also been compiled and disseminated by the National Division of Statistics. Census reports for each state present detailed analysis by state. Supplemental information and data from previous selected censuses (1973, 1980 and the mid 1980 state censuses) are used to present change overtime.

### **Geographical location and a brief history of the FSM**

#### *Geographical location, climate, and size*

The FSM consists of 607 islands spread through approximately a million square miles in the western Pacific Ocean lying between 1 degree south and 14 degrees north latitude, and between 135 and 166 degrees east longitude. Although the area encompassing the FSM, including its Economic Exclusive Zone (EEZ) is very large, the total land area is only 271 square miles with an additional 2,776 square miles of lagoon area. The 607 islands vary from large, high mountainous islands of volcanic origin to small atolls.

The FSM consists of four states: Yap, Chuuk, Pohnpei, and Kosrae. Yap is the westernmost state and has a total land area of 46 square miles which includes 12 inhabited island units. In addition to Yap's land area, the lagoon makes up 405 square miles. Chuuk consists of 7 major island groups. The largest is Chuuk Proper which is a complex group of islands. It includes 98 islands, of which 14 are mountainous islands of volcanic origin, surrounded by a coral ring forming a lagoon of over 800 square miles. The total land area in Chuuk is 49 square miles. Pohnpei consists of 6 major island groups, the largest is Pohnpei Island. The land area of Pohnpei is 132.2 square miles. Pohnpei also has 297 square miles of lagoon area in addition to its land area. Kosrae has 43 square miles of land and no lagoon. The average temperature in the FSM is about 80 degrees Fahrenheit with little yearly variation. The FSM has some of the wettest places in the Pacific.

#### *A brief history*

Spanish and Portuguese explorers came upon the Caroline Islands during the early sixteenth century, the former claiming the area as part of Spain's growing Pacific empire (Shinn, 1984, pp. 325-326). However, it was not until during the second half of the nineteenth century that Spain established small settlements mainly as a response to growing economic competition in the area from other nations. The Spanish administration lasted 13 years, from 1886 to 1899 (Hezel and Berg, 1979). But the first serious attempt to colonize the islands that currently compose the FSM was made by Germany, which purchased the Carolines from Spain in 1899 following the Spanish American War (Brown, 1977). The Germans ruled the



islands from 1899 to 1914. Japan seized Germany's possessions in Micronesia in 1914 at the outbreak of World War I. The Japanese administration lasted from 1914 to 1945. The Japanese rulers had an enormous impact. Programs established in the islands mainly dealt with establishment of infrastructure (docks, roads, hospitals, school, etc). Although these institutions were mainly supervised by the expatriate population, they provided services for the island people as well. The Japanese intention to "place a permanent Japanese imprint" in the islands was achieved.

These three nations were active in the FSM, though fundamentally different interests in the area led each to establish a markedly different presence. Following the Japanese administration, Micronesia was passed into the hands of the United States, and was a part of the United States Trust Territory of the Pacific Islands (TTPI) from 1947 until 1986. Like the Japanese, the Americans intended to develop the islands economically. Unlike the Japanese, any economic development that occurred was to benefit the local people and be subject to their control. The US administration undertook a massive build up of education and health services. In May 1979 four island groups under the Trust Territory united to form the FSM, which later became a sovereign independent nation under the Compact of Free Association between the FSM and the United States established in 1986. Despite this "independence", a major US presence remains in the area, mainly because of the funding and other interrelationships prescribed by the Compact (Compact of Hawai'i, 1989, p. 7; Compact of Free Association, 1982; Firth, 1982, p. 78).

#### *History of Census Taking in the FSM*

The population was counted during the periods before the American Administration. The Japanese collected the first systematic census data in 1920 for the areas which became TTPI, and continued to collect these data in 1925 1930, and 1935. The TTPI High Commissioner's Office took a TTPI-wide census in 1958. The 1967 census was the first census conducted during the American trusteeship to enumerate the population as of a specific date (March 26, 1967). In 1973, the TTPI administration collected another census after finding serious deficiencies in the 1970 Decennial census. The 1980 Census was the second decennial census. The reliability of the data of the 1980 was questioned particularly in the coverage of the population. However, these problems were mainly due to definition. As a consequence another census was commissioned under the law enacted by the Congress of Micronesia, and was conducted with the assistance of the South Pacific Commission. This census however turned into four individual censuses, conducted in each state at different points in time, from 1985 to 1989. These censuses are often referred to as the mid-decade censuses. Although the results of these censuses were very accurate, the fact that they were conducted at different points in time presented a problem in comparing and aggregating the figures to a national count. As a consequence the 1994 census was initiated.

#### **The 1994 FSM Census**

The 1994 census covered all persons usually residing in the FSM as of September 18, 1994. A census of the usual residents is a *de jure* count of the population. Only people who had resided or intended to reside in the FSM for six months or more prior to the census were counted. Thus short term visitors, staying for less than six months, were excluded. Usual residents who were overseas at the time of the Census were included if they intended to return to the FSM within six months. FSM citizens who were away for more than six months were not considered to be usual residents of FSM, and were excluded from the Census.

The census also covered housing units (*living quarters*), both occupied and intended for occupancy (vacants) at the time of the census. Excluded were buildings for businesses, offices, institutions, and other structures not used as *living quarters*.

The 1994 Census implementation phases are briefly summarized below. However, for interested readers, each phase is further discussed in detail in the *1994 Population and Housing Procedural History Report*, available at the Division of Statistics, OPS-FSM.

*Planning and Preparation*

Due to limited experience in nationwide census planning in the country, staff members were sent to the US Bureau of the Census (USBC) for training in census/survey methods and organization, and census data processing. In addition, a Census Advisor and a United Nations Volunteer (UNV) were provided by the USBC and United Nations Fund for Population Activities (UNFPA), respectively, to assist the national personnel in planning and conducting the population and housing census. Additional training was also given to the State Census Coordinators (SCC) on field work, sampling survey and interviewing techniques.

A series of workshops were conducted to establish the administrative setup for the census. Participants in the workshops were representatives from the national and state governments and officials from collaborating agencies--United Nations Fund for Population Activities (UNFPA), US Department of Interior, US Bureau of the Census, and South Pacific Commission (SPC). Two committees, the Census Advisory Committee (CAC) and the Census Technical Group (CTG) were established. The CAC was responsible for monitoring the proper implementation of the project. The CTG was responsible for finalizing the census instrument and implementing the census.

*Mapping*

With the assistance of the US Bureau of the Census (USBC), a mapping operation was conducted throughout the FSM. The objective of this operation was to update the USBC maps (TIGER maps) and to obtain estimates of housing units at the block level to help delineate the field assignments for the census.

*Pretest*

Since the 1994 Census was the first simultaneously conducted census in the FSM by the FSM government, no materials from the FSM could be used as a basis for the materials needed for the census. Due to this problem, and also to keep the standard and provide data comparable across the Pacific, the census materials including training manuals and field work materials, were adapted from the 1990 census of Palau and the U.S. Territories, and then modified to fit the situation in the FSM. These forms were developed at the National Census Office (NCO) and finalized by the CTG prior to the census.

A pretest operation was then held to test the applicability of the materials developed to be used in the census, and to check for problems using the forms and manuals. The forms were later revised to alleviate problems encountered during the pretest operation. These revised forms were then used for the census.

*Enumeration*

Field workers (crew leaders and enumerators) were hired and trained to carry out the actual enumeration. Each crewleader was responsible for supervising about 5 enumerators on the average. Each enumerator was assigned to conduct interviews for every housing unit and household (about 50 housing units on the average) in his or her enumeration district (ED), and fill out a questionnaire for every person in each household. The field work lasted from September 19 through the early part of November.

*Editing, Coding, and Data Processing*

The census questionnaires were edited and coded. The Preliminary data editing and coding operation was initiated at the state offices and completed at the NCO, for the purpose of compiling a preliminary count. Preliminary tables were compiled and disseminated from this operation. The questionnaires were then reviewed (for processability), coded, keyed, and verified for further analysis. Following the verification of the keyed data, specifications and programs were developed for data cleaning. The resident advisor and the others from the US Bureau of Census assisted the national staff in carrying out the data cleaning and programming activities. The software used in data cleaning, processing, and table production was the Integrated Micro-computers Processing System (IMPS).

*Data Analysis and Report Writing*

A series of data analysis workshops were held to review the progress of the report writing and consistency of the data presented in the report. The national staff were assisted by an advisor from USBC, a consultant, and a UNV specialist from UNFPA in preparing the FSM census report. The UNFPA/Country Support Team (CST), and SPC also assisted the FSM in carrying out analysis and finalizing this report.

**Geographical Distribution**

One of the important uses of a census is to provide a geographical population distribution. This information is very useful in the decision making process of a nation such as allocation of funds, development planning, policy making, and apportionment of seats in the decision making body.

*Population Distribution*

Table 1.1 and Figure 1.1 present the population distribution of the FSM from 1920 through 1994. The population increased over the years, more so now than it was before. For instance, between 1989 and 1994 the population increased by more than 10,000 person, whereas between 1920 and 1925 the population increase by less than 200 persons. The percentage distribution of the population across the states also changed over the years. Pohnpei and Kosrae's shares in the composition of the FSM population increased from 19 percent to 32 percent for Pohnpei, and from 3 percent to 7 percent for Kosrae, while Yap's share decreased from 28 percent to 11 percent in the 50 years prior to the census. Chuuk's share remain at about 50 percent.

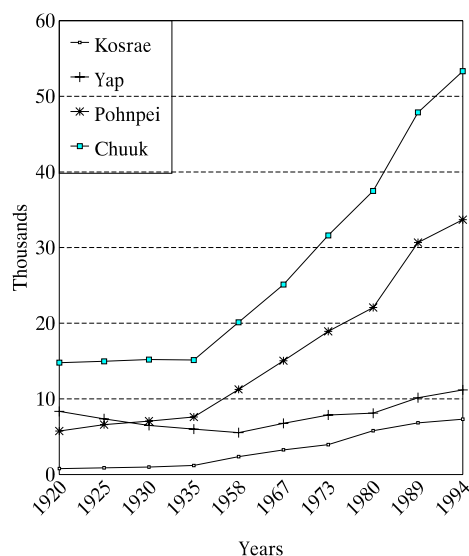
Table 1.1. Population Distribution by State: Selected census years

Census Year	Numbers					Percent				
	Total	Yap	Chuuk	Pohnpei	Kosrae	Total	Yap	Chuuk	Pohnpei	Kosrae
1920	29,660	8,338	14,788	5,748	786	100.0	28.1	49.9	19.4	2.7
1925	29,810	7,366	14,961	6,597	886	100.0	24.7	50.2	22.1	3.0
1930	29,727	6,486	15,200	7,051	990	100.0	21.8	51.1	23.7	3.3
1935	29,920	6,006	15,129	7,596	1,189	100.0	20.1	50.6	25.4	4.0
1958	39,289	5,540	20,124	11,258	2,367	100.0	14.1	51.2	28.7	6.0
1967	50,172	6,761	25,107	15,044	3,260	100.0	13.5	50.0	30.0	6.5
1973	62,357	7,870	31,609	18,926	3,952	100.0	12.7	51.0	31.1	5.3
1980	73,159	8,100	37,488	22,080	5,491	100.0	11.1	51.2	30.2	7.5
1989	95,740	10,365	47,871	30,669	6,835	100.0	10.8	50.0	32.0	7.1
1994	105,506	11,178	53,319	33,692	7,317	100.0	10.6	50.5	31.9	6.9

Source: Nan'yo-cho (1927, 1931, 1937); Office of the Census Coordinator (1975); Office of the High Commissioner (1959); School of Public Health (n.d.); US Bureau of the Census (1972, 1983a); Yap, Office of Planning and Budget (1992a, 1988, 1989); 1994 FSM Census Table P13.

Note : The 1989 population was an interpolation from the mid 1980 censuses, except for Chuuk. Population data for 1920 - 1935 are for Pacific Islanders only; remaining population data, except 1994, represent de facto population.

Figure 1.1 Population Distribution by State, FSM: 1920 to 1994



Source: Table 1.1

Table 1.2 presents the current distribution of the FSM population by state and sex. Of the 105,506 persons living in the FSM in 1994, 53,923 (51%) were males and 51,583 (49%) were females. The population was distributed unevenly among the states (see Figure 1.2). Chuuk was the most populated state. A total of 53,319 persons, a little more than half the population of the FSM, usually live in Chuuk. Chuuk was followed in order by Pohnpei (32 percent), Yap with 11 percent, and Kosrae with 7 percent.

Table 1.2. Population Distribution by State, FSM: 1994

State	Number			Percent		
	Total	Males	Females	Total	Males	Females
Total	105,506	53,923	51,583	100.0	100.0	100.0
Yap	11,178	5,565	5,613	10.6	10.3	10.9
Chuuk	53,319	27,299	26,020	50.5	50.6	50.4
Pohnpei	33,692	17,253	16,439	31.9	32.0	31.9
Kosrae	7,317	3,806	3,511	6.9	7.1	6.8

Source: 1994 FSM Census, Table P13

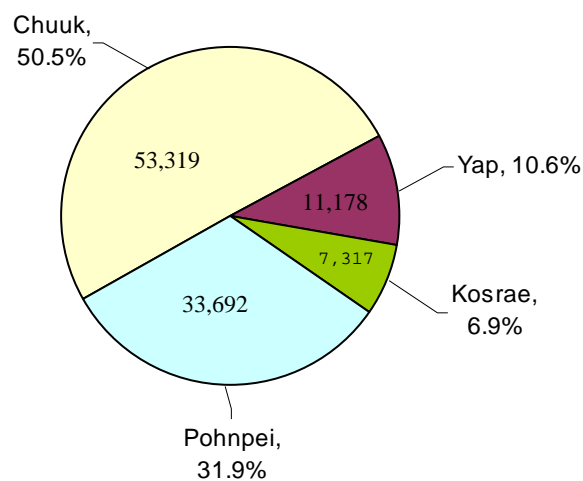
**Figure 1.2. FSM Population Distribution: 1994****Population Density**

Table 1.3 presents the population density in the FSM by state. Chuuk not only had the largest population but it also had the highest population density (number of persons per square mile). The average density for Chuuk was 1,088 persons for every square mile of land, nearly three times the national average. In contrast, the population densities in the other states were lower than the national average of 389 persons per square mile. Pohnpei, the largest and second most crowded state, had a population density of 255, closely followed by Yap with a density of 243. Kosrae was the smallest and least crowded state with a population density of 170.

Table 1.3. Population Density for FSM: 1994

Age	States				
	Total	Yap	Chuuk	Pohnpei	Kosrae
Population	105,506	11,178	53,319	33,692	7,317
Land Area (in square miles)	271	46	49	132	43
Density (per square mile)	389	243	1,088	255	170

Source: 1994 FSM Census, Table P13; FSM Information Handbook, No.1, Vol 1, 1992.

Given the population distribution for 1973 presented in Table 1.2, the density throughout FSM increased. The population density for the FSM in 1973 was 230 persons per square mile of land area. By state, the population density per square mile of land was 171 in Yap, 645 in Chuuk, 143 in Pohnpei, and 92 in Kosrae.

## **Conclusion**

Census taking improved in the 50 years prior to the 1994 census. Over the census years observed, the population of the FSM continued to increase, at a more rapid pace now than it was before. The geographical distribution of the population had also shifted in the 50 year period observed. Pohnpei and Kosrae's shares had increased while Yap's decreased. Chuuk's remain about the same. The population density increased, reflecting the growth of the population. The FSM's limited land area of 271 square miles makes population density a potential problem.



## CHAPTER 2 AGE AND SEX STRUCTURE

### Introduction

The age and sex structure of a population provides basic information necessary for planning and for providing key insights on social and economic characteristics. Age composition helps identify populations for schooling, employment, voting, and retirement. Sex distribution is important for identifying social characteristics, trends in community structure, and the population's economic potential.

### Data Description

#### *Age*

The 1994 census obtained information on age from the response to the date of birth question and the age reported in questionnaire item 4a and 4b. Age was in completed years as of September 18, 1994. In cases where age was not reported or clearly appeared to be incorrect, the Census Office employees assigned age according to relationship, marital status and other related characteristics of other individuals.

#### *Sex*

Information on sex was asked of all persons in the census. In cases where sex was not reported, census personnel determined it from the person's name. Otherwise, sex was imputed according to relationship, marital status and other related variables.

*Limitations and Comparability.* There is no limitation to the 1994 age and sex data. Every census conducted in the FSM collected age and sex data.

### Analysis of Age and Sex Data

Some important measures derived from the age and sex data will be analyzed in this chapter, namely the *sex ratio*, *dependency ratio*, *intercensal growth rate*, and *median age*. Also, we will look at the changes in the population distribution and age-sex structure and some probable causes for these changes.

#### *Population Change and Intercensal Growth*

One of the most important uses of any census is to throw light on the rate at which the population is growing annually (the *intercensal growth*). The intercensal growth rate between 1973 and 1994 falls within the range of 1.9 to 3 percent annually (Table 2.1). This rate places FSM among the nations with rapid population growth in the Pacific (Table 2.2). The annual change from 1973 to 1989 was 2.6. Between 1973 and 1994 the growth rate was 2.5 percent, and because of the long period covered, is most certainly a good reflection on average growth over the years. However, it should be noted that had it not been for the effect of increasing emigration, the intercensal growth rate would have been much higher.

The annual growth rate varied significantly by age group. Over the two decades before the census, the growth rate for the very young (0 to 4 age groups) declined from 2.1 between 1973 and 1980 to -0.2 between 1989 and 1994. In contrast, the annual growth rate of the very old (70 to 74, and 75+) age groups increased from -0.7 and 2.0 percents in 1973 to 5.2 and 2.7 percents in 1994, respectively. The difference in growth may be due to the combined effect of a decline in fertility (lowering the growth rate of the young) and a declining level of mortality (increasing the proportion of the old age population).



Table 2.1 Population Change and Annual Growth Rate by Age Group for FSM: 1973-1994

AGE	Number				Population Change			Annual Rate of Growth (%)		
	1973	1980	1989	1994	1973 to 1980	1980 to 1989	1989 to 1994	1973 to 1980	1980 to 1989	1989 to 1994
Total	62,088	73,159	95,740	105,506	11,071	22,581	9,766	2.3	3.0	1.9
0-4	11,301	13,075	16,038	15,854	1,774	2,963	-184	2.1	2.3	-0.2
5-9	9,445	11,283	15,201	15,330	1,838	3,918	129	2.5	3.3	0.2
10-14	8,264	9,584	12,970	14,749	1,320	3,386	1,779	2.1	3.4	2.6
15-19	6,965	7,732	10,379	12,251	767	2,647	1,872	1.5	3.3	3.3
20-24	5,086	6,443	7,418	8,828	1,357	975	1,410	3.4	1.6	3.5
25-29	3,523	5,456	6,718	7,063	1,933	1,262	345	6.2	2.3	1.0
30-34	2,608	4,158	5,986	6,598	1,550	1,828	612	6.7	4.0	1.9
35-39	2,788	2,637	5,158	6,079	-151	2,521	921	-0.8	7.5	3.3
40-44	2,504	2,418	3,591	5,071	-86	1,173	1,480	-0.5	4.4	6.9
45-49	2,102	2,408	2,519	3,579	306	111	1,060	1.9	0.5	7.0
50-54	2,174	1,985	2,320	2,219	-189	335	-101	-1.3	1.7	-0.9
55-59	1,526	1,821	2,130	2,105	295	309	-25	2.5	1.7	-0.2
60-64	1,448	1,568	1,817	1,985	120	249	168	1.1	1.6	1.8
65-69	928	1,087	1,484	1,395	159	397	-89	2.3	3.5	-1.2
70-74	703	670	958	1,229	-33	288	271	-0.7	4.0	5.0
75+	723	834	1,053	1,171	111	219	118	2.0	2.6	2.1

Source: 1973 TTPI Census, T4a; 1980 TTPI Census, Unpublished; 1994 FSM Census, Unpublished.

Note : 1. The figure for 1989 is an interpolation based on the mid 1980 state censuses.

: 2. 1973 and 1980 data do not include "not stated" cases.

Table 2.2. Selected Demographic Indicators from Other Micronesia Islands: Various Years

Country	Census Year	Intercensal Growth (%)	Median Age	Sex Ratio	Dependency Ratio
FSM	(1994)	1.9	17.8	105	89
Guam	(1990)	2.3	25.0	114	58
Kiribati	(1990)	2.3	19.9	98	85
Marshall Islands	(1988)	4.2	14.1	105	124
Nauru	(1992)	2.9	18.0	105	83
CNMI	(1990)	9.5	27.4	111	36
Palau	(1990)	2.0	25.2	117	64

Source: 1973 TTPI Census, T4a; 1980 TTPI Census, Unpublished; 1994 FSM Census, Unpublished.

### Age and Sex Distribution

Table 2.3 shows the percentage distribution of the FSM population by sex, from 1973 to 1994. The proportion of males under 10 years of age decreased while the proportion aged 10 to 49 years tended to increase between 1973 and 1994. The reduction in the proportion for the population below 10 years of age (from 18 to 15) is a consequence of a decline in fertility and age-selective migration. With a few exceptions, the proportion of the population at age groups 15 to 49 years showed gradual growth.

Table 2.3. Population by Age Group and Sex, FSM: 1973 - 1994

Age	Males				Females			
	1973	1980	1989	1994	1973	1980	1989	1994
Total	31,965	37,396	48,551	53,923	30,123	35,763	47,189	51,583
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0-4	18.4	18.3	17.0	15.2	18.0	17.5	16.5	14.8
5-9	15.5	15.7	16.2	14.9	15.0	15.2	15.5	14.1
10-14	13.6	13.4	13.9	14.0	13.0	12.8	13.2	14.0
15-19	11.2	10.6	10.9	11.9	11.2	10.6	10.8	11.3
20-24	7.9	8.4	7.4	8.0	8.5	9.2	8.1	8.7
25-29	5.7	7.3	6.7	6.5	5.7	7.7	7.3	6.9
30-34	4.1	5.8	6.1	6.1	4.3	5.5	6.4	6.4
35-39	4.3	3.5	5.4	5.7	4.6	3.7	5.4	5.8
40-44	4.1	3.1	3.8	4.9	3.9	3.5	3.7	4.7
45-49	3.3	3.3	2.6	3.6	3.5	3.3	2.7	3.2
50-54	3.3	2.6	2.3	2.0	3.7	2.8	2.5	2.2
55-59	2.5	2.4	2.2	1.9	2.5	2.6	2.3	2.1
60-64	2.4	2.2	1.8	1.9	2.3	2.1	2.0	1.9
65-69	1.5	1.5	1.5	1.2	1.5	1.5	1.6	1.4
70-74	1.2	0.9	1.0	1.1	1.1	1.0	1.0	1.3
75+	1.1	1.1	1.1	1.0	1.2	1.2	1.2	1.3

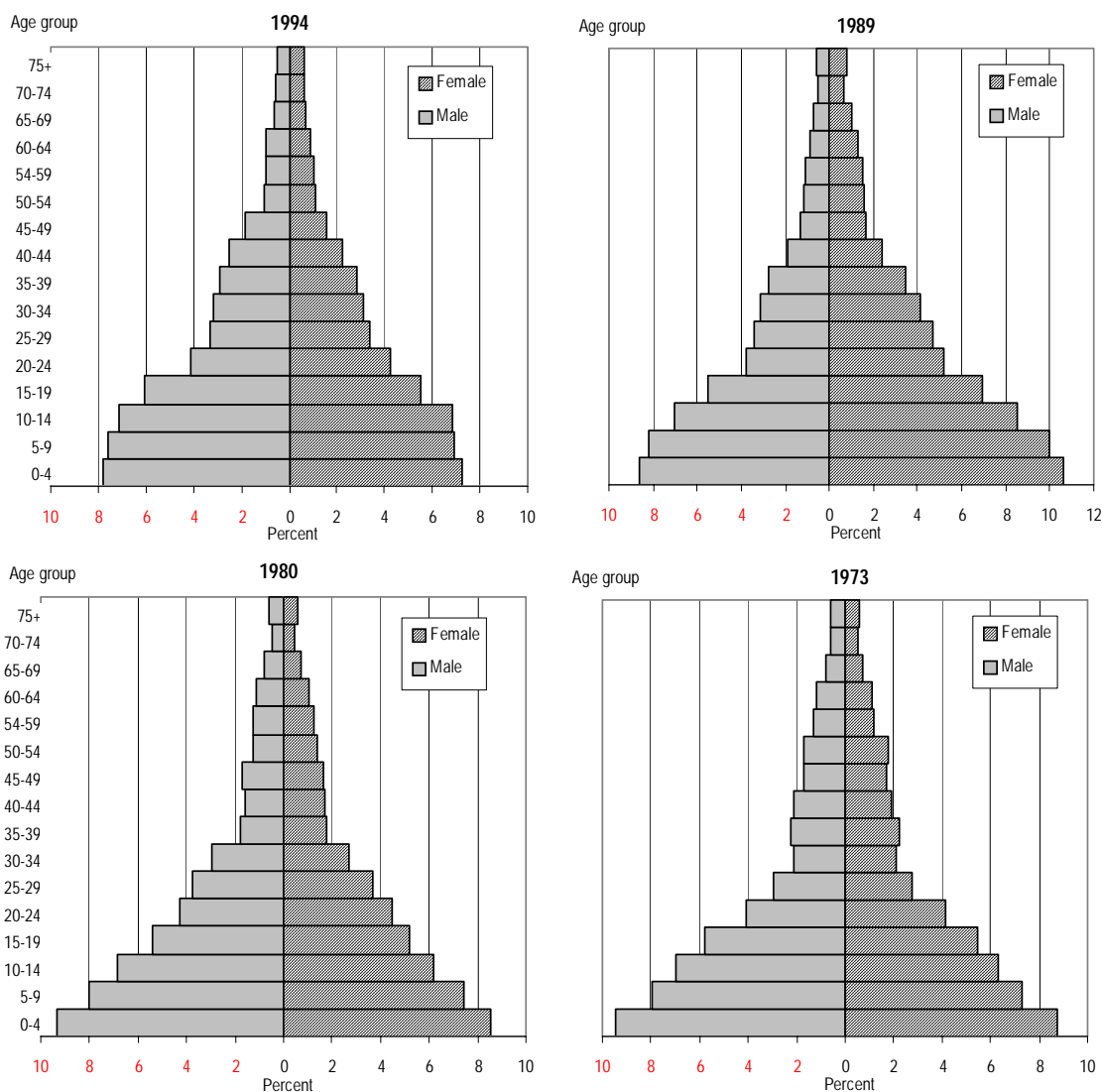
Source: 1973 TTPI Census, T4a; 1980 TTPI Census, Unpublished; 1994 FSM Census, Unpublished.

Note : 1. For this and other tables in this chapter FSM figure for 1989 is an interpolation based on the mid 1980 state censuses. State figures for the mid-1980's were from the 1985 Pohnpei census, 1986 Kosrae census, 1987 Yap census, and 1989 Chuuk census.

A useful representation of the age and sex data of the population is the population pyramid. It provides insights into the population structure of a country and is a useful basis for future planning. The age and sex structure is affected by each of the components of population growth: fertility, mortality, and migration. Figure 2.1. shows the FSM population pyramids from 1973 to 1994 for comparative purposes.

Consider the population structure in 1994. The wide base for age groups 0 to 4, 5 to 9, and 10 to 14 represents the recent births. It is noteworthy to mention that the lowest two bars are almost the same length, indicating that fertility declined during the 10 years before the census. For older ages, the narrowed bars show fewer people at older ages. The most obvious explanation is that people die when they grow old; therefore, the narrow bars at the old ages reflect mortality. Another interesting feature of this pyramid is the sharp indenting of the bars at ages 15 to 19, 20 to 24, and 25 to 29. The result of this however does not come from mortality, especially as mortality at these ages is relatively low. The more likely explanation lies in overseas emigration, as young people seek education and job opportunities abroad.

Figure 2.1 Population Structure of FSM: 1973 to 1994



When comparing the population structure of 1994 to that of 1989, the shape remained virtually the same. However, when considering over the long period of 20 years (1994 to 1973), the change in the age-sex structure was rather pronounced. The population structure for 1973 portrays higher level of fertility compared to that of 1994.

Table 2.4 shows the recent distribution of the FSM population. The distribution showed that the older the age group the smaller the group. For instance, the proportion of the population below 5 years comprised 15 percent of the population, whereas the population aged 75 and above accounted for 1 percent. This decline reflects the effect of mortality and some migration. A similar pattern is found by sex.

Table 2.4. Population by Age and Sex, FSM: 1994

Age	Number			Percent		
	Total	Male	Female	Total	Male	Female
Total	105,506	53,923	51,583	100.0	100.0	100.0
0-4	15,854	8,211	7,643	15.0	15.2	14.8
5-9	15,330	8,051	7,279	14.5	14.9	14.1
10-14	14,749	7,534	7,215	14.0	14.0	14.0
15-19	12,251	6,431	5,820	11.6	11.9	11.3
20-24	8,828	4,321	4,507	8.4	8.0	8.7
25-29	7,063	3,496	3,567	6.7	6.5	6.9
30-34	6,598	3,311	3,287	6.3	6.1	6.4
35-39	6,079	3,077	3,002	5.8	5.7	5.8
40-44	5,071	2,661	2,410	4.8	4.9	4.7
45-49	3,579	1,930	1,649	3.4	3.6	3.2
50-54	2,219	1,101	1,118	2.1	2.0	2.2
55-59	2,105	1,033	1,072	2.0	1.9	2.1
60-64	1,985	1,018	967	1.9	1.9	1.9
65-69	1,395	668	727	1.3	1.2	1.4
70-74	1,229	567	662	1.2	1.1	1.3
75+	1,171	513	658	1.1	1.0	1.3

Source: 1994 FSM Census, P13

### *Median Age*

The median age is a measure that divides the population distribution into two equal parts (the age at which half of the population is older and half is younger). Change in the median age shows if the population is aging or growing younger. The median age is especially useful when comparing the composition of a population over time and to other populations.

The median age increased by one year over the two decades before the census, indicating that the FSM population is aging (Table 2.5). From 1973 to 1994 the median age for males increased by two years while for females it increased by one year. The median age in 1994 was about 18, suggesting that the FSM had one of the youngest populations in the Pacific Island nations. Around 1990 the median age in the Pacific countries range from 14 to 27 (see Table 2.2).

Table 2.5. Median Age by State and Sex, FSM: 1973-1994.

State of Residence	Total				Males				Females			
	1973	1980	mid-80's	1994	1973	1980	mid-80's	1994	1973	1980	mid-80's	1994
Total	16.5	16.7	17.5	17.8	16.3	16.3	16.3	17.5	16.8	17.2	17.3	18.1
Yap	18.5	19.0	19.3	19.7	18.2	18.5	20.1	18.7	18.8	19.5	18.2	20.6
Chuuk	16.5	16.7	15.8	17.0	16.1	16.1	15.1	16.6	17.0	17.2	16.7	17.4
Pohnpei	16.9	16.2	16.8	18.2	15.9	15.9	16.6	18.0	15.9	16.5	16.9	18.4
Kosrae	14.7	15.9	16.5	18.8	14.3	15.8	16.0	19.3	15.2	16.1	16.9	18.3

Source: 1973 TTPI censuses, T4a; 1985, 1986, 1987, and 1989 censuses of Pohnpei, Kosrae, Yap, and Chuuk, respectively; 1994 FSM Census, P13.

Note : 1. Total figure for mid-1980's was a 1989 interpolation from the state mid 1980's censuses.

The median age varied geographically in the FSM in the last census, as well as the census years before that. In 1994 Yap had the highest median age of 20. This was followed by Kosrae with 19, Pohnpei at 18, then Chuuk with a median age of 17. Chuuk and Pohnpei (having most of the FSM population) had median ages closest to that of the FSM total. The median age increased in all the states over the two decades before the census except Chuuk. Chuuk's median remained at about 17 throughout the two decades attributed to the decline in fertility offset by increasing emigration.

### Sex Ratio

The sex ratio of FSM remained at about 105 males per 100 females in 1973 and 1980, and then dropped. In 1989 there were about 103 males to every 100 females in FSM, increasing to about 105 in 1994, as illustrated in Table 2.6. This trend held for the states as well, except for Yap. Compared to Pacific Islands presented in Table 2.2, the FSM sex ratio is rather moderate. All states displays a rather masculine population. The change in the sex ratio over the two decades was most significant in Yap and Kosrae though in opposite ways.

Table 2.6. Males per 100 Females by State, FSM: 1973 - 1994

State	1973	1980	mid '80's <sup>1</sup>	1994
Total	105.0	104.6	102.8	104.5
Yap	105.7	104.4	105.0	99.1
Chuuk	104.5	105.5	102.3	104.9
Pohnpei	105.0	102.8	104.1	105.0
Kosrae	103.8	106.0	102.2	108.4

Source: 1973, T4a and 1980, T24 TTPI censuses; 1985, 1986, 1987, and 1989 censuses of Pohnpei, Kosrae, Yap, and Chuuk, respectively; 1994 FSM Census, P13.

Note : 1. FSM figure for mid-1980's was a 1989 interpolation from the state mid 1980's censuses.

The FSM sex ratio was about 105 males per 100 females in 1994 (Table 2.5). In most societies more males are born than females, therefore the excess of males at the young ages of 0 to 9 in 1994 is not surprising. The shortage of males is especially evident at ages 20 to 29, and 50 years and older. The shortage of males for ages 20 to 29 is attributed to emigration, while the shortage of males at ages 50 and older is explained by a combined effect of emigration and mortality (the tendency for males to die younger than females, resulting in the excess of females in the older age groups. Kosrae had the highest sex ratio of 108, while Yap had the lowest (at 99). Both Chuuk and Pohnpei had sex ratios of about 105.

Table 2.7. Males per 100 females by Age Group and State, FSM: 1994

Age	Total	States			
		Yap	Chuuk	Pohnpei	Kosrae
Total	104.5	99.1	104.9	105.0	108.4
0-4	107.4	110.0	108.3	106.6	100.4
5-9	110.6	102.9	111.4	111.1	113.0
10-14	104.4	115.5	105.3	100.0	102.7
15-19	110.5	101.0	112.4	113.3	98.0
20-24	95.8	66.8	101.1	97.5	105.0
25-29	98.0	78.9	103.2	94.7	111.3
30-34	100.8	96.4	97.6	100.2	136.8
35-39	102.5	101.1	100.4	105.0	107.5
40-44	110.4	114.9	105.0	117.1	111.2
45-49	117.1	133.7	108.3	117.5	150.4
50-54	98.6	89.1	100.0	100.5	96.2
55-59	96.4	89.4	92.9	106.4	92.5
60-64	105.1	87.9	110.5	100.9	125.8
65-69	91.9	98.7	83.5	102.6	97.5
70-74	85.6	75.3	84.6	87.9	108.3
75+	77.9	100.0	85.3	88.0	90.2

Source: 1994 FSM Census, P13.

*Dependency Ratio*

The dependency ratio measures the degree of economic ease or hardship inherent in a given age-sex structure. However, it is only an index since it assumes certain age-groups as exclusively "producers" or "consumers". The dependency ratio is obtained by adding the population below 15 years to the population aged 65 and over (defined as the dependent age groups), then dividing the sum by the population aged 15 to 59 (the working age population). Often the dependency ratio is divided into old dependency (ratio of those 65 years and over to those ages 15 to 64) and young dependency (ratio of those under 15 to those ages 15 to 64). The dependency ratio should not be confused with the economically active ratio. The former considers all persons of working age, while the latter considers only those individuals of working age who are economically active, which is usually less than the dependency ratio (see Chapter 9).

In 1994 the dependency ratio of the FSM was 89 (meaning that for every 100 persons of working-age there are 89 consumers, in terms of food, clothing, shelter, and so forth). The dependency declined from 102 in 1973 to 89 in 1994, showing a relative increase in the working age population (see Table 2.8). The young dependency ratio was about 82 and the old age dependency ratio was about 7, showing that the dependency burden was particularly among the young. Similar to the total dependency ratio, the young and old dependency ratios decreased over the two decades before the census, as a result of the decline in fertility and increase in emigration of working-age adults.

Table 2.8. Dependency Ratio by State, FSM: 1973 - 1994

State	Total				Young				Old			
	1973	1980 mid '80 <sup>1</sup>	1994		1973	1980 mid '80	1994		1973	1980 mid '80	1994	
Total	102.2	99.8	98.7	89.2	93.9	92.7	91.5	82.3	8.4	7.1	7.2	6.8
Yap	92.6	91.7	89.6	78.2	76.8	81.3	79.8	70.5	15.5	10.4	9.8	7.7
Chuuk	101.9	99.2	109.4	95.2	93.6	92.5	100.9	89.2	8.3	6.7	8.6	6.1
Pohnpei	104.2	102.4	99.3	84.2	97.2	95.9	92.2	77.6	7.0	6.5	7.1	6.6
Kosrae	116.1	104.9	101.4	82.1	108.7	98.4	94.7	76.3	7.4	6.5	6.8	5.8

Source: 1973, T4a and 1980, T24 TTPI censuses; 1985, 1986, 1987, and 1989 censuses of Pohnpei, Kosrae, Yap, and Chuuk, respectively; 1994 FSM Census.

Note : 1. FSM figure for mid-1980's was a 1989 interpolation from the state mid 1980's censuses.

Among the states in the FSM, the highest dependency ratio in 1994 was in Chuuk (which also had the highest fertility rate), and lowest in Yap (with the lowest fertility rate), showing the role of fertility in the shifting of the dependency ratio in the FSM. The decline in the dependency ratio in the states over the two decades stemmed from declining fertility and age-selective immigration.

#### Accuracy Analysis for Age and Sex Data

To evaluate the accuracy of the age and sex data, the Myers index was used to measure the level of digit preference and make comparisons between populations. The method measures the preference and dislike for ages ending in all the digits (0 to 9). The value of the index ranges from 0 to 180. The lower the index, the lower the extent of digit preference and hence the better the quality of the data.

Table 2.9. Measure of Digit Preference in Age-Reporting by Myers Method, State, and Sex: 1973 - 1994

State	Total	1994		Total	1980's <sup>1</sup>		Total	1980		Total	1973	
		Male	Female		Male	Female		Male	Female		Male	Female
FSM	2.5	3.7	2.3	N/A	N/A	N/A	5.3	5.4	5.1	2.9	3.0	3.7
Yap	2.0	4.7	5.5	6.0	6.8	6.3	6.9	7.6	8.3	5.3	5.6	5.8
Chuuk	2.8	3.6	3.1	3.2	3.6	3.3	6.9	6.6	7.2	2.6	3.5	3.3
Pohnpei	3.8	4.7	3.5	3.7	4.3	3.3	4.4	5.5	3.3	3.6	3.6	5.5
Kosrae	8.1	9.9	7.4	6.0	9.9	6.5	2.4	6.6	5.0	6.5	14.8	6.0

Source: 1973, T3 and 1980, T16 TTPI censuses; 1985, 1986, 1987, and 1989 censuses of Pohnpei, Kosrae, Yap, and Chuuk, respectively; 1994 FSM Census, P16.

Notes: 1: The FSM mid-80's indices is not included since the censuses were not conducted simultaneously.

The Myers index in 1994 was 2.5 showing the age reporting to be accurate (see Table 2.9). It also showed that females were reporting their age more accurately than males. Age-reporting improved since 1973. This pattern is also true for males and females.

Age-reporting in 1994 is most accurate in Yap followed by Chuuk, Pohnpei, then Kosrae. Similar to that of all FSM, females in Chuuk, Pohnpei, and Kosrae reported their ages more accurately than males. Yap however, experienced the opposite case.

**Conclusions**

The age and sex composition of FSM changed over the last two decades. These shifts in the age-sex structure have important implications for future planning.

The annual growth rate of FSM between 1989 and 1994 was 1.9 percent, declining from a 3 percent between 1980 and 1989. This decline is attributed mostly to a decline in fertility countered by increasing emigration.

The sex ratio remained about 105 over the two decades. The trend of the sex ratio varied among the states mainly because of different migration patterns.

The FSM population had gradually aged over the two decades. The median age was approaching 18 years in 1994, an increase of just over one year over the decades. This increase almost certainly came from the combination of declining fertility (females having fewer children), low mortality (people dying at an older age now than they were before), and selective migration (immigration of working age persons). The median age also increased over the two decades among the states except for Yap.

The dependency ratio increased over the two decades. Although the decrease in the dependency ratio can be considered as a positive change (as it implied more people of working-age and fewer people to support), it should be mentioned that this decreased was due in part to immigration of foreigners.





## CHAPTER 3 HOUSEHOLDS, FAMILIES, AND MARITAL STATUS

### Introduction

This chapter presents a summary of analysis on size and composition of households and families in the nation. The household and family structures in the FSM, in most cases are the same. The determining factor for household is sharing meals by a group of people living together. But for family, the determining factor is relationship by blood, marriage, or adoption. In the FSM, most people live together because they are related. Households with unrelated members are usually found in the town centers where unrelated people may share housing for financial or other reasons. The data from the 1973 census are used in this chapter to examine the changes in household and family structure in the FSM after two decades.

Since marital status affects the household and family structure it is included in this chapter. As married couples tend to have their own family, more marriages are likely to increase the number of households and families in the nation. The data on marital status provided in this chapter examine the change in the marital status and the effects on the demographic and other sociocultural patterns.

### Definitions

#### *Household Type and Relationship*

Question 2 on the census questionnaire asked for relationship of every household member to the householder. The major relationships were: householder, husband/wife, natural son/daughter, adopted son/daughter, brother/sister, father/mother, other relative, and non-relative. The other relative category was later re-coded to include son/daughter in-law, father/mother in-law, brother/sister in-law, niece/nephew, grandparent, uncle/aunt, and cousin.

Household was defined during the census as a person or a group of people living together in a housing unit and sharing meals together. These people did not need to be related but as long as they shared their meals, they were considered a household for census purposes. A *housing unit* was a house, apartment, mobile home, group of rooms, or single room that was occupied as a separate living quarters. A unit may have had more than one household if the occupants did not share their meals together.

There were two types of living quarters used in the census; *regular household and group quarters*. *Regular households* were those where the occupants may have been a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who shared living arrangements. *Group quarters* were those places where people either lived or stayed other than their usual house or apartment such as schools, hotels or motels, hospitals, prisons, etc.

*Persons per household* was obtained by dividing the number of persons in households by the number of households (or householders).

*Persons per family* was obtained by dividing the number of persons in family households (households where two or more members were related to the householder) by the number of family households.

Householder and relationship to householder were defined as follows:

*Householder* -- the person (or one of the persons) in whose name the home was owned, being bought, or rented and who was listed as person number 1 on the census questionnaire. If there was no such person in the household, any adult household member 15 years old and over could be designated as the householder.

*Husband/wife* -- a person married to and living with a householder. This category included persons in formal marriages, as well as custom marriages.

*Natural-born son/daughter* --sons or daughters of the householder by birth, regardless of the age and marital status.

*Adopted son/daughter* --sons or daughters of the householder by legal adoption, regardless of the age of the child.

*Brother/sister* --the brother or sister of the householder, including step-brothers and step-sisters as well as adopted brothers and sisters.

*Father/mother* --parents of the householder by birth, step-parents, and parents of adoption excluding parents-in-law.

*Other relative* -- a person who was related to the householder by blood, marriage, or adoption. (In-laws, nephews,aunts,cousins,grand parents and so forth).

*Non-relative* --a person who was not related by blood, marriage, or adoption to the householder or who cannot be described by the categories given.

#### *Marital Status*

Question 5 asked for marital status of all residents. However, data were tabulated for persons aged 15 years and older. The marital status referred to the status at the time of enumeration. Traditional marriages were classified under now married.

The five marital categories were: never married, now married, widowed, divorced, and separated. They are defined below:

*Never married* -- persons who never had been married, including persons whose only marriages were annulled.

*Now married* -- all persons whose current marriage had not ended by widowhood or divorce. Regardless of whether his or her spouse was living in the household unless they were separated.

*Widowed* --person whose spouse had died.

*Divorced* --person who had legally divorced his or her spouse.

*Separated* --persons legally separated or otherwise absent from their spouse because of marital discord. Included were persons who had been deserted or who had parted because they no longer wanted to live together but who had not obtained a divorce.

When a person did not report his or her marital status, the Census Office imputed the information according to the relationship to the householder and sex and age of the person.

Limitations and Comparability: The results from the 1973 census are being used in this analysis because the data are comparable.

### Analysis of Data on Households and Marital Status

#### Households (and Families)

Table 3.1 shows the type of living quarters in FSM in 1973 and 1994. Over two decades, the population increased from 62,846 to 105,506 (68 percent). These totals did not include FSM people living abroad during the census but included non-FSM people who were living in FSM during the time of the census. The proportion of persons in group quarters decreased from 4 percent in 1973 to 2 percent in 1994.

In 1994, the average household size for the FSM was 6.8 persons, a slight decrease of point 4 persons from 1973. The average family size also had a slight decrease from 7.3 persons per family household to 7.1.

Table 3.1. Type of Living Quarters, FSM: 1973 and 1994

Living Quarters	1973	1994
Total Persons	62,846	105,506
In Regular Households	60,081	103,544
Percents	95.6	98.1
In Group Quarters	2,765	1,962
Percents	4.4	1.9
Persons per Household	7.2	6.8
Persons per Family	7.3	7.1

Source: 1973 TTPI Census, Table T3. 1994 FSM Census, Table P14

Table 3.2 shows the relationship of the household members to the householder. Almost half of the persons enumerated were children of householders. In 1973, about 46 percent of household members were children but increased by about 10 percentage points by 1994.

The proportion of other relatives decreased from 27 to about 18 percent. The proportion of non-relatives also decreased by half, from about 2 percent to below 1 percent. This suggests that household composition in the FSM was shifting from the traditional extended family to a more Westernized or immediate family members setup, probably for economic reasons.

Table 3.2. Household Composition, FSM: 1973 and 1994

Relationship to Householder	Number		Percent	
	1973	1994	1973	1994
Regular households	60,081	103,544	100.0	100.0
Householder	8,626	15,231	14.4	14.7
Spouse	6,480	11,415	10.8	11.0
Child	27,463	57,546	45.7	55.6
Other relative	16,411	18,572	27.3	17.9
Non-relative	1,101	780	1.8	0.8

Source: 1973 TTPI Census, Table T3. 1994 FSM Census, Table P14

Table 3.3 shows the household compositions in the FSM by state. This table excludes those people living in group quarters since the relationships do not apply to persons in group quarters. In 1994, the proportion of householders found in Yap was the highest (18 percent), which supports the finding in Table 3.4 that Yap had the fewest persons per household. Yap had the highest proportion of other relatives and non-relatives in households compared to the other states, and the lowest proportion of natural (own) children. On the other hand, Chuuk had the highest proportion of natural children and the lowest number of households, supporting the fact that they had the largest household size in the FSM. Pohnpei was above the national average in almost every category except natural children. Kosrae follows the national average except a slightly higher proportion for other relatives.

Table 3.3. Household Composition by State, FSM: 1994

State	Total	Relationship					
		Total Percent	Householder	Spouse	Natural Child	Other Relative	Non Relative
Total	103,543	100.0	14.7	11.0	55.6	17.9	0.8
Yap	10,648	100.0	18.1	11.7	45.3	23.4	1.4
Chuuk	52,714	100.0	13.4	10.2	59.6	16.5	0.3
Pohnpei	33,197	100.0	16.0	12.0	52.2	18.6	1.3
Kosrae	6,984	100.0	13.8	11.5	57.0	17.0	0.7

Source: 1994 FSM Census, Table P14

Table 3.4. presents a breakdown by state on the number of persons living in households, total number of households, the household size, and the number of households with 10 or more persons. This table again excludes persons living in group quarters. Chuuk had the largest household size (7.5 persons per household) and the majority of those households with 10 or more persons. Kosrae had the second highest household size (7.2 persons per household) and the highest proportion of households with 10 or more persons. Yap had 5.5 persons per household and the least number of households with 10 or more persons. Pohnpei, although it had the second highest number of households, the household size and the proportion of household with 10 or more persons were below the national average. Pohnpei had 6.3 persons per household which was below national household size.

Table 3.4. Persons per Households by State, FSM: 1994

State of Usual Residence	Persons	Households	Person per Households	Households with 10 or more persons	
				Number	Percent
Total	103,543	15,230	6.8	3,136	20.6
Yap	10,648	1,925	5.5	192	10.0
Chuuk	52,714	7,043	7.5	1,865	26.5
Pohnpei	33,197	5,298	6.3	861	16.3
Kosrae	6,984	964	7.2	218	22.6

Source: 1994 FSM Census, Table P15

*Marital Status*

Table 3.5 compares marital status for 1973 and 1994. In the 1994 Census, the proportion of never married persons in FSM was 38 percent, about 7 percentage points higher than 1973. Over two decades, the proportion of now married persons decreased from about 61 percent in 1973 to 54 percent in 1994. The proportion of separated and divorced decreased slightly by 1 percentage point while proportion of widowed remained almost constant.

The proportion of never married persons for both males and females increased, probably due to delay caused by schooling of the younger generation. The proportion of now married decreased also suggesting delay in marriage. For separated and divorced persons, the proportion of males had a very slight increase while the proportion of females decreased by 2.1 percentage points. The proportion of widowed males and females remained almost the same between the two years.

Table 3.5. Marital Status for Aged 15 Years and Over by Sex, FSM: 1973 to 1994

Marital status	1973	1994
Total	27,944	59,573
Percent	100.0	100.0
Never married	31.6	37.9
Now married	59.7	54.0
Separated/divorced	2.9	3.4
Widowed	5.8	4.7
Males	14,015	30,127
Percent	100.0	100.0
Never married	36.3	41.2
Now married	58.4	54.3
Separated/divorced	2.4	2.5
Widowed	3.0	2.0
Females	13,929	29,446
Percent	100.0	100.0
Never married	26.9	34.6
Now married	61.0	53.7
Separated/divorced	3.4	4.3
Widowed	8.6	7.4

Source: 1973 TTPI Census, Table T5. 1994 FSM Census, Table P22

Table 3.6 shows the marital status in the four states broken down by sex. The proportion of never married persons was reported highest in Chuuk (39 percent) and lowest in Pohnpei (about 36 percent). Chuuk also had the highest never married males and it was higher than the national average. For the never married females, Yap and Kosrae proportions were about equal and were higher than the other two states and the national average as well.

Over half of the population aged 15 years and over were reported as married during the 1994 census. Kosrae had the highest proportion of now married persons (about 58 percent). Pohnpei had the highest proportion of now married for females (about 57 percent) which could mean women tended to marry earlier in Pohnpei compared to the rest of the states. Chuuk had the lowest proportion of now married for males while Yap had the lowest for females.

Yap had the highest proportion of separated and divorced persons (5 percent) and the highest proportion of widowed persons. Particularly for females, about 10 percent of Yapese females were widowed. Kosrae, on the other hand, had the lowest proportion of separated and divorced and widowed persons. This table suggests that females in the FSM tended to live longer than males and perhaps males remarried after divorce or after their spouse died.

Table 3.6. Marital Status of Ages 15 years and over by State and Sex, FSM: 1994

State and Sex	Total	Percent	Never Married	Now Married	Separated/ Divorce	Widowed
<b>Total</b>	59,573	100.0	37.9	54.0	3.4	4.7
Yap	6,754	100.0	37.8	50.6	5.1	6.5
Chuuk	29,068	100.0	39.2	52.4	3.6	4.9
Pohnpei	19,500	100.0	36.4	56.7	3.0	3.9
Kosrae	4,251	100.0	36.8	58.2	1.2	3.8
<b>Males</b>	30,127	100.0	41.2	54.3	2.5	2.0
Yap	3,254	100.0	39.0	53.6	4.5	2.8
Chuuk	14,687	100.0	43.5	52.1	2.3	2.0
Pohnpei	9,954	100.0	39.4	56.4	2.5	1.7
Kosrae	2,232	100.0	36.9	60.1	1.1	1.8
<b>Females</b>	29,446	100.0	34.6	53.7	4.3	7.4
Yap	3,500	100.0	36.7	47.8	5.6	9.9
Chuuk	14,381	100.0	34.7	52.6	4.9	7.8
Pohnpei	9,546	100.0	33.3	56.9	3.6	6.2
Kosrae	2,019	100.0	36.6	56.0	1.3	6.0

Source: 1994 FSM Census, Table P22

Table 3.7 shows the Singulate Mean Age at Marriage (SMAM) for the FSM in 1973 and 1994. The SMAM is determined from the distribution of never married people, and it is the point where half are married. The SMAM in 1973 was lower than 1994 for every state meaning the population, especially the females, were married at younger ages than in 1994. In 1994, the mean age at marriage was reported highest for both sexes in Chuuk (28 years) and lowest for Pohnpei (24 years).

Table 3.7. Singulate Mean Age at Marriage, FSM: 1973 and 1994

State	1973	1994
<b>Persons</b>	<b>22.8</b>	<b>25.4</b>
Yap	22.3	26.7
Chuuk	24.0	27.8
Pohnpei	22.1	24.4
Kosrae	22.3	26.1
<b>Males</b>	<b>24.2</b>	<b>26.6</b>
Yap	23.7	27.6
Chuuk	24.2	26.9
Pohnpei	23.2	25.5
Kosrae	21.7	27.2
<b>Females</b>	<b>21.5</b>	<b>24.2</b>
Yap	21.1	25.5
Chuuk	21.3	24.6
Pohnpei	21.0	23.2
Kosrae	23.0	24.9

Source : 1973 TTPI Census, Table T5. 1994 FSM Census, Table P22

## Conclusion

The average household size in the FSM remained at about 7 persons per household over the two decades. However, the household composition changed. The proportions of natural children increased while the proportions of other relatives and non relatives decreased. This suggests that the household composition in the FSM shifted from the traditional extended families to a more Westernized or nuclear family setup.

Like other population characteristics, marriage patterns changed also. Younger generation of both men and women tended to delay their marriages, probably to pursue their education. Additionally, with the change to more market economy, getting married and running a family is expensive, so more women were in the labor force and contributed to the financial well being of the family. The proportion of separated or divorced couples was maintained for males but reduced for females. In other words, the proportion of single female parents due to separation and divorce in 1994 was less than in 1973. More widowed women in 1994 than in 1973 supported the fact that men tend to die earlier or get remarried while women live longer or remain widowed.



## CHAPTER 4 FERTILITY

### Introduction

Before large scale international migration, population growth was determined mostly by the difference between the number of people being born and the number of people dying. Today births are not the only contributing factor to population growth, but they are a significant portion, especially in the Pacific region where most families are characterized by a high level of fertility (South Pacific Commission, 1994).

Birth or fertility rates measure the impact that births have on population structure and growth. As a rule, censuses do quite well in estimating fertility as questions and techniques have been refined over the years. There are two approaches for measuring fertility, direct measures and indirect measures, both of which can be applied to the 1994 FSM Census. Since either method can be used, a useful starting point is to compare the results obtained from each. If the results differ widely, it suggests that the data used in one or both methods are incorrect.

Changes in fertility patterns and levels are often due to family planning. Census data on fertility provide benchmark information on fertility to look for changes in patterns and levels. In most countries, the introduction of family planning methods, such as contraceptives, usually lowers fertility levels of older women first. In a nation where family planning is prevalent, we expect to see lower fertility levels for the older women.

### Data Description

Vital registration in the FSM is not complete, making estimates on fertility reliant on estimates derived from a census or survey. The 1994 FSM Census asked 4 questions on fertility in order to get information on recent births, previous births, and child mortality. Fertility questions were asked to all females born before September 19, 1981 (all women age 13 and over) but were tabulated for women age 15 and over. Questions asked included how many children born to each woman were living at home, living elsewhere, or dead and categorized by sex. Also asked was the date and sex of the last child born alive and whether that child was still alive.

*Limitations and comparability.* Accurate fertility data are often difficult to capture because of poor recollection by mothers on number of births or dates of births of their children. Indirect methods of measuring fertility help to compensate for these weaknesses in the data. The 1973 TTPI Census asked questions on children ever born, children still alive and date of the last child born, by sex, to women aged 14 years and over. The 1980 Census asked women 15 and over for number of children ever born and surviving and babies born in the 12 months before the census. The 1980 collection technique would have caught women who had multiple births in the year while the 1994 and 1973 only considered most recent births, missing those women who had multiple births in the year before the census. Fertility data editing techniques for the earlier censuses were slightly different than the 1994 census.

## Analysis of Fertility Data

### Crude Birth Rate

A *crude birth rate* (CBR) is the number of births in a year divided by the mid-period population. Note that the mid-period population is not the census population, that is, the reported births refer to the last 12 months while the population refers to the date of enumeration. The CBR is a crude rate because the base of the calculation is the whole population, resulting in the rate being affected by the age and sex structure.

Two measures of how many births occurred in the 12 months prior to the census can be derived from census data. The first is the number of births reported by women in the census; the second is the population under 1 year plus the estimated number of infant deaths (deaths during the year to persons under 1 year). These two figures were not equal for the period September 1993 to September 1994.

If we use the data on births reported by women of reproductive ages in the year before the census we find a CBR of 27.3 (2,856 divided by 104,456 and multiplied by 1,000). However, this is likely to be an under count in view of the estimate derived from the second method. The second method is based on reverse survival (United Nations, 1967). This estimate considers that the children counted in the census below 1 year of age, were born in the year before the census. The method also recognizes that some babies born during this year died before the census was taken. Once these "deaths" have been added to the children counted in the census, an estimate of births during the year is obtained. It is further assumed that the effects of migration on the estimates of births are negligible (migration data suggest that for children below age 15, this assumption is reasonable).

Using the survivorship ratios and the population counted in the census aged 0, we find the crude birth rate (Table 4.1) The survivorship ratio permits the estimation of children who have died before the census. Survivorship ratios have been selected from model life tables (Coale-Demeny West level 20--for calculation see Chapter 5 on mortality), which are required since the birth and death civil registration systems in the FSM are not complete. In theory, the survivorship ratios are intended to calculate survivors forward to a later age, while here, we are surviving them backward in time to estimate the number of births; hence the term "reverse survival". To calculate the number of births in the year, the number of persons enumerated in the census aged 0 to 1 (column 1) is divided by the survivorship ratio (column 2). It is then necessary to estimate the mid-year population. The earlier mid-year population was estimated using the approximate annual growth rate of 2 percent and the total census population. As the last column shows, the CBR using reverse survival for September 1993 to September 1994 is 31.4 per 1,000.

Table 4.1. Crude Birth Rate, FSM: 1993-1994

Population aged zero (1)	Survivorship Ratio (2)	Estimated Births 1993-94 (3)	Mid-period Population (4)	CBR 1993-94 (5)
3,153	.9626	3,276	104,456	31.4

Source: 1994 FSM Census, Table P15.

The same procedure was used for 5 year periods going back 15 years before the census. The estimated crude birth rates are given in Table 4.2. The table reveals a great deal about fertility in the FSM. For the most recent period covered in the above table, 1989-1994, the CBR was 33.3 per thousand population. Although this rate is high, the trend shown suggests declining fertility. In the period 1979-84, about ten to

fifteen years before the 1994 census, the CBR was 38.5. In the ten-year interval from that time to the most recent period 1989-94, fertility declined by about 14 percent. The rate from the year before the census was 31.4. Note that this is lower than the most recent five-year rate, showing that the fertility decline observed has probably continued during the five years before the census.

Table 4.2. Estimation of Crude Birth Rates, FSM: 1979 to 1994

Age group	Years in which born	Census population	Survivorship ratio since birth	Estimated births in 5 year period	Mid-period population	Crude birth rate
0-4	1989-94	15,854	0.9487	16,711	100,360	33.3
5-9	1984-89	15,330	0.9375	16,352	90,810	36.0
10-14	1979-84	14,749	0.9327	15,813	82,168	38.5

Source: 1994 FSM Census, unpublished data and Table P15.

Note: The Survivorship ratio provides the life table probability of surviving from birth to the age group specified and is approximately equivalent to the average probability of surviving from birth during the period specified to the time of the census.

As long as the assumptions made in choosing the life table and in selecting a rate of growth are reasonable, the errors in fertility estimates using this method will be small. The principal merits of the CBR as a measure of fertility are its relative simplicity and its interpretation as a direct contribution to the rate of natural growth. However, the CBR in relation to the total population tells little about the fertility of women at reproductive ages nor about the age structure of childbearing. We must be very careful in using CBR for comparison. The CBR estimates are dependent on the age structure of a population. As a result, unless standardized, they will not be comparable over time or across regions with different age structures. Fortunately, the census data do enable us to measure fertility in more detail.

### Age Specific Fertility

To look at the recent age structure of births, children born in the past year can be classified by the age group of mothers. This tabulation enables the calculation of *age specific fertility rates* (ASFR), that is the average number of children born to each woman in an age group during the year. Relating fertility experience to age provides a more detailed description of fertility behavior, or family formation, and provides a control for changes in age structure for comparative purposes.

This report provides two methods for calculating and adjusting age specific fertility rates. One involves reverse survival of births and the other involves comparing current fertility to previous fertility to check for under counting. The reverse survival method is discussed first.

Before producing age specific rates through reverse survival, we adjusted the number of births in the past year reported by women (see Table 4.1). This type of question is often under reported and considerable care is needed to use the results. Consider, for example, the 3,276 estimated births for the year 1993-94 based on reverse survival and shown in Table 4.1. Assuming that the effects of migration for infants below one year were moderate and discrepancies arising from multiple births and maternal deaths were negligible, the response to the question eliciting information on births in the past year should be the same, or at least very close. Yet, as Table 4.3 shows, the total number of women reporting a birth in the past year was 2,856, considerably less than the 3,276 estimated using reverse survival.

In order to correct for the under count, an adjustment factor is calculated by dividing the estimated births from reverse survival by the reported number of births. In this case it would be 3,276 estimated births divided by 2,856 reported births resulting in an adjustment factor of 1.15 (see Table 4.3). The adjustment factor is then applied to the births to correct for the under count.

Table 4.3. Adjustment of Births in Year Prior to the Census, FSM: 1994

Age group	Number of women	Reported Births	Unadjusted ASFR	Adjusted Births	Adjusted ASFR
Total	24,241	2,856	...	3,276	...
15-19	5,821	272	0.047	312	0.054
20-24	4,506	693	0.154	795	0.176
25-29	3,567	672	0.188	771	0.216
30-34	3,287	581	0.177	666	0.203
35-39	3,002	399	0.133	458	0.152
40-44	2,410	191	0.079	219	0.091
45-49	1,648	48	0.029	55	0.033
TFR	...	...	4.035	...	4.628

Source: 1994 FSM Census, Table P15.

Note: Adjustment factor equals total births (reverse survival)divided  
by the number of women reporting a birth in the past year.

The technique used took advantage of the relative strengths of two approaches. Using the ratio of births estimated from reverse survival to the mothers reporting a birth as a correction factor retained the age specific pattern of fertility, but fixed the level of fertility based on the more plausible reverse survival estimate of births.

The fertility pattern illustrated in the last column of Table 4.3 appears very smooth. The low rates at 15 to 19 reflect the delay in childbearing due to a later age of marriage. Peak fertility is reached at ages 25 to 29, with 0.216 children per women, and declines steadily thereafter. While age specific fertility falls quite sharply after age 35, the slope is not sufficiently steep to suggest the use of family planning; for example, women aged 45 to 49 years continue to bear on average 0.033 children each year.

The age specific fertility rates provide too much detail to be practical for some comparisons. A very useful composite index is the *total fertility rate* (TFR) which effectively sums the current age specific fertility for each year of a woman's reproductive life. The TFR thus provides a measure of the average number of children a woman would bear under a given schedule by the end of her childbearing years. Computation from the age specific rates is relatively simple, involving the summing of annual age specific rates. The rates provided in Table 4.3 would yield a TFR of 4.6. Given the fertility levels in 1993-94, each FSM woman would give birth on average to 4.6 children during her reproductive lifetime.

The results of the reverse survival method are very similar to the second method using the indirect P/F ratio shown below. The P/F ratio method of estimating fertility compares the reported historical fertility (parity) of women to the current fertility of the same women and establishes a correction factor to apply to the age specific fertility rates to calculate a more precise total fertility rate (for further discussion on this method see Brass, 1975; Brass, et al., 1968; Arriaga, 1983 and United Nations, 1983). The correction factor adjusts for under-response and poor recollection of fertility data by older women who might under report births. Once we find the difference in reported parity and fertility, we can correct for the under count. In the case of the FSM we have chosen a correction factor of 1.15 which corrects the age specific fertility rates and results in an adjusted TFR of 4.6. The correction factor was taken from the P/F ratio that applied to women 20 to 24 because fertility has been declining rapidly in the FSM; thus, data for the older women did not portray an

accurate picture of current fertility. (For more details on this method see United Nations Manual X "Indirect Techniques for Demographic Estimation.") The increase in the P/F value suggests that there was a growing disparity between current fertility and parity and supports our conclusion that current fertility is lower than previous fertility, or fertility is declining.

Table 4.4. Calculation of Total Fertility Rate with P/F Ratio, FSM: 1994

Age group	Children ever born per woman (Parity, P)	Age specific fertility rates (ASFR, F)	Summation of ASFR's multiplied by 5 (phi)	Adjustment of phi (F)	Parity divided by adjusted phi (P/F)	Adjusted ASFR by factor of 1.15
15-19	0.129	0.047	0.234	0.312	0.413	0.054
20-24	0.769	0.154	1.003	0.667	1.152	0.177
25-29	2.090	0.188	1.945	1.565	1.335	0.217
30-34	3.475	0.177	2.828	2.490	1.396	0.204
35-39	4.705	0.133	3.493	3.238	1.453	0.153
40-44	5.692	0.079	3.889	3.726	1.527	0.091
45-49	6.289	0.029	4.035	4.193	1.500	0.034
TFR	...	4.035	...	...	...	4.648

Source: 1994 FSM Census, unpublished data.

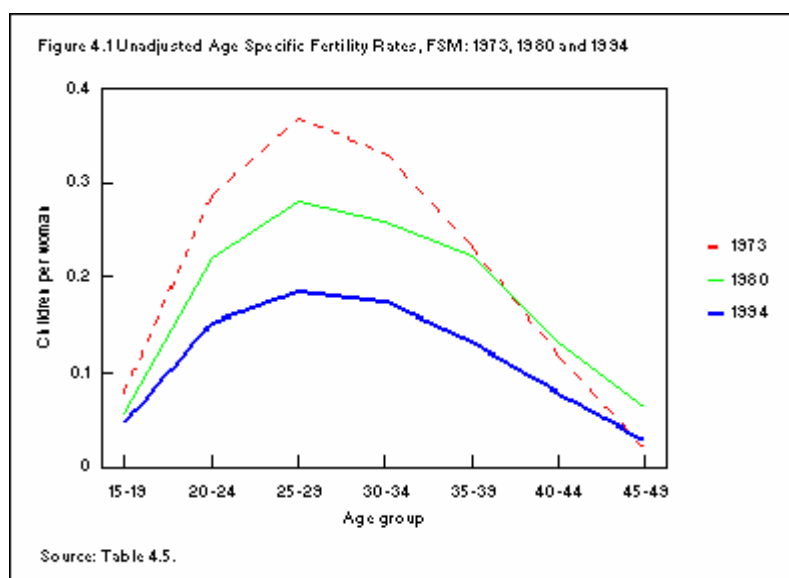
Given the fertility levels for 1993-94, an FSM woman would bear 4.6 children on average in her lifetime. The crude birth rates suggest declining fertility over the 15 years before the census. Adjusted age specific fertility rates also show a similar trend illustrated by the TFR falling from 8.3 in 1973 to 7.3 in 1980 and declining further to 4.6 in 1994 (see Table 4.5). The high fertility levels in 1973 were probably a reflection of changing health conditions in the FSM. In 1973 public health had brought down child mortality but women were still having large families to replace those children who potentially would not survive.

Figure 4.1 displays the changes in ASFRs over time. The reduction in the peak at ages 25 to 29 and the flattening of the curve suggests a decline in fertility. Although women aged 25 to 29 years are having fewer children they continue to bear children into the later reproductive years, implying small effects of contraceptives on fertility behavior. A reduction in the early reproductive ages can be seen in the figure; these were probably due to the delay in marriage mentioned in Chapter 3 on marital status.

Table 4.5. Age Specific Fertility Rates, FSM: 1973 to 1994

Age group	Implied 1973	Adjusted 1973	implied 1980	Adjusted 1980	Implied 1994	Adjusted 1994
15-19	0.078	0.090	0.057	0.068	0.047	0.054
20-24	0.288	0.333	0.222	0.265	0.154	0.177
25-29	0.369	0.426	0.281	0.336	0.188	0.217
30-34	0.331	0.383	0.260	0.311	0.177	0.204
35-39	0.232	0.269	0.224	0.268	0.133	0.153
40-44	0.116	0.134	0.131	0.156	0.079	0.091
45-49	0.020	0.023	0.064	0.076	0.029	0.034
TFR	7.168	8.283	6.187	7.394	4.035	4.648
Adj. factor	...	1.15	...	1.19	...	1.15

Source: 1973 TTPI Census, unpublished data; 1980 TTPI, unpublished data; 1994 FSM Census, unpublished data.



The *gross reproduction rate* (GRR) and *net reproduction rate* (NRR) measure only female births and are indices of generational replacement. The GRR is the average number of daughters born that will replace each woman in the absence of female mortality from birth through the childbearing years. Given a TFR of 4.6 the gross reproduction rate can be calculated by multiplying the proportion of female births by the TFR. For the FSM in 1994 the GRR, or number of daughters a woman will have on average, was 2.2. The net reproduction rate is calculated by taking the mortality of the daughters into account because some daughters will die before having children. The NRR comes to 2.0. A common benchmark for the NRR is when the NRR equals 1, which is replacement level fertility. This implies that each woman will be replaced by exactly one woman after a generation. For the FSM the current fertility level suggests that each woman will be replaced by 2 women in about 30 years time (given that an average generation is 30 years).

### Fertility of Population Subgroups

Different economic and social groups tend to have varying fertility rates. It is interesting to look at the fertility rates to see which subgroups have high fertility and which subgroups have low fertility. This can be done by considering historical parity or current fertility. In this report we have chosen to use current fertility because in most cases the number of women is large enough to see trends. However, in the state census reports, parity (children ever born) was used as well as the total fertility rates in order to compensate for the small numbers.

Table 4.6 presents age specific fertility rates for different educational backgrounds. A pattern seems to be evident in the relationship between the fertility level of a woman and her education level. Those women with more education had fewer children while those women with less education tended to have more children. Table 4.6 presents this pattern clearly. Given the 1994 fertility rates, women with college education had on average 3.1 births over their lifetime, while women with a high school education had on average 4.7 children. However, women with no schooling had lower fertility than those women with elementary or high

school education. This finding is common because some education often increases a woman's health status enough to improve her ability to bear children and to understand the importance of pre-natal care. However, once this threshold has been met, increased education seems to reduce fertility.

Table 4.6. Age Specific Fertility Rates by Mothers Educational Attainment, FSM: 1994

Age group	Total	No School	Elementary	High School	H.S. Graduate	Some College	College Graduate
15-19	0.054	0.058	0.086	0.032	0.066	0.051	-
20-24	0.177	0.191	0.218	0.172	0.158	0.126	0.105
25-29	0.217	0.222	0.217	0.245	0.181	0.215	0.192
30-34	0.204	0.184	0.199	0.213	0.253	0.187	0.123
35-39	0.153	0.143	0.166	0.153	0.164	0.131	0.109
40-44	0.091	0.097	0.093	0.094	0.096	0.074	0.060
45-49	0.033	0.043	0.029	0.048	0.026	0.021	0.025
TFR	4.648	4.689	5.040	4.792	4.717	4.020	3.076

Source: 1994 FSM Census, Table P102.

Another determinant of fertility was whether a mother was in the labor force. Table 4.7 presents data on fertility rates for women who were in the labor force, employed or unemployed, subsistence, and those who were not in the labor force. As would be expected, those women who were in the labor force had lower fertility levels (TFR of 3.7) than the women who were not in the labor force (TFR of 5.3); probably because some women who had children in the year before the census took themselves out of the labor force to care for their child and because women who did not work were more likely to have child. Within the labor force women who were working full time (35+ hours) had the lowest fertility rates. Women who were looking for work (or unemployed) had lower fertility than the women who were not in the labor force. Women in subsistence had fertility higher than other women who were employed; however, it was lower than women not in the labor force (only 1,559 women were in this category so the fertility rate should be considered with caution).

Table 4.7. Age Specific Fertility Rates by Labor Force Participation, FSM: 1994

Age group	All women	Total in labor force	Total employed	Labor force Employed 35+ hours	Subsistence	Unemployed	Not in labor force
15-19	0.054	0.068	0.065	0.084	0.044	0.086	0.051
20-24	0.177	0.138	0.136	0.121	0.156	0.134	0.200
25-29	0.217	0.167	0.160	0.152	0.161	0.185	0.247
30-34	0.204	0.158	0.150	0.144	0.179	0.170	0.235
35-39	0.153	0.127	0.122	0.108	0.167	0.107	0.177
40-44	0.091	0.071	0.063	0.056	0.081	0.094	0.108
45-49	0.033	0.030	0.030	0.023	0.033	0.024	0.036
TFR	4.648	3.796	3.629	3.444	4.101	4.009	5.270

Source: 1994 FSM Census, Table P134.

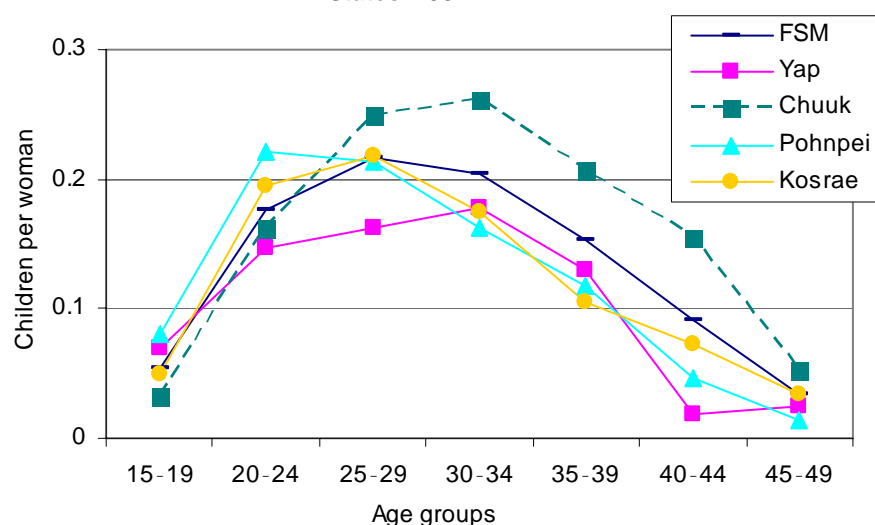
Finally, fertility differentials by state are considered in Table 4.8. The P/F ratio method of estimating fertility was used to calculate these rates. Chuuk had the highest fertility rates with 5.6 births on average per woman. Yap had the lowest fertility rates with 3.7 births per woman. (Yap's fertility rate was affected by the foreign temporary workers on Yap Proper who had very low fertility and made up a significant portion of the women of reproductive ages.) Yap and Pohnpei both had high fertility at young ages. Chuuk had high fertility at the older ages, suggesting the absence of family planning.

Table 4.8. Summary of Adjusted Fertility Rates by State, FSM: 1994

Age group	FSM	Yap	Chuuk	Pohnpei	Kosrae
15-19	0.054	0.070	0.033	0.080	0.049
20-24	0.177	0.147	0.163	0.221	0.195
25-29	0.217	0.163	0.249	0.213	0.218
30-34	0.204	0.178	0.261	0.163	0.175
35-39	0.153	0.130	0.207	0.118	0.105
40-44	0.091	0.019	0.154	0.047	0.073
45-49	0.034	0.024	0.052	0.014	0.034
TFR	4.648	3.656	5.595	4.274	4.243

Source: 1994 FSM Census, unpublished data.

**Figure 4.2. Age Specific Fertility Rates for the FSM and the Four States: 1994**



Source: Table 4.8

Children ever born per woman provides an estimate of how many children a woman is likely to have had by the time she has reached a specified age group. This measure does not reflect current fertility, except for the youngest age group. The final age group, ages 45 to 49, gives an estimate of lifetime fertility. Women in the FSM who were finishing their reproductive years (aged 45 to 49 years) in 1994 had on average 6.3 children over their lifetime (Table 4.9). Similar to the total fertility rates, Chuuk had the largest number of children ever born per mother and Yap had the smallest number.



Table 4.9. Children Ever Born per Woman by State and Mother's Age, FSM: 1994

	FSM	Yap	Chuuk	Pohnpei	Kosrae
15-19	0.129	0.151	0.086	0.190	0.099
20-24	0.769	0.688	0.651	0.967	0.820
25-29	2.090	1.739	2.042	2.339	1.831
30-34	3.475	3.082	3.664	3.421	3.025
35-39	4.705	3.966	5.061	4.577	4.251
40-44	5.692	4.545	6.279	5.270	5.365
45-49	6.286	4.871	6.734	5.913	6.740

Source: 1994 FSM Census, Table B03.

## Conclusion

The FSM had a total fertility rate of 4.6 according to the 1994 FSM Census. This rate is high by World standards and creates a rapidly growing population. However, fertility levels in the FSM are continuing to decrease, as they have been for the past two decades. If the growth rate stays at the 1994 level the population of the FSM will double in about 30 years. Fertility, however, is not the only factor influencing population size. Mortality and migration also play a large role in the population dynamics of the FSM.

Fertility rates were lower for those women with higher education and those women who were in the labor force suggesting that if policy makers want to lower population growth due to fertility, policies could be directed at increasing female education levels and increasing women's participation in the work force. Also, given the high current age specific fertility rates, it appears that the uses of family planning which usually initially lowers fertility in the older age groups, is still rather limited.



## CHAPTER 5 MORTALITY

### Introduction

As reported in Chapter 4, fertility rates in the FSM are declining. However, mortality rates in the FSM have been brought to a moderately low level, and thus little decline occurred in the recent past. The analysis on mortality data suggested that given result of the 1994 census alone, the high level of Infant mortality rate should be a real worry for FSM policy makers, particularly in the Health sector. In this chapter we estimated mortality directly from available registration data, and indirectly from recent censuses in the FSM to find the level and trend of mortality over time in the FSM.

### Data Description

Mortality can not be estimated through direct methods from the 1994 FSM Census because no direct questions were asked regarding deaths. Indirect estimates of early age mortality can be derived from the questions concerning children ever born and children still alive (questionnaire item 17a). The proportion of children surviving can be applied to model life tables to produce basic mortality rates. Children ever born and surviving were asked to women in the 1973 and 1980 censuses as well and data is provided for comparison.

Mortality indices of interest are crude death rate, infant mortality rate, child mortality rate, and life expectancy at birth. The *crude death rate* (CDR) is the most common direct measure of mortality and is defined as the number of deaths per 1,000 persons. Similar to the crude birth rate, the crude death rate is dependent on the age-sex structure; thus, it is a crude measure. An adjustment must be made before any attempt of comparing mortality over time or for different regions or countries using the CDR. The *infant mortality rate* (IMR) is defined as the number of infant deaths per 1,000 live births during the year. The IMR is a good indicator of the quality of health care in a nation because mortality is high during the first months of life and small improvements can be measured. It is also an adjusted measure that is not dependent on the age-sex structure of a region. The *child mortality rate* is defined as the probability of dying between ages 1 and 5. *Life expectancy at birth* is the average number of years a new born baby can expect to live, given the current level and pattern of mortality. Unlike the crude birth rate this measure is independent of the age structure of a nation and is thus a good measure for comparison between countries or regions.

Life expectancy is obtained from a *life table* constructed based on a set of age specific death rates, from which probability of surviving to specific age is determined. These survival probabilities are applied to an assumed cohort of births that occurred in the same year, following the survivors as they reach successive ages until all have eventually died. From the total number of all years lived, probability of survival between the ages and life expectancies at the various ages are estimated (see Arriaga, 1994 pp 74 - 83 for details on the derivation). In FSM, however, deaths are under registered, making it difficult to obtain the life table from age specific death rates calculated from registration data. As an alternative, in this Chapter a life table implied by childhood survivorship ratios has been presented.

### Analysis of Mortality Data

Direct measures of mortality could be calculated using deaths registered with the Department of Health. Unfortunately these events are under-registered and inconsistently covered, providing only a guide to the

patterns of mortality but not to the level. To compensate for the different levels of coverage and to smooth some erratic patterns, Table 5.1 presents two four-year averages of mortality rates. In both cases the CDR comes to approximately 4 per 1,000 persons, which, as we will see is an under count. The CDR is calculated using the total number of deaths in a year divided by the estimated mid-year population. Age-specific mortality rates in the case of the FSM were erratic and inaccurate because of the small number of persons and deaths and because of inaccuracies in reporting. The reported age specific death rates also shows that the coverage problem was significant for childhood mortality. Direct estimation of mortality is not possible without an accurate and complete vital registration system. The FSM must make greater efforts to improve the coverage of the vital registration program.

Table 5.1. Average Age Specific Mortality Rates (per '000) FSM: 1986 to 1989 and 1990 to 1993

	1986-1989			1990-1993		
	Deaths	Mid-period population	Age-specific Mortality Rate	Deaths	Mid-period Population	Age-specific Mortality Rate
Total	358	91,627	3.91	401	98,709	4.06
0-5	70	16,105	4.35	65	15,966	4.06
5-9	21	15,092	1.41	20	15,222	1.33
10-14	4	12,172	0.35	6	13,523	0.43
15-19	7	9,586	0.70	3	10,967	0.30
20-24	8	6,846	1.10	8	7,868	0.95
25-29	10	6,549	1.53	11	6,826	1.65
30-34	11	5,703	1.93	11	6,178	1.70
35-39	10	4,763	1.99	13	5,444	2.34
40-44	9	3,047	2.95	17	4,027	4.16
45-49	11	2,142	5.25	19	2,838	6.52
50-54	10	2,359	4.24	18	2,283	7.77
55-59	21	2,130	9.62	25	2,116	11.81
60-64	27	1,736	15.41	30	1,866	15.81
65-69	22	1,525	14.43	34	1,452	23.24
70-74	38	851	44.95	37	1,039	35.37
75-79	24	638	38.01	33	610	54.10
80+	56	383	146.21	54	484	111.05

Source: Department of Health Services, FSM; 1994 FSM Census, unpublished data.

The crude death rate, based on the registration system, is likely to be an underestimate due to the incomplete registration of deaths and should be considered only as a lower bound. In order to get better estimates of mortality, we used an indirect method to calculate child and infant mortality and find a model life table applicable to the FSM. The life table is basically a statistical model of mortality experience based on given mortality rates. Model life tables allow us to project mortality rates (and other demographic indices) once we have matched a model to the population. Given the model life table we have estimated the crude death rate to be nearly 8 per 1,000 individuals. Also, the CDR implied by the life expectancy at birth should be considered as an upper bound, mainly because, while applying the indirect techniques, we could have possibly slightly over adjusted the data. The technique gives best result when fertility and mortality have not changed much in recent past. Thus, the result obtained from indirectly estimated CDR could only be useful in providing indications for monitoring purposes.

The life table is indirectly estimated from child survival information (for further discussion on this method see United Nations Manual X "Indirect Techniques for Demographic Estimations"). The 1994 FSM Census asked women for the number of children ever born and the number of children surviving. With these data, estimations were made about the level of child mortality over the past 15 to 20 years. This technique assumes that the survivorship of children from women in different age groups reflects the child mortality for given periods before the census. This technique provides estimations of infant mortality, child mortality, and

life expectancy at birth for different years prior to the census. When we apply this method to the past three censuses we can approximate the change in level over the two decades before the census.

The method requires the calculation of children who died before the census and who were born to mothers ages 15 to 49. The average age of children born to mothers in each five year age group provides a convenient way of tracing mortality. As mothers age, so too does the average age of their children. As the proportion dead represents the risk of dying between birth and the average age of children at the time of the census, by calculating this rate for successive ages of mothers, the method essentially describes the mortality pattern for infants and children.

Table 5.2 shows the historical trends of proportion of children surviving by age of mother. As can be seen from the table, the proportion of children surviving has increased over time. In 1973 only 84 percent of children born to women ages 45 to 49 years survived to the census day. In 1994, about 93 percent of all children born to mothers ages 45 to 49 years survived to the census day. Thus we can assume that child mortality in the FSM improved between 1973 and 1994. The improvement between 1973 and 1980 was much greater than the improvement between 1980 and 1994.

Table 5.2. Children Ever Born and Children Surviving by Age of Mother, FSM: 1994

Age Group	1973			1980			1994		
	Children Ever Born	Children Surviving	Percent Surviving	Children Ever Born	Children Surviving	Percent Surviving	Children Ever Born	Children Surviving	Percent Surviving
15-19	626	584	93.3%	629	592	94.1%	749	719	96.0%
20-24	3,680	3,410	92.7%	3,969	3,751	94.5%	3,464	3,298	95.2%
25-29	5,755	5,273	91.6%	7,313	6,895	94.3%	7,454	7,051	94.6%
30-34	6,967	6,324	90.8%	8,698	8,150	93.7%	11,422	10,712	93.8%
35-39	9,677	8,512	88.0%	7,822	7,235	92.5%	14,124	13,230	93.7%
40-44	7,367	7,181	97.5%	8,145	7,483	91.9%	13,717	12,736	92.8%
45-49	6,682	5,600	83.8%	7,872	7,158	90.9%	10,366	9,633	92.9%

Source: 1994 FSM Census, Table P15; 1980 TTPI Census, Table T19; 1973 TTPI Census, Table T25 and T26.

Data on children ever born and children surviving classified by age of mother can be used to determine probabilities of surviving to specific ages. These probabilities of surviving can then be fitted to a model life table which allows us to calculate the approximate infant mortality rates and the corresponding life expectancy at birth for different time periods (United Nations, 1983; Feeney, 1976, 1980; Sullivan 1972; Coale, A., and Trussel J., 1974, 1977). The resulting mortality indices for recent censuses are summarized in Tables 5.3. The results show a decline in mortality rates over the 20 years before the census. Data for women aged 15 to 19 years were ignored because the numbers were small and child mortality for young mothers is often selectively high. The data for the final three age groups were also disregarded because of poor recollection by mothers resulting in an underestimate of the mortality rates. The most accurate information applied to women aged 20 to 34 years. These calculations could be done separately for males and females; however, in order to have an adequate number of cases the data here are presented for both sexes. The United Nations Software package for mortality measurement was used for computing the various indices and their reference periods (Arriaga, 1994).

Table 5.3 Indirect Estimates of Early Age Mortality CEB/CS, FSM: 1973 to 1994

Mother's age	Children ever born	Children surviving	Proportion dead	Age (x)	Prob. of dying by age (x)	Reference date	Infant mort. rate	Child mort. rate	Life expectancy
<b>1994 Census</b>									
20-25	0.769	0.732	0.048	2	0.051	May 1992	0.045	0.015	65.7
25-30	2.090	1.977	0.054	3	0.056	Dec. 1990	0.046	0.015	65.4
30-35	3.475	3.259	0.062	5	0.066	Apr. 1989	0.050	0.017	64.6
<b>1980 Census</b>									
20-25	1.431	1.136	0.055	2	0.058	Jun. 1978	0.051	0.018	64.3
25-30	3.383	2.518	0.057	3	0.058	Aug. 1976	0.047	0.016	65.2
30-35	5.339	4.108	0.063	5	0.064	May 1974	0.049	0.016	64.9
<b>1973 Census</b>									
20-25	1.431	1.326	0.073	2	0.079	Jul. 1971	0.067	0.027	60.7
25-30	3.383	3.100	0.084	3	0.085	Oct. 1969	0.067	0.027	60.7
30-35	5.339	4.846	0.092	5	0.094	Aug. 1967	0.069	0.028	60.4

Source: 1994 FSM Census, unpublished data; 1980 TTPI Census, unpublished data;  
1973 TTPI Census, unpublished data.

The estimates provide mortality indices for years prior to the census (see the reference dates in Tables 5.3). The averages of the three age groups 20 to 24, 25 to 29, and 30 to 34 give the most accurate data and apply to an average reference date of about 4 years before each census. Table 5.4 contains the average of these age groups and the summary of the indicators. The 1994 data provide estimates that refer to 1990, the data from 1980 refer to 1976, and the 1973 data refer to 1969.

Table 5.4. Summary Indicators from Indirect Estimation of Early Age Mortality, FSM: 1969 to 1990

Reference date	Infant mortality rate	Child mortality rate	Life expectancy
1990	46	16	65.2
1976	48	17	64.8
1969	68	27	60.6

Source: Preceding Table 5.3.

Note: These rates are calculated using the Coale-Demeny life table model West 20.

Mortality indicators improved during both time intervals. The ratio of infant deaths to births in a year reduced from 68 per 1,000 persons to 46 per 1,000 between 1969 and 1990. The probability of dying between ages 1 and 5 decreased from .027 in 1971 to .016 in 1990. Finally, the average length of life that a person could expect to live increased by almost 5 years between 1969 and 1990. However, the rapid improvements in longevity that occurred between 1969 and 1976 were not present between 1987 and 1990. The above method finds that the approximate life expectancy for the FSM in 1990 was 67.5 for women and 63.6 for men.

The trend observed in Infant mortality and life expectancy at birth could have also been slightly distorted by the quality of the mortality data in earlier censuses. As it was the case in many developing countries, the quality of data collection is improving over time (better educated enumerators and respondents, better computational facilities, etc.). In this respect, the higher life expectancy and lower Infant mortality rate observed in 1976 could be partly due to the suspected under reporting on mortality data in 1980 census.

Nevertheless, given the result the 1994 census alone, the high level of Infant mortality rate should be a real worry for FSM policy makers, particularly in the Health sector. A comparison of mortality rates for the FSM to other neighboring Pacific Islands is summarized in Table 5.5. The FSM infant mortality rate of 46 was significantly higher than the average of 33. The FSM condition was only slightly lower from the rates in Kiribati and the Marshall Island.

Table 5.5. Mortality Data from Other Neighboring Pacific Island Nations, Various Years

Country	Infant mortality rate	Life expectancy
FSM from 1994 Census data	46 (1990)	65 (1990)
FSM according to SPC data	52 (1989)	64 (1989)
Guam	9 (1991)	74 (1992)
Kiribati	65 (1990)	60 (1990)
Marshall Islands	63 (1988)	61 (1988)
Nauru	26 (1992)	56 (1981)
CNMI	9 (1991)	68 (1981)
Palau	25 (1990)	67 (1990)

Source: Preceding Table 5.4; SPC, 1995. "Pacific Island Populations."

Finally, for the purpose of generating life table for FSM, we used life expectancy at birth, computed separately from males and females survivorship data of 1994 FSM census (see appendix Table B03A). The male and female life expectancy at birth for the period of 1991 to 1992 was estimated at 64.4 and 66.8 years, respectively. Using a Coale and Demny model life table for west pattern, we generated a life table for FSM that best matched the estimated life expectancies at birth. The result is presented in Table 5.6. The life table could serve useful purposes both within the demographic community and also in the world at large. The Life table provide estimates of life expectancies at the various ages, survival ratios for each age group that could be used in population projections, constructing nuptiality tables, constructing actuarial tables, etc. It is, however, important to note that the life table was based on level of childhood mortality and the resulting level and pattern of adult mortality may not be accurate, and therefore should be used with caution.

Table 5.6. Life Table as implied by Coale &amp; Demeny Model Life Table for the West Pattern of Females and Males, FSM : 1991 - 1992

AGE	M(x,n)	Q(x,n)	I(x)	D(x,n)	L(x,n)	S(x,n)	T(x)	E(x)	A(x,n)
<b>Females</b>									
0	.04527	.04365	100000	4365	96425	.95070 a	6680000	66.8	.181
1	.00375	.01485	95635	1420	378923	.98821 b	6583575	68.8	1.453
5	.00113	.00564	94215	532	469745	.99497	6204652	65.9	2.500
10	.00088	.00441	93683	413	467383	.99455	5734906	61.2	2.500
15	.00139	.00693	93270	646	464836	.99176	5267524	56.5	2.657
20	.00191	.00949	92624	879	461006	.98960	4802688	51.9	2.597
25	.00226	.01123	91744	1030	456212	.98784	4341682	47.3	2.564
30	.00265	.01318	90714	1195	450665	.98548	3885470	42.8	2.570
35	.00324	.01607	89519	1439	444119	.98192	3434806	38.4	2.586
40	.00413	.02046	88080	1802	436088	.97614	2990687	34.0	2.607
45	.00566	.02790	86278	2408	425684	.96651	2554598	29.6	2.630
50	.00816	.04000	83870	3355	411428	.95180	2128915	25.4	2.638
55	.01191	.05795	80515	4666	391597	.92797	1717487	21.3	2.647
60	.01859	.08908	75850	6757	363390	.88804	1325890	17.5	2.653
65	.02992	.13975	69093	9655	322704	.82291	962499	13.9	2.643
70	.04978	.22240	59437	13219	265557	.72360	639795	10.8	2.607
75	.08235	.34236	46219	15823	192158	.48654 c	374238	8.1	2.539
80+	.16693	-	30395	30395	182080	-	182080	6.0	5.990
<b>Males</b>									
0	.05136	.04929	100000	4929	95979	.94628 a	6440000	64.4	.184
1	.00332	.01317	95071	1252	377159	.98852 b	6344021	66.7	1.504
5	.00119	.00592	93819	555	467708	.99473	5966861	63.6	2.500
10	.00093	.00462	93264	431	465242	.99396	5499154	59.0	2.500
15	.00162	.00805	92833	748	462433	.99018	5033912	54.2	2.684
20	.00228	.01134	92085	1044	457893	.98839	4571478	49.6	2.573
25	.00235	.01169	91041	1064	452575	.98769	4113585	45.2	2.527
30	.00265	.01317	89978	1185	447005	.98533	3661010	40.7	2.568
35	.00334	.01657	88793	1471	440446	.98054	3214004	36.2	2.610
40	.00465	.02298	87321	2006	431877	.97191	2773558	31.8	2.643
45	.00695	.03417	85315	2915	419743	.95781	2341682	27.4	2.657
50	.01057	.05159	82400	4251	402035	.93587	1921938	23.3	2.657
55	.01636	.07879	78148	6157	376254	.90270	1519903	19.4	2.647
60	.02521	.11893	71991	8562	339645	.85419	1143649	15.9	2.628
65	.03886	.17775	63429	11275	290120	.78257	804004	12.7	2.603
70	.06094	.26527	52155	13835	227039	.67979	513884	9.9	2.562
75	.09612	.38714	38320	14835	154339	.46194 c	286845	7.5	2.488
80+	.17723	-	23485	23485	132506	-	132506	5.6	5.642

Source: Implied by childhood survivorship data from 1994 FSM Census, unpublished data.

Note : a - Value given is for survivorship of 5 cohorts of birth to age group 0-4 =  $L(0,5)/500000$ b - Value given is for  $S(0,5)=L(5,5)/L(0,5)$ c - Value given is  $S(75+,5)=T(80)/T(75)$  $M(x,n)$  = Age specific central death rate $Q(x,n)$  = Probability of dying between exact ages x and x+n (age-specific mortality rate) $I(x)$  = Number of survivors at age x. $D(x,n)$  = Number of deaths occurring between ages x and x+n. $L(x,n)$  = Number of person-years lived between ages x and x+n. $T(X)$  = Number of person-years lived after age x. $E(X)$  = Life expectancy at age x. $A(x,n)$  = Average person-years lived by those who die between ages x and x+n.



**Conclusion**

Census data from the 1994 FSM Census suggest that life expectancy has increased by only 5 years between 1973 and 1994. Child survival has improved, with the largest improvement occurring between 1973 and 1980 and less improvement occurring in the 14 years after 1980. Direct estimation of mortality is not possible without an accurate and complete vital registration system. The FSM must make greater efforts to improve the coverage of the vital registration program.

It has also been indicated that FSM was one of the highest mortality regime in the Pacific (both in terms of life expectancy and Infant mortality) and the decline in Infant mortality was not satisfactory. Given the result of the 1994 census alone, the high level of Infant mortality rate should be a real worry for FSM policy makers, particularly in the Health sector.



## CHAPTER 6 MIGRATION

### Introduction

In previous chapters we discussed a number of demographic topics including population structure, fertility, and mortality. From these discussions, it is very clear that migration plays an important role in the population dynamics of the FSM. Migration is one of the main determinants of population size and growth (the others are fertility and mortality). The measurement of migration, however, is more complex. Unlike fertility and mortality (which predictably happen once in each person's lifetime) people may not ever migrate and those that do may do so more than once and for different reasons. Some people migrate for employment, for education, for vacation, visiting, and so forth.

Migration involves movement from one place to another. It can be internal, that is within national boundaries, or international (used interchangeably here with overseas migration). A person who migrates is referred to as an immigrant or in-migrant with respect to the area of destination, and an emigrant or out-migrant with respect to the place of origin (in each case the former term is used for international migration and the latter for internal migration). Censuses, as we shall see, are not the most reliable sources for measures of international migration. Other sources will be used in this report to provide at least some insight into emigration from the FSM. On the other hand, the census is a reliable source for measuring internal migration.

Migration has emerged as an extremely important factor shaping the demography of the Pacific (Connell, 1990). This is true for FSM, although the levels and patterns of migration differ in many respects from other parts of the Pacific.

To be useful, a definition of migration must take into account both space and time, to distinguish migration from the many other movements that people make. Because the census asks different questions about migration, it actually defines migration in different ways for different purposes. This is an important point for census data users to understand because it means that different migration figures presented in the different tables may not be strictly comparable with each other. For example, even though data on birthplace and residence 5 years ago provide a basis for measuring migration, the measures so obtained are defined differently, serve different purposes, and are not comparable. For the same reason, unlike with fertility or mortality, it is not easy to make comparisons of levels of internal migration between different countries.

### Data Description

#### *Birthplace*

The 1994 census asked everyone for details of place of birth and recorded island/village, municipality, and FSM state if a person was born in the FSM. When a person's birthplace was outside FSM, the name of the foreign country was recorded.

#### *Citizenship and Legal Residence*

Details of citizenship were obtained for all persons in the FSM. The question requested the municipality and state of legal residence (place where a person casts his or her vote) for FSM citizens. For non-FSM citizens, the country of citizenship was recorded.

## **CHAPTER 7**

### **RELIGION, ETHNICITY, and LANGUAGE**

#### **Introduction**

In the FSM, religion-related organizations, like youth programs, play an important role in the community, making data on religion necessary for planning purposes. The data provided in this chapter show two major religious affiliations; Roman Catholic and Protestant. Under Protestant there were several sects and Congregational was the largest group. The Protestant first came to Micronesia in 1852, beginning work on Pohnpei and Kosrae, and soon afterwards expanding to Chuuk. Although the mission sending organization was interdenominational, most of the missionaries represented the Congregational Church. The Roman Catholics arrived later, beginning their work in Yap in 1886 and Pohnpei, a year later. In the early 20th century, a German Liebenzell missionary began work in the area, eventually moving to Yap. From the 1960's on, other religions entered the area -- SDA, Assembly of God, Baptist, Jehovah Witnesses, LDS, and Bahai. (Hezel, 1983). Few cases of Traditional religion continue to exist in Yap in 1994 but in this chapter were combined with the other religions.

Data on ethnicity is useful in planning process and social research. The summary of the data collected on ethnicity during the 1994 census is also presented in this chapter. Regardless of recent immigrants into the FSM, the major ethnic groups which existed twenty years ago in the FSM, still remain. The largest foreign (non-local) ethnic group in the FSM were the Asians, which include mostly Filipinos and Chinese. The second largest non-local ethnic group were the category termed as white. This group encompasses persons from Europe, U.S., Australia, and New Zealand. Ethnicity is generally reflected in the language.

Each FSM state has its own language and most states have several dialects. In FSM history, different second languages were taught in school depending on the administering country. During the Japanese Administration (from 1914 to 1945) Japanese was used as the common language in schools, offices, etc. And when the U.S took over at the end of the World War II, English became the main language for communication. The medium of official communication at the government offices and even in the private sector is English. The native languages are mainly used at home and in the communities.

#### **Definitions**

##### *Religion*

For census purposes, religion was defined as a religious or spiritual belief or preference, regardless of whether or not this belief was represented by an organized group. Information regarding religious affiliation for all persons in the 1994 census was collected by questionnaire item 7. The TTPI Census in 1973 and the 1994 FSM census included a question on religion and the data are compared in this chapter.

##### *Ethnicity*

Data on different ethnicities in the FSM were collected in the 1994 Census by questionnaire item 6. Ethnic identity of a person is traced through his/her tribal origin. Respondents had an option of reporting up to two ethnic groups that they belonged to. Some of the common ethnicities were: Chuukese/Mortlockese, Yapese, Outer Island Yapese, Pohnpeian, and Kosraean.

##### *Language*

Data on language spoken at home came from answers to questionnaire items 15a and 15b. These questions were only asked of persons 5 years and over. For those persons that spoke more than 3

languages, they were only to provide the three most common ones in question 15a while in question 15b they were to provide the language that they usually spoke at home.

### Analysis of Data on Religion, Ethnicity, and Language

#### Religion

The first 3 tables in this chapter provide data on religions. Only two FSM censuses asked about religion which are compared in Table 7.1 below. Although new religions were introduced after the 1973 census, the majority of the population remained either Roman Catholic or Protestant.

The proportion of Roman Catholics increased slightly for each sex while the Protestant decreased over the decades. In absolute numbers both religions increased. Over 5 percent of the population claimed to be "other religion", an increase of about 4 percentage points compared to 1973. About 1 percent of the population either refused to classify their religion or had no religion.

Table 7.1 Religion by Sex, FSM:1973 and 1994

Religion	1973			1994		
	Total	Male	Female	Total	Male	Female
Total	62,731	32,128	30,603	105,506	53,924	51,582
Percent	100.0	100.0	100.6	100.0	100.0	100.0
Roman Catholic	50.0	49.7	50.4	52.7	52.8	52.5
Protestant	47.4	47.4	47.4	40.9	40.5	41.3
Other Religions	1.0	1.0	1.0	5.4	5.4	5.4
Refused/No relig	1.5	1.8	1.2	1.1	1.3	0.8

Sources: 1973 TTPI, Table T11. 1994 FSM Censuses, Table P22

Table 7.2 further shows that more persons were Roman Catholic than Protestant in all states except Kosrae. In 1994, the majority (84 percent) of Yap population were Roman Catholics while only about 5 percent were Protestant. In Kosrae, the picture was reversed. The majority, or over 90 percent of the population, were Protestant while 2 percent were Roman Catholics. In Chuuk and Pohnpei, distributions were about equal between Roman Catholic and the rest of the religions. The highest proportion who refused to answer or reported they had no religion was found in Yap at about 6 percent.

Table 7.2 Religion by State, FSM:1994

State	Total	Percent	Roman Catholic	Congregational	Other Protestant	Baptist	SDA	LDS	Other Religion	Refused/No Religion
Total	105,506	100.0	52.7	32.6	8.3	1.0	0.5	1.1	2.6	1.1
Yap	11,178	100.0	84.3	2.0	2.1	0.4	0.3	1.0	3.8	6.0
Chuuk	53,319	100.0	53.2	26.7	15.4	0.6	0.3	0.8	2.9	0.2
Pohnpei	33,692	100.0	52.4	39.9	0.9	1.8	1.1	1.3	2.2	0.5
Kosrae	7,317	100.0	1.9	88.8	-	1.1	0.7	2.1	2.9	2.4

Source: 1994 FSM Census, Table P22

Table 7.3 also indicates that the distribution of religion across the age groups was relatively even while the distribution by type of religion was uneven; about 52 percent were Roman Catholic, 41 percent were Protestant, and the other religion sects made up the 6 percent. SDA had the smallest proportion among the other religion sects and in all age groups as well.

Table 7.3 Religion by Age Group, FSM:1994

Religion	Total	0-14	15-34	35-64	65+
Total	105,506	45,933	34,740	21,038	3,795
Percent	100.0	100.0	100.0	100.0	100.0
Roman Catholic	52.7	53.6	52.4	51.6	50.1
Protestant	40.9	40.7	40.9	41.6	44.4
Congregational	32.6	32.3	32.2	33.3	36.2
Other Protestant	8.3	8.4	8.7	8.3	8.2
Baptist	1.0	0.9	1.0	1.1	0.7
SDA	0.6	0.5	0.6	0.6	0.4
LDS (Mormon)	1.1	1.1	1.1	1.0	0.8
Other Religions	2.8	2.4	2.7	2.9	2.8
Refused/No religion	1.1	0.8	1.3	1.3	0.8

Sources: 1994 FSM Census, Table P39

## Ethnicity

Table 7.4. shows the ethnicity of FSM residents by state of usual residence in 1994. Similar to the population distribution in chapter 1, Chuukese had largest share, about 51 percent (see Table 1.2). Even in Pohnpei, the number of Chuukese enumerated was as many as 1,300 persons (2.5 percent) which was the highest among the Non-Pohnpeian residents.

The Asians sub-population outnumbered the white population in all states except Pohnpei. About 66 percent of the white ethnic group were in Pohnpei. The Asian ethnic group were mostly Chinese and Taiwanese working for the fishing company. They were almost evenly distributed in the states. Polynesians in Pohnpei were mostly Nukuoroan and Kapingamarangian.

Table 7.4: Ethnicity by State, FSM: 1994

Ethnicity	Total	Percent	Yap	Chuuk	Pohnpei	Kosrae
Total	105,506	100.0	10.6	50.5	31.9	6.9
Yapese	5,516	100.0	97.5	0.6	1.8	0.1
Yap Outer Island	4,848	100.0	97.1	0.8	2.1	-
Chuukese/Mortlockese	52,197	100.0	0.1	97.3	2.5	-
Pohnpeian	25,904	100.0	0.1	0.3	99.4	0.3
Polynesian	1,582	100.0	-	0.2	99.7	0.1
Kosraean	6,682	100.0	0.2	0.2	5.5	94.1
Asian	1,914	100.0	25.9	26.6	29.9	17.7
White	537	100.0	13.2	9.7	66.1	11.0
Others	6,326	100.0	6.9	28.4	56.1	8.6

Source: 1994 FSM Census, B09

Table 7.5 shows that for the state centers, almost every ethnic group reported correspond to their place of birth. The table shows a 4 percent Yap Outer Islanders born in Yap proper and 36 percent Polynesian (Nukuoroan and Kapingamarangian) born in Pohnpei. They were most likely the descendants of the migrant parents. The foreign ethnicities like Asian and White were mostly born in U.S. and Asia. Those born in the FSM were most likely the descendants of those couples who came and bore kids in the FSM. The other possibility could be the intermarriages whereby the ethnicity of their children became a foreign based on the preference of the father or the mother ethnicity.

Table 7.5. Ethnicity by Place of Birth: FSM 1994

Ethnicity	Total Percent		Place of Birth									
			Yap	O. Is.	Chuuk	Pohn-pei	Nuk-uoro	Kapi-naga.	Kos-rae	USA Guam CNMI	Asia	Others
Total	105,506	100.0	5.5	4.5	50.2	28.9	0.4	0.6	6.6	0.8	1.7	0.7
Yapese	5,666	100.0	96.2	1.0	0.5	0.8	-	-	-	0.9	0.1	0.4
Y. Outer Islands	4,932	100.0	4.4	93.4	1.1	0.6	-	-	-	0.3	-	0.1
Chuukese/Mortlockese	49,242	100.0	-	-	99.1	0.5	-	-	-	0.3	-	-
Pohnpeian	28,411	100.0	0.1	-	0.6	97.9	0.1	0.1	0.3	0.5	0.1	0.4
Polynesian	1,641	100.0	-	-	0.2	36.4	26.0	36.8	0.1	0.1	-	0.5
Kosraean	7,198	100.0	0.3	-	0.2	3.2	-	-	94.7	0.5	0.1	0.9
Asian	2,131	100.0	1.4	0.9	4.8	3.3	-	-	1.2	2.4	84.4	1.5
White	530	100.0	1.1	-	1.9	9.8	0.4	-	1.3	63.4	0.9	21.1
Others	5,755	100.0	1.1	0.1	66.2	24.9	-	-	0.3	1.6	0.1	5.7

Source: 1994 FSM Census, P72

## Language

Data on language are used to identify communities with a large number of persons who speak a language other than or in addition to English to assess access to schools and social services. Of the 89,652 persons 5 years and over during the 1994 census, almost half were speaking Chuukese language at home (see Table 7.6 below). In every ethnic group, English speakers were found mainly because English has been used as a second language and the medium of communication at the government offices and the private sectors. Polynesian language with Polynesian ethnicity were mostly Nukuoroans and Kapingamarangian. There were some English speakers with Polynesian ethnicity and they were most likely those recent migrants from Samoa, Fiji, etc living in Pohnpei.

Table 7.6. Languages Spoken at Home by Ethnicity: FSM 1994

Ethnicity											
Language spoken	Total	Percent	Yapese	Yap O.Is.	Chuukese	Pohn-peian	Polyne-sian	Kos-raean	Asian	White	Others
Persons 5+ yrs	89,652	100.0	5.4	4.8	46.0	26.7	1.6	7.0	2.3	0.5	5.6
Yapese	5,500	100.0	85.7	12.6	0.1	0.1	-	0.2	0.7	0.1	0.6
Yap Outer Islands	3,566	100.0	0.6	97.9	0.6	0.1	-	0.1	0.2	0.1	0.4
Chuukese/Mortlockese	46,389	100.0	-	0.1	88.4	1.6	-	-	0.5	-	9.4
Pohnpeian	23,339	100.0	0.1	-	0.3	97.7	0.2	0.4	0.2	0.1	1.0
Polynesian	1,464	100.0	-	-	0.3	5.3	93.9	0.3	-	-	0.2
Kosraean	6,242	100.0	-	-	0.1	1.4	-	97.5	0.1	-	0.7
English	1,420	100.0	5.5	1.8	10.9	14.6	1.7	3.4	22.9	28.2	11.1
Japanese	46	100.0	-	-	2.2	10.9	-	-	82.6	-	4.3
Filipino	674	100.0	0.4	0.1	-	0.6	-	0.1	98.7	-	-
Chinese/Taiwanese	687	100.0	-	-	-	-	-	-	99.7	-	0.3
Koreans	6	100.0	-	-	-	-	-	-	83.3	16.7	-
Others	319	100.0	4.1	2.2	5.0	6.9	-	0.6	15.0	9.1	57.1

Source: 1994 FSM Census, P57

Table 7.7 shows the languages commonly spoken at home by place of birth. Most people in the FSM used the local language. So again, Chuukese language had the highest proportion. Few Japanese speaking persons were born in Chuuk and Pohnpei. These were most likely the offsprings of Japanese migrants.

Table 7.7. Languages Spoken at Home by Place of Birth: FSM 1994

Language spoken	Place of Birth											
	Total	Percent	Yap	O. Is.	Yap Chuuk	Pohnpei	uoro	Nuk-naga.	Kapi-rae	Kos-CNMI	USA Guam Asia Others	
Persons 5+ yrs	89,652	100.0	5.6	4.6	49.8	28.7	0.5	0.6	6.8	0.8	2.0	0.7
Yapese	5,500	100.0	85.2	12.7	0.3	0.6	-	-	-	0.5	0.1	0.6
Y. Outer Islands	3,566	100.0	3.5	94.8	0.8	0.2	-	-	-	0.4	0.1	0.3
Chuukese/Mortlockese	46,389	100.0	-	-	95.3	4.1	-	-	-	0.2	0.3	0.1
Pohnpeian	23,339	100.0	0.1	-	0.8	97.6	0.1	0.1	0.3	0.4	0.2	0.5
Polynesian	1,464	100.0	0.1	-	0.3	35.2	26.4	37.2	0.3	0.1	-	0.5
Kosraean	6,242	100.0	0.1	-	0.2	3.0	-	-	94.6	0.4	0.1	1.4
English	1,420	100.0	5.6	1.4	11.5	17.8	1.1	0.1	2.2	29.5	16.5	14.3
Japanese	46	100.0	-	-	6.5	13.0	-	-	-	-	78.3	2.2
Filipino	674	100.0	0.9	0.9	0.3	1.6	-	-	0.3	-	96.0	-
Chinese/Taiwanese	687	100.0	-	-	0.3	0.1	-	-	2.9	-	96.7	-
Koreans	6	100.0	-	-	-	16.7	-	-	-	-	83.3	-
Others	319	100.0	11.3	1.6	5.0	9.1	-	-	0.9	4.4	14.7	53.0

Source: 1994 FSM Census, P74

Table 7.8 shows the frequency of English use in the FSM by State in 1994. Yap had the highest proportion of person speaking English probably because it is the only state that the main island (Yap proper) had a completely different language than the outer islanders. For the nation, the proportion of English only was less than 2 percent. Over 7 percent reported English as their first language. English was spoken as the second language by more than 82 percents. The higher proportion for English as the second language justifies the fact that English has been the most important common language used throughout the nation. It could have also been used as fourth or fifth language for some people but the question only allowed for the 3 languages a person commonly used.

Table 7.8. Frequency of English Use by State: FSM 1994

State	Five Years & over total	Percent spoke English						
		Total	Percent	Total %	English only	1st lang	2nd lang	3rd lang
Total	89,652	41,856	46.7	100.0	1.7	7.1	82.3	8.9
Yap	9,702	5,960	61.4	100.0	0.7	3.2	92.1	4.0
Chuuk	44,879	18,504	41.2	100.0	1.9	9.6	87.6	0.9
Pohnpei	28,676	13,733	47.9	100.0	2.0	7.1	68.0	22.9
Kosrae	6,395	3,659	57.2	100.0	1.0	1.5	93.0	4.5

Source: 1994 FSM Census, P23

Table 7.9 presents English speakers at home for each age group by state. For the national average, only about 2 percent of the population used English as their common language at home. The highest number was in age group 35 to 39 years but the highest proportion was in age group 50 to 54 years. This could be the age group of the white families living in Micronesian as well as those intermarriage couples and their families using English as their main language. The 58 percent of English speakers for Pohnpei supported the fact that more non-FSM people lived and worked in Pohnpei. Additionally, the only college in the FSM, COM-FSM is located in Pohnpei. The proportions of English speakers at home were higher in the younger generation and in the working age groups.



Table 7.9. English Speakers at Home by Age Group: FSM 1994

Age groups	Five Years & over total	Total English speakers at home	Percent speak only	Percent spoke English				
				Total %	Yap	Chuuk	Pohnpei	Kosrae
Total	89,652	1,420	1.6	100.0	14.0	23.2	58.1	4.6
5 to 9 years	15,330	142	0.9	100.0	16.9	19.7	57.7	5.6
10 to 14 years	14,749	139	0.9	100.0	19.4	19.4	59.0	2.2
15 to 19 years	12,251	114	0.9	100.0	9.6	24.6	64.9	0.9
20 to 24 years	8,828	131	1.5	100.0	13.0	25.2	54.2	7.6
25 to 29 years	7,063	135	1.9	100.0	15.6	20.7	57.8	5.9
30 to 34 years	6,598	163	2.5	100.0	12.9	35.0	46.0	6.1
35 to 39 years	6,079	169	2.8	100.0	10.7	20.7	62.7	5.9
40 to 44 years	5,071	141	2.8	100.0	18.4	22.7	55.3	3.5
45 to 49 years	3,579	103	2.9	100.0	11.7	19.4	63.1	5.8
50 to 54 years	2,219	66	3.0	100.0	18.2	16.7	63.6	1.5
55 to 59 years	2,105	56	2.7	100.0	10.7	23.2	60.7	5.4
60 to 64 years	1,985	37	1.9	100.0	5.4	21.6	70.3	2.7
75 yrs & over	3,795	24	0.6	100.0	8.3	41.7	50.0	0.0

Source: 1994 FSM Census, P40

## Conclusion

Most persons enumerated in 1994 had a religion. The results of the 1973 and 1994 censuses show that Roman Catholics and Protestant remained the two major religions in the FSM. Roman Catholics outnumbered the Protestants in the 3 states other than Kosrae.

The distribution of ethnicity was similar to population. Chuukese or the common ethnic group for Chuuk State was the largest followed by Pohnpeian, Yapese, then Kosraean. Other than these local groups, there were foreign ethnic groups such as Asians and Whites. The Asians were the largest non-FSM ethnic group and they were mostly fishermen working for the locally based fishing company and the Whites were those Americans, Australians, Europeans, and the New Zealanders working or married in Pohnpei.

Language patterns in the FSM were similar to the ethnicities and their distribution also follows the population distribution. The highest proportion of the population used Chuukese. English has been used as the common language in the FSM. Pohnpei had the highest proportion used English at home possibly because it is the capital of the FSM and it is where the only college of the FSM located. Over 80 percent of the FSM population used English as their second language.

## CHAPTER 8

### EDUCATION AND LITERACY

#### Introduction

A population's level of formal schooling is considered a good indicator of both social conditions and potential for economic success. For the FSM, which is moving from a more traditional economic system to a more Westernized system, data on education serve to provide a means to evaluate cultural change. Moreover, given the important role that education has come to play in various sectors of FSM's economy, results on this subject should provide insights on the direction of development and on the changing economic potential of the nation.

The 1994 FSM census had two items for education: school enrollment and level of educational attainment. The FSM Department of Education collects statistical data annually to obtain information about school enrollment and to assess needs for special programs in bilingual education and special education. The census allows more in-depth analysis of schooling as well as educational attainment of the entire population to compare with the socio-economic characteristics of the population.

#### Data Description

##### *School Enrollment and Type of School*

The 1994 census obtained data on school enrollment from answers to questionnaire item 12. Persons were classified as enrolled in school if they reported attending a "regular" public or private school or college at any time between September 1, 1994 and the date of enumeration. The question included instructions to "include only pre-kindergarten, kindergarten, elementary school, and schooling which would lead to a high school diploma or a college degree" as regular school.

##### *Public and Private School*

A public school was defined as any school or college controlled and supported by the state or national government. The census defined schools supported and controlled primarily by religious organizations or other private groups as private.

##### *Level of School Enrolled*

The 1994 census classified persons enrolled in school at the time of the census as enrolled in pre-primary school, elementary school, high school, or college according to their response to question 13 (years of school completed or highest degree received) in combination with the response to status of school attendance. Persons who were enrolled and reported completing pre-kindergarten school or less were classified as enrolled in pre-primary school, which included kindergarten. Similarly, enrolled persons who had completed at least kindergarten, but not eighth grade, were classified as enrolled in elementary school. Enrolled persons who completed at least the eighth grade, but who were not high school graduates, were classified as enrolled in high school. Enrolled persons who reported completing high school or some college or having received a post-secondary degree were classified as enrolled in college. Enrolled persons who reported completing the twelfth grade but receiving no diploma were classified as enrolled in high school.

##### *Educational Attainment*

The 1994 census of the FSM obtained data on educational attainment from answers to questionnaire item 13. Persons were classified according to the highest grade of school completed or the highest degree received. For persons currently enrolled in school, the question included instructions to report the level of the previous grade attended or the highest degree received.

## CHAPTER 9 ECONOMIC ACTIVITY

### Introduction

The changing economy of the FSM creates a demand for data on labor force characteristics and job activities. The following chapters provide insight into the adjustment the FSM is making as it moves from a subsistence to a cash oriented economy. Information on economic activity, industries and occupations, and income are presented in the next three chapters.

The potential labor force in the FSM, defined as the population of working age (15 years and above), accounted for 59,573 persons, or 56 percent of the FSM population, at the time of the census in 1994. Many of the potential contributors to national production were not in the labor force because they were students, houseworkers looking after children, or retired. Almost half of the working age population was currently working, or seeking work in the government, the private sector, or the subsistence or traditional sectors (involving mainly agriculture and fishing).

### Definitions

In order to determine the current labor force status all respondents aged 15 years and over were asked whether they did any 'work' in the week before the census, including full-time or part-time work. Work also included full-time and part-time work in a family farm or business, with or without pay. Work did not include unpaid volunteer work. The series of questions on employment status was designed to identify several types of individuals in the FSM: persons who worked at a job or business or farm at any time during the reference week; persons who did not do such work during the reference week, but who had jobs or businesses from which they were temporarily absent; and persons who did not work during the reference week, but who were looking for work during the reference week.

The *labor force* included the employed work force as well as the unemployed.

The total *employed labor force* was made up of a number of constituent groups, including persons who worked full- or part-time at a job or business, and persons who worked mainly in farming or fishing during the reference week regardless of whether any of their produce was sold or not. The latter group has been classified in *agriculture and fishing* and further sub-classified as market oriented and subsistence.

A person was described as a *subsistence* worker if he/she mainly farmed or fished in the week before the census without selling, or intending to sell, any produce. Persons who did only some subsistence, but mainly worked at another job in the week before the census were not included in this group. Persons who farmed or fished and sold their produce were also in the agricultural/fishing group but were categorized as *market oriented*.

Unemployed persons included persons who were looking and available for work in the four weeks preceding the census.

The economically inactive working age population, those *not in the labor force*, were working age persons not classified as being employed or unemployed. A special group of inactive persons were those who were not employed nor looking for work but who said they could have taken a job if one had been offered to them. These persons were categorized as "could have taken a job".

## CHAPTER 10

### INDUSTRY AND OCCUPATION

#### Introduction

Industry and occupation data provide information on the changes occurring in the economy and how industries change employment patterns over the years. Different occupational groups classified against other characteristics show what persons hold which occupations in the FSM population. This chapter presents information collected from persons in the formal work force (not agricultural or fishing) who were currently working as well as persons who were currently not employed but worked in the five years previous to the census. Also reviewed in this chapter is the difference in employment between the private and public sectors.

In the 1994 FSM Census question 28 was for industry and question 29 for occupation for all individuals aged 15 years and over. The type of business or industry was asked along with the name of the employer in order to check the information. Industry refers to the activity of the establishment in which an economically active person worked during the reference period established for data on economic characteristics (or last worked, if unemployed). The activity of the establishment refers to the kinds of goods or services produced. Occupation refers to the kind of work done during the reference period irrespective of the industry or the status (employer/employee). The occupation groups were derived from the level of skill and experience needed for the position. Examples include manager, sales person, typist, or factory worker.

The data collected from previous censuses is not directly comparable for these classifications because of changes in definitions. The 1980 Census used definitions of industries and occupations from the U.S. standard industry and occupation classifications. The 1994 Census used classifications defined by the International Labor Organization (ILO). Although the differences are minor, ILO classifications are used by a majority of Pacific Island nations and are an international standard. The 1980 census tabulated information for individuals ages 16 and over which makes a difference when comparing to the 1994 data which is tabulated for individuals ages 15 and over.

#### Data Description

##### *Industry*

Industries within the FSM have been broken down into 14 categories by the FSM census office and are based on the International Labor Organization's International Standard Industrial Classification (ISIC). Some of the categories have been grouped together in order to accommodate the different economic activities of the FSM.

The first group contains *agriculture, forestry, fishing, and mining* (quarrying) enterprises. This group includes all agricultural production, subsistence activities, commercial fishing, mining, and quarrying.

*Construction* enterprises contain all enterprises relating to heavy construction and special building trade contractors. Construction includes additions, alterations, reconstruction, installations, and repairs.

*Transportation, communication, electric, gas, and sanitation* services all fall in one category in the ILO breakdown; however, for the FSM this group has been broken into two groups, one group for transportation and communication and one group for electricity, gas, and sanitation services. The transportation and communication group includes all establishments which provide the general public with passenger or freight

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transportation services and post and telecommunication services. The other group contains the major utilities of electricity, gas, and water supply.

*Manufacturing* of durable and non-durable goods is the third category. Manufacturing is the mechanical or chemical transformation of materials or substances into new products. The category ranges in industries from fish packaging to publishing.

*Wholesale and retail trade* are combined in one group. Both groups encompass establishments involved with selling of merchandise, wholesale implies trade to other businesses, while retail implies merchandise for personal or household consumption.

*Financial intermediation and real estate* include establishments such as depository institutions, credit institutions, investment companies, commodity brokers, and insurance agents and brokers. Real estate includes owners, lessors, lessees, buyers, sellers, agents, and developers.

*Hotels, restaurants and bars* include enterprises that provide lodging, food, and beverages. This group contains establishments that provide short-term accommodations as well as bars, canteens, and restaurants.

*Business and computer activities* include the renting of machinery and equipment, research and development, legal activities, architect and engineering services, computer activities, and other business related activities.

*Health* and social work industries include hospitals, medical and dental facilities, veterinary activities and social work facilities.

*Education* contains all establishments which provide educational opportunities for the population.

*Public administration* consists of all government agencies and organizations, local, state, national, and international. It also includes defence establishments and compulsory social security.

*Other community and social services* includes sewage and refuse disposal, membership organizations, recreational activities, libraries, and other service activities. Private household services are also included in this final category.

#### *Occupation*

The International Standard Classification of Occupations (ISCO) breaks occupations into 10 basic categories. ISCO further aggregates occupations into 3 additional levels of detail. Responses on occupation in the 1994 FSM Census were classified down to three digits in the ISCO categories. The major groups are organized by the degree of skill and experience necessary for the occupation.

The ten major groups are broken down as follows:

*Executives and managers:* this group contains occupations whose main tasks include formulating government policy, laws, and regulations, planning directing and coordinating policies and activities of enterprises or organizations. Examples are judges, government department chiefs, traditional chiefs, legislators, senior management of organizations.

*Professionals:* this group includes occupations whose tasks require a high level of professional knowledge and experience. Tasks include increasing knowledge, applying scientific and artistic concepts and theories to the solution of problems, and teaching about the foregoing in a systematic manner. Examples include mathematicians, statisticians, geologists, computer programmers, architects, engineers, nurses, doctors, teachers for secondary level and above, accountants, lawyers, judges, and economists.

*Technicians and associate professionals:* this group requires technical knowledge and experience and conducts tasks carrying out technical work connected with the application of concepts and operational methods. This group includes teachers at primary level, computer troubleshooters, ships' engineer, air traffic controller, building inspectors, medical health assistants, nutritionists, and business service agents.

*Administrative support:* also called clerks, this group includes occupations whose main tasks are to organize, store, compute, and retrieve information. This group includes office clerks (such as secretaries and word processors, transport clerks, filing clerks) and customer service clerks (such as tellers, cashiers, client information, travel agents).

*Service workers:* this group includes occupations with tasks of provide services related to travel, housekeeping, catering, personal care, protection, maintaining law and order, selling goods at shops or markets. This group includes travel stewards, waiters, cooks, child-care workers, barbers, police officers, fire fighters and stall or market sales persons.

*Agriculture and fishing workers:* these occupations include skilled workers who grow crops, breed or hunt animals, catch or cultivate fish and conserve or exploit forests.

*Craft and related trades:* tasks include extracting raw materials, constructing buildings, and other structures and making various products and handicraft goods.

*Machine operators:* includes tasks which require the knowledge and experience necessary to operate and monitor large scale industrial machinery and equipment.

*Elementary occupations and laborers:* includes persons doing simple and routine tasks involving the use of hand-held tools and physical effort. Examples are selling goods in the street, door-keeping, cleaning, working as laborers.

The final group is *armed forces*: 6 persons were recorded with this occupation because of what they were doing for the armed forces.

#### *Class of Worker*

Question 30 of the 1994 FSM Census asked for information on class of worker for every individual over 15 who had worked in the 5 years prior to the census. Class of worker refers to the type of ownership of the employing organization and is based on the U.S. Bureau of Census definitions. The private sector was classified into private for-profit employer, non-profit employer, self-employed, and working without pay for a family business or farm. Likewise, the public sector was classified into municipal government, state government, national government, and foreign or federal government (federal government refers to the U.S. federal government).

## **Analysis of Industry and Occupation Data**

### **Industry**

The number of employed persons 15 years and over more than doubled between 1980 and 1994. Table 10.1 displays the breakdown of selected industries for the FSM in 1980 and 1994. In 1980 the definitions of industries were slightly different than in 1994. We can, however, use the proportion of persons in the large groupings to see trends in industry size. Data on industry and occupation refer to persons who were currently in the formal work force (14,381) as well as persons who worked in the 5 years prior to the census (4,635).

The distribution of employment changed during the 14 year time span between 1980 and 1994. In 1980 the three largest (in terms of employees) industries were education, public administration, and the agricultural sector which included farming, forestry, fishing, and mining. In 1994 the largest portions of the economically active worked in public administration (24.7 percent), education (17.8 percent), and other service activities (13.8 percent). An increase occurred in the proportion of persons employed in public administration. In 1980 almost 20 percent of the working population was employed in public administration compared to almost 25 percent in 1994. Much of this increase can be explained by the end of the Trust Territory administration which moved some government offices from Saipan to the FSM. The other major increase occurred in the "other service activities" group which includes membership organizations and household services. Although the number of employees increased, the proportion of the working population decreased for agriculture and education.

Growth of industry is difficult to ascertain from these data because of the change in definitions. However for manufacturing, the definitions would have changed very little. The data suggest that persons working in the manufacturing of goods in the FSM increased 437 percent during the period. Definitions for hotels, restaurants and bars as well as other service activities were not the same for the two years, so these numbers should be considered with care.

Table 10.1 Industry of Employment for Age 15 and Over, FSM: 1980 and 1994

Industry	Number		Percent Change	Percent	
	1980	1994		1980	1994
Experienced formal work force 15+ years	9,249	19,016	105.6	100.0	100.0
Agriculture, Forestry					
Fishing and Quarrying	1,543	1,760	14.1	16.7	9.3
Construction	1,010	1,171	15.9	10.9	6.2
Gas, Electricity, and					
Water Supply	178	279	56.7	1.9	1.5
Transportation and					
Communication	325	727	123.7	3.5	3.8
Manufacturing	122	656	437.7	1.3	3.4
Wholesale and Retail Trade	899	1,395	55.2	9.7	7.3
Hotels, Restaurants, and Bars*	268	863	222.0	2.9	4.5
Financial Intermediation					
and Real Estate	124	362	191.9	1.3	1.9
Business and Computer Activ.	99	270	172.7	1.1	1.4
Health	542	817	50.7	5.9	4.3
Education	2,057	3,393	64.9	22.2	17.8
Public Administration	1,844	4,699	154.8	19.9	24.7
Other Service Activities*	238	2,624	1,002.5	2.6	13.8

Source: 1994 FSM Census, Table P29; 1980 TTPI Census, Table T23.

Note: \* Data from 1980 and 1994 are not comparable for the other service activities and hotels, restaurants, and bars categories. 1980 data refer to persons ages 16 and over.

Table 10.2 gives a more detailed breakdown of industries in the FSM. Of the 4,699 persons employed in public administration, more than 75 percent were males. About 18 percent of the employed persons were in the education field. Within the field of education, the category for 'adult and other education' constituted about half of the people. This was most likely due to peoples whose level or field of education was not defined and were added to this category. Private household services, such as maids, accounted for 7 percent of the employed population. The fishing industry constituted 6 percent of the employed population, 94 percent of which were males.

Table 10.2 also provides the sex distribution for each of the industries. Women dominated the industries of manufacturing of non-durable, retail trade, hotels and restaurants, financial intermediation, insurance and pensions, health and social work, and membership organizations.



Table 10.2. Detailed Breakdown of Industry by Sex, FSM: 1994

Industry	Number			Percent		
	Total	Male	Female	Total	Male	Female
Experienced formal work force 15+ years	19,016	13,031	5,986	100.0	65.9	34.1
Agriculture, forestry, fishing, quarry	1,760	1,581	179	100.0	89.8	10.2
Agriculture and livestock	508	403	105	100.0	79.3	20.7
Forestry	4	4	-	100.0	100.0	0.0
Fishing	1,206	1,139	67	100.0	94.4	5.6
Mining	39	32	7	100.0	82.1	17.9
Quarrying	3	3	-	100.0	100.0	0.0
Manufacturing	656	295	361	100.0	45.0	55.0
Manufacture of nondurables	139	84	55	100.0	60.4	39.6
Manufacture of durable	517	211	306	100.0	40.8	59.2
Electricity, gas and water supply	279	256	23	100.0	91.8	8.2
Construction	1,171	1,109	62	100.0	94.7	5.3
Wholesale and retail trade	1,395	735	660	100.0	52.7	47.3
Wholesale trade	195	115	80	100.0	59.0	41.0
Retail trade	965	440	525	100.0	45.6	54.4
Trade relating to automobiles	235	180	55	100.0	76.6	23.4
Hotels and restaurants	863	334	529	100.0	38.7	61.3
Transportation and communication	727	586	141	100.0	80.6	19.4
Land transport	210	187	23	100.0	89.0	11.0
Water transport	157	138	19	100.0	87.9	12.1
Air transport	128	97	31	100.0	75.8	24.2
Other transport activities	63	48	15	100.0	76.2	23.8
Post and telecommunications	169	116	53	100.0	68.6	31.4
Financial intermediation and real estate	362	194	168	100.0	53.6	46.4
Financial intermediation	179	69	110	100.0	38.5	61.5
Insurance and pensions	14	6	8	100.0	42.9	57.1
Other finance activities	74	40	34	100.0	54.1	45.9
Real estate	20	17	3	100.0	85.0	15.0
Renting	75	62	13	100.0	82.7	17.3
Business and computer activities	270	194	76	100.0	71.9	28.1
Computer activities	103	76	27	100.0	73.8	26.2
Research and development	20	16	4	100.0	80.0	20.0
Other business activities	147	102	45	100.0	69.4	30.6
Public administration	4,699	3,645	1,054	100.0	77.6	22.4
Education	3,393	2,197	1,196	100.0	64.8	35.2
Primary education	1,002	615	387	100.0	61.4	38.6
Secondary education	431	318	113	100.0	73.8	26.2
Higher education	244	143	101	100.0	58.6	41.4
Adult and other education	1,716	1,121	595	100.0	65.3	34.7
Health and social work	817	405	412	100.0	49.6	50.4
Other service activities	2,624	1,499	1,125	100.0	57.1	42.9
Sewage and refuse disposal	83	53	30	100.0	63.9	36.1
Activities of membership organization	1,113	555	558	100.0	49.9	50.1
Community service activities	112	71	41	100.0	63.4	36.6
Private household activities	1,306	811	495	100.0	62.1	37.9
Other establishments	10	9	1	100.0	90.0	10.0

Source: 1994 FSM Census, unpublished data.

Table 10.3 shows different educational backgrounds of people employed in different industries. For definitions on vocational and high school education, see Chapter 8 on Education. Fully 53 percent of employed persons 15 years and over had high school diplomas. In the health, education, and financial fields more than two-thirds of the personnel were high school graduates. The percent of high school graduates in different industries was not uniformly higher for males or females. Utilities, transportation, and financial industries had over 15 percentage points more females with high school diplomas than percentage males with high school diplomas.

An average of 27 percent of employed persons had some vocational training. Vocational training varied by sector. For example, more than 43 percent of the individuals employed in the health sector had vocational training, while only 15 percent of those in the hospitality industry had vocational training. Data on high school diplomas follow this trend as well with the health industry having the highest portion of employees with high school diplomas and the hospitality industry among the lowest. Males were more likely to receive vocational training than females in all industries except for agriculture, forestry, fishing, and mining.

Table 10.3. Industry by Percent of Persons with High School Diplomas and Vocational Training

	High School Graduates			Vocational Training		
	Total	Males	Females	Total	Males	Females
Experienced formal work force 15+ years	53.1	53.0	53.4	26.6	28.4	22.7
Agriculture, Forestry						
Fishing and Quarrying	43.8	45.0	33.0	16.0	15.7	18.4
Construction	41.8	41.0	54.8	23.1	23.6	14.5
Gas, Electricity, and Water Supply	59.9	57.0	91.3	38.7	40.2	21.7
Transportation and Communication	56.8	53.2	71.6	30.8	31.7	27.0
Manufacturing	36.1	42.7	30.7	16.6	25.4	9.4
Wholesale and Retail Trade	44.3	45.9	42.6	16.9	22.6	10.6
Hotels, Restaurants, and Bars	37.8	43.4	34.2	15.2	20.4	11.9
Financial Intermediation and Real Estate	68.8	60.8	78.0	32.6	33.5	31.5
Business and Computer Acti.	55.9	55.7	56.6	30.4	33.5	22.4
Health	71.7	75.1	68.4	43.8	43.0	39.4
Education	72.5	73.7	70.2	30.8	31.9	28.8
Public Administration	56.7	54.3	64.9	34.4	34.9	32.4
Other Service Activities	37.0	36.1	38.3	18.2	20.1	15.8

Source: 1994 FSM Census, Table P115.

Certain industries naturally have certain occupations such as the agriculture industry which had a majority of agriculture and fishing workers. The construction and utilities fields had the highest portion of machine operators and laborers. More than 50 percent of the education industry was comprised of technicians, associate professionals, and administrative support, while more than 50 percent of the health industry is comprised of managers, executives and professionals.

Table 10.4. Industry by Occupation, FSM: 1994

Industry	Total	Percent	Executives Managers and Prof.	Technic. Assoc. Pro. Admin. Sup	Service	Agric. and Fishing	Crafts Repair Operators Laborers	Other
Experienced formal work force 15+ years	19,016	100.0	16.3	33.1	13.9	7.3	19.1	10.4
Agriculture, Forestry								
Fishing and Quarrying	1,760	100.0	6.8	18.0	3.2	56.1	9.2	6.6
Construction	1,171	100.0	4.4	6.2	1.7	0.3	57.9	29.5
Gas, Electricity, and Water Supply	279	100.0	11.5	20.4	3.2	1.1	59.5	4.3
Transportation and Communication	727	100.0	8.5	27.9	10.5	2.5	35.4	15.3
Manufacturing	656	100.0	6.6	34.9	19.2	2.6	27.1	9.6
Wholesale and Retail Trade	1,395	100.0	6.7	46.2	12.3	0.5	25.3	9.1
Hotels, Restaurants, Bars	863	100.0	5.7	16.3	49.2	0.2	12.9	15.6
Financial Intermediation and Real Estate	362	100.0	15.2	56.6	12.2	1.7	10.8	3.6
Business and Computer Act.	270	100.0	23.3	29.6	9.6	1.9	23.0	12.6
Health	817	100.0	53.9	32.6	6.4	0.1	4.2	2.9
Education	3,393	100.0	23.4	54.1	12.7	0.9	6.0	2.9
Public Administration	4,699	100.0	22.5	30.3	16.8	2.1	16.5	11.9
Other Service Activities	2,624	100.0	9.0	31.1	16.2	7.8	23.1	12.8

Source: 1994 FSM Census, Table P170.

## Occupation

The largest occupation group of those persons ages 15 and over who were currently employed or who worked in the 5 years previous to the census was the technicians and associate professionals occupation group. This differs from 1980 when the largest occupation group was the professionals group. Again the definitions changed slightly during the two census: the 1980 census using U.S. codes and the 1994 Census using ILO codes.

Table 10.5 provides the breakdown of occupations over the 14 years prior to the census and the change in proportions of the working age in the occupation groups. The biggest differences over the 14 years were in the professionals category which decreased by more than 11 percentage points and administrative support which increased by 8 percentage points.

The percentage change in number of persons in each occupation group shows that on average, the occupation groups increased by 134 percent, with the largest change occurring in elementary occupations and laborers (the increase in armed forces should be disregarded because the number is so small). Technicians and associate professionals increased by 347 percent. The smallest increase was in the agricultural and fishing workers.

Table 10.5. Occupations of Experienced Work Force, FSM: 1980 and 1994

Occupation	Number		Percent Change	Percent	
	1980	1994		1980	1994
Experienced formal work force 15+ years	8,120	19,016	134.2	100.0	100.0
Executives and Managers	671	1,181	76.0	8.3	6.2
Professionals	1,747	1,914	9.6	21.5	10.1
Technicians and Associate Professionals	720	3,219	347.1	8.9	16.9
Administrative Support	939	3,069	226.8	11.6	16.1
Service Workers	1,416	2,650	87.1	17.4	13.9
Agric. and Fishing Workers	747	1,384	85.3	9.2	7.3
Craft and Related Workers	932	2,482	166.3	11.5	13.1
Machine Operators	601	1,143	90.2	7.4	6.0
Elementary Occupations and Laborers	347	1,968	467.1	4.3	10.3
Armed Forces	0	6	600.0	0.0	-

Source: 1994 FSM Census, Table P28; 1980 TTPI Census, Table T23.

Note: 1980 data are for individuals 16 years and over.

Of all employed persons who replied to their occupation, 69 percent were males and 31 percent were females (Table 10.6). Most of the industries had male and female representation similar to the overall representation of employed persons. The only occupation that females were in the majority was the administrative support group where 72 percent of the employees were female. Machine operators had a strong male bias with almost 95 percent of the work force male.

Table 10.6. Occupation for Persons 15 Years and Over Who Worked in 5 Years Previous to Census by Sex, FSM: 1994

Occupation	Number			Percent		
	Total	Males	Females	Total	Males	Females
Experienced formal work force 15+ years	19,016	13,030	5,986	100.0	68.5	31.5
Executives and Managers	1,181	1,002	179	100.0	84.8	15.2
Professionals	1,914	1,301	613	100.0	68.0	32.0
Technicians and Associate Professionals	3,219	2,177	1,042	100.0	67.6	32.4
Administrative Support	3,069	845	2,224	100.0	27.5	72.5
Service Workers	2,650	1,591	1,059	100.0	60.0	40.0
Agric. and Fishing Workers	1,384	1,219	165	100.0	88.1	11.9
Craft and Related Workers	2,482	2,148	334	100.0	86.5	13.5
Machine Operators	1,143	1,085	58	100.0	94.9	5.1
Elementary Occupations and Laborers	1,968	1,656	312	100.0	84.1	15.9
Armed Forces	6	6	0	100.0	100.0	0.0

Source: 1994 FSM Census, Table P28.

The three occupations with the highest skill levels (executives and managers, professionals, and technical and associate professionals) had the most individuals in the 35 to 44 age category while the other occupations all had the largest portions in the 25 to 34 age groups (Table 10.7). Less than 25 percent of the executives and managers were under the age of 34. This corresponds with the requirement for more experience and perhaps education in the executives and managers and professionals occupations. In the administrative support category there was an under-representation of 45 to 64 year old persons, while the persons ages 25 to 34 were over-represented.

Table 10.7. Age by Occupation, FSM: 1994

Occupation	Total	Percent	Age group				
			15-24	25-34	35-44	45-64	65+
Experienced formal work force 15+ years	19,016	100.0	18.1	28.9	29.6	21.8	1.6
Executives and Managers	1,181	100.0	4.2	20.2	38.1	34.3	3.1
Professionals	1,914	100.0	7.4	24.6	33.9	32.2	1.9
Technicians and Associate Professionals	3,219	100.0	13.0	23.3	35.3	27.2	1.1
Administrative Support	3,069	100.0	29.1	35.3	25.0	9.8	0.8
Service Workers	2,650	100.0	20.3	28.1	28.3	21.6	1.7
Agric. and Fishing Workers	1,384	100.0	21.7	34.3	24.5	17.1	2.4
Craft and Related Workers	2,482	100.0	19.1	28.9	28.4	22.0	1.6
Machine Operators	1,143	100.0	19.8	32.3	29.4	17.8	0.8
Elementary Occupations and Laborers	1,968	100.0	19.9	33.1	25.4	19.7	1.9
Armed Forces	6	100.0	50.0	33.3	16.7	0.0	0.0

Source: 1994 FSM Census, Table P45.

Table 10.8 presents occupation by age. Of the persons 15 to 24 years and 25 to 34 years, the greatest portion worked in administrative support occupations. For those persons 35 to 44 and 45 to 64 years the largest portion was in the technicians and associate professionals occupation group. Almost 15 percent of the oldest age group, 65 years and over, were in service occupations.

Table 10.8. Occupation by Age, FSM: 1994

Occupation	Total	Age group				
		15-24	25-34	35-44	45-64	65+
Experienced Formal Work force 15+ years	19,016	3,437	5,502	5,635	4,146	296
Percent	100.0	100.0	100.0	100.0	100.0	100.0
Executives and Managers	6.2	1.5	4.3	8.0	9.8	12.5
Professionals	10.1	4.1	8.5	11.5	14.9	12.2
Technicians and Associate Professionals	16.9	12.2	13.6	20.2	21.1	12.2
Administrative Support	16.1	26.0	19.7	13.6	7.3	8.1
Service Workers	13.9	15.7	13.5	13.3	13.8	14.9
Agric. and Fishing Workers	7.3	8.7	8.6	6.0	5.7	11.1
Craft and Related Workers	13.1	13.8	13.0	12.5	13.1	13.5
Machine Operators	6.0	6.6	6.7	6.0	4.9	3.0
Elementary Occupations and Laborers	10.3	11.4	11.9	8.9	9.4	12.5
Armed Forces	-	0.1	-	-	0.0	0.0

Source: 1994 FSM Census, Table P45.

Occupations varied between persons born in the FSM and those persons born elsewhere. Table 10.9 presents the breakdown of these two groups by occupation. The largest differences were in the administrative support and service worker occupations. FSM-born persons had the largest portions of their employed personnel in administrative support and services. On the other hand, non-FSM born persons had a larger portion among the agricultural and fishing workers and technicians and associate professionals. This corresponds with the large numbers of foreign fishing workers who are present in the FSM.

Table 10.9. Occupation by Place of Birth, FSM: 1994

Occupation	FSM Born		Foreign Born	
	1994	Percent	1994	Percent
Experienced formal work force 15+ years	16,886	100.0	2,130	100.0
Executives and Managers	1,026	6.1	155	7.3
Professionals	1,655	9.8	259	12.2
Technicians and Associate Professionals	2,699	16.0	520	24.4
Administrative Support	2,923	17.3	146	6.9
Service Workers	2,534	15.0	116	5.4
Agric. and Fishing Workers	1,025	6.1	359	16.9
Craft and Related Workers	2,114	12.5	368	17.3
Machine Operators	1,065	6.3	78	3.7
Elementary Occupations and Laborers	1,840	10.9	128	6.0
Armed Forces	5	-	1	-

Source: 1994 FSM Census, Table P79.

Table 10.10 further examines occupations in the four states. As can be seen from the table, technicians and associate professionals were the most common occupations in each state, except for Pohnpei. The most common occupation in Pohnpei was administrative support probably because of the large state and national governments. Craft production and related industries were the second most common occupations in both Yap and Pohnpei.

Table 10.10. Occupation by State, FSM 1994

Occupation	FSM	Yap	Chuuk	Pohnpei	Kosrae
Experienced formal work force 15+ years	19,016	2,964	6,838	7,320	1,894
Executives and Managers	100.0	100.0	100.0	100.0	100.0
Professionals	6.2	7.1	6.3	5.9	5.8
Technicians and Associate Professionals	10.1	8.8	13.5	7.8	8.3
Administrative Support	16.9	24.2	17.5	13.4	17.1
Service Workers	16.1	12.9	14.9	19.1	14.5
Agric. and Fishing Workers	13.9	12.2	16.8	12.9	10.5
Craft and Related Workers	7.3	5.4	5.9	7.5	14.3
Machine Operators	13.1	14.4	8.4	16.6	14.0
Elementary Occupations and Laborers	6.0	5.4	5.7	6.5	5.9
Armed Forces	10.3	9.5	11.0	10.3	9.6

Source: 1994 FSM Census, Table P28.

Nearly 50 percent of the experienced formal work force ages 25 years and over were high school graduates. Persons with at least a bachelors degree constituted about 11 percent while over 40 percent had not completed high school (Table 10.11).

Levels of educational attainment varied among occupations. For instance, over 60 percent of individuals with managerial and professional occupations had at least a high school education. Also, over 20 percent had either a bachelor's degree or higher education. Most employees in occupations other than managerial, professional and service occupations had below high school level education.

Educational attainment of employed males tended to have similar patterns to that of the female population. Nevertheless, for certain occupation categories, employed males were more likely to have either a high

school education or a bachelors degree. For example, more males in managerial or in professional categories had bachelor's degrees and above, compared to the entire population.

The proportion of high school graduates was higher for females in professional, managerial and service occupations than males. Few college educated females were in the technicians, sales, and administrative support workers or laborers or farmer categories compared to males.

Table 10.11. Educational Attainment of the Experienced Formal Work Force by Occupation and Sex, FSM: 1994

Educational attainment	Total	Exec. and managerial	Professional	Tech., sales, admin. support	Service	Agric. and fish. workers	Craft and related workers	Machine and oper. laborer	Others
Experienced formal work force 25+ years	14,753	865	4,416	1,979	2,099	1,002	1,860	2,308	224
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Below H. School Grads.	41.4	17.6	18.5	61.7	33.2	65.9	55.1	62.9	37.9
H.S. Grads. & Some Coll.	47.8	60.2	60.7	34.5	59.8	27.3	42.1	33.1	42.0
BA/BS Degree & Above	10.8	22.2	20.8	3.7	7.0	6.8	2.8	3.9	20.1
Males, 25+ years	10,458	718	3,128	1,232	634	886	1,600	2,051	209
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Below H. School Grads.	41.0	17.5	17.8	55.6	30.4	63.7	51.1	61.7	38.3
H.S. Grads. & Some Coll.	46.9	59.2	59.4	39.2	58.4	28.9	45.8	34.0	41.6
BA/BS Degree & Above	12.1	23.3	22.8	5.2	11.2	7.4	3.1	4.2	20.1
Females, 25+ years	4,295	147	1,288	747	1,465	116	260	257	15
Percent	100.0	100.0	100.0	100.0	100.0	100.0	98.8	98.4	66.7
Below H. School Grads.	42.4	17.7	20.2	71.9	34.4	82.8	79.2	72.4	-
H.S. Grads. & Some Coll.	50.0	65.3	64.0	26.8	60.4	15.5	19.6	26.1	46.7
BA/BS Degree & Above	7.6	17.0	15.8	1.3	5.2	1.7	-	-	20.0

Source: 1994 FSM Census, Table P45.

Note: This table excludes persons with no formal educational attainment.

### Class of Worker

Table 10.12 presents data for class of worker. The number of persons in the FSM working for the private sector in 1994 was almost equal to the number of persons working in the public sector. The largest portion in the private sector was in for-profit organizations (40 percent of all working persons). In the public sector the largest employer was the state government (37 percent of all working persons). These figures show the large dependency the FSM has on government employment.

Pohnpei state had almost 60 percent private sector and 40 percent public sector, while the other states had higher portions of public sector than private. In each state the vast majority of the private sector was for-profit organizations. The public sector in each state was mostly state government. Just over 8 percent of Pohnpei's employed persons were in the national government.

Employed females were represented more in the private sector as compared with males. The trends between states and within the sectors were very similar for males and females.

Table 10.12. Type of Work by State and Sex, FSM: 1994

Type of Work	FSM	Yap	Chuuk	Pohnpei	Kosrae
Experienced formal					
work force 15+ yrs.	19,016	2,964	6,838	7,320	1,894
Percent	100.0	100.0	100.0	100.0	100.0
Private	50.6	49.3	43.1	59.0	46.9
For Profit	40.7	44.1	33.6	45.6	42.3
Non-Profit	3.8	3.1	3.5	4.8	1.9
Self Employed	5.3	2.0	4.9	7.7	2.6
Work No Pay	0.8	0.2	1.2	0.8	0.1
Public	49.4	50.7	56.9	41.0	53.1
Municipal Government	6.1	0.4	11.6	4.3	2.2
State Government	37.0	43.3	42.9	26.7	46.3
National Government	4.6	3.3	1.5	8.2	3.7
Foreign/Federal	1.8	3.7	1.0	1.9	0.8
Males	13,030	1,897	4,898	4,849	1,386
Percent	100.0	100.0	100.0	100.0	100.0
Private	47.3	43.6	39.5	57.3	44.9
For Profit	37.8	38.5	29.8	44.4	41.6
Non-Profit	3.0	2.7	2.4	4.2	1.2
Self Employed	5.8	2.3	5.8	8.2	2.2
Work No Pay	0.7	0.1	1.4	0.5	0.0
Public	52.7	56.4	60.5	42.7	55.1
Municipal Government	7.2	0.6	13.5	4.7	2.5
State Government	39.5	48.9	44.7	28.2	47.8
National Government	4.4	3.6	1.5	7.9	3.8
Foreign/Federal	1.6	3.3	0.9	1.9	0.9
Females	5,986	1,067	1,940	2,471	508
Percent	100.0	100.0	100.0	100.0	100.0
Private	57.7	59.5	52.2	62.3	52.4
For Profit	47.2	53.9	43.0	48.1	44.3
Non-Profit	5.5	3.8	6.0	6.1	3.9
Self Employed	4.2	1.5	2.5	6.7	3.7
Work No Pay	0.9	0.3	0.7	1.4	0.4
Public	42.3	40.5	47.8	37.7	47.6
Municipal Government	3.7	0.0	6.7	3.4	1.4
State Government	31.7	33.4	38.3	23.6	42.1
National Government	4.8	2.6	1.4	8.7	3.5
Foreign/Federal	2.1	4.5	1.4	1.9	0.6

Source: 1994 FSM Census, Table P30.

The largest portion of private sector workers was between the ages 25 and 34 while the largest portion of public sector worker was between ages 35 and 44 (Table 10.13). Over one-third of the state and national government workers were between the ages 35 and 44. About one-third of all workers working for no pay were between the ages of 15 and 24.



Table 10.13. Class of Worker by Age, FSM: 1994

Type of Work	Total	Percent	Age group				
			15-24	25-34	35-44	45-64	65+
Experienced formal work force 15+ years	19,016	100.0	18.1	28.9	29.6	21.8	1.6
Private	9,616	100.0	26.1	33.0	23.8	15.5	1.6
For Profit	7,744	100.0	27.8	33.1	23.7	14.4	1.0
Non-Profit	719	100.0	19.7	32.8	26.4	18.9	2.1
Self Employed	1,004	100.0	16.4	32.2	24.5	21.6	5.3
Work No Pay	149	100.0	32.2	31.5	14.1	14.8	7.4
Public	9,400	100.0	9.9	24.8	35.6	28.3	1.5
Municipal Government	1,155	100.0	12.6	28.2	30.8	25.0	3.4
State Government	7,043	100.0	9.3	23.1	36.3	30.0	1.2
National Government	867	100.0	9.5	31.4	35.9	22.1	1.2
Foreign/Federal	335	100.0	12.2	31.0	37.0	18.5	1.2

Source: 1994 FSM Census, Table P45.

In 1994, government or public employees other than municipality employees, were more likely to be high school and college graduates than private sector employees (Table 10.14). Almost 65 percent of the municipal government employees had less than high school education. The private sector had fewer persons with high school or better educational attainment than the public sector. Only 40 percent of the for-profit employees had high school education.

Gender differences in educational attainment by class of work were also apparent in the FSM. In the private sector the gender differentials were quite minor, however, in the public sector (excluding municipal government) women were less likely to have bachelor's degrees than males. Over 25 percent of the males in the national government had bachelor's degrees. The national government had the smallest portion of persons with no high school diploma.

Table 10.14. Educational Attainment by Class of Worker, FSM: 1994

Educational Attainment	Total	Private				Public			
		For Profit	Non-Profit	Self-Employed	Work No Pay	Municipal	State Gov't.	National	Foreign/Federal
Experienced formal work force 25+ years	14,753	5,253	537	753	84	939	6,137	766	284
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Below H. School Grads.	41.4	53.8	49.2	66.9	78.6	64.7	26.8	16.4	25.4
H.S. Grads. & Some College	47.8	41.2	39.1	21.9	19.0	33.4	58.1	59.4	57.4
BA/BS Degree & Above	10.8	5.0	11.7	11.2	2.4	1.8	15.1	24.2	17.3
Males	10,458	3,505	295	564	54	776	4,565	521	178
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Below H. School Grads.	41.0	52.8	48.1	62.2	77.8	66.9	27.6	15.5	24.2
H.S. Grads. & Some College	46.9	41.4	38.6	23.6	18.5	31.3	56.0	58.0	56.2
BA/BS Degree & Above	12.1	5.8	13.2	14.2	3.7	1.8	16.5	26.5	19.7
Females	4,295	1,748	242	189	30	163	1,572	245	106
Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Below H. School Grads.	42.4	55.8	50.4	81.0	80.0	54.6	24.4	18.4	27.4
H.S. Grads. & Some College	50.0	40.8	39.7	16.9	20.0	43.6	64.4	62.4	59.4
BA/BS Degree & Above	7.6	3.4	9.9	2.1	-	1.8	11.2	19.2	13.2

Source: 1994 FSM Census, Table P114.

Note: This table excludes persons with no formal educational attainment.

**Conclusion**

In 1994, almost 25 percent of employed persons in the FSM worked in public administration, and almost one-half of the employed population worked in the public sector. Education was the second largest industry in the country after public administration. The most common occupations were technicians, associate professionals, and administrative support. These occupations were mostly filled by the younger population. A large part of economic activity in the FSM was government related.

During 1980 and 1994, occupation groups increased by about 134 percent, with the largest change occurring in elementary occupations and laborers. During the 14 years before 1994, technicians and associate professionals increased by 347 percent. The smallest increase was in the agricultural and fishing workers. Agriculture and fishing being the most important sectors in the FSM, the relatively little increase in these sector should be considered with caution, specially in an effort of establishing a sustainable development.

Women played a large role in the manufacturing industry: 55 percent of the industry's employees were female. Females also held the majority of administrative support occupations, while males held the majority of all other occupations.



## CHAPTER 11

### INCOME

#### Introduction

The 1994 FSM Census asked for cash income earned in 1993 from all persons 15 years and older. Income provides a measure of how well cash resources are distributed within the country as well as an insight into the sources of cash in the FSM. Cash income is the amount of money received during a fixed period of time. For the 1994 FSM Census, the time period referred to was calendar year 1993. Income includes wages or salaries, cash income from farm or non-farm business, interest on dividends or net rentals, estates or trusts, social security or retirement, and remittances.

Income was tabulated by household, by family, and by individual. Household income included all cash income earned by each member living in a housing unit who was age 15 years and over. Family income included the cash income from those members of a household with two or more related members. Individual income is based on what an individual earned during 1993. Household and family income did not include those persons enumerated in group quarters on census day. However, individual income did include those persons in group quarters.

About 35 percent of the population aged 15 years and over reported receiving cash income in 1993. These 20,924 income recipients were a small portion of the 59,573 persons in the working age population. The only persons used in the measures of income are those who reported an income for 1993. Thus measures of income were considered only for those persons who received money through salaries, wages, social security or other sources. Fully 65 percent of the population reported no income.

#### Definitions

Wage or salary income is the total amount of money earned by a person working as an employee for a private enterprise (business or farm) or a branch of government. Wage or salary income includes take-home pay plus all deductions for withholding tax, social security, union dues, bonds, uniforms, etc. Also included are piece-rate payments, commissions, tips, bonuses, and sick leave pay. Own business income includes money receipts as well as business expenses. Interest and dividends are money earned from savings or shares. Social security and government benefits includes payments from retirement, or disability payments. Remittances include money received from relatives within and outside of the FSM who are not living with the individual.

Two statistics were used to analyze income: *median* and *mean*. The median income is that income value that divides income recipients into two equal halves. The mean income is the sum of all income in a region or characteristic divided by the number of income recipients. (Similarly, the aggregate of all incomes in a region can be found by multiplying the mean by the number of persons earning income.) The median is a better estimate of average income because it places less emphasis on extreme values and is less susceptible to the effects of misreporting and processing errors. In this chapter both median and mean are used in most tables.

*Limitations and Comparability.* Income is a self-reported number and is easily misreported due to self-inflation or deflation or to poor recollection. In the case of the FSM 1994 Census, the income was received at least 9 months prior to the time of reporting, making it easier to forget small or irregular income. Other errors occurred because of misunderstandings such as reporting net rather than gross earnings. The 1980

TTPI census collected similar information on income and these data are used here with an inflation factor to compare against the 1994 Census data. Further more, the data collected during both 1980 and 1994 censuses refer to cash income only.

Income data may not fully explain the economy in the FSM because of the significant share of subsistence activities in the economy. It does, however, give an indicator of the access of the FSM population to material possessions and changes in the cash economy.

### **Analysis of Income Data**

#### **Cash Income**

Income in the FSM in 1993 varied among the states. Table 11.1 compares income statistics for the income earning population of the four states as well as the FSM. Median household income in the FSM was \$4,694 and the mean household income was higher at \$8,654. The mean income was higher than the median due to a few large incomes which raised the sum of the incomes. A median of \$4,694 means that of the 11,233 households, half of the households had incomes below \$4,694 and half of the households had incomes above this level. It is important to note that the median and mean incomes were calculated only to include those persons who reported income; thus only 35 percent of the population aged 15 years and over were included.

The four states had large variations in their median household incomes. Pohnpei had the highest median income of \$7,503; Kosrae had the next highest at \$6,739; Yap's median income was \$5,998; and Chuuk was lowest at \$2,444. Mean household incomes showed similar trends but at a higher level. Family incomes were slightly less than household incomes in every state. This finding is expected because households of unrelated persons were likely to be persons of working age, and thus more likely to be earning income.

The median individual income for the FSM was \$2,637. Among the states, individual income had a slightly different trend than household and family income. Individual income in Pohnpei was still the highest with a median of \$4,312 followed by Yap with a median income of \$3,509, Kosrae had the third highest with an individual income median of \$3,253, and Chuuk again had the lowest at \$987. Mean individual income once again showed similar results. The largest gap between median and mean occurred in Pohnpei suggesting that some very large incomes skewed the data.

Table 11.1. Household, Family and Individual Income in 1993, FSM: 1994

Type of income	FSM	Yap	Chuuk	Pohnpei	Kosrae
<b>Household</b>					
Number	11,233	1,426	4,875	4,025	907
Median	\$4,694	\$5,998	\$2,444	\$7,503	\$6,739
Mean	\$8,645	\$8,298	\$5,443	\$12,412	\$9,686
<b>Family</b>					
Number	10,649	1,285	4,696	3,793	875
Median	\$4,473	\$5,810	\$2,268	\$7,084	\$6,574
Mean	\$8,133	\$7,924	\$5,140	\$11,671	\$9,167
<b>Individual</b>					
Number	20,924	2,557	9,283	7,032	2,052
Median	\$2,637	\$3,509	\$987	\$4,312	\$3,253
Mean	\$4,740	\$4,809	\$2,875	\$7,174	\$4,753

Source: 1994 FSM Census, Table P31.

A comparison of the median income between 1980 and 1994 in Table 11.2 shows the change in household income over 14 years. The inflation factor raises the 1980 dollars to the equivalent in 1994 dollars. This factor takes into account the inflation that occurred over the 14 years. Chuuk had the most dramatic increase in household income (327 percent), more than double the changes in the other states, while Kosrae had the smallest change (17 percent). Given the very small median income in Chuuk in 1980, this large change is not surprising. However, Chuuk's median income remained well under the national average despite the increase.

Table 11.2. Median Household Income Change by State, FSM: 1980 and 1994

	1980			1994		
	Number of Households	Median	Median Adjusted to 1994 dollars	Number of Households	Median	Percent Change
FSM	10,522	\$1,073	\$2,235	11,233	\$4,694	110.0
Yap	1,608	\$1,387	\$2,890	1,426	\$5,998	107.6
Chuuk	4,979	\$275	\$573	4,875	\$2,444	326.6
Pohnpei	3,355	\$1,814	\$3,779	4,025	\$7,503	98.5
Kosrae	580	\$2,759	\$5,748	907	\$6,739	17.2

Source: 1994 FSM Census, Table P31.

Note: 1. This is a weighted average of the state medians.

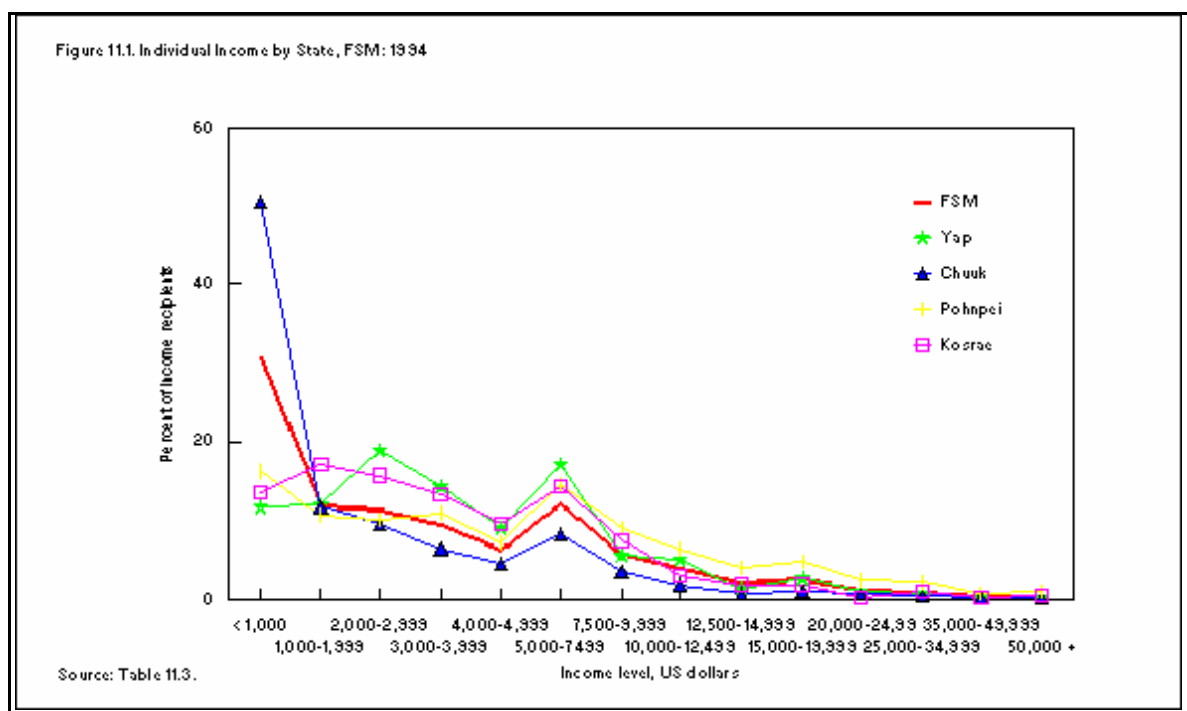
2. 1980 dollars were adjusted by a factor of .48 as reported by the FSM Department of Finance, IMF, and EMPAT Staff estimates.

Table 11.3 contains the percent breakdown of individual incomes by state and income range. Each state peaked at the \$5,000 to \$7,499 range (see also Figure 11.1), probably due to government salaries. In Yap, 17 percent of the incomes fell in this range. Table 11.3 further shows the variation in income among the states. More than 50 percent of incomes in Chuuk were below \$1,000. In the other three states about 15 percent of the incomes were below \$1,000.

Table 11.3. Percent Distribution of Individual Income in 1993 by State, FSM: 1994

Annual income	FSM	Yap	Chuuk	Pohnpei	Kosrae
Persons with income	20,924	2,557	9,283	7,032	2,052
Percent	100.0	100.0	100.0	100.0	100.0
Less than \$1,000	30.7	11.8	50.6	16.3	13.6
\$1,000 to \$1,999	12.0	11.9	11.9	10.6	17.2
\$2,000 to \$2,999	11.5	19.0	9.6	10.1	15.8
\$3,000 to \$3,999	9.5	14.5	6.3	10.8	13.3
\$4,000 to \$4,999	6.5	9.1	4.5	7.1	9.7
\$5,000 to \$7,499	12.1	17.2	8.3	14.7	14.3
\$7,500 to \$9,999	6.0	5.5	3.5	9.0	7.4
\$10,000 to \$12,499	3.9	5.0	1.9	6.3	3.0
\$12,500 to \$14,999	2.0	1.4	0.8	4.0	1.9
\$15,000 to \$19,999	2.6	2.6	1.1	4.9	1.9
\$20,000 to \$24,999	1.3	1.0	0.7	2.4	0.3
\$25,000 to \$34,999	1.0	0.7	0.4	2.0	0.9
\$35,000 to \$49,999	0.5	0.2	0.3	0.9	0.3
\$50,000 or more	0.5	0.2	0.2	1.0	0.4
Median (dollars)	\$2,637	\$3,509	\$987	\$4,312	\$3,253
Mean (dollars)	\$4,740	\$4,809	\$2,875	\$7,174	\$4,753

Source: 1994 FSM Census, Table P12.



The median income for individuals in the FSM increased steadily up to the age of 49 after which income levels began to decrease (Table 11.4). Age groups 40 to 44 and 45 to 49 had the highest median income. Males tended to follow the same pattern mentioned above except that males aged 50 to 54 maintained

relatively high incomes. Females, however, reached their income peak at ages 35 to 39 and median income of older women was much lower. This pattern is perhaps, in part, due to fewer education opportunities available to the older generation of women resulting in lower earning capacity.

Table 11.4. Individual Income in 1993 by Age and Sex, FSM: 1994

Age Group	Both sexes			Males			Females		
	Total	Median	Mean	Total	Median	Mean	Total	Median	Mean
Persons 15+ years with income	20,924	\$2,637	\$4,740	13,517	\$3,050	\$5,423	7,407	\$1,910	\$3,495
15 to 19	1,124	\$720	\$1,068	637	\$736	\$1,155	487	\$700	\$954
20 to 24	2,142	\$1,841	\$2,671	1,195	\$1,879	\$2,770	947	\$1,791	\$2,546
25 to 29	2,587	\$2,527	\$3,827	1,587	\$2,604	\$4,013	1,000	\$2,375	\$3,532
30 to 34	2,907	\$2,993	\$4,381	1,869	\$3,171	\$4,462	1,038	\$2,653	\$4,234
35 to 39	3,036	\$3,632	\$5,496	1,971	\$3,916	\$6,044	1,065	\$3,103	\$4,480
40 to 44	2,726	\$4,327	\$6,731	1,848	\$5,083	\$7,715	878	\$2,843	\$4,661
45 to 49	1,946	\$4,299	\$7,073	1,367	\$5,140	\$8,015	579	\$2,639	\$4,848
50 to 54	1,115	\$3,696	\$6,660	775	\$4,990	\$7,913	340	\$1,488	\$3,803
55 to 59	1,011	\$2,871	\$6,042	702	\$4,000	\$7,347	309	\$1,544	\$3,078
60 to 64	902	\$1,879	\$4,641	624	\$2,478	\$5,804	278	\$1,177	\$2,030
65 and over	1,428	\$1,104	\$2,179	942	\$1,471	\$2,662	486	\$774	\$1,244

Source: 1994 FSM Census, Table P31.

Individual incomes varied considerably between males and females. Table 11.5 provides the percentage of males and females in each income range. As mentioned earlier, only 35 percent of all persons aged 15 years and over reported cash income. Almost 45 percent of the working age males reported an income compared to 25 percent of the working age females. Furthermore, the data show fewer females have high incomes. Of those persons earning \$20,000 or more per year, only 20 percent were women. If income distribution was equal in the FSM, the percent of females at each income level would be similar to the representation of females who recorded an income. Thus we would expect to see the proportion of women at each income range similar to the distribution of all income earners. Instead we find that women were over-represented at the lowest income levels and in the \$5,000 and higher ranges they were under-represented.

Given the median yearly income of \$1,910 for income earning females, the average monthly income would be \$159. For males, however, with a median yearly income of \$3,050, the average monthly income would be \$254 per month -- almost a full \$100 per month difference in income between the sexes.



Table 11.5. Individual Income in 1993 by Sex, FSM: 1994

Income	Number			Percent		
	Total	Male	Female	Total	Male	Female
Persons 15+ years	59,573	30,127	29,446	100.0	50.6	49.4
Total with income	20,924	13,517	7,407	100.0	64.6	35.4
Less than \$999	6,426	3,563	2,863	100.0	55.4	44.6
\$1,000 to \$1,999	2,505	1,581	924	100.0	63.1	36.9
\$2,000 to \$2,999	2,405	1,547	858	100.0	64.3	35.7
\$3,000 to \$3,999	1,992	1,343	649	100.0	67.4	32.6
\$4,000 to \$4,999	1,354	920	434	100.0	67.9	32.1
\$5,000 to \$7,499	2,539	1,798	741	100.0	70.8	29.2
\$7,500 to \$9,999	1,246	888	358	100.0	71.3	28.7
\$10,000 to \$12,499	811	580	231	100.0	71.5	28.5
\$12,500 to \$14,999	423	321	102	100.0	75.9	24.1
\$15,000 to \$19,999	546	417	129	100.0	76.4	23.6
\$20,000 to \$24,999	263	227	36	100.0	86.3	13.7
\$25,000 to \$34,999	209	166	43	100.0	79.4	20.6
\$35,000 to \$49,999	99	78	21	100.0	78.8	21.2
\$50,000 or more	106	88	18	100.0	83.0	17.0
Median	\$2,637	\$3,050	\$1,910	...	...	...
Mean	\$4,740	\$5,423	\$3,495	...	...	...

Source: 1994 FSM Census, Table P173.

Table 11.6 compares income levels of female headed households (no husband present) to married-couple families and to all families. The median income in each state was considerably smaller for female headed households than for married-couple families. Yap had the largest disparity between median income of married couples versus female headed households with a difference of \$2,738. Chuuk had the smallest income disparity of about \$1,500 between dual parent families and female headed families. This suggests that a married-couple family is more likely to have a higher income (probably because there are more workers within the household).

Table 11.6. Median Family Income in 1993 by Type of Family and State, FSM: 1994

	Number of Families			Median Income		
	Total	Married Couple	Female Hhldr, No Husb. Pres.	Total	Married Couple	Female Hhldr, No Husb. Pres.
FSM	10,649	8,715	1,210	\$4,473	\$4,887	\$2,756
Yap	1,285	997	183	\$5,810	\$6,352	\$3,614
Chuuk	4,696	3,822	510	\$2,268	\$2,580	\$1,103
Pohnpei	3,793	3,130	433	\$7,084	\$7,526	\$5,019
Kosrae	875	766	84	\$6,574	\$6,839	\$4,818

Source: 1994 FSM Census, unpublished data.

As would be expected, income increases with educational attainment. Median income for persons who attended college was double the median income of persons who stopped studying after high school. High school graduates had a median income of \$3,379 and persons with some college had a median income of \$6,507. Persons with bachelor's degree earned double those persons with only a high school diploma. Those with only an elementary education had only half the median income of persons with high school education. Median income of elementary school educated persons was \$1,682, almost equal to those with no education (median income of \$1,680). At every educational level median income for women was less than that of men. The most significant differences (of almost \$2,000 per year) occurred with the higher educated income groups.

Table 11.7. Individual Income in 1993 by Educational Attainment, FSM: 1994

Educational Attainment	Both			Male			Female		
	Number	Median	Mean	Number	Median	Mean	Number	Median	Mean
Persons with income 25+ years	19,211	\$2,815	\$4,937	12,542	\$3,207	\$5,589	6,669	\$2,145	\$3,710
No education	1,367	\$1,680	\$3,445	881	\$2,033	\$4,132	486	\$1,029	\$2,199
Elementary									
1-3 grades	648	\$1,242	\$2,109	367	\$1,601	\$2,542	281	\$912	\$1,543
4-7 grades	2,162	\$1,182	\$2,055	1,332	\$1,554	\$2,493	830	\$879	\$1,353
Elem. graduate	2,200	\$1,682	\$2,611	1,343	\$2,003	\$2,984	857	\$1,126	\$2,026
High School									
9-11 grades	2,525	\$1,344	\$2,609	1,689	\$1,643	\$3,006	836	\$946	\$1,808
12, no diploma	1,062	\$2,151	\$3,325	704	\$2,283	\$3,588	358	\$1,833	\$2,808
HS, graduate	3,712	\$3,379	\$4,868	2,388	\$3,676	\$5,237	1,324	\$2,881	\$4,203
College:	5,535	\$6,507	\$9,103	3,838	\$6,795	\$9,924	1,697	\$5,920	\$7,247
Some, no degree	2,215	\$4,728	\$6,456	1,457	\$4,864	\$7,033	758	\$4,472	\$5,345
Assoc. academic	1,004	\$6,124	\$7,459	704	\$6,144	\$7,714	300	\$6,088	\$6,863
Assoc. vocational	1,025	\$6,873	\$8,384	700	\$7,023	\$8,698	325	\$6,534	\$7,707
Bachelors	992	\$10,000	\$12,788	740	\$10,645	\$13,656	252	\$8,462	\$10,238
Masters or higher	299	\$18,648	\$24,477	237	\$19,244	\$26,231	62	\$17,222	\$17,773

Source: 1994 FSM Census, Table P183.

A person's economic activity naturally has a bearing on their income. Table 11.8 shows the median income of each of the economic activity categories by sex. Although the data on income refers to a different time period than economic status, a majority of these persons economic status did not change. Those persons employed in the formal sector had the highest median income at \$4,271. Those persons who could have taken a job but were not looking had the lowest income at \$694. Females had consistently lower median incomes than males at every economic status.

A reasonable portion of persons in subsistence as well as persons not in the labor force had income despite their economic status. This would suggest that almost 20 percent of the subsistence workers and almost 16

percent of persons not in the labor force were receiving income from a source other than wage or salary.

Table 11.8. Individual Median Income in 1993 by Economic Status the Week Before the Census, FSM:

Economic status	Percent of 1994 work force claiming income in 1993	Number	Total	Median income	
				Male	Female
Persons 15+ years with income	35.1	20,924	\$2,637	\$3,050	\$1,910
In labor force	60.6	15,728	\$3,504	\$3,649	\$3,196
Employed	67.7	14,733	\$3,732	\$3,816	\$3,555
Formal work	87.9	12,648	\$4,271	\$4,532	\$3,815
Agriculture/fishing	28.3	2,085	\$1,088	\$1,209	\$817
Subsistence	19.4	1,138	\$779	\$798	\$716
Market oriented	63.1	947	\$1,733	\$1,780	\$1,296
Unemployed	23.6	995	\$725	\$784	\$668
Not in labor force	15.5	5,196	\$844	\$980	\$748
Could have taken a job	16.5	1,008	\$694	\$707	\$685
Not available for work	15.2	4,188	\$890	\$1,174	\$768

Source: 1994 FSM Census.

Note: Economic status refers to the week before the census, while the income data refer to 1993 income.

Table 11.9 shows median income for different occupations. Not all persons who had income in 1993 reported an occupation. Some persons with income were not working or had not had a job in the 5 years prior to the census. As was explained in the chapter on occupations, the occupations categories are according to how much skill and experience are needed for a job. Median income in 1993 followed the type of skills required for the job. Executives and managers were the highest paid occupations (median income of \$8,890). Professionals, technicians and associate professionals also had higher than average median income. Similar to findings on education and income, women had lower median income in every occupation group than men with the largest differences occurring in the executive and manager occupations.

Table 11.9. Median Individual Income in 1993 by Occupation, FSM: 1994

Occupation	Both sexes		Males		Females	
	Number	Median	Number	Median	Number	Median
Experienced work force 15+ years	15,606	\$3,740	10,854	\$3,904	4,752	\$3,397
Executive and Managers	1,085	\$8,890	922	\$9,118	163	\$7,344
Professionals	1,655	\$5,691	1,115	\$5,929	540	\$5,297
Technicians and Assoc. Prof.	2,576	\$5,786	1,798	\$6,102	778	\$4,988
Administrative Support	2,472	\$3,793	705	\$4,733	1,767	\$3,580
Service Workers	2,158	\$2,692	1,321	\$2,971	837	\$2,419
Agriculture and Fishing Workers	758	\$1,932	665	\$2,049	93	\$969
Subsistence Workers	291	\$2,919	268	\$3,027	23	\$1,875
Craft and Related Workers	2,038	\$3,233	1,770	\$3,432	268	\$2,254
Machine Operators	947	\$3,442	896	\$3,455	51	\$2,950
Elementary Occu. and Labor	1,621	\$2,652	1,389	\$2,781	232	\$2,089
Armed Forces	5	\$1,500	5	\$1,500	-	-

Source: 1994 FSM Census, Table P187.

Note: Occupation refers to the most recent job, while the income data refer to 1993 income.

Overall income levels in the public sector were higher than those in the private sector. All but the municipal government positions had median incomes higher than the overall median income (Table 11.10). National government incomes had a median of \$9,762 which was more than double the median income in the private sector. Very little difference in median income occurred between for-profit and non-profit enterprise employees. Once again, female median incomes were lower in every category.

Table 11.10. Individual Income in 1993 by Class of Work, FSM: 1994

Class of Work	Number	Both Median	Mean	Number	Males Median	Mean	Number	Females Median	Mean
Experienced work force 15+ years	15,606	\$3,740	\$5,954	10,854	\$3,904	\$6,390	4,752	\$3,397	\$4,959
Private Wage/Salary:									
For Profit	6,087	\$3,004	\$4,841	3,993	\$3,171	\$5,315	2,094	\$2,787	\$3,938
Not for Profit	562	\$3,158	\$4,923	310	\$3,486	\$5,776	252	\$2,885	\$3,873
Government:									
Municipal Govt	1,024	\$889	\$2,334	838	\$907	\$2,322	186	\$816	\$2,384
State	6,080	\$5,234	\$6,873	4,441	\$5,445	\$7,258	1,639	\$4,750	\$5,829
National	768	\$9,762	\$12,447	517	\$10,585	\$13,569	251	\$8,639	\$10,137
Federal/Foreign	287	\$5,208	\$9,040	175	\$5,644	\$9,458	112	\$4,583	\$8,388
Self-employed	730	\$1,918	\$5,656	532	\$2,186	\$6,222	198	\$1,409	\$4,134
Unpaid family worker	68	\$810	\$3,298	48	\$960	\$3,759	20	\$588	\$2,193

Source: 1994 FSM Census, Table P189.

Note: Class of work refers to the most recent job, while the income data refer to 1993 income.

Table 11.11 presents median income by source and state. The majority of persons who reported income in 1993 received their income from wages or salaries. Many of these individuals also received income from other sources, giving them multiple income sources. Wages and salaries made the largest contribution to income with the largest number of recipients and the highest median amount (\$3,786). Social security was also a significant portion of incomes with about 2,000 persons receiving some form of government assistance with a median amount of \$1,065.

Pohnpei and Chuuk had large differences between the total income and the income from wages and salaries. The median income from wages and salaries was highest in Pohnpei (\$5,440) and lowest in Chuuk (\$2,495). Remittance was the second most important source of income in Chuuk while profit from business or farm was the second most important in Pohnpei. In Chuuk about 47 percent of the income recipients were from remittances. In Pohnpei 15 percent of the income was earned through profit from businesses or farms. Source of Income for Yap and Kosrae was similar to that of the national. Every source of income had a lower median for Chuuk than for the other states.

Remittances from within the FSM had about the same median as remittances from outside of the FSM, both having an average of about \$550 over the year. More persons received remittances from inside the FSM than from outside the FSM.

Table 11.11. Median Income by Source and State, FSM: 1994

Source of income	FSM	Yap	Chuuk	Pohnpei	Kosrae
Persons earning income	20,924	2,557	9,283	7,032	2,052
Median total income	\$2,637	\$3,509	\$987	\$4,312	\$3,253
Wage or salary	14,825	2,174	5,457	5,538	1,656
Median	\$3,786	\$3,844	\$2,495	\$5,440	\$3,719
Profit from business or farm	2,098	195	642	1,058	203
Median	\$877	\$879	\$730	\$1,039	\$825
Interest, dividends, trusts, royalty	680	89	297	231	63
Median	\$696	\$685	\$604	\$831	\$808
Social security, pension, retirement	1,986	255	745	706	280
Median	\$1,065	\$1,685	\$828	\$1,164	\$1,321
Remittances from within FSM	3,258	68	2,800	259	131
Median	\$546	\$630	\$537	\$629	\$565
Remittances from outside FSM	1,893	41	1,546	145	161
Median	\$569	\$789	\$553	\$665	\$615
Other	333	22	261	40	10
Median	\$615	\$734	\$580	\$834	\$715

Source: 1994 FSM Census, unpublished data.

In Table 11.12 compares gender differentials of sources of income. As expected, most incomes were from wages and salaries. The median wage or salary was \$3,940 for males and \$3,472 for females. The next largest median income component was social security, pension and retirement: \$1,065 was the average income for those 1986 persons who claimed this source of income. Males had a higher average income for every source of income.

Table 11.12. Income Source in 1993 by Sex, FSM: 1994

Income Source	Number of recipients			Median income		
	Total	Male	Female	Total	Male	Female
Total with income 15+ years	20,924	13,517	7,407	\$2,637	\$3,050	\$1,910
Wages and salaries	14,825	10,272	4,553	\$3,786	\$3,940	\$3,472
Profit from business	2,098	1,595	503	\$877	\$925	\$753
Interest and dividends	680	477	203	\$696	\$706	\$613
Social sec. and gov. benefits	1,986	1,207	779	\$1,065	\$1,177	\$955
Remittances (within FSM)	3,258	1,630	1,628	\$546	\$553	\$540
Remittances (outside FSM)	1,893	984	909	\$569	\$575	\$562
Other income	333	200	133	\$615	\$625	\$600

Source: 1994 FSM Census, Table P31.

Note: The sum of recipients does not equal the total because some individuals had more than one source of income.

## Poverty

The poverty line is a measure used in the U.S. to measure the number of poor families and poor people. Poverty cannot be measured in the FSM because no set level of income exists to define the impoverished. The U.S. has a set matrix which defines the poverty level and the size of the family versus the income to determine who is in poverty and who is above the poverty level. The Census Office applied the 1994 U.S. poverty definition in this report only for comparison purposes to the United States. The Census office realizes that the U.S. definition of poverty is not appropriate for the FSM where economic development and cost of living are substantially different. Other than these, the income collected in the 1994 FSM Census referred to only cash income received in 1993 calendar year.

The poverty line for single adults under the age of 65 was \$7,547, well above the median individual income for all of the FSM. The U.S. poverty line for a two child family was \$15,029 in 1994 (Department of Health and Human Services; Poverty Income guidelines, as published in the federal registers, February 9, 1995). Based on the U.S. poverty matrix, 93 percent of FSM families and 91 percent of individuals were living in poverty (see Table 11.13).

Table 11.13. Families and Individuals in Poverty in 1993, FSM: 1994

	Total	Families Number	Percent	Total	Individuals Number	Percent
FSM	14,502	13,556	93.5	105,506	96,048	91.0
Yap	1,761	1,642	93.2	11,178	9,979	89.3
Chuuk	6,827	6,651	97.4	53,319	50,119	94.0
Pohnpei	4,982	4,391	88.1	33,692	29,379	87.2
Kosrae	932	872	93.6	7,317	6,579	89.9

Source: 1994 FSM Census, unpublished data.

## Conclusion

The median income for individuals in the FSM was \$2,637 in 1993, and median household income was \$4,694; an increase of approximately 200 percent since 1980 (after adjusting for inflation). Pohnpei had the largest individual median income, more than four times greater than Chuuk's, the lowest.

Income levels in the FSM showed definite patterns. Higher educated persons had higher incomes, government employees had higher incomes than private sector employees, two-parent families had higher incomes than female headed families, and males had higher incomes than females. A majority if this income came from wages and salaries while remittances and profit from businesses and farms also contributed. As the FSM becomes more reliant on the cash economy for well-being instead of subsistence, income levels will increasingly become a measuring stick for the quality of life and the distribution of resources.

## **CHAPTER 12**

### **POPULATION ESTIMATIONS AND PROJECTIONS**

#### **Introduction**

Population and housing censuses are taken decennially, mainly because censuses require tremendous expenditure of money and human energy at all implementation phases: planning, developing materials, enumeration, compilation, analysis, and publication. Both government and non-government organizations, on the other hand, require on going information about the size and structure of the nation's population for the purposes of developing and reviewing policies, budgeting, implementing programs, monitoring, etc. on a yearly basis. In this respect, civil registration data (vital statistics) are used to update census results and to estimate the extent of change over the years. In the absence of adequate civil registration, data from recent censuses are used to prepare population projections providing information on what the future population may look like. Population projections could also be thought of as scenarios of the future population and show the likely future challenges to the nation and its government. In this chapter we discuss post-censal population estimates and projections for the FSM for 20 years following the 1994 census.

#### **Projection Method**

The size of a population can be projected by taking into account changes that have occurred in the past. Sometimes, population growth rates are used in specific mathematical functions for projecting the probable future size of a population. This procedure, however, usually assumes a constant growth rate and is useful to provide only the total population size. A more useful procedure for projecting a population is to simulate how the population changes according to its components of growth: fertility, mortality and migration. Based on past information, different scenarios (assumptions on levels of fertility, mortality and migration) are made about future trends in the components. Then, the projected rates are applied to the age and sex structure of the population to determine the future population for a given scenario. This method, called the component method, was used to project the population projection presented in this chapter.

The population estimates and projections depend more on the extent to which the underlying assumptions hold true than the level of sophistication of the method. A software package, called "People" was used to make the population projections in this report. The software is relatively comprehensive and flexible in its requirements for specifying the assumptions about the components of population change. It gives the user five options in the way the fertility information can be specified, three for mortality and two for migration (People, 1990, Version 3.01).

The program provides output of a wide variety of demographic measures for every five years of projection. In what follows, however, only major results of the population projections are presented. A detailed presentation and analysis of future population growth, with special reference to planning needs has also been prepared by South Pacific Commission (SPC) (Khalidi, forthcoming). The population projections were made based on alternatives for components of population growth (based on different combinations of future fertility, mortality and migration patterns). These alternatives will help planners, policy makers, administrators, etc., to predict the impact of future populations on the nation's cultural, environmental, social and economic development prospect.

The fertility and mortality estimates used for the projections were obtained from the 1994 FSM census as presented and analyzed in earlier chapters. Since no civil registration data exist for international migration, estimates used for migration rates may not be as robust as the fertility and mortality estimates. A plausible

estimate was obtained by using data from different sources (Gorenflo and Levin, 1995; Hezel and Levin, 1996; 1994 FSM Census, Unpublished data).

## Analysis of Population Projections

### *A Review of Vital Rates and Population Growth in the FSM*

As discussed in earlier chapters, the population of the FSM has been growing steadily over the years. Recently (since Compact implementation in 1986) increasing numbers of migrants went to Guam, Saipan, Hawaii and to the U.S. mainland. The natural increase therefore was offset to a certain extent by this out flow of population. Although the exact magnitude is not known because of inadequate statistics, information from fragmentary studies indicates about one percent net annual out-migration for the FSM (Hezel and Levin, 1996). In the mean time, the population of the FSM increased from around 65,000 in 1973 to over 105,500 in 1994 (more than 60 percent increase over the two decades). The population has been growing annually at the rate of 2.6 percent during 1973 to 1989, and at 1.9 percent during 1989 to 1994 (see chapter 2 of this report). In fact, had it not been for the net out migration, the population increase would have been significantly higher than what is observed.

Fertility continued to decrease in the FSM, although the rate at which it decreased varied from one state to the other. As discussed in the fertility chapter, the total fertility rate (TFR) decreased from about 8 children per women in 1973 to about 5 to 6 children in mid 80's and 4 to 6 children in 1994. The pace of fertility decline was much sharper for the 1970's than for 1980's. Current TFRs obtained in the P/F ratio technique were 4.7 for the FSM (3.7 for Yap, 4.2 for Kosrae, 4.3 for Pohnpei and 5.6 for Chuuk). This level of fertility is considered high even by Pacific standards.

Due to the lack of complete registration, obtaining accurate measures for the level of mortality in the FSM has always been a problem. Nevertheless, as implied by the analysis of childhood mortality rates and life expectancies at birth calculated from decennial censuses, mortality has also been steadily declining in the FSM throughout the last four decades until the mid 1980's and then (after a slight upward trend) tended to remain constant (see Chapter 5, Tables 5.3). Life expectancy at birth increased from below 60 years in 1973 to about 65 years around 1992.

Table 12.1 presents a summary of demographic measures for the 1994 FSM resident population. A crude birth rate (the average number of births per 1,000 population per year) of 31 and a crude death rate (the average number of deaths per 1,000 population) of 8 classifies the FSM as a region of high fertility and moderately high mortality among the countries in the Pacific. The total fertility rate, the average number of children a women will bear during her lifetime, was about 4.7 in the FSM in 1994. This level is considered high by world standards, and in the Pacific is only exceeded by a few countries. The intercensal growth rate for the FSM was 2.0 percent. At this rate the population would double in about 35 years.



Table 12.1. Summary of Demographic Measures (Indices) from the 1994 FSM census by State

Indices	FSM	Yap	Chuuk	Pohnpei	Kosrae
Total Fertility Rate (TFR):1994	4.7	3.7	5.6	4.3	4.2
CBR (per 1,000): 1989 - 1994	33.3	28.9	35.3	32.8	27.4
CDR (per 1,000): 1989 - 1994	7.8	9.2	8.0	7.3	8.8
Life Expectancy at Birth : 1990	65.2	67.3	64.0	66.5	65.0
IMR (per 1,000): 1990	46.0	39.0	53.0	42.0	49.0
Inter censal Growth Rate (per 100):1989-1994	1.9	1.5	2.2	1.9	1.4

Source: 1994 FSM Census, Tables 4.2, 4.8, 5.4 and unpublished data

As discussed earlier, the population growth of a particular country is the result of births, deaths and net migration. Mathematically the relationship is presented in a balance equation as follows;

$$\text{Population Growth} = \text{Births} - \text{Deaths} + \text{Net migration}$$

If we apply the estimated annual intercensal growth rate of 1.9 percent and the estimated Crude Birth Rate (CBR) and Crude Death Rate (CDR) from the 1994 census, to the balanced equation, we obtain an emigration rate of about 6 per thousand. However, given the result from recent studies in Guam and CNMI alone (Hezel and Levin, 1996), the 6 per thousand emigration rate for FSM is a gross under estimation. Furthermore, the result from such procedure could only give a reliable estimate, when the CBR and CDR are obtained from accurate vital registration system. The mortality data from the vital registration in FSM suffered from serious under reporting and could only provide the lower bound (see Chapter 4 and 5 of this report). Also, the CDR implied by the life expectancy at birth could be considered as an upper bound, mainly because, while applying the indirect techniques, we could have possibly over adjusted the data. The technique gives best result when fertility and mortality have not changed much in recent past. Thus, as described below, for the purpose of population projection we have used an alternative plausible estimate of emigration rate for FSM, from an independent study (Hezel and Levin, 1996).

The age-specific fertility rates used in the projections were also derived from the 1994 census data (after adjustment using P/F Ratio technique and rejuvenating and/or reverse survival techniques). Table 12.2 presents these measures again, for reference purposes. Because the birth rates are still considered high, the projections assumed three alternative scenarios of fertility (based on speculation made about continued fertility decline in Chapter 4).

Table 12.2. Base Year Age Specific and Total Fertility Rates (TFR), FSM : 1994

Age Group	Age Specific Fertility Rates				
	FSM	Yap	Chuuk	Pohnpei	Kosrae
15 - 19	0.054	0.071	0.033	0.080	0.049
20 - 24	0.177	0.147	0.163	0.221	0.195
25 - 29	0.217	0.163	0.249	0.213	0.218
30 - 34	0.204	0.178	0.261	0.163	0.175
35 - 39	0.153	0.130	0.207	0.118	0.105
40 - 44	0.091	0.019	0.154	0.047	0.073
45 - 49	0.034	0.024	0.052	0.014	0.034
TFR	4.65	3.66	5.59	4.27	4.24

Source: 1994 FSM Census, unpublished data.

As discussed in the earlier chapters of this report, the age-specific death rates calculated from registration data suffered from coverage problems and could not be used as input for projections. Instead, age-specific mortality rates generated from indirectly estimated life expectancies at birth in conjunction with Coale and Demeny West model life tables were used in the projection (see Chapter 5). We estimated life expectancy at birth (for males and females combined) to be 65.2 years for the FSM as a whole and 67.3 for Yap, 65.5 for Pohnpei, 65.0 for Kosrae and 64.0 for Chuuk (See Table 12.1). The projection assumed a constant and a moderately declining mortality rate in the near future.

Similarly, the FSM lacks a civil registration system that keeps a record of international migration. As mentioned earlier, the only available and plausible estimate of emigration rate for the FSM to date is that of Francis Hezel and Michael Levin. These two scholars looked at recent trends in Micronesian migration (Hezel and Levin, 1996). Estimated emigration rates are summarized in Table 12.3. As can be seen from the table, the emigration rate for the FSM in the recent past was estimated at 10 per thousand per year. Given the 105,506 population of the FSM in 1994, about 1,055 persons leave to go abroad with the intention of residing for at least 6 months. The highest emigration rate was recorded for Chuuk State (12 per thousand) followed by Yap (8 per thousand) while the emigration rate was lowest for Kosrae (5 per thousand) followed by Pohnpei (6 per thousand). Inter state migration was also evident in the FSM. All states, except for Pohnpei had a net loss in terms of net inter state population flow (see Table 12.3 for details).

In the projection process, three alternative assumptions were considered for near future emigration (a constant migration rate, a moderately declining migration rate, and no migration in the near future).

Table 12.3. Net Annual Emigration Rate (per thousand) by Sex and State, FSM : 1994

State	Emigration			Inter state migration		
	Both Sexes	Male	Female	Both Sexes	Male	Female
FSM	-10.0	-11.0	- 9.0			
Yap	- 8.0	-11.0	- 5.0	-0.6	-0.2	-1.0
Chuuk	-12.0	-13.0	-11.0	-0.8	-0.8	-0.6
Pohnpei	- 6.0	- 6.0	- 6.0	+2.2	+2.4	+1.8
Kosrae	- 5.0	- 6.0	- 4.0	-3.2	-3.8	-3.0

Sources: Hezel and Levin, 1996; 1994 FSM Census, unpublished data

Note:(1) The emigration rates for males and females were derived from the total assuming a sex ratio of 132, 209, 129, 115 and 167 males per 100 females for FSM, Yap, Chuuk, Pohnpei and Kosrae, in that order.

(2) The Negative & Positive signs indicate the net impact on the resident population.

(3) Inter state annual rate of migration is estimated from five year point to point inter state migration.

### Projection Assumption

The population projections were made based on different alternatives for change in the components of population growth (fertility, mortality and migration). The obvious advantage of this procedure is that, one can examine the extreme situation for policy formulation, planning and administration purposes in relation to

the likely maximum and minimum size of the future population. In this report four alternatives are considered: **High Variant (Scenario 1)**, **Medium Variant (Scenario 2)**, **Low Variant (Scenario 3)** and **Constant Variant (Scenario 4)**. The four variants considered here are defined as follows:

**High Variant (Scenario 1)**

- i. Fertility will remain constant for the entire duration of the projection period (1994 to 2014). TFR for FSM equaled 4.7 in 1994.
- ii. The mortality rate will decline moderately producing improvement in life expectancy at birth. The present life expectancy at birth of 64.2 and 66.8 years, for males and females, respectively in 1994 will reach about 67 and 69 years in 2014.
- iii. No Migration.

**Medium Variant (Scenario 2)**

- i. Fertility will decline moderately. TFR will fall from the present level of 4.7 to about 3.7 by the year 2014 (that is a 20 percent decline).
- ii. The mortality rate will decline moderately producing improvement in life expectancy at birth. The present life expectancy at birth of 64.2 and 66.8 years, for males and females, respectively in 1994 will reach about 67 and 69 years in 2014.
- iii. Migration will decline gradually. Emigration is assumed to be constant until the year 1999 and then a 50 percent decline occurs for every five years.

**Low Variant (Scenario 3)**

- i. Fertility will decline rapidly. TFR will fall from the present level of 4.7 to about 2.7 by the year 2014 (that is a 40 percent decline).
- ii. Mortality rate will decline moderately producing improvement in life expectancy at birth. The present life expectancy at birth of 64.2 and 66.8 years, for males and females, respectively in 1994 will reach about 67 and 69 years in 2014.
- iii. Migration will decline gradually. Emigration is assumed to be constant until the year 1999 and then a 50 percent decline occurs for every five years.

**Constant Variant (Scenario 4)**

- i. Fertility will remain constant for the entire duration of the projection period (1994 to 2014). TFR for FSM equaled 4.7 in 1994.
- ii. Mortality will remain constant for the entire duration of the projection period (1994 to 2014). The present life expectancy at birth was 64.2 years for males and 66.8 years for females.
- iii. Migration will remain constant for the entire duration of the projection period (1994 to 2014). Emigration rate at present was 11 and 9 per thousand for males and females, respectively.

Figure 12.1 presents the preceding scenarios in a tabular form. For the sake of brevity only the summary of the projection results is presented for each of the scenarios. The distribution of the projected population by age and sex is presented for the medium variant projection only.

Figure 12.1. Summary of Projection Assumptions (Scenarios)

Variant (Scenario)	Fertility	Mortality	Migration
High Variant (Scenario 1)	Constant	Moderate Improvement	No Migration
Med. Variant (Scenario 2)	Moderate Decline	Moderate Improvement	Moderate Decline
Low variant (Scenario 3)	Rapid Decline	Moderate Improvement	Moderate Decline
Constant variant (Scenario 4)	Constant	Constant	Constant

Table 12.4 shows the population distribution for the base year of the population projection (that is, the population of 1994), a distribution already discussed in Chapter 2. The age and sex distribution of the population show a young population and therefore, a high potential for future population growth. About 64 percent of the population is under the age of 25 years. Nearly 49 percent (or nearly half) of the population was of school age (that is, in the age group of 5 to 24 years). The population in the age group of 0 to 14, 15 to 64 and 65 and over constituted 43.5, 53.0 and 3.6 percent, respectively.

Table 12. 4. The Age and Sex Composition of the Population ,FSM : 1994

Age Group	Number			Percent			Males per 100 Females
	Total	Male	Female	Total	Male	Female	
Total	105,506	53,923	51,583	100.0	100.0	100.0	104.5
0 - 4	15,854	8,211	7,643	15.0	15.2	14.8	107.4
5 - 9	15,330	8,051	7,279	14.5	14.9	14.1	110.6
10 - 14	14,749	7,534	7,215	14.0	14.0	14.0	104.4
15 - 19	12,255	6,434	5,821	11.6	11.9	11.3	110.5
20 - 24	8,824	4,318	4,506	8.4	8.0	8.7	95.8
25 - 29	7,063	3,496	3,567	6.7	6.5	6.9	98.0
30 - 34	6,600	3,313	3,287	6.3	6.1	6.4	100.8
35 - 39	6,079	3,077	3,002	5.8	5.7	5.8	102.5
40 - 44	5,070	2,660	2,410	4.8	4.9	4.7	110.4
45 - 49	3,578	1,930	1,648	3.4	3.6	3.2	117.1
50 - 54	2,222	1,103	1,119	2.1	2.0	2.2	98.6
55 - 59	2,105	1,033	1,072	2.0	1.9	2.1	96.4
60 - 64	1,981	1,015	966	1.9	1.9	1.9	105.1
65 - 69	1,395	668	727	1.3	1.2	1.4	91.9
70 - 74	1,225	565	660	1.2	1.0	1.3	85.6
75 - 79	588	278	310	0.6	0.5	0.6	89.7
80 - 84	346	150	196	0.3	0.3	0.4	76.5
85 +	242	87	155	0.2	0.2	0.3	56.1

Source: 1994 FSM Census, Table P13.

## Projection Results

The projection results from the four scenarios showed the role of fertility and migration in determining the future size of the population (Table 12.5). If the present level of fertility and mortality remain constant, the population of FSM would reach over 181,000 within the next 20 years. If the present level of emigration also remains constant, that is, if the present level of out migration continues for the next 20 years, the population of the FSM would grow to about 146,400 thousand by the year 2014. The current level of emigration can offset the population growth caused by the natural increase. Nevertheless, predicting future migration patterns is always difficult. Governments can not rely on overseas migration to take the population pressure off, mainly because the migration policy of the receiving countries might change. It will therefore be appropriate to examine alternative situations while developing population related policies.

The medium variant could be considered as the most likely situation, at least for the upcoming decade. According to the medium variant, the population of the FSM will reach about 154,300 within the next 20 years, an increase of nearly 50,000 (an increase equaled to the present size of Chuuk state population), within the next two decades.

Table 12.5. Summary of Five Year Population Projection (in '000), FSM 1994 to 2014

Variant Scenario)	Year				
	1994	1999	2004	2009	2014
High Variant (Scenario 1)	105.5	119.8	137.1	157.8	181.3
Med. Variant (Scenario 2)	105.5	113.0	124.4	138.5	154.3
Low Variant (Scenario 3)	105.5	112.5	122.1	133.0	144.4
Const. Variant (Scenario 4))	105.5	113.4	123.0	134.1	146.4

Source: 1994 FSM Census, unpublished data.

Table 12.6 presents the proportionate increase in the population of the states, under the medium variant projection scenario. With the medium variant scenario, the nation should expect an increase in population size of about 46 percent during the upcoming two decades. In absolute terms, the corresponding increase of the state population will be about 27,000 for Chuuk, 15,000 for Pohnpei, 4,000 for Yap and 3,000 for Kosrae. That is, by the year 2014, the resident population of Chuuk would be about 81,000; Pohnpei about 49,000; Yap about 15,000; and Kosrae about 10,000 (see Table 12.6).

Table 12.6. Summary of Population Projection (in '000) by State, Medium Variant  
FSM : 1994 to 2014

Year	FSM	State			
		Yap	Chuuk	Pohnpei	Kosrae
1994	105.5	11.2	53.3	33.7	7.3
1995	107.1	11.3	54.1	34.2	7.4
1996	108.6	11.5	55.0	34.7	7.4
1997	110.1	11.6	55.8	35.2	7.5
1998	111.6	11.7	56.5	35.7	7.6
1999	113.4	11.9	57.3	36.1	7.7
2000	115.1	12.0	58.5	36.8	7.8
2004	124.4	12.8	63.5	39.7	8.3
2009	138.5	13.9	71.4	44.0	9.1
2014	154.3	15.1	80.5	48.6	10.0

Source: FSM 1994 Census, unpublished data.

Table 12.7 further presents the age and sex distribution of the projected FSM population using the medium variant scenario. As can be seen from this table, the proportion of the population in the working age group (the population ages 15 to 64 years) would increase from about 53 percent in 1994 to over 60 percent in 2014. This is an increase of over 37,000 for the working age population. Although the absolute number is increasing, the proportion of the population in the younger age groups (the population under age 15 years) would decrease from about 44 percent in 1994 to about 36 percent. The proportion of the older age group (the proportion aged 65 years and over) would remain about 4 percent. The sex ratio (males per 100 females) would also decrease from 105 in 1994 to about 103 by the year 2014. This is a pattern similar to other developing countries, who have experienced a decline in fertility and a low level of mortality.

Table 12.7: Age Group and Sex Distribution of the Projected Population Median Variation, FSM: 1994 to 2014

Age Groups	Years								
	1995	1996	1997	1998	1999	2000	2004	2009	2014
Total	107,041	108,564	110,073	111,536	113,032	115,045	124,408	138,454	154,292
Less than 5 yrs	15,932	15,939	15,882	15,774	15,643	15,796	17,077	18,749	20,244
5 to 9 years	15,312	15,320	15,333	15,320	15,262	15,274	15,276	16,816	18,548
10 to 14 years	14,789	14,831	14,875	14,939	15,023	15,019	15,074	15,154	16,720
15 to 19 years	12,503	12,748	13,029	13,333	13,632	13,853	14,423	14,737	14,955
20 to 24 years	9,216	9,593	9,912	10,178	10,431	10,946	12,654	13,880	14,416
25 to 29 years	7,171	7,328	7,537	7,774	8,013	8,366	9,968	12,361	13,667
30 to 34 years	6,599	6,569	6,535	6,525	6,569	6,711	7,724	9,757	12,188
35 to 39 years	6,158	6,220	6,267	6,293	6,292	6,295	6,378	7,572	9,614
40 to 44 years	5,274	5,454	5,603	5,728	5,833	5,917	6,113	6,236	7,431
45 to 49 years	3,849	4,119	4,385	4,632	4,860	5,064	5,646	5,949	6,081
50 to 54 years	2,365	2,570	2,822	3,096	3,373	3,637	4,645	5,427	5,731
55 to 59 years	2,052	1,998	1,960	1,965	2,037	2,177	3,157	4,376	5,133
60 to 64 years	1,978	1,965	1,941	1,912	1,883	1,837	1,844	2,881	4,017
65 to 69 years	1,429	1,500	1,581	1,649	1,693	1,689	1,627	1,606	2,515
70 to 74 years	1,165	1,102	1,068	1,069	1,106	1,153	1,356	1,313	1,300
75 to 79 years	672	743	787	806	848	750	772	956	931
80 yrs & over	577	565	556	543	534	561	674	684	801
Median	18.0	18.2	18.4	18.7	18.9	19.1	20.1	21.4	22.3
Males	54,632	55,352	56,072	56,774	57,504	58,499	63,157	70,240	78,246
Less than 5 yrs	8,192	8,161	8,119	8,070	8,017	8,101	8,752	9,612	10,379
5 to 9 years	8,058	8,053	8,023	7,968	7,894	7,874	7,821	8,617	9,508
10 to 14 years	7,562	7,626	7,714	7,809	7,889	7,886	7,791	7,757	8,565
15 to 19 years	6,541	6,611	6,681	6,780	6,914	7,044	7,554	7,603	7,645
20 to 24 years	4,560	4,828	5,077	5,276	5,426	5,685	6,373	7,250	7,424
25 to 29 years	3,517	3,555	3,623	3,728	3,863	4,087	5,162	6,207	7,130
30 to 34 years	3,294	3,262	3,228	3,200	3,194	3,239	3,691	5,039	6,113
35 to 39 years	3,102	3,121	3,133	3,132	3,121	3,107	3,081	3,608	4,959
40 to 44 years	2,746	2,813	2,863	2,901	2,929	2,959	3,022	3,004	3,533
45 to 49 years	2,075	2,208	2,334	2,445	2,541	2,623	2,826	2,928	2,919
50 to 54 years	1,197	1,330	1,489	1,653	1,814	1,951	2,417	2,703	2,806
55 to 59 years	1,002	972	952	961	1,010	1,098	1,688	2,262	2,535
60 to 64 years	1,006	987	965	940	915	888	900	1,524	2,047
65 to 69 years	696	742	790	830	855	845	776	769	1,305
70 to 74 years	532	502	488	494	517	550	668	611	609
75 to 79 years	317	347	359	357	377	323	351	456	416
80 yrs & over	235	234	234	230	228	239	284	290	353
Median	17.7	17.9	18.1	18.4	18.6	18.8	19.8	21.1	22.0
Females	52,409	53,212	54,001	54,762	55,528	56,546	61,251	68,214	76,046
Less than 5 yrs	7,740	7,778	7,763	7,704	7,626	7,695	8,325	9,137	9,865
5 to 9 years	7,254	7,267	7,310	7,352	7,368	7,400	7,455	8,199	9,040
10 to 14 years	7,227	7,205	7,161	7,130	7,134	7,133	7,283	7,397	8,155
15 to 19 years	5,962	6,137	6,348	6,553	6,718	6,809	6,869	7,134	7,310
20 to 24 years	4,656	4,765	4,835	4,902	5,005	5,261	6,281	6,630	6,992
25 to 29 years	3,654	3,773	3,914	4,046	4,150	4,279	4,806	6,154	6,537
30 to 34 years	3,305	3,307	3,307	3,325	3,375	3,472	4,033	4,718	6,075
35 to 39 years	3,056	3,099	3,134	3,161	3,171	3,188	3,297	3,964	4,655
40 to 44 years	2,528	2,641	2,740	2,827	2,904	2,958	3,091	3,232	3,898
45 to 49 years	1,774	1,911	2,051	2,187	2,319	2,441	2,820	3,021	3,162
50 to 54 years	1,168	1,240	1,333	1,443	1,559	1,686	2,228	2,724	2,925
55 to 59 years	1,050	1,026	1,008	1,004	1,027	1,079	1,469	2,114	2,598
60 to 64 years	972	978	976	972	968	949	944	1,357	1,970
65 to 69 years	733	758	791	819	838	844	851	837	1,210
70 to 74 years	633	600	580	575	589	603	688	702	691
75 to 79 years	355	396	428	449	471	427	421	500	515
80 yrs & over	342	331	322	313	306	322	390	394	448
Median	18.3	18.5	18.8	19.0	19.2	19.4	20.6	21.7	22.6

Source: 1994 FSM Census, unpublished data.

**Conclusions**

This chapter presented four sets of population projections for the FSM, beginning with the 1994 census and continuing for two decades in to the future. The projection assumptions of a moderate decrease in fertility and migration and a moderate improvement in mortality is considered to reflect the most likely situation in the near future. These assumptions produced an increase of just over 46 percent in the total number of inhabitants in the nation. Fertility, followed by migration, continues to be the most important factor for determining the age and sex composition of the future population.

Undoubtedly, population and population related factors are extremely important to the social and economic efforts in the FSM. The nation will have to be ready to face the upcoming challenges of a larger population pressure on economic opportunities, schooling, urban services, health services, and other social services. For example, the population in the working age group (that is, the population aged 15 to 64 years) will increase by over 37,000 over the next two decades. At the same time, the school age population will also increase by about 13,500. In other words, the government will have to plan for this additional demand over and above the existing situation. Needless to say that, for the realization of sustainable development, this and other situations related to population variables need to be integrated into development planning.



## CHAPTER 13

### HOUSING CHARACTERISTICS

#### Introduction

The housing characteristics in the FSM have been organized in this chapter into four major sections; (1) general housing characteristics, (2) structural characteristics, (3) utilities, and (4) equipment. Some tables in this chapter include data from the 1980 census to examine the change in housing in the FSM over time.

The data presented in this chapter include the total and different types of housing units found in the 1994 census. The 1994 census questionnaire was a modified version of the census questionnaires used in the 1990 Palau census, so the housing data were consistent.

#### Data Description

##### *General Housing Characteristics*

A *housing unit* is a house, apartment, group of rooms, or single room occupied as separate living quarters or, if vacant, intended for occupancy as separate living quarters. Separate living quarters are those in which the occupants live and eat apart from other persons in the building and which have direct access from outside the building or through a common hall. Housing units built not for household occupancy but for group of unrelated persons was defined as group quarter. Group quarters include institutionalized and non-institutionalized quarters such as prisons/local jails, hospitals, school/college dormitories, etc. This chapter deals exclusively with housing units.

The 1994 FSM Census included both occupied and vacant housing units as part of the housing inventory. Recreational boats, tents, etc, were also included in the questionnaire to enumerate people using them as their usual residence. The census classified a housing unit as occupied if it was the usual residence of the person or group of persons inhabiting it at the time of enumeration or if the occupants were only temporarily absent.

A vacant housing unit was one which contained no residents at the time of enumeration, unless its occupants were only temporarily absent. The census also considered vacant those units temporarily occupied at the time of enumeration by persons who usually resided elsewhere. A new unit not yet occupied was classified as vacant if construction had reached the point where all exterior windows and doors, and final usable floors, were in place. The census did not consider unoccupied units open to the elements as vacant. Also excluded from vacant units were quarters used entirely for non-residential purposes, such as store, office, or storage facility.

The 1994 census distinguished between owner-occupied and renter-occupied housing units, a characteristic referred to as tenure. Questionnaire item H22, asked of all occupied housing units, dealt with tenure.

The census classified a housing unit as owner-occupied if the owner or co-owner resided in the unit on census day, even if the unit was mortgaged or not fully paid for. The remaining occupied housing units were classified as renter-occupied, regardless if cash or some other means of remittance was used. The census recorded a housing unit as "rented for cash" if any money rent was paid or contracted for; this rent could come from individuals either living in the unit or elsewhere, or from an organization. Rental units classified under "occupied without payment of cash rent" generally were those provided free by friends or relatives, or in exchange for services such as those provided by a resident manager or tenant worker.

Questionnaire item H6 concerned the year a structure was built. Data on year of construction was collected for both occupied and vacant housing units. Data on the year a structure was built referred to when the building was first constructed, not when it was remodeled, added to, or converted. Recently built structures that met the housing unit definitional requirements (all exterior windows, doors, and final usable floors installed) were assigned to the "1993-1994" category.

#### *Structural Characteristics*

The 1994 census obtained information on the number of housing units in a structure from questionnaire item H1, which it recorded for all housing units. A structure comprised a separate building that either had open space on all four sides or was separated from other structures by dividing walls that extended from ground to roof. The statistics presented in this report refer to the number of housing units in separate structures of specified type and size. The following categories applied:

- .One-unit, detached -- a single-unit structure detached from any other structure (except a shed or garage). A one-family house which contained a business was considered detached as long as the building had open space on all four sides.
- .One-unit, attached -- a one-unit structure which had one or more walls extending from ground to roof separating it from adjoining structures. In double houses and houses attached to non-residential structures, each housing unit was an individual attached structure if the dividing or common wall extended from ground or roof.
- .Two or more units -- housing units in structures containing two or more housing units, further categorized as units in structures with 2, 3 or 4, 5 to 9, 10 to 19, 20 or more units.
- .Other -- any housing unit that did not fit the previous categories, such as abandoned cars, campers, vans, and shacks.

The 1994 census obtained information on the number of rooms per housing unit from questionnaire item H7, with resulting information recorded both for occupied and vacant housing units. The intent of this question was to count the number of whole rooms used for living purposes. For each unit, whole rooms included living rooms, dining rooms, kitchens, bedrooms, finished recreation rooms, enclosed porches suitable for year-round use, and lodger's rooms. Excluded were kitchenettes, bathrooms, open porches, balconies, halls for foyers, utility rooms, unfinished attics or basements, and other unfinished space used for storage.

Data on bedrooms were obtained from questionnaire item H8, with resulting information recorded for both occupied and vacant housing units. The number of bedrooms refers to the count of rooms designed to be used as bedrooms and the number of rooms that one would count as bedrooms when listing a housing unit for sale or for rent. The 1994 census included as bedrooms all rooms intended for use as bedrooms even if residents were using them for some other purpose on Census Day. Housing units comprising a single room, such as an efficiency apartment, by definition were classified as having no bedroom.

Data on material used for the outside walls of housing units were obtained from questionnaire item H3, for both occupied and vacant housing units. The census classified each unit according to the type of material used most in the construction of its outside walls and included as separate categories "Poured concrete", "Concrete blocks", "Metal/Tin", "Plywood", "Thatch", "Local wood or bamboo", "Other", and "No walls".

The census collected data on the material used for the roofs of housing units with questionnaire item H4, the results recorded both for occupied and vacant housing units. The census classified each housing unit according to the type of material used most in the construction of its roof. The material categories employed were "Poured concrete", "Metal/Tin", "Wood", "Thatch", "Bamboo", and "Other".

The 1994 census collected data on type of material used for the foundation of housing units with questionnaire item H5, both for occupied and vacant housing units. Census personnel classified each housing unit according to the type of material used most in its foundation. The categories employed were "Concrete", "Wood pier or piling", "Coral", "Stone", and "Other" for those other than the first four categories.

#### *Utilities*

The 1994 census collected data on electric power with questionnaire items H10, recorded for both occupied and vacant housing units. Even if the power had been shut off for some reasons, the census considered the unit to have electric power.

The census data on source of water were obtained from questionnaire item H15, also recorded for occupied and vacant housing units. Categories 1 to 9 on question H15 dealt with the sources of drinking water to the household.

"A public (government) system only" refers to when there was running water comes through water pipes from any common source supplying 5 or more houses or apartments and it was the only source of water for the entire household or apartment.

"A community water system only" refers to when there was running water comes through water pipes supplied by a village or community water system or obtained from a well that was maintained by the community.

"A public and catchment" refers to when there was running water from a public system and there was also catchment in which rain water was collected.

"An individual well" refers to when the water came from a well on the property or on neighboring property serving fewer than 5 houses or apartments. Well water hand drawn, wind drawn, or engine drawn whether piped or not piped and stored in tanks or used directly from the well were included.

"A catchment, tanks, or drums only" refers to when the source of water was a catchment, tanks, or drums in which rain water was collected. Such sources usually serve only one structure.

"A public standpipe or street hydrant" refers to when there was an elevated tank or vertical storage cylinder connected to a public system from which nearby residents draw water.

"Purchased bottled water" refers to when the household depended only on water purchased from businesses.

"Some other sources such as a spring, river, creek, etc." being used by the household as the main source of drinking water.

Data on water supply, also referred to as "Piped water" related to the source of water, were obtained from questionnaire items H9a to H9d, recorded for both occupied and vacant housing units. Piped water signified a housing unit where water was available at a sink, wash basin, bathtub, or shower. The piped water may have been located within a housing unit, in a hallway associated with the unit, or in a room used by several other households in the building containing the unit (even if occupants had to go outdoors to reach that part of the building). If both hot and cold water were available, the census recorded the type of energy used by the water heater; "electricity", "gas", "solar power", or "other fuels".

Data on sewage disposal were obtained from questionnaire item H16, recorded both for occupied and vacant housing units. Housing units were classified as connected to a "public sewer", or a "septic tank or cesspool", or disposing of sewage by "other means". In the FSM a public sewer system may be operated by a government or semi-government body or by a private organization where sewer pipes were connected to a processing plant. The septic tank or cesspool is an underground tank or pit for sewage disposal and limited to one or two toilets. The "other" category included housing units which disposed of sewage in any manner not covered by the other specific categories.

#### *Equipment*

The 1994 census obtained information on plumbing facilities from questionnaire items H9a, H9c, and H9d for occupied and vacant housing units. Following the 1990 U.S. Census in the territories, a unit was considered to have complete plumbing facilities when it had piped water, a flush toilet, and a bathtub or shower, regardless of whether these facilities were located in the unit being enumerated or inside the building which contained that unit.

Data on sinks with piped water were obtained from questionnaire item H17e, recorded for both occupied and vacant housing units. For classification as a housing unit possessing a sink with piped water, such a sink had to be in the unit itself or inside the building containing the housing unit enumerated.

Questionnaire items H9d and H16 addressed the type of toilet facilities both in occupied and vacant housing units. A flush toilet consisted of any toilet connected to piped water and emptying into a public sewer, septic tank or cesspool. If the unit did not have a flush toilet, the toilet could be an outhouse, privy, or benjo; otherwise, the last category, "Other", was used.

The 1994 census collected data on bathtub and shower with questionnaire item H9c both for occupied and vacant housing units. A bathtub or shower was counted only if connected permanently to piped running water, thus excluding equipment such as portable bathtubs.

Questionnaire items H17a and H17b concerned cooking facilities and were asked at both occupied and vacant housing units. Main cooking facilities were those used most often for the preparation of meals, located either outside or inside the housing unit enumerated or in the building containing that housing unit. The 1994 census classified units with cooking facilities according to the energy used to power them, although the present study does not consider this information. A housing unit with "No cooking facilities" comprised a unit with no cooking facilities available inside or outside the building.

Questionnaire items H18 and H19 asked for the number of vehicles used for land transportation as well as boats used by the household for water transportation.

Finally, the census collected data on household appliances such as refrigerator, deep freezer, air-conditioning, television and VCR, telephone or CB radio, and any other battery operated radio.

## Analysis of Housing Data

### General Housing Characteristics

Of the 16,609 housing units enumerated in the 1994 FSM Census, 1,378 were vacant with housing data but no population data. A total of 15,230 housing units were occupied. Tables 13.1, 13.2, and 13.3 compare the total and types of housing units in 1994 with previous censuses, and the type and age of occupied housing units in each state.

Table 13.1 shows the two types of housing units; occupied and vacant. Between 1980 and 1994, both types of unit showed an increase of about 2 percent per year. The distribution of the two types of units was about equal for the two censuses.

Table 13.1. Total Housing Units, Occupied Housing Units, and Others, FSM: 1980 & 1994

Tenure	Number		Annual percent change	Percent	
	1980	1994		1980	1994
Total HUs	11,562	16,609	2.2	100.0	100.0
Occupied HUs	10,522	15,230	2.2	91.0	91.7
Vacant	1,040	1,379	1.8	9.0	8.3

Source: 1980 TTPI Census, H2 and 1994 FSM Census, H06

Government and planning agencies use information on renter occupied units in combination with income and other characteristics to develop housing programs designed to meet the housing needs of people at different economic levels. Table 13.2 shows the total occupied units and tenure by states in 1994. Like the population distribution, Chuuk had the most housing units and owner occupied units and Kosrae had the least in both types of units. For the renter occupied units, Pohnpei had the most, about 307 units (5.8 percent). Pohnpei, being the capital of the FSM, had more people from other states and countries who migrated for work increased the demand for rental houses compared to the rest of the states. In all states, the proportion of no cash rent or free was much higher than cash rent. Housing and property in the FSM is still mostly distributed among family making cash rent less likely.

Table 13.2. Total Housing Units by State, FSM: 1994

State	Total housing units	Occupied					Percent				
		Total	Owner	Renter			Total	Owner	Renter		
				Cash	No cash	Others			Cash	No cash	Others
Total	16,609	15,230	11,643	407	2,795	385	100.0	76.4	2.7	18.4	2.5
Yap	1,980	1,925	1,442	29	412	42	100.0	74.9	1.5	21.4	2.2
Chuuk	7,581	7,043	5,301	57	1,494	191	100.0	75.3	0.8	21.2	2.7
Pohnpei	6,030	5,298	4,035	307	835	121	100.0	76.3	5.8	15.8	2.3
Kosrae	1,018	964	865	14	54	31	100.0	94.7	1.5	5.6	3.2

Source: 1994 FSM Census, H06

The year of construction indicated the amount of new housing constructed during the decade and provided age of the FSM housing. It also measures, when used in combination with data from previous censuses, the disappearance of old housing from the inventory. Table 13.3 shows the age of the housing units in the FSM by State. Question H6 asked for the year the house was first built to determine the age of the house. In every state, most houses were constructed relatively recently. Once again, Chuuk State, being the most populated state, had the most number of units constructed over the two decades. Pohnpei, being the capital of the FSM, where rental houses are in high demand, increased in the most recent time period almost double to those built in 1985 to 1989.

Table 13.3. Year of Construction by State, FSM: 1994

State	Total HU	Number						Percent					
		1990-1994	1985-1989	1980-1984	1970-1979	Before 1970	Total	1990-1994	1985-1989	1980-1984	1970-1979	Before 1970	Total
Total	16,609	5,005	3,728	2,827	3,103	1,946	100.0	30.1	22.4	17.0	18.7	11.7	100.0
Yap	1,980	574	455	360	338	253	100.0	29.0	23.0	18.2	17.1	12.8	100.0
Chuuk	7,581	2,168	1,899	1,258	1,554	702	100.0	28.6	25.0	16.6	20.5	9.3	100.0
Pohnpei	6,030	1,930	1,137	1,003	1,069	891	100.0	32.0	18.9	16.6	17.7	14.8	100.0
Kosrae	1,018	333	237	206	142	100	100.0	32.7	23.3	20.2	13.9	9.8	100.0

Source: 1994 FSM Census, H01

### Structural Characteristics

Description of building indicates areas of single-family homes and of small or large apartment buildings. The data collected could be used as an aid in planning for extension of utility lines, schools and playgrounds, and environmental needs.

Table 13.4 shows the number of occupied housing units by number of units within each structure. The majority of the occupied housing units were one-detached housing units. The structures with one or more attached were about 7.1 percent or about 81.6 percentage points lower than the one detached structures. There was a total of 270 structures with multiple apartment units reported. Structures with 3 or 4 apartments were less common than those with 5 or more apartments. The 373 units categorized under other were those occupied housing units with no specifications on the questionnaires.

Table 13.4. Occupied Housing Units by Number of Units per Structure, FSM: 1994

Units in Structure	Number	Percent
Occupied HU	15,230	100.0
One detached	13,513	88.7
One or more attached	1,074	7.1
Bldg. w/ 2 apt.	106	0.7
Bldg. w/ 3 or 4	64	0.5
Bldg. w/5 or more	100	0.6
Other	373	2.4

Source: 1994 FSM Census, H01

Table 13.5 shows the number of units per structure in the states for 1994. For every state, the one detached housing unit was the most common. One or more attached housing units and apartments were mostly found in Pohnpei and Chuuk which could be due to the customs and traditions whereby extended families lived in a compound and share one kitchen and the house rental demand. Pohnpei had the most apartments and they were mostly rental units. Kosrae had no structures with 3 or more units maybe because it is the youngest state with the smallest population with very few business investments going on there.

Table 13.5. Units per Structure by State, FSM: 1994

State	Occupied Housing Units	One detached	One or more attached	Bldg. with 2 apt.	Bldg. with 3 or 4 apt.	Bldg. w/ 5 or more	Others
Total	15,230	13,511	1,073	105	64	103	374
Yap	1,925	1,761	177	18	11	13	5
Chuuk	7,043	6,297	433	21	22	22	248
Pohnpei	5,298	4,550	467	64	31	68	118
Kosrae	964	903	56	2	-	-	3

Source: 1994 FSM Census, H01

The number of rooms provided the basis for estimating the amount of living and sleeping space in the housing unit. Table 13.6 shows the percentage change in the number of rooms per occupied housing unit and the percent of units with 1 to 8 or more rooms in 1980 and 1994. The increases in the number of rooms in 1994 suggests people were getting wealthier. The availability of housing loan packages provided by the federal and local housing programs could have also caused this increase. Over the period, the average number of rooms per unit increased by about 2 rooms. Western influences on the way of life in the FSM also contributed to the increasing number of rooms within a unit. For convenience, rooms for kitchens, bathrooms, showers, etc. were built inside the unit. For privacy, separate rooms were built for the parents and the children as well.

Table 13.6. Rooms, FSM: 1980 and 1994

Rooms	Number		Percent Change	Percent	
	1980	1994		1980	1994
Occupied HU	10,557	15,231	30.7	100.0	100.0
1 room	3,400	3,494	2.7	32.2	22.9
2 room	2,931	3,238	9.5	27.8	21.3
3 room	2,124	3,240	34.4	20.1	21.3
4 room	1,242	2,425	48.8	11.8	15.9
5 room	561	1,679	66.6	5.3	11.0
6 room	204	733	72.2	1.9	4.8
7 room	44	258	82.9	0.4	1.7
8 or more room	51	164	68.9	0.5	1.1
Median	1.6	3.3	...	...	...

Source: 1980 TTPI, H03 &amp; 1994 FSM Census, H02

Table 13.7 shows that Yap and Pohnpei had fewer average number of rooms than the national average, meaning Kosrae and Chuuk had the most units with more rooms. In other words, units in Chuuk and Kosrae were more likely to have kitchens and laboratories or were built with more bedrooms.

Table 13.7. Rooms by State, FSM: 1994

State	Occupied Housing Units	Number of rooms per Occupied Units								
		1	2	3	4	5	6	7	8+	Median
Total	15,231	3,494	3,238	3,240	2,425	1,679	733	258	164	3.3
Yap	1,925	681	421	377	213	140	61	20	12	2.7
Chuuk	7,044	1,319	1,345	1,543	1,329	945	390	109	64	3.6
Pohnpei	5,298	1,427	1,268	1,078	715	434	206	102	68	3.0
Kosrae	964	67	204	242	168	160	76	27	20	3.9

Source: 1994 FSM Census, H02

The number of bedrooms were used in combination with number of occupants to provide a measure of crowding. Builders and planners use this information to find out how much additional housing is needed to relieve crowded housing conditions.

Table 13.8 compares the bedrooms reported for those units in 1980 and 1994 and the percentage change. Over the period, the total number of housing units in the FSM increased by 47 percent. While the proportion of housing units with 1 bedroom show a negative change, the multiple bedrooms increased by over 100 percent. These changes justify that people tend to build units with multiple bedrooms although the household and family size declined (see chapter 3). The median bedrooms increased by .4 percentage points, not as much as the increase in the number of rooms in the previous tables.

Table 13.8. Bedrooms, FSM: 1980 and 1994



Bedrooms	Bedrooms		Percent Change	Percent	
	1980	1994		1980	1994
Total HU	11,304	16,609	46.9	100.0	100.0
1 bedroom	6,632	6,482	-3.5	58.7	39.0
2 bedrooms	2,577	5,509	113.8	22.8	33.2
3 bedrooms	1,473	3,006	104.1	13.0	18.1
4 bedrooms	467	1,196	156.1	4.1	7.2
5 or more bedrooms	155	416	168.4	1.4	2.5
Median	1.9	2.3	...	...	...

Source: 1980 TTPI, H12 and 1994 FSM Censuses, H02

Table 13.9 shows the number of units with 1 bedroom to 5 or more bedrooms in each state. In 1994, one-bedroom housing units were most common in Yap and Pohnpei while two-bedroom units were common in Kosrae. The number of units with 1 and 2 bedrooms were about equal in Chuuk. Chuuk and Pohnpei had the most units with 5 or more bedrooms reported. Yap had the least number and proportion of units with five or more bedrooms.

Table 13.9. Bedrooms by State, FSM: 1994

State	Total Housing Units	Number of Bedrooms				
		1	2	3	4	5+
Total	16,609	6,482	5,509	3,006	1,196	416
Yap	1,980	864	620	352	109	35
Chuuk	7,581	2,624	2,598	1,611	584	164
Pohnpei	6,030	2,751	1,911	859	355	154
Kosrae	1,018	243	380	184	148	63

Source: 1994 FSM Census, H02

Type of material used for roofs, walls, and foundation are used to determine the structural composition of housing and as an indicator of housing that might endanger the health and safety of the occupants. Table 13.10 shows the main materials used for the roofs of the housing units in 1980 and 1994. About 3 in every 4 housing units in both censuses used metal roofing. Metal roofs, wood, and thatch roofs decreased in 1994 while concrete roofs increased. In other words, people are turning away from using local materials but using imported materials. Among other reasons, concrete structures last and ideal for a place like the FSM where tropical storms frequently hit.

Table 13.10. Materials Used for Roof, FSM: 1980 and 1994

Type of Material	Rooms		Percent	
	1980	1994	1980	1994
Housing Units	11,562	16,609	100.0	100.0
Poured Concrete	243	2,466	2.1	14.8
Metal	9,023	12,668	78.0	76.3
Wood	345	187	3.0	1.1
Thatch	1,788	1,157	15.5	7.0
Other	163	131	1.4	0.8

Source: 1980 TTPI, H12 and 1994 FSM Censuses, H01

Table 13.11 shows that most houses in the FSM used metal or tin for roofing (over 76 percent). Among other reasons, people in the FSM prefer to use metal/tin for roofing to catch rain water, especially for drinking. In all states, except Yap, poured concrete was the second most common material for roofing. In Yap, other roofing, that is thatched and wooden were used more than poured concrete maybe because they are affordable or may be because most Yapese are conservative in their customs and traditions.

Table 13.11. Materials Used for Roof by State, FSM: 1994

State	Total	Number			Total	Percent		
		Poured Concrete	Metal	Other		Poured Concrete	Metal	Other
Total	16,609	2,466	12,668	1,475	100.0	14.8	76.3	8.9
Yap	1,980	101	1,427	452	100.0	5.1	72.1	22.8
Chuuk	7,581	1,241	5,982	358	100.0	16.4	78.9	4.7
Pohnpei	6,030	993	4,405	631	100.0	16.5	73.1	10.5
Kosrae	1,018	131	854	33	100.0	12.9	83.9	3.2

Source: 1994 FSM Census, H01

Table 13.12 presents the type of wall materials in 1980 and 1994. The proportion of housing units with concrete walls increased over the period while the others decreased. The increase in concrete implies the quality and value of houses improved over the period.

Table 13.12. Materials Used for Outside Walls, FSM: 1980 &amp; 1994

Type of materials	Number		Percent change	Percent	
	1980	1994		1980	1994
Housing units	11,562	16,609	2.2	100.0	100.0
Concrete	1,690	6,990	5.4	14.6	42.1
Poured concrete	486	3,272	6.1	4.2	19.7
Concrete blocks	1,204	3,718	4.8	10.4	22.4
Metal	4,116	4,970	1.2	35.6	29.9
Wood	4,835	4,206	-1.1	41.8	25.3
No walls	346	86	-21.6	3.0	0.5
Others	575	357	-4.4	5.0	2.1

Source: 1980 TTPI Census, H12 and 1994 FSM Census, H01

Table 13.13 shows the materials used for the outside walls of FSM housing units in 1994. In Yap, the proportion of metal walls was the highest (48 percent) while the highest proportions in the other states were concrete walls. The proportional distribution for Chuuk was about equal between the three categories while Pohnpei and Kosrae had more concrete walls. More units with concrete walls also indicated that housing standards in the FSM is improving.

Table 13.13. Materials Used for Outside Walls by State, FSM: 1994

State	Housing Units	Number			Total	Percent		
		Concrete	Metal	Wood & Other		Concrete	Metal	Wood & Other
Total	16,609	6,990	4,971	4,648	100.0	42.1	29.9	28.0
Yap	1,980	428	950	602	100.0	21.6	48.0	30.4
Chuuk	7,581	2,869	2,331	2,381	100.0	37.8	30.7	31.4
Pohnpei	6,030	3,074	1,663	1,293	100.0	51.0	27.6	21.4
Kosrae	1,018	619	27	372	100.0	60.8	2.7	36.5

Source: 1994 FSM Census, H01

Table 13.14 presents the types of house foundations in the states. The majority of the housing units in

Kosrae were concrete. In Yap, concrete and wood foundations were about equal. Yap also had the highest proportion of stone or coral foundations. Chuuk and Pohnpei had a similar distribution in each type of foundation, the majority were concrete foundations.

Table 13.14. Materials Used for Foundation by State, FSM: 1994

State	Housing Units	Concrete	Number Wood/ Pier/ Piling	Stone/ coral	Total	Concrete	Percent Wood/ Pier/ Piling	Stone/ coral
Total	16,609	10,845	4,428	1,336	100.0	65.3	26.7	8.0
Yap	1,980	863	778	339	100.0	43.6	39.3	17.1
Chuuk	7,581	5,041	1,894	646	100.0	66.5	25.0	8.5
Pohnpei	6,030	3,979	1,712	339	100.0	66.0	28.4	5.6
Kosrae	1,018	962	44	12	100.0	94.5	4.3	1.2

Source: 1994 FSM Census, H01

### Utilities

Data on electric power and air conditioning are useful in planning and assessing power consumption, living conditions, and the housing quality. Data are also useful in planning the rural electrification programs and seeking alternative economical power sources.

Table 13.15 shows an increase in the usage of public utility power, generator, and solar power in the FSM between 1980 and 1994. In 1980, only 28 percent of housing units had electricity, no units had solar power, and the majority had no electricity. But in 1994, about 50 percent used electricity, 1 percent used solar power, and the number of units not using electricity dropped to less than 50 percent. In 1980, for every 10 units, 7 units were not using any means of electricity but in 1994 only 4 units for every 10 units had no electricity.

Table 13.15. Electric Power, FSM: 1980 and 1994

Electric Power	Number 1980	1994	Percent 1980	1994
Housing Units	11,562	16,609	100.0	100.0
With Electricity	3,276	8,401	28.3	50.6
Public utility	2,247	7,713	19.4	46.4
Generator	1,029	688	8.9	4.1
Solar Power	-	103	-	0.6
No electricity	8,286	8,105	71.7	48.8

Source: 1980 TTPI Census, H10 and 1994 FSM Census, H04

Data on air conditioning are used as a measure of power consumption and can be used to help prevent power failure. Table 13.16 shows that about half of the housing units in the FSM used electricity and about 5 percent of these units using electricity had air-conditioning. Almost every house in Kosrae had access to electricity but only 7 per 100 houses used air-conditioning. Chuuk, on the other hand, had the lowest proportion of housing units using electricity. Pohnpei had the most housing units with electricity and air conditioning which may mean living standard in Pohnpei was better than the other states. The household, family, and individual income on Table 11.1 in chapter 11 also supported the fact that living conditions in Pohnpei was better.

Table 13.16. Electricity and Air Conditioning, FSM: 1994

|--|--|

State	Total Units	Number		Percent	
		Electricity	Air conditioning	Electricity	Air conditioning
<b>Total</b>	<b>16,609</b>	<b>8,401</b>	<b>901</b>	<b>50.6</b>	<b>5.4</b>
Yap	1,980	1,048	76	52.9	3.8
Chuuk	7,581	2,662	273	35.1	3.6
Pohnpei	6,030	3,738	482	61.8	8.0
Kosrae	1,018	953	70	93.6	6.9

Source: 1994 FSM Census, H04

Lack of water supply and flush toilet toilets has been connected with diseases and morbidity in the past. For instance, the social problems of urbanization were well documented in July 1982 when sewage disposal in Chuuk lagoon contaminated seafood and resulted in a severe cholera outbreak. Subsequent studies revealed that only 6 percent of households in Weno during that time had adequate sanitation (central water supply and flush toilet), Connell 1983:7/8).

Table 13.17 shows the number of housing units using piped water in 1980 and 1994 and the percent change and the percent distribution. The housing units with piped water increased by more than 9 folds and the units with no piped water decreased by 14 percent showing expansion in the piped water system during the decade. The housing units with hot and cold piped water increased but not as much as those with cold piped water only.

Table 13.17. Piped Water, FSM: 1980 and 1994

Piped Water	Number		Percent Change	Percent	
	1980	1994		1980	1994
Total Housing Units	11,562	16,609	43.7	100.0	100.0
Piped Water	726	7,276	902.2	6.3	43.8
Hot and cold Piped water	211	670	217.5	1.8	4.0
Cold water only	515	6,606	1182.7	4.5	39.8
No piped water	10,836	9,333	-13.9	93.7	56.2

Source: 1980 TTPI, H2 and 1994 FSM Censuses, H03

Table 13.18 presents the water supply in each state. The national average shows that about half of the housing units in the FSM had not used piped water and Chuuk had the highest proportion. The other half had mainly cold piped water. The 4 percent using both hot and cold water were found mostly in Pohnpei. Yap and Pohnpei had almost fifty-fifty split on housing units with piped water and those without piped water. Over 88 percent of the majority of the housing units in Kosrae had piped water. Chuuk had the reversed situation than Kosrae whereby majority had no piped water. Among other things, the situation in Chuuk suggests that the water improvement in Chuuk should be a priority.

Table 13.18. Water Supply, FSM: 1994

State	Total Housing Units	Number			Total	Percent		
		Hot & Cold	Cold Only	No Piped Water		Hot & Cold	Cold Only	No Piped Water
<b>Total</b>	<b>16,609</b>	<b>670</b>	<b>6,606</b>	<b>9,333</b>	<b>100.0</b>	<b>4.0</b>	<b>39.8</b>	<b>56.2</b>
Yap	1,980	53	954	973	100.0	2.7	48.2	49.1
Chuuk	7,581	180	1,722	5,679	100.0	2.4	22.7	74.9
Pohnpei	6,030	399	3,027	2,604	100.0	6.6	50.2	43.2
Kosrae	1,018	38	903	77	100.0	3.7	88.7	7.6

Source: 1994 FSM Census, H03

Table 13.19 shows the sources of drinking water in 1980 and 1994. The proportion of units using public and

community systems increased by over 76 percent. The proportion of housing units using water catchments for drinking was highest in 1980 and 1994 because it is more healthier, cheaper, and has better taste. The ground and river water made up the least source of drinking water (other category).

Table 13.19. Source of Drinking Water, FSM: 1980 and 1994

Source of Drinking Water	1980	Number	1994	Percent Change	1980	Percent	1994
Total Housing Units	11,562		16,609	43.7	100.0		100.0
Public & community systems	2,690		4,738	76.1	23.3		28.5
Individual Well	1,586		1,518	-4.3	13.7		9.1
Catchment, tank drums	4,687		8,395	79.1	40.5		50.5
Public stand pipe	351		120	-91.8	12.6		0.7
Other	2,248		1,838	60.9	9.9		11.1

Source: 1980 TTPI Census, H10 and 1994 FSM Census, H03

Table 13.20 reports the main source of drinking water in the states. The national average shows that over 50 percent of the housing units used water catchments such as tanks and drums to collect their drinking water. In Yap, Chuuk, and Kosrae, the proportion using catchments exceeded the national average. The public water system in Pohnpei was recently privatized and improved so unlike the other states, Pohnpei has more public system recipients than water catchment users. The main water source in Yap and Kosrae was the community system. Individual wells were also mostly used in Pohnpei. A small portion of housing units used public stand pipes or bottled water.

Table 13.20. Source of Drinking Water by State, FSM: 1994

State	Total HUs	Percent	Pub. sys. only	Comm. sys. only	Pub. sys. and catch.	Comm. sys. and catch.	Indi-vidual well	Catch., tanks, drums	Pub. stand pipe	Purch-ased bottled water	Others
Total	16,609	100.0	15.0	7.8	2.9	2.9	9.1	50.5	0.7	1.2	9.9
Yap	1,980	100.0	4.0	21.8	5.1	5.8	1.3	60.7	-	0.5	0.9
Chuuk	7,581	100.0	3.4	2.6	1.8	2.2	8.0	69.3	1.0	0.8	10.8
Pohnpei	6,030	100.0	35.1	8.1	2.0	2.2	14.5	22.5	0.6	2.0	13.0
Kosrae	1,018	100.0	3.0	16.8	11.8	7.2	1.1	57.1	1.0	0.1	2.0

Source: 1994 FSM Census, H03

Table 13.21 presents the type of sewage disposal in the FSM in 1980 and 1994. Over the period, the proportion of public sewer recipients doubled. Septic tanks or cesspools also increased by about 218 percent or about 3 times more, than in 1980. The other category includes those toilets with no sewage disposal system. This was still the largest group, although, the proportion decreased by about 20 percentage points in 1994.

Table 13.21. Sewage disposal, FSM: 1980 &amp; 1994

Sewage disposal	Number		Percent change	Percent	
	1980	1994		1980	1994
Total housing units	11,562	16,609	43.7	100.0	100.0
Public sewer	560	1,781	218.0	4.8	10.7
Septic tank - cesspool	362	2,796	672.4	3.1	16.8
Others	10,640	12,032	13.1	92.0	72.4

Source: 1980 TTPI Census, H10 and 1994 FSM Census, H03

Table 13.22 presents sewage disposal systems in each state. Kosrae had the highest proportion of housing

units hooked up to the public sewer systems (about 21 percent) and septic tank or cesspool (about 55 percent). Chuuk and Yap had the least proportion of housing units hooked up to the public sewer system but both had over 80 percent of the total housing units still using the traditional disposal like pits, benjo or bushes, shores, etc.

Table 13.22. Sewage Disposal by State, FSM: 1994

State	Total	Number			Total	Percent		
		Public Sewer	Septic tank or cesspl.	Other		Public Sewer	Septic tank or cesspl.	Other
Total	16,609	1,781	2,796	12,032	100.0	10.7	16.8	72.5
Yap	1,980	185	113	1,682	100.0	9.3	5.7	84.9
Chuuk	7,581	550	941	6,090	100.0	7.3	12.4	80.3
Pohnpei	6,030	832	1,180	4,018	100.0	13.8	19.6	66.6
Kosrae	1,018	214	562	242	100.0	21.0	55.2	23.8

Source: 1994 FSM Census, H03

Table 13.23 presents the percent change in plumbing facilities and the percentage distribution of the types of plumbing facilities in 1980 and 1994. Housing units with complete cold water plumbing had the largest increase (about 640 percent). Those units lacking complete plumbing had a very small change (about 22.5 percent) and had the highest proportion in both years. Those units with hot and cold water facilities also increased over the period by about 2 percentage points.

Table 13.23. Plumbing Facilities, FSM: 1980 and 1994

Plumbing Facilities	Number		Percent Change	Percent	
	1980	1994		1980	1994
Total Housing Units	11,562	16,609	43.7	100.0	100.0
With Complete Plumbing	535	3,094	478.3	4.6	18.6
With Hot & cold water	211	670	217.5	1.8	4.0
With cold only	324	2,424	648.1	2.8	14.6
Lack of complete plumbing	11,027	13,515	22.6	95.4	81.4

Source: 1980 TTPI Census, H2 and 1994 FSM Census, H03

Table 13.24 shows the number of housing units equipped with complete plumbing facilities at the time of census in 1994. Lack of development in the outer islands and the remote areas from the center contributed to the high proportion of units still lacking complete plumbing. The complete plumbing units were those with piped water, bathtub or shower, toilet, and kitchen facilities inside the housing units. Over 50 percent of the housing units equipped with water heaters were found in Pohnpei where most expatriates and high level income people lived.

Table 13.24. Plumbing Facilities, Occupied Housing Units by State, FSM: 1994

State	Total	Public Sewer	Septic tank or cesspl.	Other
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State	Total Housing Units	Total	Complete Plumbing		Lacking complete plumbing
			Hot & Cold water	Cold water	
<b>Total</b>	16,609	3,094	670	2,424	13,515
Yap	1,980	426	53	373	1,554
Chuuk	7,581	658	180	478	6,923
Pohnpei	6,030	1,689	399	1,290	4,341
Kosrae	1,018	321	38	283	697

Source: 1994 FSM Census, H03

Table 13.25 shows that outhouse or privy toilet facilities which were commonly used in 1980 decreased by 15.8 percent over the period. While the decrease may mean more units were upgraded to flush toilets, the number of units without any toilet facility doubled during the period.

Table 13.25. Toilet Facilities, FSM: 1980 and 1994

Toilet Facilities	Number		Percent Change	Percent	
	1980	1994		1980	1994
Total Housing Units	11,562	16,609	43.7	100.0	100.0
Flush toilet inside	663	2,472	272.9	5.7	14.9
Flush toilet outside	1,011	3,243	220.8	8.7	19.5
Outhouse or Privy	7,692	6,476	-15.8	66.5	39.0
Other or None	2,196	4,418	101.2	19.0	26.6

Source: 1980 TTPI Census, H2 and 1994 FSM Census, H03

Table 13.26 presents the number of units with inside and outside toilet facilities. About 2 of every 3 occupied housing units in 1994 still lacked flush toilets. Either they were still using benjo or pits or no toilet facilities at all. About 20 percent used flush toilets but outside the unit while only 15 percent had flush toilets installed inside the unit. While Yap and Chuuk had a majority of their housing units not equipped with flush toilets, Kosrae had almost 85 percent of the units equipped with flush toilets, followed by Pohnpei, about 42 percent. Kosrae had the highest proportion (about 26 percent) of units with toilet facilities inside the unit while Chuuk had the lowest (about 8 percent).

Table 13.26. Toilet Facilities by State, FSM: 1994

State	Total Housing Units	Number			Total	Percent		
		Flush Toilet Inside	Flush Toilet Outside	No Flush Toilet		Flush Toilet Inside	Flush Toilet Outside	No Flush Toilet
<b>Total</b>	16,609	2,472	3,243	10,894	100.0	14.9	19.5	65.6
Yap	1,980	263	100	1,617	100.0	13.3	5.1	81.7
Chuuk	7,581	606	1,320	5,655	100.0	8.0	17.4	74.6
Pohnpei	6,030	1,334	1,223	3,473	100.0	22.1	20.3	57.6
Kosrae	1,018	269	600	149	100.0	26.4	58.9	14.6

Source: 1994 FSM Census, H03

Table 13.27 shows the number of housing units with and without bathtub and shower in the FSM in 1980 and 1994. In addition, the table also presents the percent change between 1980 and 1994 with the distribution of those units with or without bathtub and shower. As the table shows, the percent change of units with bathtub and shower increased by 953 percent while those who did not decreased. The percentage distribution also shows that units with shower facilities increased tremendously from 6 percent in 1980 to about 46 percent in 1994. In contrast, the proportion of units with no bathtub decreased from 94 percent to about 54 percent showing improvement on bathtub or shower facilities. Unlike the toilet facilities, people seemed to set priority on the shower facilities rather than toilet facilities. This could also be due to the fact

that in the outlying and remote areas, some households had no toilet facilities, but had bathtub.

Table 13.27. Bathtub or Shower Facilities, FSM: 1980 and 1994

Bathtub or Shower	Number		Percent Change	Percent	
	1980	1994		1980	1994
Total Housing Units	11,562	16,609	43.7	100.0	100.0
Bathtub or Shower	732	7,706	952.7	6.3	46.4
No Bathtub or Shower	10,830	8,903	-17.8	93.7	53.6

Source: 1980 TTPI Census, H2 and 1994 FSM Census, H03

Table 13.28 presents the bathtub or shower facilities in each state. Pohnpei had the highest proportion of housing units with complete shower facilities inside the house (about 13 percent) but only higher than Kosrae by less than 1 percentage points. Yap and Chuuk had less than 10 percent of the housing units with bathtubs or showers inside the unit and over 50 percent had no bathtub or using river or streams for shower. In every 10 housing units in Pohnpei, about 1 had shower or bathtub inside the unit, 5 outside the unit, and 4 with none. Those categorized under "None" were merely those using the rivers, streams, and nearby wells to shower. In every state, the majority had shower outside.

Table 13.28. Bathtub or Shower Facilities by State, FSM: 1994

State	Total Housing Units	Number Bathtub/Shower			Total Housing Units	Percent Bathtub/Shower		
		Inside	Outside	None		Inside	Outside	None
Total	16,609	1,322	6,384	8,903	100.0	8.0	38.4	53.6
Yap	1,980	159	814	1,007	100.0	8.0	41.1	50.9
Chuuk	7,581	272	2,130	5,179	100.0	3.6	28.1	68.3
Pohnpei	6,030	770	2,712	2,548	100.0	12.8	45.0	42.3
Kosrae	1,018	121	728	169	100.0	11.9	71.5	16.6

Source: 1994 FSM Census, H03

The type of cooking facilities presented here measures the level of living and determine the adequacy of household facilities. Table 13.29 shows that for every 10 occupied units in 1994, only 4 units had the main cooking facilities inside the unit. Kosrae had the highest proportion (about 54 percent) and Yap had the lowest proportion (24 percent). In all the states, the majority used kerosene stove. In every 10 houses in the FSM, 7 units used kerosene stove, 2 units used electric range, and the other facilities like gas stove, micro oven, etc made up the remaining. While Table 13.15 (above) stated that 50 percent of the HUs in the FSM had electricity, more people used kerosene for cooking, possibly for economical reasons rather than convenience.

Table 13.29. Main Cooking Facilities Inside Unit by State, FSM: 1994

	Total HUs w/	Percent HUs w/	Percent - main cooking facilities inside unit



State	Occupied housing units	cooking facil. inside	cooking facil. inside	Total	Elec. range	Kero. stove	Gas stove	Micro. oven	Port. elec. stove	Wood stove	Open fire	Others
Total	15,230	5,828	38.3	100.0	20.9	70.2	1.1	0.5	3.8	1.8	1.1	0.5
Yap	1,925	470	24.4	100.0	23.6	62.8	2.8	0.6	6.4	0.4	2.8	0.6
Chuuk	7,043	2,223	31.6	100.0	15.2	77.6	0.6	0.3	3.1	1.2	1.3	0.8
Pohnpei	5,298	2,616	49.4	100.0	24.4	66.4	1.4	0.7	3.4	2.7	0.8	0.2
Kosrae	964	519	53.8	100.0	25.6	64.5	0.2	0.4	6.6	1.5	1.0	0.2

Source: 1994 FSM Census, H04

Table 13.30 shows that almost 60 percent of the total occupied housing units in the FSM cooked mainly outside the unit. In all states, except Pohnpei, most housing units used open fire outside the unit as their main cooking facilities. Pohnpei used wood stoves as their main cooking facilities outside the unit.

Table 13.30. Main Cooking Facilities Outside Unit by State, FSM: 1994

State	Occupied housing units	Total HUs w/ cooking facil. outside	Percent HUs w/ cooking facil. outside	Percent main cooking facilities outside unit								
				Total	Elec. range	Kero. stove	Gas stove	Micro. oven	Port. elec. stove	Wood stove	Open fire	Others
Total	15,230	9,080	59.6	100.0	1.0	20.9	0.2	0.5	0.3	25.7	50.3	1.2
Yap	1,925	1,424	74.0	100.0	0.7	18.5	0.4	0.1	0.3	2.2	77.7	0.1
Chuuk	7,043	4,629	65.7	100.0	0.3	14.1	0.1	0.2	0.2	24.3	59.0	1.9
Pohnpei	5,298	2,582	48.7	100.0	1.9	28.0	0.2	0.9	0.2	43.1	24.7	0.9
Kosrae	964	445	46.2	100.0	3.8	58.0	-	1.3	2.7	14.2	20.0	-

Source: 1994 FSM Census, H04

Information on the number of vehicles and boats regularly used is helpful to officials who plan traffic lights, parking facilities, etc. Table 13.31 shows the number of vehicles and boats kept at home for use by members of the household. The national proportion of housing units reported with vehicle was 25 percent. Kosrae had the highest proportion and Chuuk had the least. Over 80 percent of the units with vehicle had only one vehicle while about 20 percent had two or more. Pohnpei, being the capital of the FSM and the most developed state with circumferential and paved roads, had the most cars. Pohnpei Island has the biggest land mass and most people commute to work during the time of the census were using cars.

For boats, Chuuk reported the most boats. Chuuk had the most islands and the biggest lagoon in the FSM. About 30 percent of the occupied housing units reported they had boats and from this group, about 89 percent had 1 boat and 11 percent had 2 or more boats. In Chuuk and Yap, most islands used boats as their main transportation. In Chuuk, the large percentage of those units using boats were mostly from the Southern Namoneas and Faichuuk or those islands in Chuuk lagoon. Boats are used in these places for not fishing only but to shop or commute to work in Weno. Recently, with the crowding in Weno, people of Faichuuk and Northern Namoneas, tend to move out to their islands and commute to work in Weno.

Table 13.31. Vehicles and Boats by State, FSM: 1994

Vehicle				Boat	
Occupied	Total	Percent		Total	Percent

State	housing units	HUs w/ vehicle	HUs w/ vehicle	1	2+	HUs w/ boat	HUs w/ boat	1	2+
Total	15,230	3,863	25.4	81.7	18.3	3,425	22.5	88.8	11.2
Yap	1,925	528	27.4	82.2	17.8	406	21.1	82.8	17.2
Chuuk	7,043	1,012	14.4	82.2	17.8	2,121	30.1	89.4	10.6
Pohnpei	5,298	1,755	33.1	80.9	19.1	741	14.0	90.7	9.3
Kosrae	964	568	58.9	82.6	17.4	157	16.3	86.6	13.4

Source: 1994 FSM Census, H05

Table 13.32 shows the monthly cost of electricity to residents of the FSM in 1994. In all states, except Chuuk, the highest proportion were charged with a monthly average cost ranging from \$10 to \$19. Chuuk had the least proportion using electricity and the highest proportion charged with the least amount. Kosrae had the highest proportion of housing units with electricity and the highest proportion charged with the second least category. Of all housing units with electricity in FSM more than half were in Pohnpei. Kosrae seemed to have the cheapest charge for electricity.

Table 13.32. Monthly Cost of Electricity by State, FSM: 1994

State	Occupied housing units	Total	Percent with elect.	Percent electricity cost in US dollars						
				Percent	1-9	10-19	20-29	30-39	40-49	50+
Total	15,230	6,595	43.3	100.0	23.3	28.1	18.7	10.5	4.8	14.5
Yap	1,925	1,004	52.2	100.0	12.1	23.5	23.3	14.3	9.5	17.3
Chuuk	7,043	1,260	17.9	100.0	31.7	22.6	11.7	12.1	3.0	19.0
Pohnpei	5,298	3,411	64.4	100.0	21.7	29.0	20.9	9.3	4.7	14.4
Kosrae	964	920	95.4	100.0	30.1	37.6	15.2	8.9	2.8	5.3

Source: 1994 FSM Census, H05

Table 13.33 shows the average monthly cost of kerosene. This table supports the fact that kerosene stove was used as the main cooking facilities in the FSM. Although it is not as efficient as electric cooking facilities, some people found it cheaper and suitable for them. Unlike the monthly electricity cost, the majority were paying less than \$10 a month on kerosene. In Chuuk, the highest proportion were paying a range between \$10 to \$19. Chuuk spent more on kerosene than any other states because half of the FSM population lived there. Chuuk's proportions paying an average from \$30 and more were all exceeding the national average. These were most likely due to units using kerosene refrigerators in the outer islands and the lagoon areas where there was no electricity.

Table 13.33. Monthly Cost of Kerosene by State, FSM: 1994

State	Occupied housing units	Total	Percent using kerosene	Percent kerosene cost in US dollars						
				Percent	1-9	10-19	20-29	30-39	40-49	50+
Total	15,230	13,325	87.5	100.0	44.3	30.9	15.4	4.0	2.1	3.3
Yap	1,925	1,519	78.9	100.0	73.5	19.0	5.8	1.1	0.3	0.3
Chuuk	7,043	6,254	88.8	100.0	20.5	37.8	25.3	7.0	3.6	5.9
Pohnpei	5,298	4,718	89.1	100.0	62.4	26.3	7.2	1.6	1.0	1.4
Kosrae	964	834	86.5	100.0	66.7	27.5	4.4	1.1	0.2	0.1

Source: 1994 FSM Census, H05

Table 13.34 presents the average monthly cost of water by state. Yap and Pohnpei had the highest proportions of units paying water. Over 90 percent in Chuuk and Kosrae did not pay for water. In Kosrae, the communities had their own water system, so water was free; except for those 55 recipients who were probably those using the public water system in Lelu, the state center.

Table 13.34. Monthly Cost of Water by State, FSM: 1994

State	Occupied housing units	Total paying water	Percent paying water	Percent water cost in US dollars						
				Percent	1-9	10-19	20-29	30-39	40-49	50+
Total	15,230	3,163	20.8	100.0	47.0	22.4	12.0	6.5	3.7	8.3
Yap	1,925	757	39.3	100.0	79.5	14.5	3.2	1.1	0.7	1.1
Chuuk	7,043	421	6.0	100.0	57.7	21.1	9.5	4.0	0.7	6.9
Pohnpei	5,298	1,930	36.4	100.0	30.8	26.4	16.4	9.3	5.6	11.5
Kosrae	964	55	5.7	100.0	85.5	1.8	1.8	3.6	1.8	5.5

Source: 1994 FSM Census, H05

Table 13.35 shows the other fuel costs for oil, gas, wood, etc., to fully determine the total utility costs for the unit. The national average shows that 4 units in every 10 units paid \$50 and over for other fuel costs each month. The people of the FSM do not normally spend money buying woods therefore the other fuel costs could be mainly gas(oxygen) for appliances. In Chuuk, over half of the housing units were paying \$50 or more on other fuels per month. Pohnpei and Yap proportions paying \$50 or more were about equal.

Table 13.35. Monthly Cost of Other Fuel by State, FSM: 1994

State	Occupied housing units	Total paying other fuel	Percent paying other fuel	Percent other fuel cost in US dollars						
				Percent	1-9	10-19	20-29	30-39	40-49	50+
Total	15,230	4,236	27.8	100.0	9.1	8.1	15.4	11.4	13.4	42.6
Yap	1,925	137	7.1	100.0	18.2	12.4	11.7	11.7	11.7	34.3
Chuuk	7,043	1,978	28.1	100.0	8.9	6.6	12.6	8.3	9.9	53.6
Pohnpei	5,298	1,541	29.1	100.0	9.7	9.4	17.4	12.8	15.9	34.7
Kosrae	964	580	60.2	100.0	6.0	8.8	20.7	17.6	19.3	27.6

Source: 1994 FSM Census, H05

Of all 15,230 occupied housing units, the value was reported for only 76 percent. Table 13.36 presents the value of those housing units reported by state. For the nation, the median value was about \$5,000. Chuuk seemed to have better condition or valued housing units than the rest of the states. Chuuk had the highest proportion of housing units valued \$20,000 and over. The highest proportion (about 30 percent) of housing units in Pohnpei were valued at less than \$2,500. Kosrae had the least proportion of units valued \$20,000 or more but the highest proportion with average valued unit. The highest proportion (about 25 percent) of the housing units in Yap did not have a value reported.

Table 13.36. Value of House by State, FSM: 1994

State	Total occupied units	Percent	Value of house(unit)						
			Less \$2000	\$2500 4999	\$5000 9999	\$10000 14999	\$15000 19999	\$20000+	Non-response
									Median value

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Total	15,230	100.0	21.7	16.3	20.8	7.3	4.1	6.3	23.6	\$5,059
Yap	1,925	100.0	24.1	17.4	17.9	6.1	3.4	6.0	25.1	4,424
Chuuk	7,043	100.0	16.0	13.3	24.8	9.2	5.0	7.0	24.7	6,677
Pohnpei	5,298	100.0	29.5	18.2	14.1	5.3	3.0	6.0	23.8	3,677
Kosrae	964	100.0	15.8	25.2	33.3	7.9	3.8	3.7	10.3	5,584

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Source: 1994 FSM Census, H06

## Conclusion

The housing conditions in the FSM have been improving. This was evident from the improvement in housing unit facilities like electricity, lavatories, piped water, and the increased number of rooms per housing unit. Concrete walls and tin roofs are taking over the traditional wood walls and thatched roofs.

The total number of housing units increased from about 11,600 in 1980 to over 16,600 in 1994. More than half of all housing units were built between 1985 and 1994. In 1994, about 51 percent of the housing units had electricity compared to 28 percent in 1980. Of all housing units in 1994, over 46 percent had flush toilet and about 34 percent had bathtub/shower. About 44 percent of all housing units had piped water as compared to about 6 percent in 1980.

## CHAPTER 14 THE EMIGRANTS

### Introduction

The Federated States of Micronesia's Compact of Free association with the United States, implemented in November, 1986, grants its citizens free access to the United States and its territories. This created new opportunities for Micronesians, who hitherto had been allowed into the United States for schooling but not for employment. It also opened a "new and unique chapter in Pacific Islander migration" (Rubinstein 1991:1). Hezel and Levin (1996) have recently looked at migration flows of Micronesians to Guam and the CNMI in the early 1990s. Here we will look at some of the characteristics of the migrants, and compare them with the Micronesians who remain in Micronesia.

The first significant emigration from the Federated States of Micronesia began in the years following the implementation of the Compact of Free Association in 1986, as hundreds of FSM citizens left for Guam and the Commonwealth of the Northern Mariana Islands (CNMI). Micronesians settled in Hawaii and the United States mainland, as well, but their numbers were much smaller. The emigration was not surprising, even without the implementation of the Compact of Free Association, because of FSM's high population growth and almost no job expansion. The beginnings of the outflow were first noted in an article that appeared in the first years after the Compact implementation (Hezel and McGrath 1989). Over the next few years, other researchers have looked at the changing numbers of Micronesian migrants (Rubinstein 1990, 1993; Rubinstein and Levin 1992, Hezel and Levin 1996).

Migrants moved to both Guam and the CNMI for jobs, but especially to Guam. Some migrant laborers maintained such close social bonds with their families and communities that they were virtually commuters. Those who left had the freedom to return home permanently, with little or no rupture of kinship ties, if personal circumstances demanded. The Compact removed a former immigration barrier. At the same time, 1986 was the beginning of the reduction of the large U.S. subsidies to which Micronesia had become accustomed since the 1960s. So it was that island peoples once described as possessing a "homing instinct," started their tentative, purposeful migration northward (Hezel and Levin 1989: 43).

Unfortunately, although the 1994 Census tried to collect simultaneous data on Micronesian emigrants, much of the collected data were ambiguous. In order to compare the collected 1994 data with outside sources, we use two sources: the 1992 census of Micronesians on Guam (UOG 1993), and the 1993 survey of Micronesian migrants to the CNMI (Levin, 1995). These data shed light not only the differences between the immigrants and the Micronesians who remain in Micronesia, but also the differences between the migrants to Guam and the CNMI.

The 1992 survey showed that 4,932 persons born in the Federated States of Micronesia had migrated to Guam, and the 1993 survey showed 2,261 FSM persons having migrated to the CNMI. Hezel and Levin (1996) plot the growth of the migrant communities in their recent paper. Four sets of data showed the Micronesian community on Guam growing from 1,700 in 1988 (Hezel and McGrath 1989:49-51) to 2,944 in 1990 (US Bureau of the Census, 1992) to 2,973 later in 1990 (K. Hezel, personal communication), to the 4,954 at the end of 1992 (UOG, 1993). For the CNMI, we have only two points - the 1,754 recorded in the 1990 census and the 2,261 recorded in the 1993 survey. Hezel and Levin (1996) estimated the Micronesian populations on Guam and Saipan to be about 6,300 and 2,400, respectively, in 1994. The estimated 8,700 FSM citizens residing on Guam and in the CNMI in 1994 represented about 8 percent of the entire FSM-born population. The emigration rate for the FSM between 1986 and 1994, then, was about 1 percent per year. We will be looking at the data for the individual states in State monographs.

## Demography

The earliest FSM migrants to Guam were predominantly young people, mostly males, in search of jobs. Many of the original households were inherently unstable, composed of several young men in their twenties or thirties working at low-paying jobs and pooling their income to cover rent and other expenses (including periodic trips home) (Hezel and McGrath 1989:58-60). In the absence of a viable authority structure and generational depth, such "peer-group households," as Rubinstein terms them, were continually "dissolving and reforming, with new arrivals coming in, others moving out" (Rubinstein 1993:260).

These households inevitably follow the immigration model found so often around the world, as two generation and later multi-generation households have been forming. What is somewhat surprising is the rapidity of the change. Where other migrant communities in other places take a generation or two to form nuclear families, even with many loosely related kin and friends, the process has been speeded up considerably in the Micronesian case. Rubinstein notes (1993:260-1) and the data we present here back up that in recent years household members are being selected according to kinship principles seen in the home populations, with grandparents and other older people being added, giving the household important generational depth.

Table 14.1 shows the difference in ages among residents in the Federated States of Micronesia, and among the migrants. The median age — the point where half the population is older and half younger — was 18 years for FSM, but about 24 years for the migrants. Hence the average migrant was about 6 years older.

Table 14.1. Population distribution by age, 1994 FSM residents & FSM-born in Guam and CNMI: 1992-94

Age	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total	112,699	105,506	4,932	2,261	100.0	100.0	100.0	100.0
0-4	16,307	15,854	214	239	14.5	15.0	4.3	10.6
5-9	15,951	15,330	396	225	14.2	14.5	8.0	10.0
10-14	15,315	14,749	350	216	13.6	14.0	7.1	9.6
15-19	13,045	12,251	578	216	11.6	11.6	11.7	9.6
20-24	10,190	8,828	1,060	302	9.0	8.4	21.5	13.4
25-29	8,133	7,063	813	257	7.2	6.7	16.5	11.4
30-34	7,476	6,598	614	264	6.6	6.3	12.4	11.7
35-39	6,554	6,079	326	149	5.8	5.8	6.6	6.6
40-44	5,391	5,071	213	107	4.8	4.8	4.3	4.7
45-49	3,768	3,579	138	51	3.3	3.4	2.8	2.3
50-54	2,331	2,219	81	31	2.1	2.1	1.6	1.4
55-59	2,194	2,105	60	29	1.9	2.0	1.2	1.3
60-64	2,052	1,985	45	22	1.8	1.9	0.9	1.0
65-69	1,446	1,395	44	7	1.3	1.3	0.9	0.3
70-74	1,242	1,229	0	13	1.1	1.2	0.0	0.6
75+	1,304	1,171	0	133	1.2	1.1	0.0	5.9
Median	18.4	17.8	24.4	23.9	...	...	...	...

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

Less than 2 in every 10 Guam migrants was less than 15 years old, compared to 3 in 10 of the CNMI migrants, and more than 4 in 10 of those residing in the FSM. On the other hand, the bulk of the migrants to both Guam and the CNMI were between 15 and 34 years, not surprising since these are ages when migration is easiest, small numbers of students going to school, but other unmarried, unattached migrants going to look for jobs (or to have a good time.)

A look at the older end of the population distribution tells a similar story, with elderly migrants (60 and older) representing 8 percent of the CNMI population, compared to less than 2 percent on Guam. This age group comprises about 5 percent of the total population of the FSM.

In the early years of the migration, the distribution of the ages by sex probably differed considerably, but by the time of the surveys and the census, the distributions were about the same, and about the same as for the total population (Tables 14.2 and 14.3).

Table 14.2. Age distribution for males, 1994 FSM residents & FSM-born in Guam and CNMI: 1992-94

Age	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total	57,779	53,923	2,801	1,055	100.0	100.0	100.0	100.0
0-4	8,458	8,211	131	116	14.6	15.2	4.7	11.0
5-9	8,389	8,051	226	112	14.5	14.9	8.1	10.6
10-14	7,811	7,534	173	104	13.5	14.0	6.2	9.9
15-19	6,811	6,431	279	101	11.8	11.9	10.0	9.6
20-24	5,045	4,321	599	125	8.7	8.0	21.4	11.8
25-29	4,078	3,496	480	102	7.1	6.5	17.1	9.7
30-34	3,833	3,311	393	129	6.6	6.1	14.0	12.2
35-39	3,338	3,077	188	73	5.8	5.7	6.7	6.9
40-44	2,855	2,661	138	56	4.9	4.9	4.9	5.3
45-49	2,025	1,930	69	26	3.5	3.6	2.5	2.5
50-54	1,162	1,101	47	14	2.0	2.0	1.7	1.3
55-59	1,077	1,033	32	12	1.9	1.9	1.1	1.1
60-64	1,049	1,018	23	8	1.8	1.9	0.8	0.8
65-69	692	668	23	1	1.2	1.2	0.8	0.1
70-74	576	567	0	9	1.0	1.1	0.0	0.9
75+	580	513	0	67	1.0	1.0	0.0	6.4
Median	18.1	17.5	24.9	23.8	...	...	...	...

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

The median age for males in the FSM was about half a year younger than for the females; the median ages for males and females were about the same in the CNMI, and males were more than a year older than females on Guam, which could reflect a selective migration of males to Guam. Because males marry later than females, and tend to have higher mobility, more older males may be making the journey to Guam, whether as full time migrants or part-time commuters.

Table 14.3. Age distribution for females, 1994 FSM residents &amp; FSM-born in Guam and CNMI: 1992-94

Age	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total	54,920	51,583	2,131	1,206	100.0	100.0	100.0	100.0
0-4	7,849	7,643	83	123	14.3	14.8	3.9	10.2
5-9	7,562	7,279	170	113	13.8	14.1	8.0	9.4
10-14	7,504	7,215	177	112	13.7	14.0	8.3	9.3
15-19	6,234	5,820	299	115	11.4	11.3	14.0	9.5
20-24	5,145	4,507	461	177	9.4	8.7	21.6	14.7
25-29	4,055	3,567	333	155	7.4	6.9	15.6	12.9
30-34	3,643	3,287	221	135	6.6	6.4	10.4	11.2
35-39	3,216	3,002	138	76	5.9	5.8	6.5	6.3
40-44	2,536	2,410	75	51	4.6	4.7	3.5	4.2
45-49	1,743	1,649	69	25	3.2	3.2	3.2	2.1
50-54	1,169	1,118	34	17	2.1	2.2	1.6	1.4
55-59	1,117	1,072	28	17	2.0	2.1	1.3	1.4
60-64	1,003	967	22	14	1.8	1.9	1.0	1.2
65-69	754	727	21	6	1.4	1.4	1.0	0.5
70-74	666	662	0	4	1.2	1.3	0.0	0.3
75+	724	658	0	66	1.3	1.3	0.0	5.5
Median	18.6	18.1	23.6	24.0	...	...	...	...

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

Probably the most striking measure of the contrast between migrants to Guam and the CNMI is in the dependency ratio — that is, the number of dependent children and elderly for every 100 workers. While Guam's dependency ratio was 27 dependents for every 100 workers, the ratio was 62 in the CNMI (a doubling in 3 years, and showing a substantial increase in the number of nonworking members of the FSM households.) Hezel and Levin note that migrant households in the CNMI are much further along the road to "normalization and stabilization" than are Guam's (1996).

As noted in Chapter 2, the 1994 Census showed about 105 males for every 100 females in the country. The overall ratio for migrants to Guam was 131, showing about 4 males for every 3 females (Table 14.4). (Hezel and Levin [1996] note that the preponderance of males on Guam increased between 1990 when the ration was 121 and 1992.) In the CNMI, however, the overall ratio was reversed, with women outnumbering men. The higher percentage of women in the Northern Marianas might be attributed in part to the garment industry.



Table 14.4. Males per 100 Females by Age Group, 1994 FSM residents &amp; FSM-born in Guam and CNMI: 1992-94

Age	Numbers			
	Total	FSM 1994	Guam 1992	CNMI 1993
Total	105.2	104.5	131.4	87.5
0-4	107.8	107.4	157.8	94.3
5-9	110.9	110.6	132.9	99.1
10-14	104.1	104.4	97.7	92.9
15-19	109.3	110.5	93.3	87.8
20-24	98.1	95.9	129.9	70.6
25-29	100.6	98.0	144.1	65.8
30-34	105.2	100.7	177.8	95.6
35-39	103.8	102.5	136.2	96.1
40-44	112.6	110.4	184.0	109.8
45-49	116.2	117.0	100.0	104.0
50-54	99.4	98.5	138.2	82.4
55-59	96.4	96.4	114.3	70.6
60-64	104.6	105.3	104.5	57.1
65-69	91.8	91.9	109.5	16.7
70-74	86.5	85.6	...	225.0
75+	80.1	78.0	...	101.5

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

For Guam, the surplus of males appears at almost every age group, peaking at 178 males per 100 females for the age group 30 to 34 years and 184 for ages 40 to 44. Only the age groups 40 to 49 in the CNMI had more males than females.

As we showed in Chapter 3, about 54 percent of both the adult males and females in the Federated States of Micronesia in 1994 were married (Table 14.5). About the same percentage of the males in the CNMI were married, but less than half of the adult females there were married (Table 14.5). On the other hand, for Guam, both males and females showed the reverse of what is seen in the FSM, namely that a much larger percentage of the migrants to Guam were never married. Of course, since it is easier for never married people to move than married people, it is not surprising that large numbers of Micronesians take advantage of the closeness of Guam. Also, these are the same "commuters" we referred to earlier, people who can easily move back and forth between Guam and their home islands — and it is easier for never married persons to do this, than married persons.

Table 14.5. Marital Status, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Marital Status	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
<b>Males</b>	33,109	30,127	2,285	697	100.0	100.0	100.0	100.0
Never married	13,991	12,403	1,287	301	42.3	41.2	56.3	43.2
Now married	17,701	16,362	957	382	53.5	54.3	41.9	54.8
Separated	396	379	17	0	1.2	1.3	0.7	0.0
Widowed	619	599	16	4	1.9	2.0	0.7	0.6
Divorced	402	384	8	10	1.2	1.3	0.4	1.4
<b>Females</b>	31,972	29,446	1,708	818	100.0	100.0	100.0	100.0
Never married	11,430	10,201	862	367	35.8	34.6	50.5	44.9
Now married	16,966	15,802	763	401	53.1	53.7	44.7	49.0
Separated	667	626	33	8	2.1	2.1	1.9	1.0
Widowed	2,204	2,178	16	10	6.9	7.4	0.9	1.2
Divorced	705	639	34	32	2.2	2.2	2.0	3.9

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

By age 49, most women have completed their families. The data on children ever born in the census showed that the average woman in the FSM in 1994 aged 45 to 49 had had 6.3 children (Table 14.6). This was also the value for the migrant females of this age on Guam; however, women of this age residing in the CNMI had fewer children, only 4.8, on average. Similarly, at ages 40 to 44, the average for CNMI of 3.8 was between 1.5 and 2 children less than for the FSM and for migrants to Guam.

Table 14.6. Children Born per Woman by Age of Woman, FSM, Guam, and CNMI

Place and Year	Age of Woman						
	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49
<b>Total</b>	0.1	0.7	2.0	3.4	4.7	5.6	6.3
<b>FSM (1994)</b>	0.1	0.8	2.1	3.5	4.7	5.7	6.3
<b>Guam (1992)</b>	0.0	0.3	1.2	2.7	4.1	5.3	6.3
<b>CNMI (1993)</b>	0.3	1.0	1.9	2.5	3.7	3.8	4.8

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants to the CNMI

For the younger women, however, the reverse was true. While the average female migrant to Guam aged 20 to 24 had almost no children, the average migrant to CNMI had one child (about the same as for the FSM residents.) The average woman 25 to 29 in the FSM and in CNMI had about 2 children compared to only 1 on Guam. Once again, because Guam is closer to the home islands, women who have no children, or only one child, can more easily avail themselves of the opportunity to go back and forth in a kind of commuting.

### Social Characteristics

About 4 percent of the FSM population spoke English as their first language at home (Table 14.7). Here, we must use first reported language for comparability with the migrants to Guam and the CNMI, where only one language was collected. About 3 percent of the migrants to Guam spoke English at home, but 15 percent of the CNMI migrants spoke this language. The migration to CNMI has been much longer, starting in Trust

Territory times, when Micronesians went to Saipan to work in the the Trust Territory government there, with some marrying (or their children marrying) and continuing to reside on the island even after the onset of the Commonwealth in the CNMI, and the beginning of the Compact migration in 1986.

Table 14.7. Language, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Language	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total, (5+ yrs)	96,332	89,652	4,739	1,941	100.0	100.0	100.0	100.0
Speak English	4,127	3,699	139	289	4.3	4.1	2.9	14.9
Other language	92,205	85,953	4,600	1,652	95.7	95.9	97.1	85.1
Chuukese	48,794	44,492	3,463	839	50.7	49.6	73.1	43.2
Pohnpeian	23,713	22,931	640	142	24.6	25.6	13.5	7.3
Ping/Mokil	210	0	3	207	0.2	0.0	0.1	10.7
Polynesian	1,489	1,444	34	11	1.5	1.6	0.7	0.6
Kosraean	6,421	6,216	183	22	6.7	6.9	3.9	1.1
Yapese	5,599	5,287	194	118	5.8	5.9	4.1	6.1
Carolinian	3,927	3,693	82	152	4.1	4.1	1.7	7.8
Other language	2,052	1,890	1	161	2.1	2.1	0.0	8.3

So

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

Of those who did not speak English, almost 3 in every 4 migrants to Guam spoke Chuukese at home, compared to less than half of those in the CNMI. The 10 percent of the CNMI migrants speaking Pingelapese and Mokilese is not surprising since residents of those islands are long time residents on Saipan. Also, the large number of "Carolinian" speakers includes those early century migrants, both in themselves and those marrying earlier Carolinian migrants, as well as the newer migrants from the Outer Islands of Yap and Chuuk (also marrying into Carolinian families).

For education, Hezel and Levin (1996) have compared 1990 Census data for Guam and the CNMI for FSM migrants and for the general population, and found that the average education of the FSM migrants was substantially poorer than that of the general population in each place. The 71 percent of Guam's general population 25 years and over being high school graduates was 15 percentage points higher than the FSM migrants' attainment; in the CNMI, 66 percent of the general population finished high school compared to only 47 percent of the FSM citizens (Table 14.8). For college educated, the percentage of FSM born with college degrees was only about one-third that of the general population in both places. "This relatively low level of educational attainment explains why FSM migrants have usually held entry-level jobs (for example, security guards, chambermaids, seamstresses, waiters, and cooks), even after several years abroad." (Hezel and Levin, 1996).

Table 14.8 Educational Attainment of persons age 25 and over, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Educational Attainment	Numbers				Cumulative Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total, (25+ yrs)	45,693	38,494	4,953	2,246	...	...	...	...
None	9,719	8,765	567	387	100.0	100.0	100.0	100.0
Elem: 1 to 4	2,824	2,292	342	190	78.7	77.2	88.6	82.8
Elem: 5 & 6	3,641	3,116	349	176	72.5	71.3	81.6	74.3
Elem: 7	1,604	1,322	192	90	64.6	63.2	74.6	66.5
Elem: 8	5,966	4,952	797	217	61.1	59.7	70.7	62.5
HS: 1	1,980	1,571	289	120	48.0	46.9	54.6	52.8
HS: 2	2,075	1,573	369	133	43.7	42.8	48.8	47.5
HS: 3	1,350	990	259	101	39.1	38.7	41.3	41.5
HS: 4	2,118	1,673	170	275	36.2	36.1	36.1	37.0
HS graduate	6,504	5,230	890	384	31.5	31.8	32.7	24.8
Some college	3,667	2,879	636	152	17.3	18.2	14.7	7.7
AA/AS occup	1,249	1,191	51	7	9.3	10.7	1.9	0.9
AA/AS academic	1,138	1,138	0	0	6.6	7.6	0.8	0.6
Bachelor's degree	1,226	1,181	35	10	4.1	4.7	0.8	0.6
Grad/prof degree	632	621	7	4	1.4	1.6	0.1	0.2

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

For the data shown here, we see that while about 1 in every 3 of the 1994 FSM resident population 25 years and over were high school graduates, and about the same proportion of the Guam migrants were high school graduates, only about 1 in every 4 of the adult CNMI migrants was a high school graduate. For the college graduates, however, the differences are rather striking. Almost 5 percent of the FSM resident adults were college graduates compared to less than one percent of those on Guam and in the CNMI. Clearly, in percentage of college graduates is a measure of the Brain Drain, that drain does not exist.

The lower levels of educational attainment are also seen in the percentages for those with 8 years of schooling or above. While about 60 percent of the FSM adult population had 8 or more years of school, this was true for more than 70 percent of the adult migrants on Guam, and 62 percent of those on Saipan (probably statistically the same as those in the FSM).

For the males, about 41 percent of the FSM residents 25 years and over were high school graduates compared to 34 percent of those on Guam, and only 28 percent in the CNMI (Table 14.9). And, for the college graduates, 7 percent of the FSM residents were college graduates compared to about 1 percent of those on Guam and in the CNMI.

Table 14.9. Educational Attainment for Males, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Educational Attainment	Numbers				Cumulative Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total, (25+ yrs)	23,239	19,375	2,815	1,049	...	...	...	...
None	4,103	3,596	321	186	100.0	100.0	100.0	100.0
Elem: 1 to 4	1,151	889	178	84	82.3	81.4	88.6	82.3
Elem: 5 & 6	1,497	1,241	178	78	77.4	76.9	82.3	74.3
Elem: 7	670	524	107	39	70.9	70.4	76.0	66.8
Elem: 8	2,602	2,089	433	80	68.1	67.7	72.1	63.1
HS: 1	984	759	165	60	56.9	57.0	56.8	55.5
HS: 2	1,099	824	220	55	52.6	53.0	50.9	49.8
HS: 3	726	528	157	41	47.9	48.8	43.1	44.5
HS: 4	1,201	965	107	129	44.8	46.1	37.5	40.6
HS graduate	3,782	3,085	512	185	39.6	41.1	33.7	28.3
Some college	2,341	1,869	376	96	23.3	25.2	15.5	10.7
AA/AS occup	879	841	34	4	13.3	15.5	2.2	1.5
AA/AS academic	767	767	0	0	9.5	11.2	1.0	1.1
Bachelor's degree	891	862	21	8	6.2	7.2	1.0	1.1
Grad/prof degree	546	536	6	4	2.3	2.8	0.2	0.4

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

But, for the females, we see a different situation, indicating that well educated females might be more likely than the males to leave for jobs on Guam. About 22 percent of the FSM female residents and the CNMI migrants 25 years and over were high school graduates compared to 31 percent of those on Guam (Table 14.10). These percentages show an outward pull from Guam.

Table 14.10. Educational Attainment for Females, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Educational Attainment	Numbers				Cumulative Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total, (25+ yrs)	22,454	19,119	2,138	1,197	...	...	...	...
None	5,616	5,169	246	201	100.0	100.0	100.0	100.0
Elem: 1 to 4	1,673	1,403	164	106	75.0	73.0	88.5	83.2
Elem: 5 & 6	2,144	1,875	171	98	67.5	65.6	80.8	74.4
Elem: 7	934	798	85	51	58.0	55.8	72.8	66.2
Elem: 8	3,364	2,863	364	137	53.8	51.6	68.8	61.9
HS: 1	996	812	124	60	38.8	36.7	51.8	50.5
HS: 2	976	749	149	78	34.4	32.4	46.0	45.4
HS: 3	624	462	102	60	30.1	28.5	39.1	38.9
HS: 4	917	708	63	146	27.3	26.1	34.3	33.9
HS graduate	2,722	2,145	378	199	23.2	22.4	31.3	21.7
Some college	1,326	1,010	260	56	11.1	11.2	13.7	5.1
AA/AS occup	370	350	17	3	5.2	5.9	1.5	0.4
AA/AS academic	371	371	0	0	3.5	4.1	0.7	0.2
Bachelor's degree	335	319	14	2	1.9	2.1	0.7	0.2
Grad/prof degree	86	85	1	0	0.4	0.4	0.0	0.0

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

At the lower levels of educational attainment females on Guam also are doing better. While about 52 percent of the FSM adult female population had 8 or more years of school, this was true for more than 69 percent of the adult migrants on Guam, and 62 percent of those on Saipan. Here, there may truly be a kind of brain drain, since the population of female migrants to Guam is better educated than those in the FSM or

those going to the CNMI.

The data for college graduates show lowered levels of educational attainment than for the males. Only 2 percent of the FSM resident females were college graduates compared to about less than 1 percent of those on Guam and almost none of those in the CNMI.

These data show that the outflow of migrants to Guam and the CNMI cannot be called a "brain drain" in the usual sense of that term. They also confirm that those Micronesians with the best degrees, and thus the brightest prospects for employment, will remain in the FSM and take the best jobs (Hezel and McGrath 1989:62 and others). Those who have left home are most frequently those with a high school diploma, or even less education, who would be entering the labor pool in the FSM without the kind of credentials that would have given them a competitive edge in the battle for employment.

### Economic activity

Only 42 percent of the FSM population 16 years and over in 1994 was in the labor force (excluding those doing subsistence only), compared to about 56 percent for those in Guam and the CNMI (Table 14.11). About 54 percent of the FSM males were in the labor force, compared to 66 percent in Guam, and 68 percent in the CNMI; for females, about 31 percent of the FSM adult female population was in the labor force compared to 42 percent on Guam (about what it was for the total FSM population in 1994), and 46 percent in the CNMI.)

Table 14.11. Labor Force Participation, 1994 FSM residents & FSM-born in Guam and CNMI

Labor Force Participation	Numbers			
	Total	FSM 1994	Guam 1992	CNMI 1993
Total, 16+ yrs	62,279	56,896	3,904	1,479
In labor force	27,383	24,372	2,185	826
Percent	44.0	42.8	56.0	55.8
Males, 16+ years	31,664	28,745	2,246	673
In labor force	17,590	15,646	1,488	456
Percent	55.6	54.4	66.3	67.8
Females, 16+ years	30,615	28,151	1,658	806
In labor force	9,793	8,726	697	370
Percent	32.0	31.0	42.0	45.9

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

Even these data show changes from earlier in the Compact period. Some observers, in recent years (particularly some of Guam's bureaucrats), say that many FSM migrants now go to Guam not to work, but to educate their children in Guam's schools, or to take advantage of the welfare benefits available on the island. The data on labor force participation, while extremely susceptible to the whims of inflation/deflation and recession/expansion of the major powers like the United States and Japan, also can show real change. It is useful to note that the percentage of adult Micronesians on Guam who were employed decreased from 62 percent to 56 percent between 1990 and 1992, while the total island employment increased 24 percent during the period (Hezel and Levin 1996).

The decrease of employed adult FSM migrants in the CNMI during roughly the same period was much

smaller, down from 58 to 56 percent. We may expect this downward trend in employment to continue — at least in the short term — as migrants reconstitute their households and bring in an increasingly large number of housewives and older people who will not immediately enter the labor force; of course, eventually even these newest immigrants to the CNMI may move into the labor force and add to the household's income.

The 1990 Census data showed that Micronesian labor force participation on Guam was comparable to that of the general population on the island. Close to 70 percent of all FSM-born migrants in 1990 were either working or seeking employment at that time, whatever their original reason may have been for moving to Guam. The CNMI saw an appreciable difference in labor force participation: 64 percent of FSM migrants versus 82 percent of the general population. The CNMI Micronesian labor force participation was lower than for Guam, perhaps because of a different economy, while the very high rate of participation of the general population there can be explained by the many foreign-born workers.

Occupations are usually related to educational attainment, that is, usually the greater the educational attainment, the higher status the job. The data from the 1994 Census and the surveys tend to bare this out. About 16 percent of the employed FSM residents 16 years and over in 1994 were managers and professionals compared to 11 percent of those in the CNMI and 3 percent of those on Guam (Table 14.12). (Since about 10 percent of the occupations in the CNMI were not reported, the figures for CNMI may be somewhat skewed). These data show that a larger percentage of FSM residents are in these higher status jobs than the migrants; of course, in any migrant community it takes time to work one's way into these higher status jobs, unless educational background or work experience is sufficient to go immediately into these jobs.

Table 14.12. Occupation for persons age 16 and over, 1994 FSM residents & FSM-born in Guam and CNMI

Occupation	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total, (16+ yrs)	21,913	18,920	2,185	808	100.0	100.0	100.0	100.0
Managers and Profess	3,242	3,091	60	91	14.8	16.3	2.7	11.3
Tech, sales, admin	6,876	6,368	304	204	31.4	33.7	13.9	25.2
Service	3,567	2,631	858	78	16.3	13.9	39.3	9.7
Farm, fish	1,468	1,367	91	10	6.7	7.2	4.2	1.2
Crafts	2,646	2,468	120	58	12.1	13.0	5.5	7.2
Oper., fabr, labor	3,956	2,989	683	284	18.1	15.8	31.3	35.1
Unknown (incl AF)	158	6	69	83	0.7	0.0	3.2	10.3

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

About 34 percent of the employed FSM residents were in technical, sales, and administrative support occupations, a second level of "white collar" workers. Only about 25 percent of the CNMI workers were in these occupations, and only 14 percent of those on Guam. Hence, while about half of all workers in the FSM were "white collar", but only 16 percent of those on Guam, and 36 percent of those in the CNMI. Note that in FSM, at least, almost all government workers fall in these categories.

On the other hand, almost 2 of every 5 Guam migrant workers were in service occupations, likely showing lower educational attainment among these migrants since less education is needed to do service occupations than to be managers or technical workers. About 14 percent of the FSM resident workers were in service occupations, and less than 10 percent of those in the CNMI.

The CNMI, with its garment industries, had the highest proportion of operators, fabricators, and laborers, at 35 percent of the workers. More than 31 percent of Guam's workers were in this category and only 16 percent of the resident FSM workers. These workers are the traditional "blue collar" workers, and because of the lack of manufacturing and other industries in the FSM, few workers are in this category.

For the males, a smaller percentage of workers were technicians (since many of these are secretaries, nurses aides, and teacher's aides), and a greater percentage were operators, fabricators, and laborers (Table 14.13). Almost 2 in every 5 of Guam's male migrants were in this latter category, showing construction workers, as well as those in manufacturing.

Table 14.13. Occupation for Males, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Occupation	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total, 16+	14,893	12,961	1,488	444	100.0	100.0	100.0	100.0
Managers and Profess	2,404	2,301	41	62	16.1	17.8	2.8	14.0
Tech, sales, admin	3,371	3,115	155	101	22.6	24.0	10.4	22.7
Service	2,093	1,579	464	50	14.1	12.2	31.2	11.3
Farm, fish	1,295	1,203	84	8	8.7	9.3	5.6	1.8
Crafts	2,278	2,134	119	25	15.3	16.5	8.0	5.6
Oper., fabr, labor	3,357	2,623	581	153	22.5	20.2	39.0	34.5
Unknown (incl AF)	95	6	44	45	0.6	0.0	3.0	10.1

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

More than half of all the female FSM resident workers were technicians, in sales, or worked as administrative support personnel (Table 14.14). By contrast, more than half of Guam's female migrant workers were in service occupations. For the CNMI, the largest category for females was "operators, fabricators, and laborers", reflecting participation in the garment industries, but it is also important to note that 28 percent of the CNMI females worked as technicians, sales, or in administrative support.

Table 14.14. Occupation for Females, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Occupation	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total, (16+ yrs)	7,020	5,959	697	364	100.0	100.0	100.0	100.0
Managers and Profess	838	790	19	29	11.9	13.3	2.7	8.0
Tech, sales, admin	3,505	3,253	149	103	49.9	54.6	21.4	28.3
Service	1,474	1,052	394	28	21.0	17.7	56.5	7.7
Farm, fish	173	164	7	2	2.5	2.8	1.0	0.5
Crafts	368	334	1	33	5.2	5.6	0.1	9.1
Oper., fabr, labor	599	366	102	131	8.5	6.1	14.6	36.0
Unknown (incl AF)	63	0	25	38	0.9	0.0	3.6	10.4

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

## Housing

The 1994 FSM census and the surveys in Guam and the CNMI provide information on housing conditions in their respective areas. Housing variables give information in themselves for planning, but also serve as



social indicators. By considering these items by themselves, and in combination with other variables, government agencies can assess changing housing conditions, energy consumption, water and sewer distribution and use, and so forth. The FSM census had 16,609 housing units compared to the 599 units in Guam and 440 units in the CNMI (Table 14.15).

Table 14.15. Materials for Walls and Roof, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Housing	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
<b>MAIN MATERIAL FOR WALLS</b>								
Total	17,648	16,609	599	440	100.0	100.0	100.0	100.0
Poured concrete	3,321	3,272	31	18	18.8	19.7	5.2	4.1
Concrete blocks	4,276	3,718	374	184	24.2	22.4	62.4	41.8
Metal	5,151	4,970	50	131	29.2	29.9	8.3	29.8
Wood	4,454	4,206	142	106	25.2	25.3	23.7	24.1
Thatch	446	443	2	1	2.5	2.7	0.3	0.2
<b>MAIN MATERIAL FOR ROOF</b>								
Total	17,648	16,609	599	440	100.0	100.0	100.0	100.0
Concrete	2,946	2,466	344	136	16.7	14.8	57.4	30.9
Metal	13,190	12,667	228	295	74.7	76.3	38.1	67.0
Wood	250	217	25	8	1.4	1.3	4.2	1.8
Thatch	1,262	1,259	2	1	7.2	7.6	0.3	0.2

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

About 1 in every 5 housing units in the Federated States of Micronesia in 1994 had concrete walls, and another 1 in 5 units were constructed of concrete blocks. While slightly less than half of the migrant housing units in the CNMI were built of concrete, either blocks or poured concrete. The percentage of units with metal walls was about the same in the FSM as the CNMI, but the percentage of migrant units on Guam with metal walls was much less. About 3 percent of the units in the FSM still had thatch walls. Hence, the quality of the walls on Guam was more substantial than those in the FSM and in the CNMI, which were about the same.

Similarly, almost 3 in every 5 migrant housing units on Guam had roofs made of concrete compared to about 3 in every 20 in the FSM, and 3 in every 10 in the CNMI. Most of the rest of the roofs in all three areas were metal — about 3 in every 4 in the FSM, 2 in every 3 in the CNMI, but only 2 in every 5 on Guam. Once again, Guam's housing was superior to that in the CNMI and in the FSM, more of the units were built of concrete and had concrete rather than metal roofs.

As noted earlier, the average household in the FSM in 1994 had about 6.8 persons. The FSM citizens on Guam in 1992 were distributed in 599 housing units, with an average of 8.3 persons, while the average migrant housing unit in the CNMI held only 5.1 persons (Table 14.16). Housing units in general in the CNMI tended to be physically larger than those on Guam and in the FSM, in part because many Guam migrants lived in apartments, while many more of the CNMI migrants and FSM residents lived in single-family houses (but the FSM units tended to be smaller.)

Table 14.16. Housing, 1994 FSM residents &amp; FSM-born in Guam and CNMI

Housing	Numbers				Percents			
	Total	FSM 1994	Guam 1992	CNMI 1993	Total	FSM 1994	Guam 1992	CNMI 1993
Total Units	17,648	16,609	599	440	100.0	100.0	100.0	100.0
Persons per unit	...	6.8	...	...	...	...	...	...
Median:								
Rooms	...	3.2	...	...	...	...	...	...
Bedrooms	...	2.3	...	...	...	...	...	...
Public system water	3,944	2,963	593	388	22.3	17.8	99.0	88.2
Inside tub/shower	3,069	2,272	545	252	17.4	13.7	91.0	57.3
Public sewer	2,469	1,781	526	162	14.0	10.7	87.8	36.8
Hot/cold water	1,078	670	348	60	6.1	4.0	58.1	13.6
Cold water only	7,094	6,606	241	247	40.2	39.8	40.2	56.1
No flush toilet	11,116	10,895	37	184	63.0	65.6	6.2	41.8
Electricity	9,430	8,514	560	356	53.4	51.3	93.5	80.9
Electric stove	2,112	1,416	481	215	12.0	8.5	80.3	48.9
Refrigerator	4,676	3,899	525	252	26.5	23.5	87.6	57.3
Television	5,548	4,864	438	246	31.4	29.3	73.1	55.9
Video Cassette Player	4,505	3,958	350	197	25.5	23.8	58.4	44.8
Radio	8,503	7,740	476	287	48.2	46.6	79.5	65.2
Sir conditioner	1,140	903	138	99	6.5	5.4	23.0	22.5
Telephone	4,900	4,455	296	149	27.8	26.8	49.4	33.9
No car	12,925	12,746	73	106	73.2	76.7	12.2	24.1

Source: 1994 FSM Census, 1992 Survey of Micronesians on Guam,  
1993 Survey of Micronesian Migrants in the CNMI

Migrant housing on Guam was considerably more crowded than housing in the CNMI, partly because of the higher rental rates on Guam (and the lack of available low cost housing). A single room on Guam had an average of 2.4 occupants, compared to the 1.7 figure for the CNMI.

Source of water and plumbing differed between the three areas. While about 1 in every 6 FSM units was connected to a public water system, almost every unit in Guam had public water, and more than 7 in every 8 units in the CNMI. About 1 in every 10 units in the FSM had access to a public sewer compared to almost 9 in 10 on Guam but only about 4 in 10 in the CNMI. Similarly, only 14 percent of the units in the FSM had an inside bathtub or shower compared to 91 percent on Guam and 57 percent in the CNMI. Hence, migrants to Guam had the handiest access to water, followed by the CNMI migrants, with the FSM residents being least likely to be able to simply walk to a tap and have water.

Only 4 percent of the housing units in the FSM had both hot and cold running water, compared to about 14 percent in the CNMI, but about 58 percent of those on Guam. While hot water is a convenience for washing clothes and cooking, since the climate in all areas is so warm, hot water is not the necessity it is in other places in the world.

However, fully 2 in every 3 housing units in the FSM did not have a flush toilet, compared to only 2 in 5 units in the CNMI, and 1 in 16 among the Guam migrants. While flush toilets are big users of sometimes limited supplies of water, the FSM residents give up certain aspects of sanitation for the privilege.

About half of the FSM resident units were connected to electricity in 1994, compared to about 4 in every 5 in the CNMI, and most of the Guam migrant units. While electricity is usually considered a necessity in this day and age, and hence is expected in most societies, many of the outlying areas of the major islands, and

almost all of the Outer Islands are ill equipped to maintain electrical systems, and, therefore, do not have them. Most of the households in Guam and Saipan, of course, do have access to electricity.

Because of the lack of electricity, many appliances could not be used in the FSM housing units. Only 8 percent of the FSM units had electric stoves compared to 80 percent of Guam's units, and about half of those in the CNMI. Many of the rest of the units used kerosene stoves, but others used the traditional methods — wood or coconut husks — at least in the outlying areas of the FSM. About 1 in every 4 FSM units had a refrigerator (compared to 88 percent on Guam and 57 percent in the CNMI), 3 in 10 had a television (compared to 3 in 4 for Guam and more than half for CNMI), and 1 in 4 had a Video Cassette recorder (compared to almost 3 in 5 for Guam and 2 in 5 for CNMI). All of these appliances are clearly more prevalent in Guam and the CNMI because electricity is available, and because the households, for whatever reason, are more readily able to afford them.

Radios and telephones are important for transmitting information, particularly in times of potential catastrophe. About half of the housing units in the FSM had a working radio, whether battery or electric, compared to about 4 in every 5 among the Guam migrants, and about 2 in every 3 units in the CNMI. Similarly, while about 1 in every 4 units in the FSM had a telephone, compared to about half of the Guam migrant's units and about 1 in every 3 units among the CNMI migrants.

Air conditioners, of course, provided a level of cooling unavailable from fans alone. And while the FSM, being equatorial, tends to be very hot and very humid, only about 1 in every 20 units had air conditioning (compared to about 1 in every 5 units among the migrants to both areas). Cost is a factor, as is maintenance. But energy consumption could also be greatly affected if many units suddenly had installed and used air conditioning units; among Guam's other current problems with electricity has been the enormous increase in air conditioning use in the last few years.

Finally, owning an automobile is important for transportation, but also is something of a status symbol. Automobiles, while giving greatly increased mobility, also often become a drain on housing financial resources, as well as contribute to various kinds of pollution in an already fragile environment. About 3 in every 4 FSM resident units did not have at least one car, compared to 1 in every 8 Guam migrant units, and about 1 in every 4 units.

So, Guam offers its migrants well-built but rather cramped housing with less living space per person than those in the CNMI (or in many places in FSM). Even recreational spaces and cooking areas were indoors, in marked contrast to Micronesian custom on their home islands (Levin and Mailos 1992: 5-7). On the other hand, the housing on Guam was equipped with all of the conveniences that a significant number of CNMI migrants lacked, and which most of the housing units in the FSM did not have. In short, the CNMI offers migrants a lifestyle that is very similar to what the FSM residents continue to have. Whatever the housing facilities the CNMI migrants may lack, the environment is more comfortable for the families that are gradually assembling there.

## **Conclusion**

The migration rate from the FSM, which has been rather steady since 1986, shows no signs of falling off completely in the near future. In view of the continued high fertility in the Federated States of Micronesia, we can expect emigration either to maintain its present high level or to increase, unless the governments of

Guam and the CNMI intervene.

Over the first half decade of the Compact period, the average annual migrant outflow was about 1,000 persons, or about 1 percent of the FSM resident population per year. In all likelihood, this annual number will not be reduced significantly in the near future. By the year 2000, for example, Guam could have as many as 10,000 FSM migrants, including more than 8,000 Chuukese.

We know from census items that the traffic to Guam and the CNMI is not one way; considerable back migration occurs, that is, return of former emigrants to their original home. Indeed, much of the appeal of Guam and the CNMI, in contrast to Hawaii and the mainland United States, is the ease and inexpensiveness of a return trip to one's home island. The extent of back migration has yet to be adequately measured, however.

The data from the 1992 and 1993 surveys reveal some pronounced differences between the FSM migrant communities on Guam and in the Northern Marianas, and of the resident population in the FSM. The households in the CNMI were rapidly filling out with dependents — women, children, and the elderly — and were evidently well on the way to full reconstitution as normal Micronesian households. Although no strong evidence exists that this was happening on Guam, the data provide hints of the ways in which the Micronesian community there was being transformed between 1990 and 1992. The drop in employment rate among migrants and the possible increase in the number of those who speak their own language more than English suggests that more migrants are choosing not to enter the labor force. We can expect that in future years the size and pattern of the FSM-born households will continue to develop along the lines of the model elucidated by Rubinstein.

A comparison of the educational achievement of migrants with the resident FSM population explodes the myth of a "brain drain" from the FSM since the implementation of the compact. Contrary to what we read in the academic and popular press, the FSM is not being deprived of its most valuable human resources through migration. The best educated of the FSM citizens, those with college degrees, generally stayed home to take their pick of jobs on their own islands. Meanwhile, the unemployed high school graduates (or less than graduates) without the skills or educational attainment to compete for jobs at home left to take advantage of the job markets in Guam and in the CNMI. By and large, they took jobs having little appeal for local people and lack the background to advance beyond these entry-level occupations. Far from being a "brain drain", out migration is a spillway for excess bodies in the labor pool — that is, those who would be unemployable at home.

The total income earned by migrants on Guam and in the CNMI is estimated at more than \$35 million a year during the period studied and ought to have been well over \$40 million in 1995. This represents a substantial sum of money, given the present feeble condition of the FSM's economy. The remittances that were recorded in 1994 signal for the first time a change in direction of the dollar tide; the money has at least begun to flow into rather than out of the FSM, and the remittances of \$1.26 million in 1993 should increase in years to come.

The data on the short period between the 1990 census and the surveys on Guam and in the CNMI a few years later are less significant for the numbers they report than for the trends they reveal. Not only are the extent and rate of the FSM population outflow more precisely defined, but the changing patterns of household composition and other features of life in the migrants' destinations are taking clearer shape.

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Appendix B

**1994**

**FSM - WIDE CENSUS**

**QUESTIONNAIRE**



**1994 CENSUS OF POPULATION AND HOUSING  
FEDERATED STATES OF MICRONESIA (FSM)  
OFFICE OF PLANNING AND STATISTICS**



**INTRODUCTION:** Hello, my name is (Your name) and I'm working for the 1994 FSM Housing and Population Census. This is my identification (PAUSE). I have some questions I need to ask you. Ask the questions on page 1. Complete a form for each household.

**GEOGRAPHIC CODES  
COMPLETE BEFORE THE INTERVIEW**

A. State: <input type="checkbox"/>	F. Municipality: <input type="checkbox"/>
B. Enumeration District: <input type="checkbox"/>	G. Village: <input type="checkbox"/>
C. Block: <input type="checkbox"/>	H. Time Interview Started: <input type="checkbox"/>
D. Map Spot: <input type="checkbox"/>	<input type="checkbox"/> AM <input type="checkbox"/> PM
E. Household Number: <input type="checkbox"/>	

I. Description of the housing unit:

**COMPLETE AFTER THE INTERVIEW**

J. Respondent's Name: \_\_\_\_\_

K. Respondent's Telephone No.: \_\_\_\_\_

L. Population: Male ☐ Female ☐ Total: ☐

M. Type of unit: ☐ Occupied ☐ Regular Vacant ☐ URE

N. Completed after: ☐ Yes ☐ No

O. Total number of households in the unit: ☐

P. This interview completed: ☐ AM ☐ PM

Q. CERTIFICATION: I certify that the entries I have made on this questionnaire are true and correct to the best of my knowledge.

Enumerator's Name (Print): \_\_\_\_\_ Enumerator's Code: ☐

Enumerator's Signature: \_\_\_\_\_ Date: ☐ / ☐ / ☐ 1994 (MM/DD/YY)

Crew Leader's Signature: \_\_\_\_\_ Date: ☐ / ☐ / ☐ 1994 (MM/DD/YY)

Crew Leader District (C/D): \_\_\_\_\_

**NOTICE:** You are required by Public Law No. 5-77 to answer the 1994 Census. Your answers will be kept confidential by that same law. Only sworn Census employees may see your answers. Your information will only be used for statistical purposes.

The 1994 Census of Population and Housing must count every person at his or her "usual residence." This means the place where the person lives and sleeps most of the time. Include:

- Everyone who usually lives here such as family members, housemates and roommates, foster children, roomers, boarders, and live-in employees.
- Persons who are temporarily away on a business trip, on vacation, or in a general hospital.
- Students who live here while attending school/collage.
- Newborn babies born on or before September 18, 1994.
- Persons who stay here most of the week, even if they have a home elsewhere.
- Persons who stay here who are staying here in a temporary place.
- Persons who stay here in a temporary place.
- Persons who are confined in a institution.
- Students who live somewhere else while attending school.
- Persons in the Armed Forces who live somewhere else.
- Persons who stay somewhere else most of the week.

OFFICE USE ONLY COVERAGE 1a ☐ 1b ☐

1a. Please give me the names of each person living here whose usual residence is this household on September 18, 1994, including all persons staying here who have no other home. Begin with the household member in whose name the home is owned, being bought, or rented. If there is no such person, start with any adult household member. If EVERYONE is staying here, temporarily and usually lives in no other place, give me the name of each person and complete 1b.

Each booklet contains one (1) up to ten (10) persons. If more than 10 persons live in this household, you must use more than one booklet.

LAST FIRST MI.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

BOOKLET ☐ 1 OF ☐

1b. When you told me the names of the persons living here on September 18, 1994, did you leave anyone out because you were not sure if the person should be listed - for example, someone temporarily away on a business trip or vacation, a newborn baby still in the hospital, or a person who stays here once in a while and has no other home?

- 1 ☐ Yes - Determine if you should include the person(s) based on the instructions for question 1a. If so, include the person and write the person's number.
- 2 ☐ No

If you told me the names of the persons living here on September 18, 1994, did you include anyone who was temporarily away on a business trip or vacation, a newborn baby still in the hospital, or a person who stays here once in a while and has no other home?

- 1 ☐ Yes - Determine if you should include the person(s) based on the instructions for question 1a. If so, include the person's number. If not, draw a line through any entry.
- 2 ☐ No

If EVERYONE listed is staying here, temporarily and usually lives in no other place, mark (X) in column 1b.

1c. Where do these people usually live? If the usual residence is within the FSM, enter the State, Municipality, and Village.

State: \_\_\_\_\_ Municipality: \_\_\_\_\_ Village: \_\_\_\_\_

If the usual residence is not within the FSM, enter the country.

Country: \_\_\_\_\_

**NOTES:**



## HOUSING QUESTIONS

**H1. Which best describes this building? Include all apartments even if vacant.**

1. ☐ A pre-fabricated detached house any other house
2. ☐ A one family house attached to one or more houses
3. ☐ A building with 2 apartments
4. ☐ A building with 3 or 4 apartments
5. ☐ A building with 5 to 9 apartments
6. ☐ A building with 10 to 19 apartments
7. ☐ A building with 20 or more apartments
8. ☐ Other \_\_\_\_\_
9. ☐ Don't know

**H2. When did (person 1 listed in line 1 of question 1a on page 1) move to this house/apartment?**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> 1959 - 1964 | 2. <input type="checkbox"/> 1965 - 1969     |
| 3. <input type="checkbox"/> 1970 - 1974 | 4. <input type="checkbox"/> 1975 or earlier |
| 5. <input type="checkbox"/> 1975 - 1979 | 6. <input type="checkbox"/> Don't know      |

**H3. What is the MAIN type of material used for the outside walls of this building?**

- Read each category and mark (X) ONE box.**
- |   |  |
|---|--|
| 1. <input type="checkbox"/> Poured concrete | 2. <input type="checkbox"/> Tagish               |
| 3. <input type="checkbox"/> Concrete blocks | 4. <input type="checkbox"/> Local wood or bamboo |
| 5. <input type="checkbox"/> Metal/tin       | 6. <input type="checkbox"/> Other                |
| 7. <input type="checkbox"/> Plywood         | 8. <input type="checkbox"/> No walls             |

**H4. What is the MAIN type of material used for the roof of this building?**

- Read each category and mark (X) ONE box.**
- |   |                                    |
|---|------------------------------------|
| 1. <input type="checkbox"/> Poured concrete | 2. <input type="checkbox"/> Thatch |
| 3. <input type="checkbox"/> Metal/tin       | 4. <input type="checkbox"/> Bamboo |
| 5. <input type="checkbox"/> Wood            | 6. <input type="checkbox"/> Other  |

**H5. What is the MAIN type of material used for the foundation of this building?**

- |   |                                   |
|---|-----------------------------------|
| 1. <input type="checkbox"/> Concrete            | 2. <input type="checkbox"/> Stone |
| 3. <input type="checkbox"/> Wood pier or piling | 4. <input type="checkbox"/> Other |
| 5. <input type="checkbox"/> Coral               |                                   |

**H6. What is the MAIN type of material used for the floor of this building?**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> 1959 - 1964 | 2. <input type="checkbox"/> 1965 - 1969     |
| 3. <input type="checkbox"/> 1970 - 1974 | 4. <input type="checkbox"/> 1975 or earlier |
| 5. <input type="checkbox"/> 1975 - 1979 | 6. <input type="checkbox"/> Don't know      |

**H7. How many bedrooms are there in this house/apartment? Count all bedrooms including a kitchen bedroom, but do NOT count a bathroom, a living room, a dining room, or a hall.**

- ☐ Bedroom, if 8 or more rooms enter 8

**H8. How many rooms are designed primarily for sleeping?**

- ☐ Bedroom, if 8 or more rooms enter 8

**H9. Do you have piped water?**

- |  |               |
|--|---------------|
| 1. <input type="checkbox"/> Yes, hot and cold in this unit   | EXP TO<br>M20 |
| 2. <input type="checkbox"/> Yes, cold only in this unit      |               |
| 3. <input type="checkbox"/> Yes, cold only outside this unit |               |
| 4. <input type="checkbox"/> No piped water                   |               |

**H10. What type of energy does your water heater use most?**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Electricity | 2. <input type="checkbox"/> Solar power |
| 3. <input type="checkbox"/> Gas         | 4. <input type="checkbox"/> Other fuel  |

**H11. Do you have a bathtub or shower?**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Yes, in this unit     | 2. <input type="checkbox"/> Yes, outside this building |
| 3. <input type="checkbox"/> Yes, in this building | 4. <input type="checkbox"/> No                         |

**H12. Do you have a flush toilet?**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Yes, in this unit      | 2. <input type="checkbox"/> No, latrine, pit, or bucket |
| 3. <input type="checkbox"/> Yes, in this building  | 4. <input type="checkbox"/> No, other or none           |
| 5. <input type="checkbox"/> Yes, outside this unit |   |

**H13. Does this unit have electric power?**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Yes, public utility | 2. <input type="checkbox"/> Yes, solar power |
| 3. <input type="checkbox"/> Yes, generator      | 4. <input type="checkbox"/> No               |

**H14. Do you have a telephone or CB radio in this unit?**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Yes, both           | 2. <input type="checkbox"/> Yes, CB radio only |
| 3. <input type="checkbox"/> Yes, telephone only | 4. <input type="checkbox"/> None               |

**H15. Do you have a battery operated radio? Count car radios, translator radios, and other battery operated sets in working order or needing only new batteries for operation.**

- |  |                                |
|--|--------------------------------|
| 1. <input type="checkbox"/> Yes, 1 or more | 2. <input type="checkbox"/> No |
|--|--------------------------------|

**H16. Do you have a television set or Video Cassette Recorder (VCR)?**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Yes, both TV and VCR | 2. <input type="checkbox"/> Yes, VCR only |
| 3. <input type="checkbox"/> Yes, TV only         | 4. <input type="checkbox"/> No            |

**H17. Do you have air conditioning?**

- |  |
|--|
| 1. <input type="checkbox"/> Yes, central air conditioning system |
| 2. <input type="checkbox"/> Yes, 1 installed room unit           |
| 3. <input type="checkbox"/> Yes, 2 or more individual room units |
| 4. <input type="checkbox"/> No                                   |

**H18. What is your main source of drinking water?**

- |  |
|--|
| 1. <input type="checkbox"/> A public system only                           |
| 2. <input type="checkbox"/> A community system only                        |
| 3. <input type="checkbox"/> A public system and catchment                  |
| 4. <input type="checkbox"/> A community system and catchment               |
| 5. <input type="checkbox"/> An individual well                             |
| 6. <input type="checkbox"/> A catchment, tank, or cistern only             |
| 7. <input type="checkbox"/> A public standpipe or steel hydrant            |
| 8. <input type="checkbox"/> Purchased bottled water                        |
| 9. <input type="checkbox"/> Some other source such as spring, stream, etc. |

**H19. Is there a public sewer or septic tank in this unit?**

- |  |
|--|
| 1. <input type="checkbox"/> Yes, connected to a public sewer           |
| 2. <input type="checkbox"/> No, connected to a septic tank or cesspool |
| 3. <input type="checkbox"/> No, use other means                        |

**H20. Are you using any fertilizer or other chemicals on your land?**

- |   |
|---|
| 1. <input type="checkbox"/> Inside this unit            |
| 2. <input type="checkbox"/> Outside this unit           |
| 3. <input type="checkbox"/> No fertilizer - EXP TO H17a |

**H21. What is the MAIN source of fuel for this unit?**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Electric range | 2. <input type="checkbox"/> Portable electric stove |
| 3. <input type="checkbox"/> Kerosene stove | 4. <input type="checkbox"/> Wood stove              |
| 5. <input type="checkbox"/> Gas stove      | 6. <input type="checkbox"/> Open fire               |
| 7. <input type="checkbox"/> Microwave oven | 8. <input type="checkbox"/> Other                   |

**H22. Do you have a refrigerator in this unit?**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Yes, electric | 2. <input type="checkbox"/> Yes, kerosene   |
| 3. <input type="checkbox"/> Yes, gas      | 4. <input type="checkbox"/> No refrigerator |

**H23. Do you have a television set in this unit?**

- |                                 |                                |
|---------------------------------|--------------------------------|
| 1. <input type="checkbox"/> Yes | 2. <input type="checkbox"/> No |
|---------------------------------|--------------------------------|

**H24. Do you have a sink in this unit?**

- |                                 |                                |
|---------------------------------|--------------------------------|
| 1. <input type="checkbox"/> Yes | 2. <input type="checkbox"/> No |
|---------------------------------|--------------------------------|

**H25. How many people have ever lived in this unit?**

- |  |
|--|
| 1. <input type="checkbox"/> If 8 or more enter 8 |
|--|

**H26. How many people have ever lived in this household?**

- |  |
|--|
| 1. <input type="checkbox"/> If 8 or more enter 8 |
|--|

**H27. What is the average monthly bill for electricity for this unit?**

- |                                       |  |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------|--|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. <input type="checkbox"/> \$1 - \$5 | 2. <input type="checkbox"/> \$6 - \$10 | 3. <input type="checkbox"/> \$11 - \$15 | 4. <input type="checkbox"/> \$16 - \$20 | 5. <input type="checkbox"/> \$21 - \$25 | 6. <input type="checkbox"/> \$26 - \$30 | 7. <input type="checkbox"/> \$31 - \$35 | 8. <input type="checkbox"/> \$36 - \$40 | 9. <input type="checkbox"/> \$41 - \$45 | 10. <input type="checkbox"/> \$46 - \$50 | 11. <input type="checkbox"/> \$51 - \$55 | 12. <input type="checkbox"/> \$56 - \$60 | 13. <input type="checkbox"/> \$61 - \$65 | 14. <input type="checkbox"/> \$66 - \$70 | 15. <input type="checkbox"/> \$71 - \$75 | 16. <input type="checkbox"/> \$76 - \$80 | 17. <input type="checkbox"/> \$81 - \$85 | 18. <input type="checkbox"/> \$86 - \$90 | 19. <input type="checkbox"/> \$91 - \$95 | 20. <input type="checkbox"/> \$96 - \$100 | 21. <input type="checkbox"/> \$101 - \$105 | 22. <input type="checkbox"/> \$106 - \$110 | 23. <input type="checkbox"/> \$111 - \$115 | 24. <input type="checkbox"/> \$116 - \$120 | 25. <input type="checkbox"/> \$121 - \$125 | 26. <input type="checkbox"/> \$126 - \$130 | 27. <input type="checkbox"/> \$131 - \$135 | 28. <input type="checkbox"/> \$136 - \$140 | 29. <input type="checkbox"/> \$141 - \$145 | 30. <input type="checkbox"/> \$146 - \$150 | 31. <input type="checkbox"/> \$151 - \$155 | 32. <input type="checkbox"/> \$156 - \$160 | 33. <input type="checkbox"/> \$161 - \$165 | 34. <input type="checkbox"/> \$166 - \$170 | 35. <input type="checkbox"/> \$171 - \$175 | 36. <input type="checkbox"/> \$176 - \$180 | 37. <input type="checkbox"/> \$181 - \$185 | 38. <input type="checkbox"/> \$186 - \$190 | 39. <input type="checkbox"/> \$191 - \$195 | 40. <input type="checkbox"/> \$196 - \$200 | 41. <input type="checkbox"/> \$201 - \$205 | 42. <input type="checkbox"/> \$206 - \$210 | 43. <input type="checkbox"/> \$211 - \$215 | 44. <input type="checkbox"/> \$216 - \$220 | 45. <input type="checkbox"/> \$221 - \$225 | 46. <input type="checkbox"/> \$226 - \$230 | 47. <input type="checkbox"/> \$231 - \$235 | 48. <input type="checkbox"/> \$236 - \$240 | 49. <input type="checkbox"/> \$241 - \$245 | 50. <input type="checkbox"/> \$246 - \$250 | 51. <input type="checkbox"/> \$251 - \$255 | 52. <input type="checkbox"/> \$256 - \$260 | 53. <input type="checkbox"/> \$261 - \$265 | 54. <input type="checkbox"/> \$266 - \$270 | 55. <input type="checkbox"/> \$271 - \$275 | 56. <input type="checkbox"/> \$276 - \$280 | 57. <input type="checkbox"/> \$281 - \$285 | 58. <input type="checkbox"/> \$286 - \$290 | 59. <input type="checkbox"/> \$291 - \$295 | 60. <input type="checkbox"/> \$296 - \$300 | 61. <input type="checkbox"/> \$301 - \$305 | 62. <input type="checkbox"/> \$306 - \$310 | 63. <input type="checkbox"/> \$311 - \$315 | 64. <input type="checkbox"/> \$316 - \$320 | 65. <input type="checkbox"/> \$321 - \$325 | 66. <input type="checkbox"/> \$326 - \$330 | 67. <input type="checkbox"/> \$331 - \$335 | 68. <input type="checkbox"/> \$336 - \$340 | 69. <input type="checkbox"/> \$341 - \$345 | 70. <input type="checkbox"/> \$346 - \$350 | 71. <input type="checkbox"/> \$351 - \$355 | 72. <input type="checkbox"/> \$356 - \$360 | 73. <input type="checkbox"/> \$361 - \$365 | 74. <input type="checkbox"/> \$366 - \$370 | 75. <input type="checkbox"/> \$371 - \$375 | 76. <input type="checkbox"/> \$376 - \$380 | 77. <input type="checkbox"/> \$381 - \$385 | 78. <input type="checkbox"/> \$386 - \$390 | 79. <input type="checkbox"/> \$391 - \$395 | 80. <input type="checkbox"/> \$396 - \$400 | 81. <input type="checkbox"/> \$401 - \$405 | 82. <input type="checkbox"/> \$406 - \$410 | 83. <input type="checkbox"/> \$411 - \$415 | 84. <input type="checkbox"/> \$416 - \$420 | 85. <input type="checkbox"/> \$421 - \$425 | 86. <input type="checkbox"/> \$426 - \$430 | 87. <input type="checkbox"/> \$431 - \$435 | 88. <input type="checkbox"/> \$436 - \$440 | 89. <input type="checkbox"/> \$441 - \$445 | 90. <input type="checkbox"/> \$446 - \$450 | 91. <input type="checkbox"/> \$451 - \$455 | 92. <input type="checkbox"/> \$456 - \$460 | 93. <input type="checkbox"/> \$461 - \$465 | 94. <input type="checkbox"/> \$466 - \$470 | 95. <input type="checkbox"/> \$471 - \$475 | 96. <input type="checkbox"/> \$476 - \$480 | 97. <input type="checkbox"/> \$481 - \$485 | 98. <input type="checkbox"/> \$486 - \$490 | 99. <input type="checkbox"/> \$491 - \$495 | 100. <input type="checkbox"/> \$496 - \$500 | 101. <input type="checkbox"/> \$501 - \$505 | 102. <input type="checkbox"/> \$506 - \$510 | 103. <input type="checkbox"/> \$511 - \$515 | 104. <input type="checkbox"/> \$516 - \$520 | 105. <input type="checkbox"/> \$521 - \$525 | 106. <input type="checkbox"/> \$526 - \$530 | 107. <input type="checkbox"/> \$531 - \$535 | 108. <input type="checkbox"/> \$536 - \$540 | 109. <input type="checkbox"/> \$541 - \$545 | 110. <input type="checkbox"/> \$546 - \$550 | 111. <input type="checkbox"/> \$551 - \$555 | 112. <input type="checkbox"/> \$556 - \$560 | 113. <input type="checkbox"/> \$561 - \$565 | 114. <input type="checkbox"/> \$566 - \$570 | 115. <input type="checkbox"/> \$571 - \$575 | 116. <input type="checkbox"/> \$576 - \$580 | 117. <input type="checkbox"/> \$581 - \$585 | 118. <input type="checkbox"/> \$586 - \$590 | 119. <input type="checkbox"/> \$591 - \$595 | 120. <input type="checkbox"/> \$596 - \$600 | 121. <input type="checkbox"/> \$601 - \$605 | 122. <input type="checkbox"/> \$606 - \$610 | 123. <input type="checkbox"/> \$611 - \$615 | 124. <input type="checkbox"/> \$616 - \$620 | 125. <input type="checkbox"/> \$621 - \$625 | 126. <input type="checkbox"/> \$626 - \$630 | 127. <input type="checkbox"/> \$631 - \$635 | 128. <input type="checkbox"/> \$636 - \$640 | 129. <input type="checkbox"/> \$641 - \$645 | 130. <input type="checkbox"/> \$646 - \$650 | 131. <input type="checkbox"/> \$651 - \$655 | 132. <input type="checkbox"/> \$656 - \$660 | 133. <input type="checkbox"/> \$661 - \$665 | 134. <input type="checkbox"/> \$666 - \$670 | 135. <input type="checkbox"/> \$671 - \$675 | 136. <input type="checkbox"/> \$676 - \$680 | 137. <input type="checkbox"/> \$681 - \$685 | 138. <input type="checkbox"/> \$686 - \$690 | 139. <input type="checkbox"/> \$691 - \$695 | 140. <input type="checkbox"/> \$696 - \$700 | 141. <input type="checkbox"/> \$701 - \$705 | 142. <input type="checkbox"/> \$706 - \$710 | 143. <input type="checkbox"/> \$711 - \$715 | 144. <input type="checkbox"/> \$716 - \$720 | 145. <input type="checkbox"/> \$721 - \$725 | 146. <input type="checkbox"/> \$726 - \$730 | 147. <input type="checkbox"/> \$731 - \$735 | 148. <input type="checkbox"/> \$736 - \$740 | 149. <input type="checkbox"/> \$741 - \$745 | 150. <input type="checkbox"/> \$746 - \$750 | 151. <input type="checkbox"/> \$751 - \$755 | 152. <input type="checkbox"/> \$756 - \$760 | 153. <input type="checkbox"/> \$761 - \$765 | 154. <input type="checkbox"/> \$766 - \$770 | 155. <input type="checkbox"/> \$771 - \$775 | 156. <input type="checkbox"/> \$776 - \$780 | 157. <input type="checkbox"/> \$781 - \$785 | 158. <input type="checkbox"/> \$786 - \$790 | 159. <input type="checkbox"/> \$791 - \$795 | 160. <input type="checkbox"/> \$796 - \$800 | 161. <input type="checkbox"/> \$801 - \$805 | 162. <input type="checkbox"/> \$806 - \$810 | 163. <input type="checkbox"/> \$811 - \$815 | 164. <input type="checkbox"/> \$816 - \$820 | 165. <input type="checkbox"/> \$821 - \$825 | 166. <input type="checkbox"/> \$826 - \$830 | 167. <input type="checkbox"/> \$831 - \$835 | 168. <input type="checkbox"/> \$836 - \$840 | 169. <input type="checkbox"/> \$841 - \$845 | 170. <input type="checkbox"/> \$846 - \$850 | 171. <input type="checkbox"/> \$851 - \$855 | 172. <input type="checkbox"/> \$856 - \$860 | 173. <input type="checkbox"/> \$861 - \$865 | 174. <input type="checkbox"/> \$866 - \$870 | 175. <input type="checkbox"/> \$871 - \$875 | 176. <input type="checkbox"/> \$876 - \$880 | 177. <input type="checkbox"/> \$881 - \$885 | 178. <input type="checkbox"/> \$886 - \$890 | 179. <input type="checkbox"/> \$891 - \$895 | 180. <input type="checkbox"/> \$896 - \$900 | 181. <input type="checkbox"/> \$901 - \$905 | 182. <input type="checkbox"/> \$906 - \$910 | 183. <input type="checkbox"/> \$911 - \$915 | 184. <input type="checkbox"/> \$916 - \$920 | 185. <input type="checkbox"/> \$921 - \$925 | 186. <input type="checkbox"/> \$926 - \$930 | 187. <input type="checkbox"/> \$931 - \$935 | 188. <input type="checkbox"/> \$936 - \$940 | 189. <input type="checkbox"/> \$941 - \$945 | 190. <input type="checkbox"/> \$946 - \$950 | 191. <input type="checkbox"/> \$951 - \$955 | 192. <input type="checkbox"/> \$956 - \$960 | 193. <input type="checkbox"/> \$961 - \$965 | 194. <input type="checkbox"/> \$966 - \$970 | 195. <input type="checkbox"/> \$971 - \$975 | 196. <input type="checkbox"/> \$976 - \$980 | 197. <input type="checkbox"/> \$981 - \$985 | 198. <input type="checkbox"/> \$986 - \$990 | 199. <input type="checkbox"/> \$991 - \$995 | 200. <input type="checkbox"/> \$996 - \$1000 | 201. <input type="checkbox"/> \$1001 - \$1005 | 202. <input type="checkbox"/> \$1006 - \$1010 | 203. <input type="checkbox"/> \$1011 - \$1015 | 204. <input type="checkbox"/> \$1016 - \$1020 | 205. <input type="checkbox"/> \$1021 - \$1025 | 206. <input type="checkbox"/> \$1026 - \$1030 | 207. <input type="checkbox"/> \$1031 - \$1035 | 208. <input type="checkbox"/> \$1036 - \$1040 | 209. <input type="checkbox"/> \$1041 - \$1045 | 210. <input type="checkbox"/> \$1046 - \$1050 | 211. <input type="checkbox"/> \$1051 - \$1055 | 212. <input type="checkbox"/> \$1056 - \$1060 | 213. <input type="checkbox"/> \$1061 - \$1065 | 214. <input type="checkbox"/> \$1066 - \$1070 | 215. <input type="checkbox"/> \$1071 - \$1075 | 216. <input type="checkbox"/> \$1076 - \$1080 | 217. <input type="checkbox"/> \$1081 - \$1085 | 218. <input type="checkbox"/> \$1086 - \$1090 | 219. <input type="checkbox"/> \$1091 - \$1095 | 220. <input type="checkbox"/> \$1096 - \$1100 | 221. <input type="checkbox"/> \$1101 - \$1105 | 222. <input type="checkbox"/> \$1106 - \$1110 | 223. <input type="checkbox"/> \$1111 - \$1115 | 224. <input type="checkbox"/> \$1116 - \$1120 | 225. <input type="checkbox"/> \$1121 - \$1125 | 226. <input type="checkbox"/> \$1126 - \$1130 | 227. <input type="checkbox"/> \$1131 - \$1135 | 228. <input type="checkbox"/> \$1136 - \$1140 | 229. <input type="checkbox"/> \$1141 - \$1145 | 230. <input type="checkbox"/> \$1146 - \$1150 | 231. <input type="checkbox"/> \$1151 - \$1155 | 232. <input type="checkbox"/> \$1156 - \$1160 | 233. <input type="checkbox"/> \$1161 - \$1165 | 234. <input type="checkbox"/> \$1166 - \$1170 | 235. <input type="checkbox"/> \$1171 - \$1175 | 236. <input type="checkbox"/> \$1176 - \$1180 | 237. <input type="checkbox"/> \$1181 - \$1185 | 238. <input type="checkbox"/> \$1186 - \$1190 | 239. <input type="checkbox"/> \$1191 - \$1195 | 240. <input type="checkbox"/> \$1196 - \$1200 | 241. <input type="checkbox"/> \$1201 - \$1205 | 242. <input type="checkbox"/> \$1206 - \$1210 | 243. <input type="checkbox"/> \$1211 - \$1215 | 244. <input type="checkbox"/> \$1216 - \$1220 | 245. <input type="checkbox"/> \$1221 - \$1225 | 246. <input type="checkbox"/> \$1226 - \$1230 | 247. <input type="checkbox"/> \$1231 - \$1235 | 248. <input type="checkbox"/> \$1236 - \$1240 | 249. <input type="checkbox"/> \$1241 - \$1245 | 250. <input type="checkbox"/> \$1246 - \$1250 | 251. <input type="checkbox"/> \$1251 - \$1255 | 252. <input type="checkbox"/> \$1256 - \$1260 | 253. <input type="checkbox"/> \$1261 - \$1265 | 254. <input type="checkbox"/> \$1266 - \$1270 | 255. <input type="checkbox"/> \$1271 - \$1275 | 256. <input type="checkbox"/> \$1276 - \$1280 | 257. <input type="checkbox"/> \$1281 - \$1285 | 258. <input type="checkbox"/> \$1286 - \$1290 | 259. <input type="checkbox"/> \$1291 - \$1295 | 260. <input type="checkbox"/> \$1296 - \$1300 | 261. <input type="checkbox"/> \$1301 - \$1305 | 262. <input type="checkbox"/> \$1306 - \$1310 | 263. <input type="checkbox"/> \$1311 - \$1315 | 264. <input type="checkbox"/> \$1316 - \$1320 | 265. <input type="checkbox"/> \$1321 - \$1325 | 266. <input type="checkbox"/> \$1326 - \$1330 | 267. <input type="checkbox"/> \$1331 - \$1335 | 268. <input type="checkbox"/> \$1336 - \$1340 | 269. <input type="checkbox"/> \$1341 - \$1345 | 270. <input type="checkbox"/> \$1346 - \$1350 | 271. <input type="checkbox"/> \$1351 - \$1355 | 272. <input type="checkbox"/> \$1356 - \$1360 | 273. <input type="checkbox"/> \$1361 - \$1365 | 274. <input type="checkbox"/> \$1366 - \$1370 | 275. <input type="checkbox"/> \$1371 - \$1375 | 276. <input type="checkbox"/> \$1376 - \$1380 | 277. <input type="checkbox"/> \$1381 - \$1385 | 278. <input type="checkbox"/> \$1386 - \$1390 | 279. <input type="checkbox"/> \$1391 - \$1395 | 280. <input type="checkbox"/> \$1396 - \$1400 | 281. <input type="checkbox"/> \$1401 - \$1405 | 282. <input type="checkbox"/> \$1406 - \$1410 | 283. <input type="checkbox"/> \$1411 - \$1415 |
|---------------------------------------|--|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|





2 | ☐ Yes, on active duty in past, but not now

3 | ☐ No



# POPULATION QUESTIONS

<p><b>20a.</b> Did ... work at any time LAST WEEK, either full-time or part-time? Work includes part-time or full-time work such as helping without pay in a family business or farm. It also includes active duty in the Armed Forces. Work does NOT include unpaid volunteer work. Read each category and mark(X) in the ONE box that applies.</p>	<p><b>24a.</b> What time did ... leave home most days to go to work LAST WEEK?</p> <p>Hour Minute</p>	<p><b>31b.</b> How many weeks did ... work in 1993, excluding subsistence activity? Count paid vacation, paid sick leave, and military service.</p> <p>Number of weeks</p>
<p>1 Yes, worked full-time or part-time at a job at business and did NOT fishing or fishing</p> <p>2 Yes, worked full-time or part-time at a job at business and did SOME fishing and fishing</p> <p>3 Yes, worked MAINLY in fishing or fishing</p> <p>4 Yes, did MAINLY housework and SOME farming, fishing, production of handicrafts, etc.</p>	<p><b>24b.</b> How many minutes did it usually take ... to get from home to work LAST WEEK?</p> <p>Number of minutes</p>	<p>The following questions are about income received in 1993.</p> <p>If an exact amount not known, accept a best estimate. If not income in 32a, 32b, or question 33 was a loss, write "loss" above the dollar amount.</p>
<p>5 No, HOUSEWORK ONLY</p> <p>6 No, Sought work/Student</p> <p>7 No, retired</p> <p>8 No, Unpaid Volunteer work</p> <p>9 No, other reason, specify</p>	<p><b>25.</b> Was ... on vacation, away sick, or temporarily absent from a job last week for any other reason?</p> <p>1 Yes, Reason for temporary absence, specify</p> <p>2 No</p>	<p>32a Did ... earn income from wages, salaries, commissions, fees, tips or tips, honoraria, amount before deduction for taxes, bonds, dues, or other items?</p> <p>1 Yes, ask - How much?</p> <p>Enter ANNUAL amount in dollars</p>
<p><b>20b.</b> What did ... mainly do?</p> <p>1 Gardening</p> <p>2 Fishing</p> <p>3 Animal raising</p> <p>4 Gardening and fishing</p> <p>5 Gardening and fishing</p> <p>6 Gardening and fishing</p> <p>7 Other</p>	<p><b>26a.</b> Has ... been looking for work to earn money during the last 4 weeks?</p> <p>1 Yes</p> <p>2 No</p>	<p>32b Did ... earn income from interest, dividends, annuities, royalties, or other income, amount before deduction for taxes, bonds, dues, or other items?</p> <p>1 Yes, ask - How much?</p> <p>Enter ANNUAL amount in dollars</p>
<p><b>20c.</b> The ... produced, flew, caught, and ... sold were they for ... own or family consumption, or did ... sell them?</p> <p>1 Own/family consumption - never sold</p> <p>2 Own/family consumption-never sold sometimes give away</p> <p>3 Occasionally sold</p> <p>4 Regularly sold</p>	<p><b>26b.</b> Could ... have taken a job LAST WEEK if one had been offered?</p> <p>If NO, Ask - For what reason?</p> <p>1 No, already has a job</p> <p>2 No, temporarily ill</p> <p>3 No, other reasons (No school, etc.)</p> <p>4 Yes, would have taken a job</p>	<p>32c Did ... earn income from capital gains, losses, or other income, amount before deduction for taxes, bonds, dues, or other items?</p> <p>1 Yes, ask - How much?</p> <p>Enter ANNUAL amount in dollars</p>
<p><b>20d.</b> How many hours did ... work LAST WEEK in ... subsistence activity? ... time off and add any overtime hours worked.</p> <p>Number of hours</p>	<p><b>27.</b> When did ... last work at a job, business, or farm, even for a few days?</p> <p>1 1994</p> <p>2 1993</p> <p>3 1992</p> <p>4 1990 to 1991</p> <p>5 1985 to 1989</p> <p>6 1980 to 1984</p> <p>7 1975 to earlier</p> <p>8 Never worked or did subsistence only</p>	<p>32d Did ... earn income from other sources, amount before deduction for taxes, bonds, dues, or other items?</p> <p>1 Yes, ask - How much?</p> <p>Enter ANNUAL amount in dollars</p>
<p><b>22.</b> Where did ... usually work LAST WEEK?</p> <p>1 Home</p> <p>2 Office</p> <p>3 Factory</p> <p>4 Retail</p> <p>5 Other</p>	<p><b>28a.</b> For whom did ... usually work? ... name of the company, business, or employer.</p> <p>28b. What kind of business or industry was ... Describe the activity at location ... employed. For example: hospital, factory, retail bakery, etc.</p> <p>28c. What kind of work was ... doing? For example: registered nurse, industrial machinery mechanic, cake baker, etc.</p>	<p>32e Did ... earn income from other sources, amount before deduction for taxes, bonds, dues, or other items?</p> <p>1 Yes, ask - How much?</p> <p>Enter ANNUAL amount in dollars</p>
<p><b>23a.</b> What type of transportation did ... usually use to get to work LAST WEEK? If more than one method of transportation usually used during the trip, mark(X) in the one used for most of the distance.</p> <p>1 Car, truck or private vehicle</p> <p>2 Bus</p> <p>3 Public Van or Bus</p> <p>4 Taxi/cab</p> <p>5 Motorcycle</p> <p>6 Bicycle</p> <p>7 Walked</p> <p>8 Worked at home</p>	<p><b>29.</b> What were ...'s most important activities or actual duties? For example: patient care, repair machines, taking orders, etc.</p>	<p>32f Did ... earn income from other sources, amount before deduction for taxes, bonds, dues, or other items?</p> <p>1 Yes, ask - How much?</p> <p>Enter ANNUAL amount in dollars</p>
<p><b>23b.</b> How many persons ... including ... usually rode to work LAST WEEK?</p> <p>Persons</p>	<p><b>30.</b> Was ... Read Ret. Mark (X) ONE box</p> <p>1 Employee of PRIVATE FOR PROFIT company, business or individual, for wages, salaries, or commissions</p> <p>2 Employee of PRIVATE NOT FOR PROFIT, tax exempt, or charitable organization</p> <p>3 Municipal GOVERNMENT employee</p> <p>4 State GOVERNMENT employee</p> <p>5 National GOVERNMENT employee</p> <p>6 FOREIGN/FEDERAL employee</p> <p>7 SELF EMPLOYED</p> <p>8 Working WITHOUT PAY in a family business or farm</p> <p>31a. Last year (1993), did ... work, even for a few days, at a paid job or in a business or a farm, excluding subsistence activity?</p> <p>1 Yes</p> <p>2 No</p>	<p>32g Did ... earn income from other sources, amount before deduction for taxes, bonds, dues, or other items?</p> <p>1 Yes, ask - How much?</p> <p>Enter ANNUAL amount in dollars</p>

### INTERVIEWER INSTRUCTIONS:

*Before you leave this housing unit, be sure you have recorded--*

- 1. Information in items A, B, C, D, E, F, G, H and I on the front cover of the questionnaire.*
- 2. The respondent's name in item J and the respondent's telephone number (if any) in item K on the front cover of the questionnaire.*
- 3. Information in items L, M, N, O and P are complete.*
- 4. Your signature (name) and the date under item Q on the front cover of the questionnaire.*

**Also, be sure you have--**

- 5. Completed as many of the census questions as possible, including the last resort questions.*
- 6. Completed the FOR VACANT UNITS section on page 3.*
- 7. Enter the required information on the Lists of Regular Households on the listing record and the ED map.*
- 8. Write all entries clearly.*

### THANK THE RESPONDENT FOR HIS/HER COOPERATION.

NOTES:
