

No. 8

**BASIC DESIGN STUDY REPORT**  
**ON**  
**SWINE PRODUCTION IMPROVEMENT PROJECT**  
**IN**  
**FEDERATED STATES OF MICRONESIA**

**FEBRUARY 1988**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

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## PREFACE

In response to the request of the Government of the Federated States of Micronesia, the Government of Japan has decided to conduct a basic design study on the Project for Improvement of Swine Production and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Micronesia a study team headed by Mr. Katsuhiko Ohashi, Vice Director, Miyazaki Livestock Breeding Farm, Ministry of Agriculture, Forestry and Fisheries, from October 28 to November 20, 1987.

The team had discussions on the Project with the officials concerned of the Government of Micronesia and conducted a field survey in the Project area. After the team returned to Japan, further studies were made, a draft report was prepared and a mission to explain and discuss it was dispatched to Micronesia. As a result, the present report has been prepared.

I hope that this report will serve for the development of the project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Federated States of Micronesia for their close cooperation extended to the team.

February, 1988



Kensuke Yanagiya

President

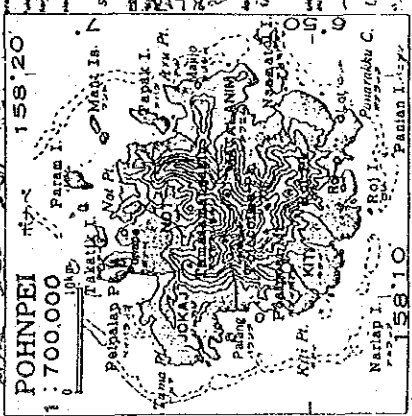
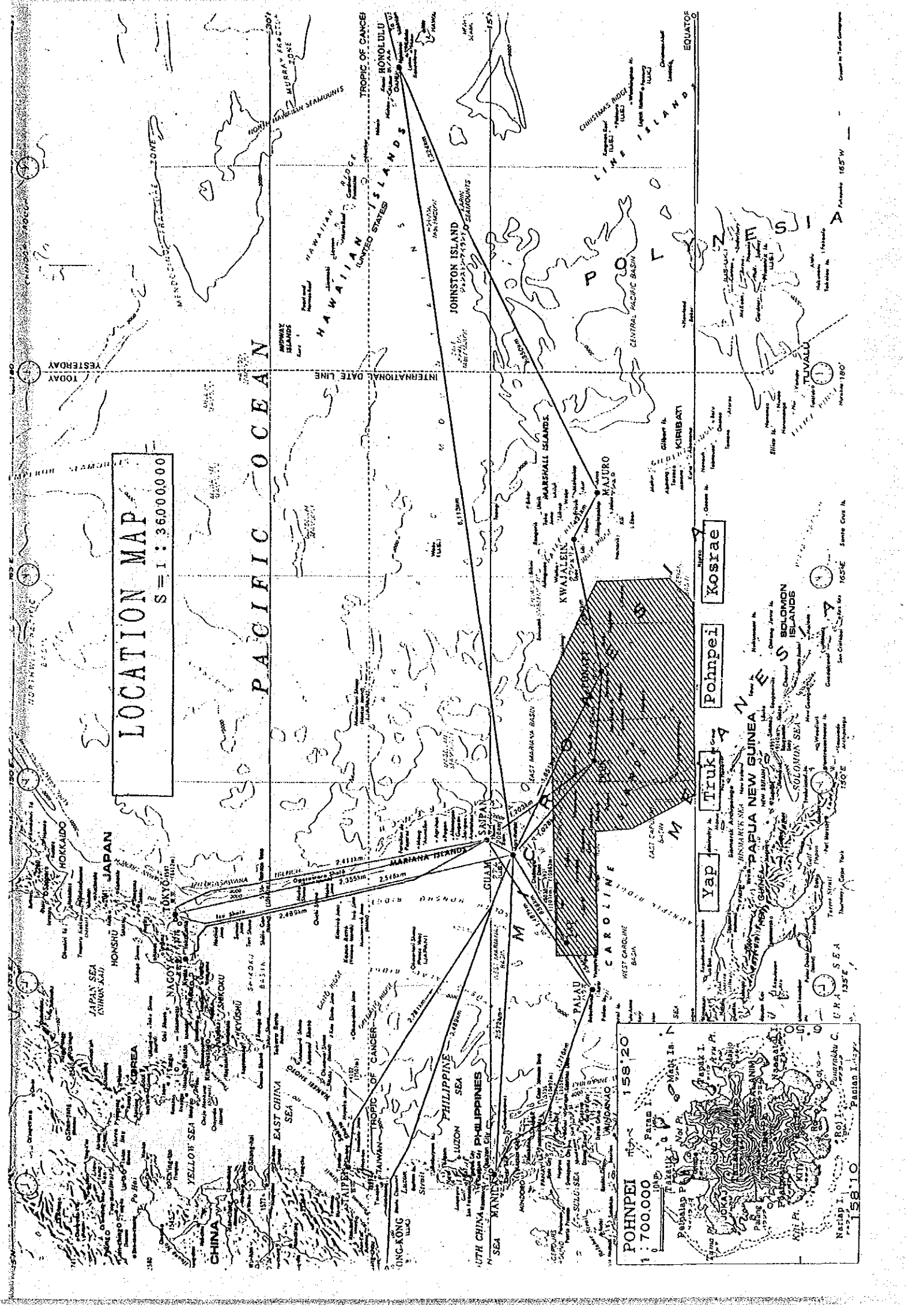
Japan International Cooperation Agency





LOCATION MAP  
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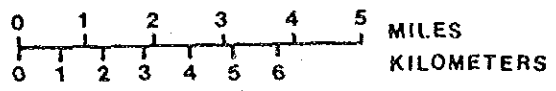
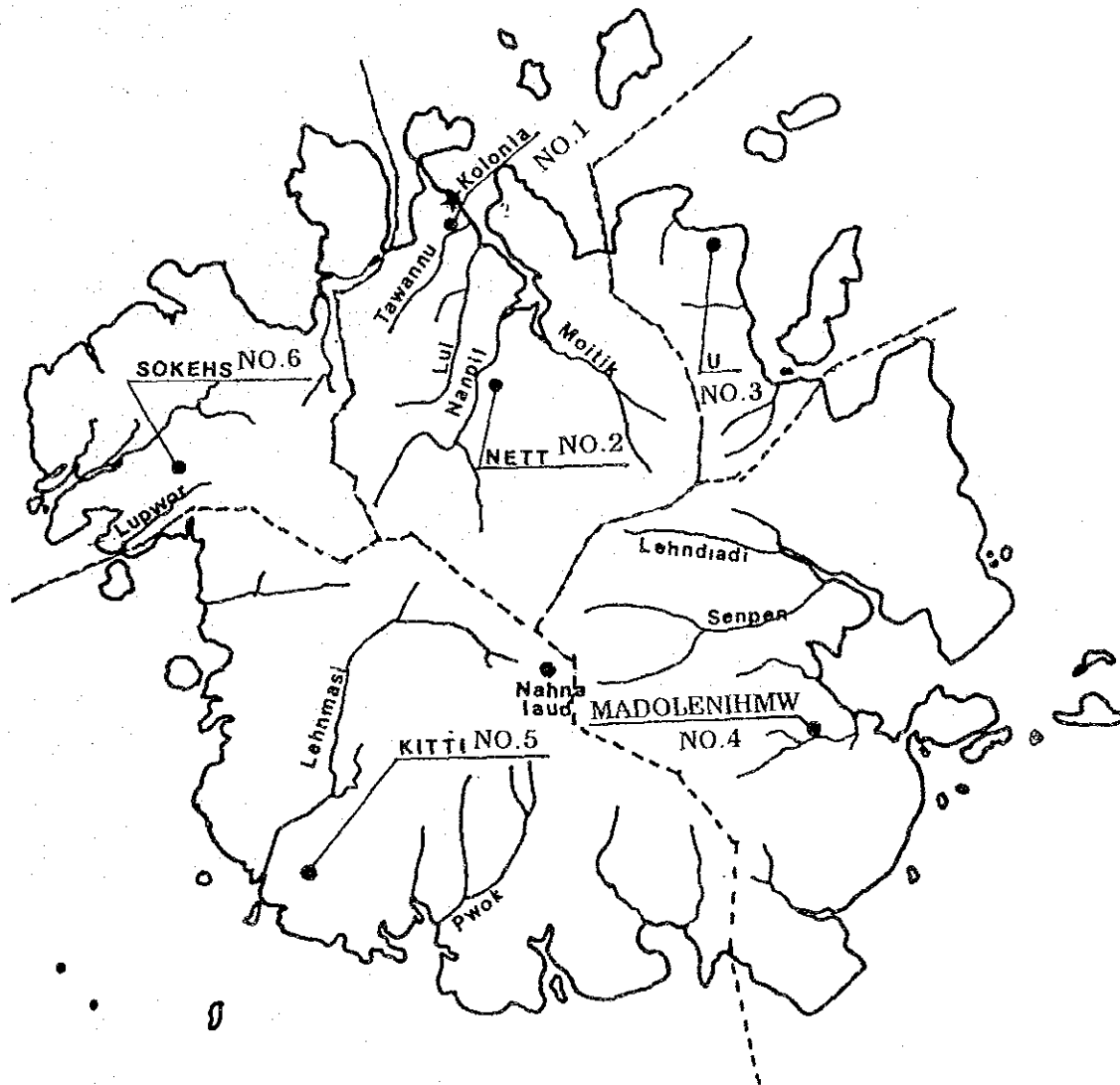
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# PROJECT SITES ON POHNPEI ISLAND



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## SUMMARY



## Summary

The Federated States of Micronesia consists of 607 islands extending across more than a million square miles of the Western Pacific, and lies between the equator and 14 degrees north latitude and between 135 and 166 degrees east longitude. The total land area is small, being only 270.8 square miles, with an additional 2,776 square miles of lagoons. Pohnpei is one of the four Federated States of Micronesia (Truk, Pohnpei, Yap and Kosrae). It has the largest area (133.4 square miles) and a total population of 28,000.

About 85% of the population of Pohnpei is concurrently engaged in agriculture and fishing. The people mainly engage in cultivating root crops and tropical fruit, in addition to raising swine.

Pork, a traditional food in the area, being the only source of animal protein, plays an important dietary role in Pohnpei. However, since there is a shortage of boars at the present multiplication center (the multiplication rate of boars is very low due to excessive inbreeding and the fact that modern sterilizers are not available on Pohnpei), eighty-five tons of pork must be imported every year.

Feed for animal husbandry depends upon imports; this is the reason for the sudden increases in pork prices. In order to cope with the situation, the federated government has placed great emphasis on improving the breed of swine and on the home production of feed, and has made plans for improving the present multiplication center. For this important project, the government has requested grant aid cooperation from the Japanese Government.

In response to the request from the Government of the Federated States of Micronesia, the Government of Japan decided to conduct a basic design study to examine the implementation of the Project for the Improvement of Swine Production with grant aid from Japan and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent the basic design study team to the Federated States of Micronesia from 28 October to 20 November 1987.

The field study was conducted in cooperation with the Department of Conservation and Resources Surveillance, Pohnpei State Government. It was agreed that the team would convey to the Government of Japan the requests of the Government of the Federated States of Micronesia that the former would take the necessary measures for cooperation by providing the facilities and equipment necessary for the Project within the scope of the Japanese economic cooperation program in grant form and follow the First State Development Plan of Pohnpei State. A survey of the Project site, and discussions concerning the maintenance and operation system undertaken by the Pohnpei State Government and about technical extension to the local farmers were conducted.

The Project, based on the results of the basic design study, will have the following objectives: to upgrade the productivity of the swine industry, to reduce the cost of pork, to improve the quality of meat and decrease the amount of pork imports, and to construct a Main Pig Breeding Center at the Pohnpei Agriculture Station and five Sub-breeding Stations on Pohnpei Island.

Taking into consideration Pohnpei Island's present situation, the objectives of the Main Breeding Center are as follows:

1. To upgrade the productivity of pig production by means of breed improvement, improvement of breeding technology, and establishment of an extension service.
2. To increase and improve the quality of pork production.
3. To increase the production of local feed and to establish a pork marketing system.

The Main Pig Breeding Center is to be the base for extension services and for the introduction of the objectives mentioned above.

Necessary measures to be undertaken by the Government of Japan are as follows:

- 1) Design and construction of a main breeding center and five sub-breeding stations
- 2) Design and construction of incidental facilities
- 3) Procurement and conveyance of equipment for main center and sub-stations



Necessary arrangements to be undertaken by the Government of the Federated States of Micronesia:

- 1) To clear, level and reclaim the sites, as needed, before the start of construction.
- 2) To provide facilities for the distribution of electricity, telephone service, water supply and other incidental facilities outside the building.
- 3) To construct and prepare access roads to the Project sites.

The executive agency for the Project is the Department of Conservation and Resources Surveillance of the Pohnpei State Government, who will make contract arrangements with a Japanese consultant company and a Japanese contractor. The Japanese consultant and contractor will make the detailed designs and carry out the tasks of procurement, conveyance, construction, and supervision of the construction work. For the administration and implementation of the Project, counterparts and other necessary personnel will be assigned to the Department of Conservation and Resources Surveillance.

The total construction period, including the conveyance period by ship, will be 9 months. After the agreement of the Exchange of Notes, the Project will proceed with the detailed design, preparing of tender documents and tendering. The inspection of the completed facilities and procured equipment will be performed within a period of 13 months.

The main breeding center and five sub-breeding stations will be located throughout Pohnpei Island. The main breeding center at Pohnpei Agriculture Station will be under Pohnpei State Government control. The five sub-breeding stations will be controlled by the municipal governments under the direction of the Division of Agriculture.

Based on the results of the study, implementation of the Project will lead to an increase in the number of superior quality pigs, the upgrading of productivity and the home production of feed. Also, it will lower the production cost of good quality pork, increase the supply of pork (the only source of animal protein in the country), and contribute to the security of the residents' livelihoods and in improving their standards of living.

Moreover, it can be anticipated that the further development of swine breeding in the Federated States of Micronesia will spread throughout the entire country once the Project is implemented.

In view of the above, it will be most meaningful to proceed with the Project and to carry out the work with grant aid from the Government of Japan.

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## Abbreviations

|      |   |
|------|---|
| CCM  | : Community College of Micronesia                 |
| COM  | : College of Micronesia                           |
| CTAS | : College of Tropical Agriculture and Sciences    |
| C&RS | : Conservation and Resources Surveillance         |
| D    | : Duroc   |
| DOI  | : Department of the Interior                      |
| E/N  | : Exchange of Notes                               |
| FDIC | : Federal Depository Insurance Corporation        |
| FSM  | : Federated States of Micronesia                  |
| FY   | : Fiscal Year                                     |
| GDP  | : Gross Domestic Product                          |
| GNP  | : Gross National Product                          |
| H    | : Hampshire                                       |
| GSP  | : Gross State Product                             |
| HUD  | : Housing Urban Development                       |
| JCI  | : Japan Consulting Institute                      |
| JICA | : Japan International Cooperation Agency          |
| N/A  | : Not Available                                   |
| NEPB | : National Environmental Protection Board         |
| NOAA | : National Oceanic and Atmospheric Administration |
| OIA  | : Office of Island Affairs                        |
| PATA | : Pacific Area Travel Association                 |
| PATS | : Pohnpei Agriculture and Trade School            |
| PCSP | : Pohnpei Continuing Survey Program               |
| PICS | : Pohnpei Island Central School                   |
| PMA  | : Pacific Missionary Aviation                     |
| SNA  | : System of National Accounts                     |
| TTPI | : Trust Territory of the Pacific Islands          |
| UN   | : United Nations                                  |
| USDA | : United States Department of Agriculture         |
| W    | : Large Yorkshire or Large White                  |





## CHAPTER 1 INTRODUCTION



## CHAPTER 1 INTRODUCTION

About 85% of the population of Pohnpei State, Federated States of Micronesia, is concurrently engaged in agriculture and fishing. The people mainly engage in cultivating root crops and tropical fruit, in addition to raising swine. Pork, a traditional food in the area, being the only source of animal protein, plays an important dietary role in Pohnpei. However, since eighty-five tons of pork must be imported every year and as the feed for animal husbandry depends upon imports, pork prices rise steadily.

In order to cope with this situation, the Government of the Federated States of Micronesia has requested grant aid cooperation from the Japanese Government. In response to the request, the Japanese Government decided to conduct a basic design study to examine the implementation of the Project with grant aid from Japan and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent a basic design study team to the Federated States of Micronesia from 28 October to 20 November 1987.

The executive agency for this project is the Division of Agriculture, the Department of Conservation and Resources Surveillance of the Pohnpei State Government. This executive agency cooperated in the field survey, and coordinated with other ministries concerned.

At the beginning of their mission, the study team had a series of discussions pertaining to the request for the Project with the officials concerned of the Government of the Federated States of Micronesia and of the Government of Pohnpei State. After that, they looked into the present condition of swine production, the construction situation and the economic situation on Pohnpei Island, and investigated the Project area.

Major points agreed on as a result of the discussions were written up as the Minutes of Discussions between representatives of both parties. The schedule of the study team and the names of its members are listed in the appendices of this report. The names of personnel interviewed in Pohnpei are also listed.

On returning to Japan, the study team, using the data collected in Pohnpei, examined and analyzed the Project. They then drew up the optimum basic design for the Project.

As a result of the above mentioned basic design study, this report has been prepared.

## CHAPTER 2 BACKGROUND OF THE PROJECT



## CHAPTER 2 BACKGROUND OF THE PROJECT

### 2-1 Nature, Society and Economy

#### 2-1-1 Nature and Population

The Federated States of Micronesia consists of four states (Yap, Kosrae, Truk, and Pohnpei), and the capital of the Federated States of Micronesia is Kolonia Town in Pohnpei State. Pohnpei State is located at 7° north latitude and 158° east longitude within an east-west chain of islands known collectively as the Carolinian archipelago, and consists of Pohnpei Island, 25 smaller islands, and 137 widely scattered outer islands. The total land area is 133.22 square miles. Pohnpei Island is a steep mountainous area; the highest mountain is 2,595 feet above sea level. The climate of Pohnpei is characterized by rainfall and high temperatures. The average annual rainfall measured in Kolonia is about 195 inches; sudden showers occur every day. Although it has no change of seasons, the average rainfall for January and February is about 30% less than the annual monthly average. The average annual temperature is 81.3 degrees F.

The total population of the Federated States of Micronesia was 76,050 in 1980, and the total population of Pohnpei State was 28,286 in 1985.

The average annual rate of population increase for the past twelve years has been almost 4 percent. Although about three-quarters of the people on Pohnpei are native speakers of the Pohnpeian language, English is the official language in the state. The population of the island is divided about equally between the two Christian religions, Protestant and Catholic.

#### 2-1-2 Economy

- (1) The constitution of the Federated States of Micronesia took effect on May 10, 1987, and the Government of the Federated States of Micronesia and the Government of the United States executed a Compact of Free Association between the two

governments. The Congress of the Federated States of Micronesia is in Pohnpei Island; it is a unicameral body of 14 members.

State governments, municipal governments and traditional governance are approved under the national government. In other words, there are four governments in the States; this is a special characteristic of this country. The Nation's economy is mainly supported by agriculture, but the government is aware of the serious imbalance in the Nation's economy; the Federated States of Micronesia has always run a trade deficit.

The total capital formation in 1983 was \$40.23 million while savings were \$18.92 million. This means that the Federated States of Micronesia ran a trade deficit of \$21.32 million in 1983.

Table 2-1 presents the gross domestic product of the FSM per capita for FY 1982. Each State's GDP was calculated separately.

Table 2-1 Per Capita GDP, FSM, FY 1982

| Population | State     | Per capita GDP<br>FY 1982 |
|------------|-----------|---------------------------|
| 5,880      | Kosrae    | \$954                     |
| 25,050     | Pohnpei   | 797                       |
| 41,460     | Truk      | 660                       |
| 9,994      | Yap       | 1,334                     |
| 82,334     | Total FSM | \$905                     |

- (2) The Pohnpei Government is also aware of the serious imbalance in the state's economy. At the present time, Pohnpei State is running a trade deficit of \$10 million. The major merchandise exports and imports are as follows:



Table 2-2 Merchandise Imports for Pohnpei

| Commodity                  | 1982 Value U.S. \$ | 1983 Value U.S. \$ | 1984 Value U.S. \$ |
|----------------------------|--------------------|--------------------|--------------------|
| Food                       | 4,232,083          | 4,575,418          | 4,962,656          |
| Beverages and Tobacco      | 1,583,052          | 1,687,533 ***      | 1,793,489          |
| Crude Materials            | 154,791            | 414,312            | 484,376            |
| Petroleum *                |                    |                    |                    |
| Animal & Vegetable Fat     | 2,910              | 36,772             | 2,309              |
| Chemicals                  | 623,075            | 790,529            | 887,104            |
| Manufactured Goods         | 1,291,665          | 1,766,360          | 1,899,024          |
| Machinery and Vehicles     | 1,921,188          | 2,708,423          | 2,897,965          |
| Miscellaneous Manufactured | 1,304,607          | 1,286,456          | 1,391,645          |
| Items N. E. S. **          | 7,728              | 90,500             | 5,376              |
| Total                      | 11,121,099         | 13,356,303         | 14,323,944         |

\* The above data do not include importation of petroleum products. However, the estimated amount of import of petroleum products for 1982 was \$5.1. Million

\*\* N. E. S. Not Elsewhere Specified.  
\*\*\* Estimated

Source: Office of Planning, Budgeting, and Statistics,  
(OPB&S) Pohnpei State

Division of Statistics, Office of Planning  
and Statistics/National Government, FSM

Table 2-3 Merchandise Exports for Pohnpei

| Item                          | 1979          |          | 1980          |          | 1981          |          | 1982          |          | 1983          |          |
|-------------------------------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
|                               | Quantity Lbs. | Value \$ | Quantity Lbs. | Value \$ | Quantity Lbs. | Value \$ | Quantity Lbs. | Value \$ | Quantity Lbs. | Value \$ |
| 1. Pepper                     | 35,417        | 12,396   | 26,976        | 10,790   | 437           | 437      | 1,037         | 2,333    | 1,145         | 6,984    |
| 2. Copra                      | 2,919,159     | 554,640  | 2,956,000     | 413,840  | 2,191,716     | 219,172  | 1,699,988     | 169,988  | 1,525,540     | 297,480  |
| 3. Other Agriculture Products | --            | --       | --            | --       | 5,960         | 1,192    | 82,725        | 16,545   | 178,373       | 73,132   |
| 4. Trochus Shell              | 242,000       | 108,900  | --            | --       | 214,603       | 128,762  | 138,848       | 83,308   | --            | --       |
| 5. Fish                       | --            | --       | 600           | 402      | 6,939         | 4,025    | 7,961         | 5,174    | 11,056        | 7,739    |
| 6. Crabs/Lobsters             | --            | --       | --            | --       | 4,489         | 5,970    | 2,738         | 3,641    | 3,400         | 4,420    |
| 7. Handicraft                 | --            | 30,745   | --            | 48,285   | --            | 33,865   | --            | 36,066   | --            | 47,552   |
| 8. Coconut Products           | --            | --       | --            | --       | --            | --       | --            | --       | 4,823         | 9,430    |
| 9. Total Value                |               | 706,681  |               | 473,317  |               | 393,423  |               | 317,055  |               | 446,737  |

Source: Office of Planning, Budgeting, and Statistics (OPB&S) Pohnpei State

### 2-1-3 Traditional society and administrations

The influence of the American administration on the traditional structure has been mainly political. The kingdoms were renamed municipalities in 1947, and a chief magistrate was elected as the highest executive official in each. A council was also elected as the legislative body for each municipality. Although the real power of the traditional leaders has diminished, they still retain considerable influence on the municipal level. Great deference is shown to traditional leaders in both etiquette and language.

Each municipality is divided into some twenty or thirty sections (Kousapw), whose heads are appointed by traditional leaders. The larger sections contain twenty-five to thirty-five farmsteads with about two hundred people, but the smaller ones might contain only four or five families. Section chiefs look out for the interests of the higher municipality leaders and keep an eye on the productive ability of farmsteads. They also allocate tribute responsibilities for food brought to feasts and other functions. They are the link that transmits the wishes of the traditional leaders to the individual farmers.

In 1963, Riesenbergh reported the numbers of sections as follows:

|                                |          |
|--------------------------------|----------|
| Madolenihmw                    | 28       |
| U                              | 15       |
| Kitti                          | 37       |
| Nett                           | 23       |
| Sokehs                         | 21       |
| <u>Pakin (outlying island)</u> | <u>1</u> |
| Total                          | 125      |

(Source: A Guide to Pohnpei)

The leaders of the 125 sections actually execute administrative events including sacred rites, forming the traditional society of Pohnpei.

#### 2-1-4 Food Situation on Pohnpei Island and future trends

##### (1) Pohnpeians' eating habits

Unlike when the island was self-sufficient, some 50% of the population of Pohnpei Island now have the habit of eating rice as the staple food. The remainder of the population eats breadfruit (21%), bananas (14%), flour (4.1%), and others (4.1%). Currently the rice consumed here is all imported.

Main side dishes consist of pork products (19.2%) which are divided into canned pork (15.3%) and fresh pork (3.9%), followed by vegetables such as onions, cucumbers and green

onions (15.5%), eggs and chicken (14.6%) and others such as seasonings (30.1%).

The reason that Pohnpeians have come to rely mainly on rice is that it was mandated by the previous Japanese administration and that the import of rice, which was halted since the end of World War II, has been resumed with the increased purchasing power of the private sector resulting from aid from the USA.

Thus, currently, the eating habits of Pohnpeians focus chiefly on rice (staple food) and pork and its processed products. (Source: Second Micronesia Pohnpei Island Scientific Survey Report compiled by the Overseas Agricultural Study Team, Osaka Prefectural University.)

The reasons why these foods achieved the primary positions are that rice and canned pork fit the taste of the islanders, are easily cooked, the ceremony of Kamadipw can be omitted, and they can be eaten at any time as foods outside the category of traditional foods.

Table 2-4 Pohnpei Food Imports

|                     | <u>1982</u>      | <u>1983</u>      |
|---------------------|------------------|------------------|
| Rice                | 892,000          | 961,400          |
| Meats               | 1,086,000        | 1,173,900        |
| Vegetables & Fruits | 222,900          | 240,300          |
| Other Food          | <u>2,031,200</u> | <u>2,199,800</u> |
| Total Food          | 4,232,100        | 4,575,400        |

Source: Pohnpei State Office of Planning and Statistics (1983) and FSM Office of Planning and Statistics (1982).

The prices above are the F.O.B. prices at ports of shipment. Accordingly, their unloaded prices in Pohnpei Island additionally include the charterage and insurance premium that the importer must bear. The prices above do not include \$141,000 which is the price of the foods imported for school meals.

Rice accounts for 20% of the cost of imported foods, while vegetables account for 5%. Most of the imported foods shown above can be substituted for using products of Pohnpei Island such as:

cucumbers, bananas for cooking, sweet potatoes, limes, corn, lettuce, green onions, eggplants, tomatoes, green peppers, avocados, mandarin oranges, pineapples, eggs, and chicken.

In order to improve the present situation, the Agricultural Bureau, predicating that the propagational activities of the existing Agriculture Station (staff of 46) have a limit, has provided each village with an agriculture propagation center under the 5-year plan. The bureau is deliberating the direct conveyance of agricultural administration of the farmers, which have, to date, been left unadministered, to the agricultural chief of each village, thereby raising the extent of self-sufficiency in food and further decreasing food imports in the future.

## 2-2 Summary of Farming and Animal Husbandry (Pohnpei State)

### 2-2-1 Farming in general

#### (1) Land utilization

The 1985 statistics indicate that 34% (117.3 km<sup>2</sup>) of the total land area is arable land while 64% (220.8 km<sup>2</sup>) is covered with forest and mangrove forest.

Table 2-5 Percent of Land Area by Use

| Land Use   | Percent of Area | Land Type       | Percent of Area |
|--|-----------------|-----------------|-----------------|
| Subsistence Tree Crops<br>Bananas<br>Breadfruit<br>Coconut | 30.0 %          | Plateau         | 20 %            |
| Woodland   | 50.0 %          | Steep Mountains | 61 %            |
| Mangrove Swamp   | 14.0 %          | Mangrove Swamp  | 14 %            |
| Specialty Crops<br>Vegetables<br>Black Pepper              | 4.0 %           | Bottom Lands    | 5 %             |
| Urban  | .7 %            |                 |                 |
| Other  | 1.3 %           |                 |                 |

Source: Soil Survey of Island of Ponape, Federated States of Micronesia, U.S.D.A. Soil Conservation Service

Source: Soil Survey of Island of Pohnpei, Federated States of Micronesia, U.S.D.A. Soil Conservation Service

(2) Production of principal farm products

(a) Production of principal plants

Principal plants are grown chiefly by the traditional self-sufficient style.

The output of vegetable crops varies considerably with each year. The 1984 statistics indicate that output was in the order of cucumbers, while rape and watermelons, accounting for some 80% of the total output.

Fruits are produced in the order of mangos, papayas and pineapples, and the 1984 statistics indicate that the output of mangos was predominant, accounting for some 65% of the total output.

Taros, bananas, mangos, and citrus fruits (limes and lemons) are supplied in a lump to retailers and markets. When a shipping deal with an international ship calling at a port of the Federated States of Micronesia has once been concluded, citrus fruits, mangos and bananas are exported to Guam, Kwajalein, Majuro and other outlying islands.

The output of copra peaked at 5,438 tons in 1974, but since then had kept dropping until 1983 when a copra production measure was implemented by the administration to recover to 3,800 tons/year from 1,050 tons/year.

The production of black pepper as a cash crop is currently limited to Pohnpei Island, and is, though low, on the rise year by year. The 1982 statistics indicate that the year's output reached 12.4 tons or double the output of two years before. The estimated optimum growing area for black pepper is 300 ha, but only 8 ha is used at the present time.

(b) Production of principal livestock

The 1985 statistics indicate that the output of pork reached \$230,250 (or 153,500 pounds in live weight output), accounting for some 70% of the total output, which was followed by fowl eggs which earned \$75,570, accounting for 23.5%.

Table 2-6 Livestock - Output and Value

|  | 1985         |              |
|--|--------------|--------------|
|  | Output       | Value U.S.\$ |
| Pork (output on live weight basis)         | 153,500 Lbs. | 230,250      |
| Eggs                                       | 45,800 Doz.  | 75,570       |
| Beef (Output on live weight basis)         | 5,000 Lbs.   | 2,500        |
| Goat meat (chevon) (Live weight basis)     | 2,500 Lbs.   | 1,500        |
| Village fowl (Chicken) (Live weight basis) | 16,500 Lbs.  | 11,000       |

Source: Division of Agriculture, Pohnpei State

Table 2-7 Agriculture Output (Out-Put in Lbs.)

| Agriculture Item   | 1981<br>Out-Put | 1982<br>Out-Put | 1983<br>Out-Put | 1984<br>Out-Put |
|--------------------|-----------------|-----------------|-----------------|-----------------|
| <b>Vegetables</b>  |                 |                 |                 |                 |
| Head Cabbage       | 5,141           | 15,874          | 8,609           | 7,875           |
| Chinese Cabbage    | 8,001           | 31,277          | 24,978          | 21,418          |
| Cucumber           | 32,120          | 44,694          | 37,704          | 38,176          |
| Tomato             | 1,177           | 419             | 550             | 715             |
| Green Onion        | 2,440           | 1,070           | 809             | 1,436           |
| Pumpkin            | 1,887           | 2,615           | 5,911           | 3,471           |
| Egg Plant          | 2,366           | 4,786           | 3,335           | 3,471           |
| Bell Pepper        | 3,983           | 7,228           | 3,838           | 5,016           |
| Watermelon         | 8,136           | 27,262          | 25,158          | 20,186          |
| Others             | 655             | 789             | 868             | 770             |
| <b>Fruits</b>      |                 |                 |                 |                 |
| Papaya             | 7,860           | 10,060          | 11,917          | 9,945           |
| Pineapple          | 5,157           | 5,157           | 1,552           | 3,955           |
| Tangerine          | 1,401           | 1,401           | 1,770           | 1,524           |
| Lemon              | 5,462           | 4,969           | 3,685           | 4,377           |
| Mango              | 9,616           | 24,433          | 38,479          | 27,381          |
| <b>Root Crops</b>  |                 |                 |                 |                 |
| Yam                | 26,212          | 38,545          | 39,451          | 34,735          |
| Cassava            | 10,609          | 24,563          | 19,349          | 18,735          |
| Sweet Potato       | 20,056          | 12,243          | 15,086          | 15,794          |
| Colocasia taro     | 14,489          | 59,132          | 6,845           | 26,822          |
| Sakau              | 136,285         | 277,820         | 120,370         | 178,158         |
| Taro               | 10,951          | 1,380           | 34,321          | 12,250          |
| <b>Other Crops</b> |                 |                 |                 |                 |
| Pepper (Fresh)     | 15,000          | 24,000          | 12,000          | 58,000          |
| Drinking Coconuts  | 68,128 nuts     | 17,612          | 235,037         | 36,414          |
| Coconuts           | 23,702 nuts     | 35,568          | 340,813         | 31,116          |
| Banana             | 194,364         | 291,419         | 210,343         | 2,320,417       |
| Breadfruit         | 53,300          | 75,163          | 20,605          | 530,222         |

Source: Division of Agriculture, Pohnpei State

(3) Distribution of agricultural crops

As per the 1985 statistics.

(a) Distributive prices of crops

The distributive prices of crops vary with school meals, hospitals, restaurants, markets and retail shops. Their purchase prices affect the distributive prices in the individual districts.

Table 2-8 Purchases of Local Agricultural Production by Major Local Institutions

| Item        | Quantity & Prices Paid by Purchaser  |                           |                               |                           |
|-------------|--------------------------------------|---------------------------|-------------------------------|---------------------------|
|             | Department of Education Food Service |                           | Pohnpei State Hospital        |                           |
|             | Total Quantity for 1985 (lbs)        | Average Price per lb (\$) | Total Quantity for 1985 (lbs) | Average Price per lb (\$) |
| Cucumbers   | 21,142                               | .60                       | 1,133                         | .60                       |
| Yams        | 37,595                               | .38                       | -                             | -                         |
| Cabbages    | 26,892                               | .70                       | 1,495                         | .70                       |
| Pumpkins    | 307                                  | .20                       | 115                           | .45                       |
| Breadfruit  | 17,287                               | .28                       | 536                           | .20                       |
| Taro        | 41,042                               | .30                       | 472                           | .45                       |
| Bananas     | 95,265                               | .30                       | 2,067                         | .20                       |
| Lemons      | 3,161                                | .50                       | 102                           | .70                       |
| Watermelons | 8,840                                | .45                       | 903                           | .45                       |
| Eggs        | 563 dozens                           | 1.75 per dozen            | -                             | -                         |

Source: Pohnpei State Department of Education Food Service  
Pohnpei State Hospital



Table 2-9 Purchases of Local Agricultural Production  
by Local Stores, Restaurants & Markets

| Item         | Quantity & Prices Paid by Purchaser       |                                    |   |                                    |   |                                    |
|--------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|
|              | Local Stores                              |                                    | Local Restaurants                         |                                    | Local Markets                             |                                    |
|              | Average<br>Quantity<br>Purchased<br>(lbs) | Average<br>Price<br>per lb<br>(\$) | Average<br>Quantity<br>Purchased<br>(lbs) | Average<br>Price<br>per lb<br>(\$) | Average<br>Quantity<br>Purchased<br>(lbs) | Average<br>Price<br>per lb<br>(\$) |
| Cucumbers    | 1,927                                     | .55                                | 1,381                                     | .50                                | 2,640                                     | .42                                |
| Yams         | -   | -                                  | -   | -                                  | 1,547                                     | .38                                |
| Cabbages     | 525                                       | .73                                | 1,058                                     | .77                                | 680                                       | .62                                |
| Pumpkins     | -   | -                                  | -   | -                                  | 1,480                                     | .18                                |
| Breadfruit   | -   | -                                  | -   | -                                  | 5,200                                     | .20                                |
| Taro         | -   | -                                  | -   | -                                  | 4,600                                     | .17                                |
| Bananas      | 325                                       | .48                                | 630                                       | .23                                | 5,400                                     | .17                                |
| Lemons/Limes | -   | -                                  | 377                                       | .45                                | 1,120                                     | .56                                |
| Watermelons  | -   | -                                  | -   | -                                  | 1,840                                     | .42                                |
| Eggs         | 307<br>dozens                             | 1.40<br>per dozen                  | 2,718<br>dozens                           | 1.78<br>per dozen                  | 35<br>dozens                              | 1.63<br>per dozen                  |

Though fowl eggs are a poultry product, they are added to the list because the distributive price of fowl eggs by market transaction has been established. Restaurants and eating houses are the largest buyers of fowl eggs, possibly due to the fact that since they have to use a certain amount of quality fowl eggs, they buy at the highest price per dozen as compared with other customers.

(b) Prices of Animal products and distribution of pork

In the 1985 statistics, the prices of animal products, except for the prices of fowl eggs, are the estimated values of the Agricultural Bureau, the Ministry of Resources Supervision, because no market prices have yet been established.

The estimated domestic output of Pork is 61.4 tons or \$270,000 in terms of estimated output, \$4.4 per kilogram, while imported pork registered 85 tons or \$6.6 per kilogram. The estimated domestic output of beef is 1.1 tons or \$2.3 per kilogram while imported beef registered 4.0 tons or \$6.2 per kilogram.

Because of the increasing life spans, the rapidly increasing population, the self-sufficient diet, and the shift toward a monetary economy as well as the trend emphasizing money rather than possessing swine as the symbol of wealthy, a change is taking place in the conventional consumption of pork. However, since the unauthorized slaughtering of swine is not permitted, the distribution of pork plus its economic value has been hindered, resulting in increased imports of pork despite the increased production of pork.

Table 2-10 Estimated Livestock Production and Imported Animal Products

| Item           | Quantity of Local Production | Estimated Value in Dollars (\$) | Quantity Imported | Estimated Landed Price in Dollars (\$) |
|----------------|------------------------------|---------------------------------|-------------------|--|
| Meat           |                              |                                 |                   |  |
| Pork           | 61.4 tons                    | 270,000                         | 85 tons           | 3.00 lb                                |
| Beef           | 1.1 tons                     | 2,500                           | 40 tons           | 2.80 lb                                |
| Goat           | .5 tons                      | 1,500                           |                   |  |
| Eggs           | 4,500 doz                    | 75,570                          | 44,640 dozen      | 1.49 doz                               |
| Poultry, Cuts  | -                            | -                               | 137 tons          | .40 lb                                 |
| Poultry, Whole | -                            | -                               | 470 tons          | .86 lb                                 |
| Animal Feed    |                              |                                 |                   |  |
| Pigs           | -                            | -                               | 418 tons          | .19 lb                                 |
| Poultry        | -                            | -                               | 218 tons          | .20 lb                                 |

Source : Pohnpei State Department of Conservation & Resource Surveillance, Division of Agriculture

(4) Summary of farmsteads

A total of 11 farmsteads were chosen for survey at random; 5 from Madolenihmw, 3 from U, 2 from Nett, and 1 from Sokehs. Most of these farmsteads are situated on the flatlands near the coasts having access to the trunk roads, but some are situated on hills. Their lands are all their own. The average total land area managed by the farmers is 8.0 ha; the smallest is 4 ha and the largest is 12 ha.

Many of the householders are engaged in agriculture, five are the staff or drivers of the Agriculture Experiment Station, but some family members other than the householders are engaged in other trades.

The average number of family members is 7.4, but there is a large difference (2 - 14 members) between farmsteads.

On Pohnpei Island, all farmsteads are encircled with various species of tropical fruit trees such as banana trees or breadfruit trees, and with root crops such as yams and taro. Surveys disclosed that these trees and plants have traditionally been cultivated by the individual farmsteads as their self-sufficient crops in the form of semi-cultivation and semiwild growth. However, in recent years, the raising of cash crops such as vegetables and black pepper has been expanding on Pohnpei Island while an increase in the numbers of those engaged in other trades (mainly public servants) has raised the purchasing power at markets, causing changes in the style of self-sufficient farming and in the species of plants grown.

Most forming households are composed basically of the main house and a cooking house, and rich farmsteads additionally have a place of assembly called nahs. The traditional buildings on Pohnpei Island were constructed mostly of the trees which exist there in abundance. However, at the present time, those constructed of concrete blocks, with the roof sheathed with steel sheets, are prevailing.

Table 2-11 Summary of the Surveyed Farmsteads

| No.                      | 1  | 2  | 3              | 4  | 5              | 6              | 7  | 8              | 9  | 10                              | 11             |
|--------------------------|--|--|----------------|--|----------------|----------------|--|----------------|--|---------------------------------|----------------|
| Village                  | Nett                                       | Nett                                       | Sokabs         | U  | U              | U              | Madolenihmw                                | Madolenihmw    | Madolenihmw                              | Madolenihmw                     | Madolenihmw    |
| Vocation of householder  | Staff with Agricultural Experiment Station | Staff with Agricultural Experiment Station | Farmer         | Staff with Agricultural Experiment Station | Farmer         | Driver         | Staff with Agricultural Experiment Station | Farmer         | Farmer                                   | Farmer                          | Farmer         |
| Number of family members | 10   | 8  | 4              | 4  | 8              | 8              | 2  | 7              | 10                                       | 14                              | 6              |
| Topography and location  | Hill                                       | Flatland                                   | Hill           | Coast side                                 | Flatland       | Coast side     | Coast side                                 | Flatland       | Flatland                                 | Mountain                        | Mountain       |
| Area of land owned (ha)  | 8  | 6  | 6              | 9  | 7              | 4              | 12   | 10             | 10                                       | 6                               | 11             |
| Type of land property    | Private                                    | Private                                    | Private        | Private                                    | Private        | Private        | Private                                    | Private        | Private                                  | Private                         | Private        |
| Type of building         | Concrete block                             | Concrete block                             | Concrete block | Concrete block and wood                    | Concrete block | Concrete block | Wood                                       | Concrete block | Concrete block                           | Concrete block                  | Concrete block |
| Roofing material         | Steel sheet                                | Steel sheet                                | Steel sheet    | Steel sheet and coconut palm tree leaves   | Steel sheet    | Steel sheet    | Steel sheet                                | Steel sheet    | Steel sheet and coconut palm tree leaves | Steel sheet                     | Steel sheet    |
| Walling material         | Concrete block                             | Concrete block                             | Concrete block | Concrete block and wooden board            | Concrete block | Concrete block | Wooden board                               | Concrete block | Concrete block and wooden board          | Concrete block and wooden board | Concrete block |

Source: Second Micronesia Pohnpei Inland Scientific Survey Report Compiled by the Overseas Agricultural Study Team, Osaka Prefectural University.

(5) Estimated number of farmsteads

Since no statistical survey on the number of farmsteads has ever been performed, estimation was performed on the number of farmsteads in each village based on the average of 7.4 family members per farmstead. The results are given below.

This estimation was made of Kolonia town, Sokehs municipality, Nett municipality, U municipality and Madolenihmw municipality in Pohnpei Island. The population on which the estimation was based is the value of the 1985 statistics. 85% of the population was assumed to be living on farmsteads.

Table 2-12 Population by municipalities, agricultural population, and number of farmsteads

| Municipality | Population | Agricultural population | Number of farmsteads |
|--------------|------------|-------------------------|----------------------|
| Kolonia      | 6,506      | 5,530                   | 747                  |
| Sokehs       | 5,091      | 4,327                   | 585                  |
| Nett         | 3,394      | 2,885                   | 390                  |
| U            | 2,546      | 2,164                   | 292                  |
| Madolenihmw  | 3,677      | 3,125                   | 422                  |
| Kitt         | 1,131      | 961                     | 130                  |
| Total        | 22,345     | 18,992                  | 2,566                |

Source: Economic & Social Statistics of Pohnpei State

2-2-2 Administrative machinery for agriculture

(1) Present status

The administration of comprehensive agriculture (including stockbreeding) is performed by the Division of Agriculture of Pohnpei State under the control of the Department of Conservation & Resources Surveillance, the Federated States of Micronesia.

The Agriculture Station reporting to the Division of Agriculture is responsible for technical instructions on comprehensive agriculture.

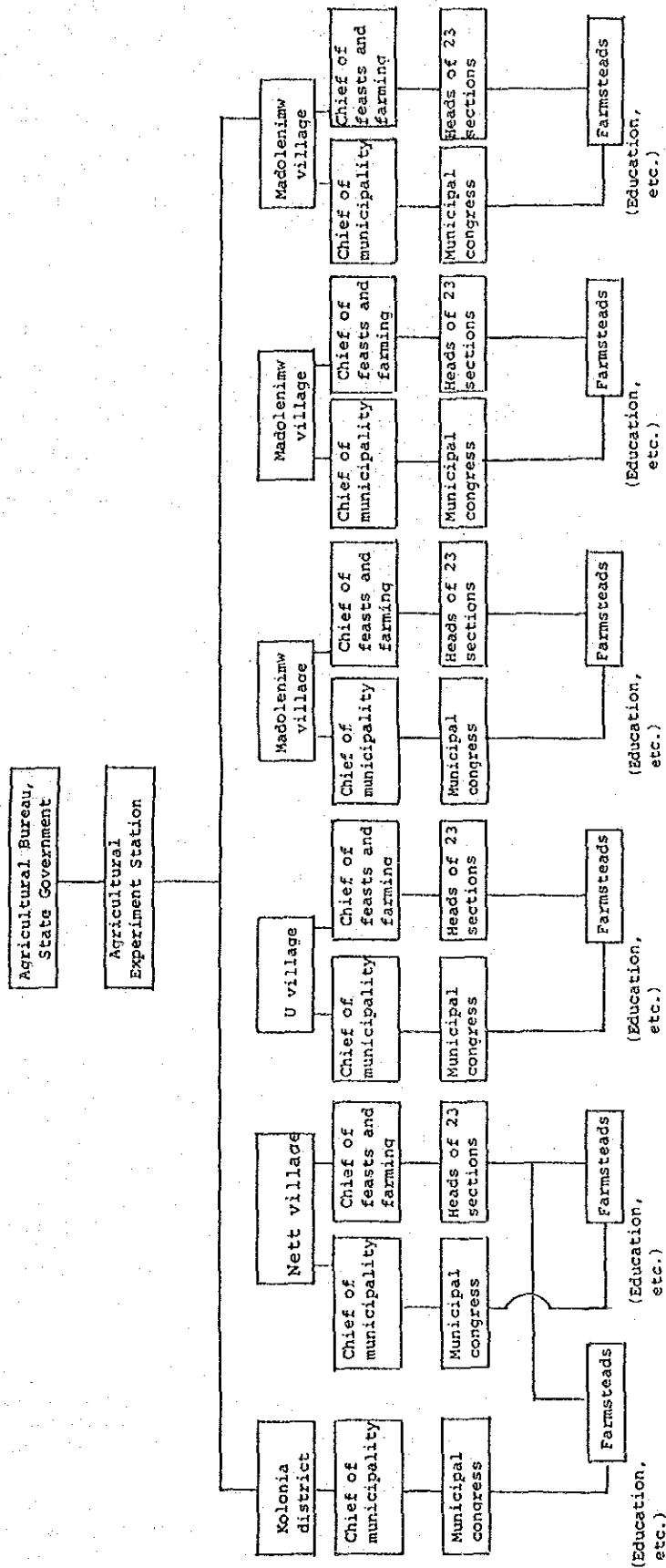
The history of the Agriculture Station is long and dates back to the year 1926, when the Micronesian Islands were mandated by a Japanese administration, which provided the Pohnpei Agriculture Station under the jurisdiction of the then Micronesia Ministry. Tests began primarily on paddy rice plants and medicinal herbs. After World War II, since the Micronesian Islands became a United States Trust Territory placed under UN trusteeship, the Japanese-tilled farmlands were left untilled and have become secondary forest now.

Currently, sweet potatoes, cowpeas, cassava, and spice are being test-grown, as well as versatile species of fruit trees, taro and breadfruit trees. The growing of coconut palm tree saplings is also being done. The administrative machinery is shown below.

(2) Points at issue

Recently, agricultural production under the control of the Pohnpei State Government has come to include the growing of cash crops such as vegetables. Since agricultural production itself is closely related to the traditional tillage ceremony, Kamadipw, and self-sufficient agriculture is the rule, the section head nominated by the Nahmwarki, the chief of feasts and farming, issues instructions on farming to his following, strictly limited, however, to the production of the hogs, yams and breadfruit trees required for feasts. The number of section heads in the five villages of Pohnpei Island is as many as 124. These heads are under the chief of feasts and farming (Nahmwarki). Though the Agriculture Station propagates the growing test results of various crops into the farmsteads, the effect of such propagation is limited because of the current self-sufficient agriculture led by the section heads.

Table 2-13



Source: The 1968 Survey Report of Risenberg appearing in "A Guide to Pohnpei."

2-2-3 Situation of Animal Husbandry - general

- (1) It was historically long years ago when hogs were first introduced to Pohnpei Island, where hogs are most respected. Hogs are regarded not only as the symbol of prestige in the traditional feasts but also as economic treasures. Hogs are grown in pens around Kolonia while in other areas most hogs are grazed.

On Pohnpei Island, breeding facilities at large include small-sized pens accommodating 40 to 50 hogs. These pens are constructed mostly of combined wood and light gauge steel, with partitions being of both light gauge steel and wire fabric. In large-sized facilities, the pens for use by boars are constructed of concrete blocks.

Ten to twenty hogs are accommodated in single-row pens while double-row pens are built for accommodation of more than 20 hogs.

Other than large-sized pens, smaller pens in the seaside areas are built over the sea while they are located along the rivers in the inland area. The disposal of manure is left to natural wash-away with the aid of the 5,000 mm of rainfall per year.

Some large-sized pens are provided with a precipitation tank which is usually finally discharged unattended. None of the precipitation tanks is of a closed type. A 1986 newspaper article reported that the price of a hog is approximately \$4.42 per kilogram (\$2 per pound) on Pohnpei Island. Some 6,000 hogs have been used for a direct offering at funerals and Kamadipw.

- (2) Fowls had been on Pohnpei Island since before human history. Fowls are raised for both edible meat and egg-laying. Like fishes, fowls are a major source of protein for the Pohnpeians. Almost all farmsteads located outside of Kolonia raise one cock for a flock of hens. Fowls roam freely and find feed by themselves. Fowls are always given mashed



coconut or mashed papaya or small gobbets of yam so that they return to their owner. In local areas, the fowls are skinny and hard to handle. These fowls lay only 70 eggs a year.

Throughout Pohnpei Island, there are four poultry farms where a total of 3,000 layers are raised. These poultry farms supply fresh, quality eggs at all times to stores. Most chickens on the market are imported foreign products. (Ducks are also raised, but not many, having no economic impact.)

(3) Pohnpeians have varied views on cattle and have used cattle for meat and milk, as well as for tilling. Small farmsteads feed their cattle vines because the areas available for cattle to graze are small. However, the cattle particularly prefer the yams which Pohnpeians need for their own food, and thus cause damage to yam farms. In the initial stage of World War II, 600 head of cattle were in Madolenihmw village in traction service and were used for weeding the coconut forests (two head of cattle per 120 coconut trees per hectare of forest). This number, however, was reduced to 68 head, for during World War II the Japanese ate the cattle.

(4) On Pohnpei Island, the water buffalo was regarded as a fierce animal for its appearance, like a dangerous African water buffalo. Today, the water buffalos of Pohnpei Island are regarded as resembling the African water buffalo in appearance only. In the past decade, tame, quiet water buffalos have been seen sporadically throughout the island. Though the Japanese claim that there were no water buffalo from 1925 to 1931, in fact, 26 head of water buffalo were there in 1937. Data indicates that 60 head of water buffalo were on Pohnpei in the early period of the American administration, but the 1977 animal statistics indicate 64 head. The water buffalos are primarily used for tillage and transportation.

The Japanese slaughtered and ate water buffalos, but the meat of water buffalo did not appeal to the appetite of the Pohnpeians.

- (5) Some 500 goats are on Pohnpei Island, and can be seen grazing on grass throughout the island.

#### 2-2-4 Status of hog breeding

##### (1) Status of hog breeding

The latest statistics indicate that the number of hogs raised in Pohnpei State amounts to 15,000 head. Estimating from this figure, the number of breeding hogs will be about 2,500 head. Assuming that there are some 2,000 breeding farms, 7.5 head (including hoglings) will be the estimated average per farm. (The total number of farmsteads is 2,660.)

On Pohnpei Island, breeding facilities at large include small-sized pens accommodating 40 - 50 hogs, constructed mostly of combined wood and light gauge steel, with partitions being of both light gauge steel and wire fabric. In large-sized facilities, the pens for use by boars are constructed of concrete blocks.

Ten to twenty hogs are accommodated in single-row pens while double-row pens are built for accommodation of more than 20 hogs.

Other than large-sized pens, smaller pens in seaside areas are built over the sea while they are located along the rivers in inland areas. The disposal of manure is left to natural wash-away with the aid of the 5,000 mm of rainfall per year.

Some large-sized pens are provided with a precipitation tank which is usually finally discharged unattended. None of the precipitation tanks is of a closed type.

##### (a) Breeds

The breeds of native island hogs are unidentified. The results of this survey show that most breeds have been crossbred through successive generations, and

specifically, because of the previous existence of Berkshire and Middle Yorkshire types, the breeds on Pohnpei Island would be a crossbred with those raised before World War II.

Modern species of Large White, Hampshire and Duroc hogs, totalling 10 head, were imported 10 years ago and achieved good results. However, disorderly inbreeding followed immediately, causing the resulting hogs to be small in size, reducing their breeding capacity, and conspicuously degenerating their reproductive and meat producing capacities.

The survey revealed that a sow farrows once a year and the number of piglets from a litter is a low five.

(b) Breeding methods

Breeding methods take advantage of the natural conditions. Pens are built along the coast and along rivers depending on whether they are located in the mangrove forest or river areas.

The pens are built with an open enclosure braced with deformed rebars for construction use, and the roof is sheathed with galvanized steel sheet. Pens measure about 1 m x 1 m or 1 m x 1.5 m, are a common type without a separate hogling pen, farrowing pen or boar pen.

Nipple drinkers are generally used for watering. Manure is disposed of several times a day by washing the pens with tap water dashed through a hose and then discharging untreated into the sea and rivers.

Manure management for the pens located on hills and flatlands relies on the evaporation of the farmlands where the manure is disposed of.

In these areas, hogs are grazed, but such grazing is somewhat restricted because crops are injured by hogs. Grazing tendency is stronger on the hills than on the flatlands.

On the flatlands, another style of grazing is seen within the premises where a certain area is enclosed with laid-up stones.

For forage feeding, hogs are fed two times a day with assorted feeds imported from the USA and Australia. Powder or pelletized forage is spread on the pen floor.

Some breeders feed their hogs their unique forage blended with assorted imported forage (CP 48%) and cooked foods.

The survey encountered scenes where some breeders were feeding their hogs a mixture of leftover foods, animal internal organs, coconuts, bananas and taro, boiled altogether over burning coconut bark.

Further, the hogs in pasture are fed once a day, and are not well nourished.

Specifically, the sows with hoglings are in pasture. However, judging from the state of the nourishment of the sows, the farrowing interval tends to be prolonged because after weaning, the sow requires several days until it becomes estrous next. This gives rise to problems.

(c) Method of slaughtering and meat preparation

At the present time, there is no slaughterhouse. The custom of using pork for ceremonies, mainly such as marriages and funerals, has continued for a long period of time since olden times.

In such ceremonies, a live hog is offered, followed by stabbing it to death through the heart. Then, the hair is removed with a heated stone, the internal organs taken out and, in their original forms, wrapped with banana leaves, overlaid with heated stones and baked. The baked meat is cut into gobbets, brought as gifts to the individual houses of the attendants, and then eaten together with the family members.

This practice is employed in family events.

Should the host of a ceremony own no hog to offer, in many cases, a live hog will be bought as an offering from a nearby meat store. A live hog is expensive, \$1.50 to \$2.00 per pound. A heavy hog is most valued, particularly a barrow with large tusks. For this reason, some farmers are always prepared for any ceremonial occasion.

In case the storage of a live hog is desired, a market or restaurant will be negotiated with to sell it at approximately \$3 per kilogram. The hog will then be slaughtered and stored for sale in a freezer. Such markets or restaurants are few in number.

The frozen pork supplied to restaurants, etc. is mostly imported.

Therefore, no standards or distribution structure have yet been established, nor is a processing facility available.

- (d) Markets for processed products such as pork, hams and sausages

It is often voiced that consumers desire to eat pork at least once a week, but that is impossible because it is so expensive.

The prices of imported meats on sale currently at the markets, etc. are as follows, but are purchased chiefly by restaurants, foreigners and wealthy people. Ham and bacon are purchased by many people for their high preservability (\$3.29/pound of bacon).

Table 2-14. Retail prices of imported pork in Kolonia town  
(As per the results of the survey in November 1987)

|                  |             |
|------------------|-------------|
| Spare ribs       | \$2.45/lbs. |
| Choice pork      | 2.35        |
| Ground pork      | 2.60        |
| Fresh pork hocks | 1.15        |
| Pork butt        | 2.25        |
| Belly            | 1.88        |
| Ham hocks        | 1.50        |
| Lunchon meat     | 1.5/198 g   |

(e) Sanitary measures for hogs

No malignant hog disease has ever appeared, but hogs should receive examinations to stamp out entozoa. Provision of a sterilizing bath and measures to prohibit access of visitors to the pigpens should be mandatory. Regular sterilization of the pens is required as well.

(2) Supply of sows and boars for breed improvement

(a) Agriculture Station

The Existing Agriculture Station was built in 1926. It measures a total area of 6.5 ha and is responsible for the execution of tests and studies on comprehensive agriculture. At the present time, three boars (of the Hampshire and Duroc species) are being raised, but not much production is being undertaken.

In the past, the station produced crossbreds based on the Large White species and once transferred some 600 head of hoglings to breeders (1985). The transfer price was \$35 per 15 kg of weight, and the average number farrowed per hog was five head.

The station at the present time is remarkably deteriorated (it was built 23 years ago), and there are no pure bred sows or boars at all.

(b) Status of other breeding supply farms

PATS farm (annexed to an agricultural school)

This farm also used to produce and distribute hoglings, while, at the present time, it is undertaking the production of crossbreds from two boars and ten sows. It has stopped the distribution of hoglings because its hogs are supplied to feed the boarding students at the agricultural school. The existing sows and boars are not of good quality. The barn has also progressively deteriorated.

(3) Status of breeding facilities, and points at issue

All of the breeding facilities covered by this survey are poor, and small in size as well as severely deteriorated. Among other problems, since disorderly crossbreeding has been done to such an extent that the capability of hogs to provide the purebred sows and boars which are the basis for breed improvement, this goal cannot be achieved; thus the improvement of breeds is halted not only at the productive center but also throughout Pohnpei State.

2-2-5 Status of forage

(1) Raw forage materials produced on Pohnpei Island

(a) Potatoes and fruits

Major raw forage materials include root crops such as taro, yams, cassava, and fruits such as coconuts, bananas and breadfruit. No details are available as to the growing area of root crops and their yields. The area in which coconuts, bananas and breadfruit are cultivated accounts for 30% of the gross area of Pohnpei

Island, of which the estimated coconut growing area measures 5,000 acres with 297,000 coconut palm trees (the data released from the Pohnpei State Department of Conservation & Resources Surveillance). The growing lands are optimum for such planting and other than being weeded occasionally, coconuts require little care and are never fertilized.

(b) Output

The 1984 outputs of major forage materials are given below, but there is no data available as to how much of these materials were supplied for forage use.

Table 2-15 Outputs of Major Forage Materials

| Agriculture Item   | (Out-Put in Lbs) |                 |                 |                 |
|--------------------|------------------|-----------------|-----------------|-----------------|
|                    | 1981<br>Out-Put  | 1982<br>Out-Put | 1983<br>Out-Put | 1984<br>Out-Put |
| <b>Vegetables</b>  |                  |                 |                 |                 |
| Head Cabbage       | 5,141            | 15,674          | 8,609           | 7,375           |
| Chinese Cabbage    | 8,001            | 31,777          | 74,778          | 21,418          |
| Cucumber           | 32,120           | 44,694          | 37,704          | 38,176          |
| Tomato             | 1,177            | 419             | 550             | 733             |
| Green Onion        | 2,440            | 1,070           | 809             | 1,436           |
| Pumpkin            | 1,387            | 2,613           | 5,911           | 3,471           |
| Egg Plant          | 2,366            | 4,786           | 3,333           | 3,471           |
| Bell Pepper        | 3,983            | 7,278           | 3,838           | 5,016           |
| Watermelon         | 6,136            | 27,262          | 25,138          | 20,186          |
| Others             | 655              | 759             | 868             | 770             |
| <b>Fruits</b>      |                  |                 |                 |                 |
| Papaya             | 7,660            | 10,060          | 11,917          | 9,945           |
| Pineapple          | 5,357            | 5,157           | 1,557           | 3,955           |
| Tangerine          | 1,401            | 1,401           | 1,770           | 1,524           |
| Lemon              | 5,462            | 4,969           | 7,665           | 4,377           |
| Mango              | 9,616            | 28,433          | 38,479          | 17,351          |
| <b>Root Crops</b>  |                  |                 |                 |                 |
| Yam                | 26,212           | 38,545          | 39,451          | 34,733          |
| Cassava            | 10,609           | 24,563          | 19,349          | 18,735          |
| Sweet Potato       | 20,036           | 12,243          | 15,085          | 15,794          |
| Cubacasia turn     | 14,489           | 59,132          | 6,845           | 26,822          |
| Sakau              | 126,285          | 277,820         | 120,310         | 178,158         |
| Taro               | 10,851           | 1,360           | 34,321          | 12,250          |
| <b>Other Crops</b> |                  |                 |                 |                 |
| Pepper (fresh)     | 12,000           | 24,000          | 12,000          | 59,000          |
| Drinking Coconuts  | 68,128 nuts      | 17,612          | 231,037         | 36,414          |
| Coconuts           | 23,702 nuts      | 35,548          | 340,813         | 31,116          |
| Banana             | 194,364          | 291,419         | 210,343         | 2,320,417       |
| Breadfruit         | 53,300           | 75,163          | 20,605          | 530,222         |

Note: Production estimate based on the 3 years (1981 - 1983) marketed production plus the estimate home consumption.  
Source: Division of Agriculture, Pohnpei State.

(c) Status of cultivation of root crops

(1) Yams

Yams are planted from December through April, inside small areas enclosed with stone dikes. Holes are dug, yams planted and covered with soil to a thickness of several centimeters. The vines are tied to supports, and altogether hidden so that



nobody else can find the planted area, and occasionally cared for before sunrise. The yams planted must be protected against damage by wild animals, but not against the hogs in pasture.

The maturing period varies with the species, weather, and when planted, but yams are harvestable all the year round depending on planting intervals and the choice of species (early-ripening and slow-maturing).

(ii) Taro

On Pohnpei Island, seventeen species of taro are cultivated, the species being chosen to match the marshy or dry or tilled ground. Generally, taro is planted during the rainy season. Stalks, branches and stubbles are washed with water, planted, and covered with soil. Taro planting is performed mostly in marshy ground. Hibiscus leaves are used as a fertilizer.

Once the plating area has been chosen, water will be introduced to ease the covering of soil. Differing with the species, taro can be harvested 1 to 3 years after it is planted.

(iii) Cassava

The cassava cultivated on Pohnpei Island is of the San Salvador species. It grows in any type of soil. There are two species, sweet and bitter, which can be planted in any season throughout the year. The sweet species matures in 6 months and the bitter in 12 months.

(d) Ingredients of major forage crops

Table 2-16

| Variety              | Dry component | Crude protein | Crude fat | Crude fiber | Ash   | Soluble nonnitric oxide |
|----------------------|---------------|---------------|-----------|-------------|-------|-------------------------|
| Cassava (dried)      | 87.5 %        | 2.7 %         | 0.6 %     | 4.0 %       | 5.5 % | 74.7 %                  |
| Sweet potato (raw)   | 26.72         | 0.95          | 0.57      | 1.55        |       | 26.80                   |
| Taro (raw)           | 25.55         | 1.46          | 0.52      | 0.92        | 1.15  | 21.51                   |
| Yam (raw)            | 25.00         | 1.98          | 0.28      | 1.43        | 1.05  | 20.26                   |
| Coconut meat (raw)   | 35.41         | 3.35          | 19.42     | 0.97        |       |                         |
| Coconut meat (dried) | 89.00         | 7.58          | 69.09     |             |       |                         |
| Copra cake           | 90.28         | 17.53         | 8.75      | 12.19       | 6.12  | 46.63                   |
| Papaya (raw)         | 6.80          | 1.00          | 0.10      | 0.80        | 0.50  | 5.20                    |
| Banana (dried)       | 89.56         | 5.35          | 1.07      | 3.52        | 5.14  | 74.48                   |

(e) Effectiveness of utilization of crops for livestock forage

The copra cake (copra meal) produced from coconuts is utilizable as a protein forage while yams, breadfruit, cassava and bananas can be utilized as an energy forage.

The active production of these self-suppliable crops would result in a considerable decrease in the cost of forage.

(2) Fish

(a) Outputs and prices of fishery resources (1985)

Table 2-17

| Type          | Quantity<br>(short tons) | Landed<br>Value<br>(\$000's) | 2) |
|---------------|--------------------------|------------------------------|----|
| Reef          |                          |                              |    |
| Reef Fish     | 217 - 275                | 256.0 - 700.0                | 3) |
| Mangrove Crab | 35                       | 95.4                         |    |
| Lobster       | 3                        | 5.3                          |    |
| Clams         | 4                        | 4.4                          |    |
| Pelagic 4)    |                          |                              |    |
| Yellowfin     | 100 - 142                | 190.0 - 221.0                |    |
| Skipjack      | 55 - 250                 | 75.5 - 375.5                 |    |
| Mahimahi      | 30                       | 39.0                         |    |
| Wahoo         | 5                        | 5.8                          |    |
| Marlin        | 2                        | 1.7                          |    |

Note 1: Based on provisional data & estimates.

2: Price paid to fishermen.

3: Estimated within a wide range, as high as \$1,000,000.

4: Pelagic = deep sea.

Source: Pohnpei State Economic Development Authority  
Pohnpei State Department of Conservation &  
Resource Surveillance, Division of Marine Resources

(b) Farm prices of imported assorted forage (as per the results of the survey performed on November 6, 1987 at the Pohnpei Agricultural Experiment Station)

Table 2-18

| Forage  | Weight | Price   | Imported from |
|---|--------|---------|---------------|
| Layers  | 88 lbs | \$13.80 | Australia     |
| Layers pellet                                     | 80     | 16.80   | USA           |
| Chick starter                                     | 80     | 17.40   | USA           |
| Pig starter                                       | 80     | 18.40   | USA           |
| Pig Grower  | 88     | 13.20   | Australia     |
| Sow Ration  | 80     | 16.30   | Australia     |
| Pig Breeder                                       | 88     | 13.20   |               |
| Pig Grower  | 80     | 15.95   |               |
| Barastoc Farmix<br>200 (high proteinic<br>forage) | 80     | 22.00   |               |

Note: 60% of the imported forage is marketed at the Agricultural Experiment Station, while 40% is marketed at Palm Terrace, Nakasone, KCCA, and AMBROS.

(c) Ingredients of assorted imported forage

The guaranteed ingredients of Pig Grower (NANNA Pro., Los Angeles)

|               |                |
|---------------|----------------|
| Crude protein | 16.0% and over |
| Crude fat     | 3.0% and over  |
| Crude fiber   | 6.0% and under |
| Ash           | 8.0% and under |

Note: Subject to the continuous feeding of this forage to a hog weighing 50 lbs. and over

The guaranteed ingredients of Barastoc Farmix 200  
(Corowh Company, Australia)

|                  |                          |
|------------------|--------------------------|
| Crude protein    | 48.0% and over           |
| Crude fat        | 8.0% and over            |
| Crude fiber      | 5.0% and under           |
| Salt             | 2.0%                     |
| Fluorine         | 0.04%                    |
| V.A.             | 80,000 units/kg and over |
| V.D <sub>3</sub> | 12,000 units/kg and over |

Assorted ingredients:

Cotton cake, rapeseed cake, sunflower cake, soybean cake, field peas, lupine meal, bone meal, bone meat meal, powdered blood, fish meal, and salt.

Note: This assorted forage is the base to be blended with barley and wheat.

(4) Status of hog feeding

- (a) A total of 400 tons of assorted forage for hogs is imported from the USA and Australia, and this quantity is too small to feed the 15,000 head of hogs on Pohnpei Island.

The methods of feeding vary such that (1) hogs are fed with a small quantity of assorted forage once in the morning and then grazed, (2) hogs are fed with a mixture of assorted forage and self-supply forage twice a day, and (3) hogs are fed with only assorted forage which is scattered on the floor twice a day. Methods (1) and (2) are predominant.

- (b) Other than assorted forage, hogs are given copra (raw or meal), taro, banana, cassava, and leftovers, and, in May, surplus breadfruit.

These are given to hogs as a single taste or a mixture of any of these and fish internal organs boiled altogether. The self-supply forage is not grown deliberately for forage use, but as food for the family members and for sale to the markets, and the remainder is given to hogs.

Accordingly, the amounts of forage to be given to hogs are not weighed, but given haphazardly. Other than in Kolonia town, hogs are not raised in barns, but generally fed a small amount of assorted forage or copra in the morning and then grazed. There is no data as to what and how much the hogs in pasture eat.

(5) Points at issue regarding breeding from the viewpoint of forage

(a) Imbalanced nourishment

The breeding of hogs on Pohnpei island relies on primitive, unattended pasture. Hogs are fed with small amounts of assorted forage, copra, taro, banana, and leftovers. They also graze on field plants. These belong to the category of energy forage, and the requirements for protein, vitamins, minerals, etc. are not met, presumably inducing the following results:

- (i) High mortality of hoglings due to undernourishment.
- (ii) Retarded growth of pork hogs.
- (iii) Corpulence of breeding hogs ---- a decrease in breeding achievement.

2-2-6 Technical levels of hog breeding

(1) Hog breeding in traditional society

The history of hog breeding on Pohnpei Island is long and dates back 150 years. Hogs have since been grazed on leftovers of breadfruit, yams, and taro which are the natural gifts of Pohnpei Island.

Recently, although pens have been built adjacent to the farmstead dwellings in the Kolonia town district and in the coastal areas or by rich farmsteads where there is considerable forage available, in the inland areas the hogs are fed only twice a day, in the morning and evening, and grazed for the remainder of the day because these farmsteads are near the hills and located away from the neighboring farmsteads.

Since these farmsteads cling to the deep-rooted concept that hogs are reared for feasts, but not for sale, the quality of pork is not considered as important as the weight of a live hog. In the traditional society, the objective of the production of hogs can be thoroughly accomplished through the pasturage method, and accordingly the breeding level is low.

(2) Modern breeding methods

There are no specific modern breeding methods used on Pohnpei Island, except the technical ones employed by Pohnpei Agriculture & Trade School, which is quite modern when compared with conventional pasturage. Those who graduated from or are currently studying in the school have reached 271 in number. Assuming that 50% of this number majored in the agricultural course, approximately 150 students have mastered modern hog breeding technology. Currently, they are still young and few in number. And since there is no hog breeding study team nearby, the technology that they have acquired at no small pains at school is not being utilized, but in reality they are making a living by working as drivers in the Kolonia town. Nevertheless, it is a certainty that on Pohnpei Island, the existence of these youths will be a new motivating power for modern breeding technology in the future.

2-3 Summary of Proposed Facilities

2-3-1 Organization and details of the Project

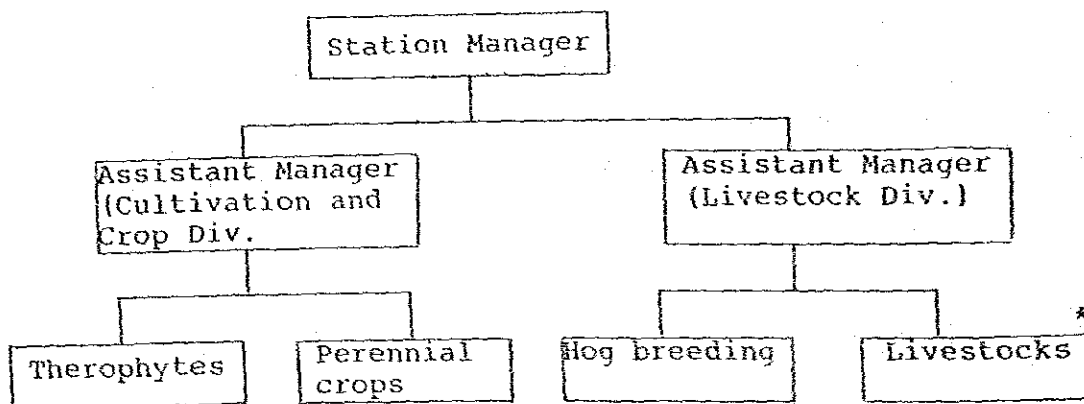
The Kolonia Town Agriculture Station, which is regarded as the main breeding center, is located in the heart of Kolonia, the capital of the Federated States of Micronesia. The station is under the management of the Division Agriculture, the Pohnpei State Department of Conservation & Resources Surveillance, and has a staff of 46. Currently, the station performs activities centering on studies related to crops and farm animals. On the farms of the station are raised hogs and fowls. The various species of fruits, taro and breadfruit trees are also cultivated. And the experimental cultivation includes tropical plants and spices. The results of experiments are propagated to the farmsteads at large.

2-3-2 Operating structure and budget

(1) Operating structure

The operating structure of the station is such that two assistant managers report directly to the station manager. One of the two assistant manager is responsible for the cultivation and crop division and the other is responsible for the livestock division. The organization of the station is as charted below:

Table 2-19



(\*) The livestock here chiefly consists of fowls. Currently, an expert from the USA is residing there, taking care of the rearing.



Currently, the Pohnpei State Agriculture Station is staffed with 46 members. Inferring from the fact that their average wage is \$1.30 per hour, the direct operating cost alone will be \$126,000 per annum, and adding in other maintenance costs, an estimated annual budget of \$165,000 will be required. The government's internal expenditures are broadly classified into operating expenditures and construction expenditures, and the Department of Conservation & Resources Surveillance, which is over the Agriculture Station, has appropriated operating expenditures of \$4,503,000 and construction expenditures of \$650,000 a year, which are regarded as sufficient. Currently, the station employs three hog breeding engineers, and one of them has over 20 years' experience.

### 2-3-3 Status of activities

#### (1) Rice planting

With the advent of the 1960s, the experimental cultivation of rice was commenced. In 1961, the then Trust Territory Government Department of Agriculture investigated the feasibility of rice planting, followed up by inviting a Japanese engineer named Heiki Tanaka in 1964, and subsequently rice planting began at the agricultural experiment stations located in Senipen (the area where the most extensive rice crops were cultivated) and Kolonia.

Table 2-20 Rice plant cultivation area and harvests

| Year | Area<br>(ha) | Production<br>(kg) |
|------|--------------|--------------------|
| 1964 | 1.2          | 363                |
| 1965 | 2.8          | 8,464              |
| 1966 | 5.7          | 5,450              |

Source; Second Micronesia Pohnpei Island Scientific Survey Report Compiled by the Overseas Agricultural Study Team, Osaka Prefectural University.

Under the guidance of the Agriculture Station, an 81 ha rice planting project was commenced at the Tamon Bay coast area situated northeast of Madolenihmw village. Because of poor land grading and irrigation facilities, not more than 5.3 ha could be cultivated. In 1974 those islanders who desired taking up rice planting gathered to the Hahnwarkis of Madolenihmw and other villages, discussing how to set up a rice cultivation organization. As a result, a joint organization for rice planting was to be established. However, due to the fact that the poor grading of the land required large tilling machines and rice-planting machines which could not be operated well by the islanders; that the species of rice to be planted was plagued by many problems including damage by birds; that the quality of the rice crop was poor due to insufficient drying of the harvests; as well as the fact that rice planting required a much larger labor force than conventional agriculture, the experimental cultivation of rice plants was suspended in 1980.

(2) Dry field farming

Currently, the experimental cultivation of sweet potatoes, cassava and cowpeas is carried out in addition to the cultivation of fruits such as guavas and mandarin oranges. Recently, efforts have been exerted in the cultivation of pepper, which is already well under way. The experimental cultivation of coconut palm saplings is also under way.

(3) Hog breeding

Breeding facilities on Pohnpei Island were built some 23 years ago. In 1985, some 60 head of hoglings could be transferred to breeders, but currently only 3 boars (of the Hampshire and Duroc species) are being raised. Due to this, the production of purebred has been suspended.

## 2-3-4 Status of facilities and equipment

### (1) Facilities

The facilities under the proposed project are on the 7 ha premises of the Agriculture Station located in the Kolonia district, their arrangements and sizes being as shown in the attached drawings.

#### (a) Hog breeding facilities

The existing breeding facility is at location 4 on the layout plan, with the following details:

Building area: 256.2 m<sup>2</sup>

Construction : Light gauge steel

Roof : Galvanized corrugated steel sheet

Floor : Wood trowel finished concrete floor with drainage slope

The breeding facility is divided into 23 pens separated with a concrete block wall for boars and with steel wire fabric wall for sows. Of the 23 pens, 12 are for sows and boars. Each pen measures 2.5 m x 5.5 m = 13.75 m<sup>2</sup>. The remaining 11 pens are for farrowing and growers.

This building was built 23 years ago, and though partly extended, it is in a bad state of deterioration.

There is only one receptacle in this building, from which all power supply is obtained. No lighting system is provided.

Each pen is furnished with a nipple drinker.

Manure is disposed of through the ditches at either side of the building into a settling tank. As this tank is not of the closed type, it is exposed directly to rainwater, causing it to not function.

(b) Other facilities within the Agriculture Station are:

1 Administrative Building

Area : 360 m<sup>2</sup>  
Construction : Steel  
Roof : Ribbed colored steel sheet roofing  
Exterior wall : Ribbed colored steel sheet siding

Note: The laboratory is used for the study of blights and insects harmful to crops.

2 Warehouse and Workers' Room

Area : 33.6 m<sup>2</sup>  
Construction : Steel  
Roof : Ribbed colored steel sheet and, the building roofed with galvanized corrugated steel sheet  
Exterior wall : Ribbed colored steel sheet siding

Note: Forage Warehouse No. 1 is for hog use and equipped with two air-conditioners for dehumidification. The forage for the existing hogs is supplied from this warehouse. Forage Warehouse No. 2 is for fowls, and is not equipped with an air-conditioner.

3 Workshop

Area : 436.5 m<sup>2</sup>  
Construction : Concrete block and wood  
Roof : Galvanized corrugated steel sheet  
Exterior wall : Concrete block masonry with tooled joints.

4 Poultry House

Area : 298.11 m<sup>2</sup>  
Construction : Wood  
Roof : Galvanized corrugated steel sheet  
Exterior wall : Wainscot with concrete block masonry to a height of 1.1 m. Upper opening covered with wire fabric.

- 5 Compost House  
 Area : 279.66 m<sup>2</sup>  
 Construction : Light gauge steel  
 Roof : Galvanized corrugated steel sheet  
 Exterior wall : Wainscot with concrete block masonry  
 to a height of 1.5 m.
- 6 Duck House  
 Area : 36.0 m<sup>2</sup>  
 Construction : Wood  
 Roof : Galvanized corrugated steel sheet  
 Exterior wall : Wainscot with concrete block masonry  
 to a height of 1.1 m. Upper opening  
 covered with wire fabric.
- 7 Cock House  
 Area : 14.4 m<sup>2</sup>  
 Construction : Wood  
 Roof : Galvanized corrugated steel sheet  
 Exterior wall : Wainscot with concrete block masonry  
 to a height of 1.1 m. Upper opening  
 covered with wire fabric.
- 8 Farming Tool Storage  
 Area : 45.0 m<sup>2</sup>  
 Construction : Concrete block masonry  
 Roof : Galvanized corrugated steel sheet  
 Exterior wall : Concrete block masonry

(2) Equipment

The equipment used by the Agriculture Station:

|                  |                  |                                   |
|------------------|------------------|-----------------------------------|
| Vehicles:        | Truck 4-ton      | 1 unit                            |
|                  | Truck 2-ton      | 3 units (1958 model)              |
|                  | Jeep 2-ton       | 1 unit (old)                      |
| For farming use: | Tractor, Yammer  | 5 units (but 3 units are<br>used) |
|                  | Tractor, Johndey | 5 units                           |
|                  | Bulldozer        | 2 units (1 unit is used)          |

#### Harmful Insect Laboratory:

|                            |  |
|----------------------------|--|
| Microscope                 | 3 units (1 Olympus unit<br>is usable)  |
| Chemicals shelf            | 1 unit                                 |
| Sieve                      | 1 ea (ø300 mesh)<br>Meshes are broken. |
| Refrigerator<br>(700 lit.) | 1 unit                                 |
| Oven                       | 1 unit                                 |
| Balance                    | 1 unit                                 |

#### Hog breeding equipment:

|             |        |
|-------------|--------|
| Dummy sow   | 1 unit |
| Wheelbarrow | 1 unit |

#### 2-4 Outline of Related Projects

##### 2-4-1 Agricultural Programs and Projects

The state's current agricultural programs emphasize extension services and farmer education. And there are active programs for propagating and distributing to farmers improved species of crops and livestock.

However, there is a problem of lack of agricultural research, especially adaptive research to improve the yield of existing crop varieties so as to increase farm productivity with the existing technology and level of farm operations.

To cope with these situations the government has adopted the following objectives:

- target small householders as developers of the Nation's agricultural potential;
- expand and diversify agricultural production for domestic consumption and for export;
- increase livestock production to limit importation of meat products;
- improve marketing systems for agricultural produce;
- protect the Nation's crops and animals against diseases;

To achieve the above mentioned objectives, the Government of FSM and the Government of Pohnpei State will pursue the development of the Nation's agricultural potential through the following programs and projects:

1. National Government

(a) Agricultural research program:

The national government will support adaptive research in agriculture at the state agriculture stations. The program will involve the acquisition of improved crop varieties and the introduction of new food and crops to determine which varieties will thrive in the various states. The program will also cover the acquisition of improved varieties of existing livestock and the introduction, multiplication, and distribution to farmers of new domesticated animals.

Estimated cost: \$160,000

(b) Quarterly Journal of Agriculture and Forestry:

The national government will fund the publication of a Quarterly Journal of Agriculture and Forestry to disseminate information on research findings, appropriate methods for growing existing and new crops. The annual grant fund for supporting the publication is placed at \$40,000. The initial cost of setting up the journal is placed at \$30,000.

Estimated cost: \$230,000

(c) Animal health, meat inspection, and plant protection programs:

The national government will continue to strengthen the existing animal health program including the construction of post-entry quarantine stations. Meat inspection will be instituted to meet World Health Organization requirements as an aspect of the animal health program. Existing plant protection programs will

be improved by extending periodic invitations to entomologists and plant pathologists.  
Estimated cost: \$560,000

2. Pohnpei State Government

(a) Coconut rehabilitation project

The project involves assistance to owners of coconut groves in rehabilitating their groves so that they can become more productive. The assistance will be in the form of improving the existing coconut palm varieties by crossbreeding, supplying farmers with improved seedlings, instructing farmers on the thinning of groves, and so on.

Estimated cost: \$490,000

(b) Agricultural research

Research programs at the Pohnpei Agriculture Station will be mainly adaptive research and field trials.

Estimated cost: \$135,000

(c) Agricultural production service

The research program will employ a novel way of using government sponsored crews to cultivate both public and private lands to increase food production.

Estimated cost: \$1.45 million

(d) Farm equipment service

The project will maintain a set of small farm machines and equipment to be rented to farmers.

Estimated cost: \$592,000

(e) Livestock improvement program

The existing livestock improvement program will be expanded.

Estimated cost: \$315,000



(f) Animal feed demonstration farm

The project involves the establishment of an animal feed mixing plant which will obtain about 50% of its raw materials from a demonstration farm.

Estimated cost: \$286,000

(g) Agricultural revolving fund

The project represents a continuation of an ongoing project to import farm inputs for resale to farmers at landed cost plus a small markup.

Estimated cost: \$241,000

(h) Training

To upgrade their level of competence, agriculture field extension workers will receive regular in-service courses in improving extension methods for crops and livestock, and participate in specialized short-term overseas courses. To accomplish this an Agricultural Training Unit will be established.

Estimated cost: \$180,000

(i) Biannual Pohnpei agriculture show

An agriculture show will be held with the purpose of enabling active and potential farmers to exchange ideas, and for businessmen to display and demonstrate agricultural equipment supplies to farmers.

Estimated cost: \$51,000

(j) Agricultural extension centers

Agricultural extension centers will be established in municipalities on the main island that are relatively far away from the Pohnpei Agriculture Station.

Estimated cost: \$102,000

(k) Agriculture information unit

An agriculture information service is a vital part of an effective agricultural extension system. An agriculture information unit will be set up in the Pohnpei Agriculture Station and will include a library with a small publication section.

Estimated cost: \$225,000

(l) Production loan fund

The purpose of this fund is to make available to interested and qualified applicants low interest long-term loans having adequate grace periods. The proposed loan fund is for black pepper, crops, and swine production.

Estimated cost: \$885,000

2-4-2 Present Condition of Related Facilities and Equipment

It was presumed that approximately 15,000 pigs were raised on Pohnpei Island in 1985. In and around Kolonia, the capital of FSM and Pohnpei State, pigs are confined in simplified pens having concrete floors and wire fences in accordance with the state's regulations. In other areas, the traditional way of raising pigs in backyards is still employed. Step by step this situation is improving. At the present time, two large-scale swine breeding farmers have been conducting operations on the island other than at the Pohnpei Agriculture Station.

(a) Japanese Christ Church Mission

Japanese Christ Church Mission is managing a swine and poultry farm in Ohwa, Madolenihmw Municipality. The size of the farm includes 150 head (including sows, boars, and pigs) of swine and a 700-layer poultry operation.

(b) PATS (Pohnpei Agriculture and Trade School)

PATS has its own attached farm with 10 sows and a boar. Offspring are raised until they weigh 200 lbs or more, and are then privately supplied as breeding stock to local farmers.

Modern breeds, such as Large White, Hampshire, and Duroc, were imported from the USA ten years ago. Their progeny were produced in the Pohnpei Agriculture Station, delivered to local farmers at low prices, and crossbred with local breeds. However, dense inbreeding has resulted in body miniaturization and a depression in the number of piglets farrowed and in their survival rate.

2-5 Request for the Project

2-5-1 Particulars of the Request

Pohnpei is one of the four Federated States of Micronesia (Truk, Pohnpei, Yap, and Kosrae). It has the largest area (980 km<sup>2</sup>) and a total population of over 28,000.

About 85% of the population of Pohnpei is concurrently engaged in agriculture and fishing. The people mainly engage in cultivating root crops and tropical fruit, in addition to raising swine.

Pork, a traditional food in the area, being the only source of animal protein, plays an important dietary role in Pohnpei. However, since there is a shortage of boars at the present multiplication center (the multiplication rate of boars is very low due to excessive inbreeding and the fact that modern sterilizers are not available on Pohnpei), eighty-five tons of pork must be imported every year.

Feed for animal husbandry depends upon imports; this is the reason for the sudden increases of pork prices. In order to cope with the situation, the federated government has placed great emphasis on improving the breed of swine and on the home production of feed, and has made a plan for improving the present multiplication center. For this important project, the government has requested grant aid cooperation from the Japanese Government.