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Evaluation of Agricultural Statistics for ADAP

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Evaluation of Agricultural Statistics for ADAP

Stuart T. Nakamoto¹, Homer K. Rowley², and Donald A. Martin²

The Agricultural Development in the American Pacific (ADAP) Directors requested that the USDA, National Agricultural Statistics Service (NASS) extend its statistical program to the ADAP region: American Samoa, the Federated States of Micronesia (FSM), Palau, the Republic of the Marshall Islands (RMI), Guam, and the Commonwealth of the Northern Marianas (CNMI). The ADAP Directors consist of the Directors of the respective schools of agriculture in the following Land-Grant institutions: University of Hawaii, University of Guam, American Samoa Community College, College of Micronesia, and Northern Marianas Community College. We acknowledge and thank the Directors, the ADAP staff, and our cooperators in each Land Grant for their assistance in this project.

This is the final report on the feasibility of, and our recommendations on establishing agricultural statistics in the region. The current section presents material that is generally applicable over the region, with separate sections containing relevant notes for each jurisdiction.

Procedure

Nakamoto and Rowley visited American Samoa, the Federated States of Micronesia (FSM) and the Commonwealth of the Northern Marianas (CNMI) to assess the feasibility of establishing an agricultural statistics program in those regions. Nakamoto and Martin also undertook an evaluation of Palau and Guam. For this study's purposes, and due in part to logistics, the Republic of the Marshall Islands (RMI) was judged to be sufficiently similar to FSM and Palau so a separate evaluation was not conducted. Pohnpei was similarly viewed as representative of FSM. Institutionally, RMI, FSM, and Palau are under the College of Micronesia.

Our on-site evaluations focused on defining the data needs of each jurisdiction as perceived by potential users, ongoing activities, what resources were available, and the major problems or bottlenecks to providing the desired statistics. The strategy was to evaluate the "practical utility" of providing the statistics necessary, including the availability of statistical expertise, ability to collect data in a short time frame, producer lists, control data, enumerators, presence of a mail delivery system, telephone systems, literacy level of producers, equipment and personnel to evaluate and process data, etc.

The discussions in all cases began with Land-Grant personnel but also extended to Departments of Agriculture and/or Natural Resources, Commerce, Economic Development, and similar agencies; government-affiliated organizations; and development banks. Elected officials, importers, and producer and buyer groups have been included where possible. We also toured local facilities such as public markets and retail outlets.

Results

For the purposes of this study, we found there are two types of agriculture in the Pacific--subsistence agriculture in American Samoa, FSM, Palau, and RMI, and commercial production agriculture in

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Guam and the Northern Marianas. The frequency and type of statistics required vary between the two types of agriculture.

Subsistence Agriculture: Major crops of subsistence farms include bananas, breadfruit, taro, yams, cassava, sweet potatoes, cucurbits, coconuts, chickens and pigs. Most product is for home or family consumption, but excess supplies are delivered to public markets. Producers are generally not attuned to the principles of supply and demand, and many may not be literate.

Statistical reports of quarterly, semi-annual or annual frequency would provide the basic information needed by legislators, cabinet-level officials, government planners, credit organizations, and other policymakers for decisions such as relates to setting economic policy, budgeting and taxation, determining land use, setting up and evaluating subsidy programs, and determining import needs of basic foods and agricultural inputs. Annual statistics could suffice for initial needs in many jurisdictions. This is likely to change as the respective economies are developed and the information is used.

Typical situation includes the need for definition of a farm and lack of farm lists, jurisdictional disputes among various agencies, and resource constraints in collecting, processing, and disseminating data.

Commercial Production Agriculture: This type of agriculture exists in Guam and the Northern Marianas. What makes these two areas different from American Samoa, FSM, RMI, and Palau is the extent of economic development. Guam has a strong US military presence with a major Naval base that now replaces Subic Bay Naval Base in the Philippines. Both Guam and CNMI, especially Saipan, have a sizable tourist industry that caters to Japanese Nationals (who are just 2-3 hours flight time away) as well as to other Asian and Mainland US visitors. Rota and Tinian are predominantly rural, but heavily influenced by activities on Guam and Saipan.

Agriculture production is mostly for cash sales for the Saipan and Guam markets. Imports are also a major source of supply. Because of the frequency of typhoons, most crops are low-growing vegetables. Taller crops, such as bananas and papayas, are heavily damaged by storms. The longer it has been since a typhoon, the more bananas and papayas that are planted.

As for subsistence agriculture, periodic information would be useful to decision makers in the regions with commercial agriculture. However, producers, marketers, and importers there also have a definite need for more sophisticated on-going forecasts whereby they can make production and marketing decisions. Information is also useful for obtaining loans and for documenting losses from natural disasters. Most of these businesses are well aware of the effects of supply and demand on price.

Land Grant personnel in Guam and CNMI have a direct need for vegetable statistics and in some cases are already collecting the data. However, publishing the data has been a problem because of personnel constraints in compiling and summarization.

Issues related to NASS

There are three major issues related to the potential participation by the USDA National Agricultural Statistics Service. These are:

1. The definition or status of each jurisdiction as a political entity. Essentially, the question is whether the jurisdictions in question are to be treated as an American state or as a foreign country. This affects the specific programs that would be involved (e.g., International Programs Office) and the associated funding sources, among others. The International Programs Office provides technical assistance and training, but they do not fund or take control of projects.
2. NASS funding. Several of the options for setting up a system involve various cooperative or joint arrangements between NASS and the jurisdictions, while the extreme cases involve one or the

other undertaking all activities. We have been advised that no resources are directly available from NASS for such arrangements. Any resources must be obtained via (1) congressional delegations and (2) action by the ADAP Directors for coordination between the top administrators of NASS and USDA-CES-ADAP, given that the Cooperative Extension Service funds ADAP. This would involve either funds from the USDA Secretary of Agriculture being budgeted to NASS, or a directive to NASS to utilize existing resources.

3. NASS activities are governed by confidentiality legislation, which could especially affect the handling, publication, and dissemination of information. This legislation essentially prohibits disclosure of information that will allow individual operations to be identified, unless permission to do so is obtained from those persons. Specific situations include cases where one operator has 60% or more of a crop (percentage being measured in terms of variable of interest), or if there are three or less producers of any crop. This problem is exacerbated when information is partitioned into smaller divisions such as districts or islands. The usual remedy is to include individual crops into a larger grouping or aggregation into a larger geographical region.

The applicability of US confidentiality rules is tied into the definition of each jurisdiction as a political entity.

Recommendations

The following recommendations are made with the caveat that they should NOT be considered without a direct request to NASS from ADAP. This is the understanding of NASS and the ADAP Directors. Because of the mix of foreign and American soils, as well as the two diverse types of agriculture involved, our recommendations may be considered atypical of NASS requests.

Our recommendation is for regional NASS office(s) that would serve the ADAP Pacific, with local coordination at each of the sites involved. The local coordination would include data collection and some processing (e.g., data entry, verification), some local analysis and reporting (as for daily or weekly radio reports), and a certain amount of list maintenance (e.g. updating addresses). The number of statisticians involved would depend on institutional arrangements and siting, as discussed below. The statisticians would be responsible for supervising the collection, editing, summarization and publication of pertinent agricultural statistics; maintenance of data bases, linkages with national interests such as Federal databases and NASS Wide Area Network (WAN); and contact with Washington DC.

The major benefits of a regional arrangement are lower overhead costs, mostly from shared resources and activities that would otherwise be duplicated and perhaps inefficiently utilized at individual sites, and from better coordination of certain activities. Some of the higher costs of a regional arrangement are higher travel expenses for local personnel to the regional center and vice versa, and costs related to communication and coordination between the local sites and the regional office.

Should Hawaii be involved, certain setup costs may be minimized (e.g. obtaining and configuring office space, developing telecommunications linkages, acquisition of certain hardware and software). Besides the accumulated experience and expertise, certain economies of scope or synergy would be gained by having a "critical mass" of both statisticians and support personnel. However, new positions would be required since it would be nearly impossible to absorb such a workload in the Hawaii office without having to drop existing programs, and travel and communication costs are likely to be higher. It was also indicated that the Directors ideally preferred to have NASS statisticians in each Land-Grant's locality rather than in Hawaii.

We recommend a statistician be assigned for Guam and the CNMI. The statistician could be located in Guam or Saipan although that could prove sensitive if the issue of "ownership" should arise.

Hawaii would be a third siting option. Nevertheless, at least one staff-year is needed to conduct a minimal program.

Statistical programs for the subsistence areas are not so easily resolved. Our recommendation is to involve the International Programs Office, at least for the FSM and Palau, to develop a quarterly, or semi-annual reporting program for agricultural production. If they were not allowed to do the same for American Samoa and the RMI, then we suggest a statistician be assigned to work all of the subsistence areas with a combination of NASS and international funding. An alternative, if joint NASS and outside funding is not feasible, would include American Samoa and the RMI assignments with the Guam/Marianas statistician, with appropriate shifting of supporting resources. We recognize that the siting of the statistician is likely to be an issue.

Again, it cannot be overemphasized that these recommendations hinge on ADAP securing permanent funding through USDA for NASS. From the outset, we suggested that ADAP officials begin the process of securing funding through the Cooperative Extension Service or through their representatives in Congress (American Samoa and Guam), as well as the development of cooperative programs similar to what most existing NASS offices have in place. In fact, we feel confident that a cooperative agreement for Guam and the CNMI would be possible. As of this writing, it is our understanding that ADAP has not been successful.

Other Options

Four other institutional arrangements that were considered are a NASS-only system, local-only system, a joint program, and Do Nothing.

1. Under the NASS-only office arrangement, NASS would set up and staff an office either regionally or in each jurisdiction and collect, analyze, and distribute information, without any participation or contribution from the local government agencies or Land Grant. While such an arrangement is possible, it is highly improbable especially under current fiscal and political constraints. Further, we have been advised that NASS will not pursue agricultural statistics for ADAP without local initiative.
2. At the other extreme, it is possible that the local government, or some entity in the jurisdiction would implement an agricultural statistics system without any external assistance. Such a system might come about by legislative action to either create a new entity or essentially force cooperation among local agencies, or by unilateral activity by the local Land Grant, ADAP, or some government agency with the resources to do so. This option is likely to be the most costly effort in terms of the resources that would be required, and the inherent inefficiency of "reinventing the wheel," that is, not using the expertise of NASS or potential external sources of funding.
3. A joint NASS-local government office for each jurisdiction would be a combination of the previous two options. Thus, all costs would be divided between the US government and local government, but all the resources would be at local disposal. The share of local government could be funding or in-kind, such as personnel and office space.

This arrangement was judged as an inefficient use of resources, again given current economic and political conditions and particularly if the resources (e.g., specialized personnel such as statisticians and data enumerators, and equipment, software, and office space) were dedicated to only this project. The problem would be less if such resources were shared with other activities, as via in-kind funding. Other considerations include inter-agency cooperation and competing duties, among others.

4. We presume that doing nothing is not desirable since the existing situation was a major impetus in developing this project. However, this will effectively be the option selected if there is no follow-up activity.

Resources needed

The resources needed to set up and operate an agricultural statistics system include the following. Rates and total costs will depend on the particular institutional arrangement and especially location (e.g., wage rates, cost of living adjustments, transportation). These resources could be provided via direct funding, or in-kind by redirecting resources from other uses.

1. Personnel
 - Enumerators or surveyors to collect data.
 - Data entry clerks to enter data from surveys into computer. The use of students to enter data as part of a training or internship program may be a viable option. Since students are expected to have very little experience, procedures such as double entry verification would be necessary to minimize errors.
 - Statistician to supervise other positions. Duties are listed under Recommendations.
 - Computer programmer/analyst/technician. Including software and hardware support, graphics.
 - Support staff such as clerical help.
2. Equipment. Computer equipment might be shared with existing operations, or might be set up as independent systems. In the former case, the project would require priority access.
 - Computer hardware, including Pentium or faster system with 1+ GB hard drive, backup system, printer, uninterrupted power supply, high-speed modem.
 - Data entry may require additional, less powerful computer systems.
 - Software, including spreadsheet, database, telecommunication, and word processing compatible with other NASS operations.
 - Facsimile
 - Tie-in to NASS Wide Area Network
3. Operations and supplies
 - domestic and overseas travel including airfare, per diem, ground transportation
 - postage, fax, long-distance telephone
 - printing
 - office supplies
4. Office space, including parking, janitorial services and utilities.

Projected Output

The ideal system is viewed as having the following outputs or products. Output could range from annual publications for legislative and cabinet-level decision-making to more frequent information (such as planting intentions, weather conditions, and supply projections) that could be useful to marketers, growers, and even consumers.

1. Annual report. This publication would be similar to the *Statistics of Hawaiian Agriculture* by the Hawaii Agricultural Statistics Service with appropriate modifications for local situations. Basic information includes number of farms, crop production, acreage in crop, acreage harvested, yield per acre, farm price, market supply for each crop and in total and by production area.
2. Periodic reports. Certain types of information would be more appropriate as a publication, but may be of limited value if only released on an annual basis. The frequency would depend on the specific information and the users.
3. Newspaper and similar periodicals. A regular newspaper column or section could be a relatively low cost, timely manner of distributing information such as production and market conditions, augmented by special features such as research results from Land Grant, special announcements, or notices of upcoming events.
4. Radio or TV spots. This activity is viewed as a short (e.g. 5-10 minute) public service announcement, similar in concept to the newspaper but using a different media. This would ideally be a regular feature, perhaps tied in with news or the weather report. The frequency might be 2-3 times per week, or even daily. The radio program used in Western Samoa, and past programs in Guam and American Samoa were cited as examples.
5. Other. Certain information, especially if needed in a timely manner, could be made available via fax or telephone on a call-in basis. The Internet and the World Wide Web is a related, new development that will be of importance in the future.

The next step...

All good intentions notwithstanding, we believe the agricultural statistics system will ultimately fail without certain follow-up actions.

- Someone needs to be responsible for guiding the project through to completion, but that person must also have the authority and the resources to do so. Without authority and resources, this will be a "paper exercise" with very little progress beyond the current situation.
- The major bottlenecks in each jurisdiction need to be eliminated, or at least alleviated. It seems that this can occur by fiat (i.e., directive from above) or by having the affected parties buy into this project. As discussed under Other Options, a completely unilateral action (i.e., ADAP/Land Grant take on project without cooperation of other local agencies) is possible, but would require an unreasonable amount of resources.
- Determining a desirable or acceptable institutional structure and siting will help determine further actions. Our general recommendation is presented in this report.
- ADAP's role will be in facilitating any regional arrangements, and especially in following through on the communication and funding with the respective Washington offices.

Evaluation of Agricultural Statistics for American Samoa

Background

Interviews were conducted with representatives of American Samoa Community College (ASCC), American Samoa Government (ASG) Departments of Agriculture (DOA), Treasury--Customs Division, and Economic Development and Planning (DPO), the Senate and House of Representatives of the *fono* (ASG legislature), importers/retailers, and growers. These were organized and facilitated by Larry Hirata and Salei'a Afele-Fa'amuli.

Current Status and Resources

Some agricultural statistics are currently published for American Samoa. These are the US Census of Agriculture, conducted once every 10 years, and certain information in the annual American Samoa Statistical Digest, prepared by the ASG Economic Development and Planning Office.

Various pieces of data are currently collected.

- The ASG Dept. of Agriculture regularly collects market information from the marketplace in Pago Pago. About 50% of sales are conducted through the marketplace, with the remainder going directly to retail outlets. Some of this information is published in the annual statistical digest.
- DOA also administers a farm subsidy program, whereby producers who meet certain criteria can purchase feed and farm inputs at subsidized cost. One of the requirements for participation is providing periodic information, such as current production and planting intentions. This information is not tabulated, however. A major obstacle is lack of computers and lack of training and technical/statistical expertise.
- The Department of the Treasury collects import data, an aggregate of which is reported in the annual statistical digest. Current tabulation is by hand, but the department is in the process of computerizing, including adaptation of a modified Harmonized Commodity Description and Coding System. The Harmonized System is the standard being adapted worldwide for classifying imports and exports, and for administering customs programs, including the collection and reporting of trade data.
- ASCC Land Grant collects data as part of its extension program. Only the information that regards crops planted and farmer problems are being compiled. ASCC has also collaborated with DOA in conducting extensive survey work, notably after recent hurricanes to assess damages.
- Farmers essentially are not required to pay taxes (oversimplified statement of situation). Therefore, there is no mechanism by this means (taxes, licenses, etc.) to track producers. It was noted that this lack of tax records is also a problem in obtaining farm loans.

The Economic Development Planning Office (DPO) is currently designated as the central data collecting agency for ASG. DPO has experience with the US Dept. of Commerce census, and apparently has both computer systems and trained personnel. DPO also is the contact with FAO, development banks, etc.

The lack of farm tax records precludes the usefulness of agricultural statistics in obtaining farm credit, and some expressed a belief that information was not important to producers as "growers can sell anything they produce." However, other discussions indicate that market conditions could affect producers ("more produce are put into a package," "sell for any price so don't need to take produce home," "rather feed pigs than accept a price below \$X"), and retailers stated that their imports might

be affected by knowledge of upcoming local production. The lack of data for documenting recent disaster claims was also cited as a case where producers would benefit from having official statistics.

Producers stated that rather than a lack of information, a more important constraint for them is intermittent supplies or an absolute lack of inputs such as seed, fertilizers, and agricultural chemicals. A major side benefit of this project is a broader awareness of this problem. Based on our discussions, certain members of the American Samoa Legislature indicated a willingness to address the issue, including increases or changes in the current farm subsidy program. ASCC Land Grant was also connected with the USDA Rural Development Administration (formerly Agricultural Cooperative Service) for information and assistance in forming cooperatives. In part, such cooperatives can be useful in obtaining farm supplies.

While there was general support for agricultural statistics, there were few specific commitments. DPO expressed willingness to assist initially, but would prefer not to participate in an ongoing data collection program. Most of the interviewed leaders of both houses of the *fono* agreed they need a statistical program and questioned the source of funding. At best, organizations expressed willingness to support an effort and/or to participate in the initial stages (but not an ongoing program). Of note, DOA did not participate nor contribute beyond an initial meeting.

Outlook

Agriculture is central to American Samoa's economy and the Samoan way of life. There was general consensus that some form of agricultural statistics is desirable, and that the collection, consolidation, and reporting system needs to be improved.

The meetings showed that strong support (i.e., necessary to develop and operate a program) was lacking. The notable exception was the unconditional willingness of the ASCC President, Dr. Failautusi Avegalio, for ASCC to develop and manage an agricultural statistics program. President Avegalio strongly stated his support for a program, and views it as an integral part of both the college and American Samoa. He expressed an interest in establishing a NASS node, wants to see Land Grant take the lead role in a coordinated effort with other ASG agencies, and also stressed the importance of establishing a regional program in the American Affiliated Pacific.

We view the interest and support of President Avegalio as an avenue with strong potential.

Given the potential and available resources and the likely sources of the raw data, the ideal system is viewed as a cooperative venture between both USDA/NASS and American Samoa, and among the various ASG agencies and ASCC.

Besides an annual publication, the radio program used in Western Samoa was cited as an example of a more timely method of distributing information, with usefulness that would extend beyond producers to the rest of the community. In the past, ASCC had access to both radio and TV time. Newspaper column would be a natural complement to such an activity.

Bottlenecks

1. The most pressing and most significant issue that would impede the development of an agricultural statistics program in American Samoa, is the relationship among ASCC and the various ASG agencies, but especially the Dept. of Agriculture. The combination of socio-political and cultural structure and customs of American Samoa is a major factor. This is heightened by the natural competition between departments for limited resources, and by funding (and therefore responsibilities) of ASCC being essentially separate from the ASG. Some of our observations are symptomatic of the severity of this problem.

- There is apparently a considerable overlap of research and extension duties being carried out by DOA and ASCC. Some overlap might be expected, but duplication is an inefficient use of resources. Many opportunities are possible if those resources were more fully utilized.
- In the collaborative work on assessing hurricane damage, the completed survey forms were never transferred from DOA to ASCC. For one, information could not be used to establish a farmer database.
- After an initial meeting with project members, DOA refused to participate further, citing a need to confer with and get director approval. Members of the *fono* criticized the lack of DOA participation.
- In a follow-up, ASCC requested to review DOA's reporting forms for the Farm Subsidy Programs and the information forms used at the Pago Pago marketplace. DOA responded that the request should be made via the Governor's Office.

An immediate, unilateral resolution of this conflict is unlikely, so we believe any collaborative efforts will need to be negotiated at the cabinet level. Staff of all agencies involved are otherwise severely constrained in the activities they can successfully undertake, and there is a risk of alienating the data sources.

2. There is no current, complete, and regularly maintained list of farmers. Various lists have been produced in the past by different agencies. In particular, the current major lists (including some control data) are for the farm subsidy program, and as relates to the marketplace. Any data collection efforts must resolve the use of these lists.
3. "Farm" needs to be defined, and are not recognizable by the untrained eye. Most of the population in American Samoa relies on subsistence agriculture, and much of production does not enter the commercial market because of strong social customs, so sales alone are a poor characteristic. Factors associated with the land tenure system also adds complications, as in whether the individual or the extended family is the appropriate farm unit. Thus, the number of farms/farmers has ranged from 300-400 to the thousands. It is likely that definitions already in practice (e.g., for farm subsidy program) be used or modified.
4. Farmers need to be interviewed in person, including field observations by surveyors. Major problems were cited with mail and telephone, including incomplete coverage. Literacy could be a problem.
5. The use of the "package" (with varying quantity and quality) as a sales unit, would need to be incorporated into a statistics system. Packages are typically put together by grower, who targets sales prices at customary rates (e.g. \$0.50 or \$1 per package). Other items are sold by unit, e.g. taro corms, coconuts.

Evaluation of Agr Statistics for the FSM

Background

The Federated States of Micronesia (FSM) consists of the states of Yap, Chuuk, Pohnpei and Kosrae. Each state is a group of many islands, but usually most of the State's population and commerce occurs on one island. The FSM Capitol is in Pohnpei State. Our visit was confined to Pohnpei Island because it has the largest land area in the FSM and is where the FSM national government, Pohnpei state government, and College of Micronesia (COM) headquarters are located.

Interviews and facility tours were organized and facilitated by Robert Jackson and Anita Suta. These included the FSM (National) Department of Research and Development, Pohnpei State Government Department of Commerce and Industry: Business Development and Statistics Division, Pohnpei State Department of Conservation Resource Surveillance (Dept. of Agriculture), FSM Development Bank, PCP (Pohnpei Copra Processors?), and public market and retail outlets in Kolonia.

Current Status and Resources

Agriculture in the FSM is subsistence agriculture, including some vegetables, hard and soft taro, bananas, yams, sakau (or kava, a mildly narcotic drink pounded from roots of the pepper plant), betel nut, cassava, citrus (Kosrae), papayas, and pigs. Most production is very small scale and is measured in "rows and hills." Intercropping is the general practice, and crops are often planted in "layers"--e.g. coconut and breadfruit on top, then yams, then taro and sakau. Vegetables are a relatively recent addition to the traditional diet, while yams, sakau, and pigs play a major role in social customs on Pohnpei. The size of yams and sakau, for example, give prestige to the presenter. Sakau are characterized as "one man", "two man", or "more than two man" sakau, according to the number of persons needed to carry a plant. Individual yams can weigh hundreds of pounds after being grown for 5-6 years.

Copra is a dying industry. There are perhaps 10 percent of the growers left, mostly on the outer islands, who produce 600-700 short tons annually. Comment was made "the more we sell, the more we lose," but the operation is maintained to support the growers. The emphasis now is on making other products from the coconut tree.

Most production is consumed on the "farm" and excess production is sold at local markets, with proceeds especially used to buy rice and canned meats. Sales are to retailers and directly to consumers, but much production, especially the traditional crops, rot in the field. Produce sold in the public market is also associated with fish markets where Marine Resources collects some information on fish.

There are about 12 importers/wholesalers-retailers. Produce takes 2-3 weeks by boat from the US West Coast. Our observation of supermarkets showed a somewhat limited selection of fresh produce, probably due to perishability. Prices were high, but not that much more than Hawaii for the same time of year. Agricultural inputs are also a major import.

The FSM national government has close coordination with state governments. FSM produces some statistical bulletins and annual reports at the Federal level, but only with limited agricultural information. Users were happy with trade statistics. A census was underway with partial US funding, but only on population. The FSM Department of Research and Development includes agriculture, marine resources-fisheries, commerce and industry, and labor.

A statistical yearbook is published by Pohnpei State.

The Pohnpei State Department of Conservation Resource Surveillance (CRS) takes on the responsibilities of a Department of Agriculture elsewhere. There is one CRS Extension Agent for

each of five municipalities on Pohnpei, and CRS was recruiting Extension people for the outer islands. Since the Compact was signed, CRS also entered into some research projects.

The department is involved in a number of activities:

- CRS is a major distributor of production inputs. They produce a monthly report on planting materials and fertilizers issued to farmers based on agent contacts and day to day operations.
- Given the role of pigs, yams, and sakau in Pohnpei for social stature, CRS estimates the amount used for celebrations, funerals, and other ceremonial feasts. (about 5,000 pigs per year and 300-400 sakau plants per month are typically used). An agent attends and records the data, totals are compiled, and then the local media reports the number and amounts used on a monthly basis.
- Major outlets for black pepper and poultry are contacted for monthly purchase statistics, from which annual totals are extrapolated.
- Information for outgoing agricultural commodities is collected from quarantine and import data are also tallied from shipping manifests.

They don't conduct any agricultural surveys, and no price data are recorded. Periodical surveys were conducted up to two years ago. Monthly information from buyers was collected five years ago, but was discontinued due to declining cooperation.

The College of Micronesia (COM) has campuses in each state as well as Palau and the Marshall Islands. All sites are computerized, but computer training is apparently needed. In part, potential users need to see applications for computers, then training in how to make such things happen.

Outlook

There is a recognized need for agricultural information. Some examples:

- The question "Where can we market our products?" has arisen in the FSM Cabinet
- The Asian Development Bank asked for agricultural statistics as part of their evaluation of a loan to FSM.
- Pohnpei State Dept. of Commerce and Industry could use agricultural statistics in evaluating some of their programs and as background information for drafting legislation, and also expressed a need for a consumer price index.
- An obstacle to the FSM Development Bank's activities is a lack of information on agriculture, such as types of crops, prices, yields, inputs, etc.
- Problems with FEMA for disaster assistance was cited.

Strong support was expressed for an agricultural statistics program, and the implementation of a program was received enthusiastically by all of our contacts. Cooperation between COM and the state and FSM federal governments appear to be excellent.

Bottlenecks

1. The lack of funding and expertise/training are probably the major bottlenecks to an agricultural statistics program. Other problems were not evident, or could be addressed by the program.

2. No definition of a farm. FEMA couldn't (or wouldn't) provide damage funds to farmers because they (FEMA) didn't recognize a farm. For certain crops, the existing data collection practices (e.g., use at feasts, definition of sakau sizes, survey of pepper processors) should be incorporated into the definitions. Relatedly, the status of any list of farmers is not known.
3. Farmers may need to be interviewed in person, including observations by surveyors. CRS's agent network should be a valuable asset in this regard.
4. As part of the "bigger picture," a major related problem is the perceived status of agriculture. Farming is viewed as an undesirable occupation, especially by the younger generation. Some activities addressing this problem are conducted by the Pohnpei Dept. of Commerce and Industry (C&I) and FSM Development Bank.

As part of the State and Federal development plans for the region, C&I works closely with four Banks to train potential businesspersons and to develop business plans and economic loan packages. Some examples from agriculture include a slaughterhouse and livestock/poultry operations. The Development Bank funds small scale and larger businesses, with agricultural projects being one of their funding priorities. They're interested in a number of crops as well as processed products for both export and import replacement, and supporting industries. Both organizations are trying to instill an attitude of producing as a way of life by developing successful agricultural enterprises.

Evaluation of Agricultural Statistics for Palau

Background

Palau's government is patterned after the US. There are 16 states, some of which are very small (population of less than 100 people). However, the National government and each state all have a full slate of officials so government is a major employer. States get budgets from the Palau national government.

Palau has signed a Compact of Free Association with the US that, in part, calls for development funds to be made available by the U.S. government. The Palau Master Development Plan is a requirement for the release of Compact funds. The plan was scheduled for completion soon after our interviews and is reportedly a grassroots effort.

There is a fair amount of uncertainty given the changes that will occur with the Compact. For one, most US Federal programs will cease. The Palau Community College (PCC) was recently formed with the reorganization of the College of Micronesia. Since the College of Micronesia Land Grant/CES is part of the endowment for all ADAP, the full ramifications for development of an agricultural statistics program are not clear.

Interviews were organized by Ayano Baules and facilitated by Ismael Anastacio, with representatives of the Land Grant Office in Palau, the Palau Community College (PCC), Palau National Government agencies including Department of Resources and Development and Division of Agriculture and Mineral Resources, National Emergency Management Office and Palau Master Plan staff, National Government cabinet including the Vice President of Palau and the Ministry of Resources and Development, and Palau Community Action Agency. Meetings that were also arranged with legislators, importer/retailers, bankers, growers, and other non-government organizations were unsuccessful due to cancellations or no-shows.

Considerable background information is available in various documents associated with the Palau Master Development Plan. These include:

1. Davis, Derrin. "National Master Development Plan, Agriculture and Forestry Section" (approval status by Palau or US Congress not known)
2. Miles, Joel E., Minoru F. Ueki, and Robert V. Bishop. March 4, 1994. "Background and Situational Assessment of Land Resources (Agricultural) Development in Palau (for the Palau Master Development Plan)"

Distribution of the master plan documents otherwise seems limited. Unspecified collections at the University of Hawaii are reportedly more complete sources of information than any source on Palau. Selected information is merged with our interviews and reproduced in this document.

Current Status and Resources

Palau consists of 4 high islands and about 200 coral and coralline islands. Babeldaob is the second largest land mass in the ADAP region after Guam, and contains more than enough land to support Palau's population into the foreseeable future. Cultivated land and agroforestry use less than 4% of the land area. Most farming is on Babeldaob while most people are on the adjoining island of Koror.

Most land has moderate to severe physical limitations (including sloped land and poor and acidic soil), so the preferred production system is multi-canopy agroforestry. Significant areas of land are in a degraded state--grasslands and savannah--traced back to the Japanese colonialism period. Besides the limitations of land, poorly developed markets and limited infrastructure also hamper the development of agriculture. However, agriculture can expand without clearing more land. The planned road

linking all of Babeldaob with Koror is the major infrastructural development that will impact agriculture, opening up vast tracts for production as well as access to markets.

Palau is unusual among island nations in that agriculture is a relatively minor sector. Agriculture is also declining in importance from an estimated 9.8% of GDP in 1983, down to 2.9% (\$2.6 million) of GDP in 1992. Agriculture suffers from low social status and has been negatively affected by wage earning; tourism has diverted labor away from agriculture, and it is also easier to hire foreign labor to raise crops. In the existing commercial farms, management and labor is mostly foreign, and the 1990 census had only 48 persons who listed their employment as agriculture. However, agriculture, tourism, and marine resources are targeted for development under the Palau Master Development Plan.

Agriculture is predominantly subsistence and traditionally handled by women, while men have fished. The main crops are taro, cassava/tapioca, sweet potato, banana, papaya, coconut, betel nut, betel pepper leaf, chickens and pigs. Taro is important for cultural uses and provides the traditional power base for women, including extended family operations and the opportunity for women to socialize. Tapioca is exported regularly to Guam and Saipan. Fisheries people may have some info on export statistics.

There are no more than a dozen commercial operations that focus on vegetable and melon production, including watermelon, cabbages, bell pepper, and cucumbers. Fishing boats purchasing produce via agents are a major buyer. Ten years ago, almost 100% of vegetables were imported.

Food imports will similarly increase. For example, the estimated consumption in 1990 was 42# of chicken and 127# of rice per capita or 650,000 pounds of chicken and 2 million pounds of rice. Estimates for the year 2000 are 1.1 million pounds of chicken and 3.3 million pounds of rice. 1983 food imports were \$2 million, 1990 \$6.120 million (nominal dollars) The Division of Agriculture collects food import data.

Markets have occasional surpluses when several growers deliver on the same day. Produce availability otherwise varies according to monthly shipments from the US West Coast. Although a central market is planned, current sales are through stores and similar retail outlets. Sales of local produce have averaged about \$600,000 per year, of mostly vegetables and eggs. Vegetables listed are Chinese cabbage, cucumbers and watermelon, while fruits are banana and papaya.

Overall, very little agricultural statistics are currently reported for Palau. Any data apparently exist only as internal government reports, with the exception of information that is published in the master development plans and associated documents, prepared as prerequisites to the release of Compact funds. Statistics on production make no differentiation between commercial and subsistence agriculture. A census of agriculture was completed and was being processed by the US Bureau of the Census as of August 1994.

The Division of Agriculture relies on voluntary participation to collect monthly market statistics on quantity and value of selected products, and data on imports and exports are recorded via Customs and Plant Quarantine. This information does not include home consumption, but is estimated to cover 60% of production. The information is used mostly as a monthly administrative report. There are no apparent published reports or other public dissemination of information.

There are a number of organizations in Palau, especially non-government organizations (NGOs) that are affiliated with agriculture. These are likely players in any agricultural statistics program.

- Resources and Development, Division of Agriculture and Mineral Resources (DOA). The division has over two dozen personnel, including extension agents, forestry specialists, quarantine inspectors, and animal technicians. Activities include an experiment station, pig and poultry breeding units, forestry field station, agriculture store selling farm inputs at subsidized

prices, and an agricultural inputs revolving fund. As in most government agencies, current funding was a problem, with 90% to 95% of budgets being allocated to personnel.

- College of Micronesia Land Grant and Palau Community College. COM Land Grant/CES is headquartered in Pohnpei. Palau Community College (PCC) was recently formed with the reorganization of COM. COM-LG and PCC are further discussed below.
- Palau Community Action Agency (PCAA) is concerned mostly with food and nutrition programs, but is expanding to fruit trees and agriculture systems, especially minimal use of pesticides. PCAA does training and on-site advising, distributes extension materials, and provides seed and planting materials. PCAA has close cooperation with other NGOs and DOA.
- OISCA International is a Japan-supported training farm on Babeldaob that hosts Palau, FSM, and Marshall Island students. The farm often has \$4,000+ /month sales in Koror, and has limited cooperation with only DOA.
- Palau Resources Institute emphasizes traditional crops and the role of women and customs in agriculture.
- Republic of China, under its Agriculture Technical Mission Program, has a demonstration farm focusing on farm management techniques and the introduction of new crops, especially vegetables. The farm produces fruits and vegetables, which are donated to DOA for local sale.
- National Development Bank of Palau. Provides agricultural loans at "concessional" interest rates, but has few applicants and (as of late 1994) only 9 outstanding agriculture loans and 2 forestry loans.

Outlook

The Compact will provide opportunities as well as uncertainties. Economic expansion under the Compact will focus on Marine Resources, Agriculture, and Tourism. Given agriculture's situation, population and tourism growth will result in significant increases in agricultural imports. Planners expect opportunities for some import substitution, especially for chicken, eggs, and vegetables. Economic growth combined with any advances in agriculture should provide other opportunities.

Most acknowledged a relatively weak statistical data base. A lack of funding also limited past efforts to collect data. The agricultural census in process had been prepared and enumerators were trained earlier, but implementation was delayed due to a funding shortfall. The Palau Resources Institute had planned a Food Production and Exchange Survey, but also ran into funding problem. PCC had forwarded a proposal for a data center, to collect labor-related data for the region. The effort was frustrated because of (1) lack of data, (2) lack of expertise, (3) lack of formal methods to collect, analyze, and disseminate the data.

While there will be an infusion of funds with the Compact, it is imperative that those resources be used to prepare for long-term needs. This is the intent of the Palau Master Development Plan. However, preparation of the plan was hampered by a lack of data, and it is likely that data limitations will similarly hamper its implementation. This seems to be an ideal opportunity for an agricultural statistics program.

Bottlenecks

1. We perceive a high degree of nationalistic pride in Palau that has been fostered by the Compact of Free Association. The process of developing the Compact has undoubtedly nurtured a common

local viewpoint concerning outsiders. A typical observation was that “outsiders come in, stir things up, and leave. Then the next group comes in to do the same thing.” So, outsiders are a nuisance to be humored and tolerated, but the ritual is wearing thin. An awareness and sensitivity to this perception will be useful in any future work.

2. However, that is a minor consideration in comparison to the major problem relative to ADAP and developing an agricultural statistics program, and that is the status of COM Land Grant. Extreme dissatisfaction and even animosity towards COM-LG was apparent in most interviews. The prevailing sentiment was that Palau is not getting anything out of COM-LG and that COM-LG needs to be involved in local issues, as activities are dictated out of Pohnpei. COM-LG is left “out of the loop” so has limited effectiveness. This rift may be insurmountable, and could effectively block any program in Palau.
3. Further, some discussed a strategy to lobby USDA for a separate Land Grant for Palau. In part, Palau’s share would involve transferring DOA’s extension agents to Land Grant for matching US funds. This has great appeal, especially given current fiscal conditions. An evaluation of that proposal is beyond the scope of this report, but such an effort is likely to dilute a funding request to USDA for agricultural statistics.
4. The greatest single constraint to agriculture in general involves human resources, and in particular the negative mindset regarding agriculture. Agriculture has low social status and at best represents hard work with low returns. Some factors and issues:
 - It is easier to import rather than grow food, and to hire foreign labor to grow taro.
 - The younger generation is taking on other wage-paying jobs, so skills and knowledge are not being passed down, i.e., are being lost.
 - College educated with agricultural background are in government, and getting to be of retirement age without replacements. There are low management skills otherwise, and there are no students working on agriculture degrees.
 - While agriculture is traditionally women’s work, there are few female agricultural professionals, e.g. extension agents in the Div. of Agriculture.

There is a strong educational effort in agriculture. Each elementary school has an agriculture teacher, compulsory agriculture courses in 7th and 8th grades, and courses through grade 12. Post-high school agricultural education falls under PCC, NGOs and Land Grant. PCC has a 2-year AS degree in agricultural science. Thus, there is an opportunity to improve agriculture’s standing and to build for the future. Some reorganization and coordination among the agencies dealing with agriculture will greatly enhance this effort.

Evaluation of Agricultural Statistics for Guam

Background

Interviews and facility tours were organized and facilitated by Victor Artero, Robert Barber, and Jeff Barcinas. These included representatives of University of Guam Land Grant, Guam Dept. of Commerce and Dept. of Agriculture, Agricultural Board of Commissioners, Guam Senate, growers, retail outlets and the Chamorro Village market. Representatives of importers and retailers were unable to meet with us.

Current Status and Resources

Guam has an active commercial agriculture sector that developed with the economic boom. Truck farming is the primary focus, then livestock, nursery (including golf courses and hotels), fruits, and aquaculture. Typhoons strongly dictate crop selection; there was a considerable amount of papayas and bananas only because of the long interval since the last storm. Ornamentals are recognized as a growth industry. Of note, the predominant viewpoint is to include golf courses and hotel landscaping in agriculture. Hawaii is less inclined to hold this viewpoint, so any agricultural statistics in this area would be innovative.

Buyers of local produce are the Dept. of Education (DOE), retail stores, hotels and restaurants, and the Harmon flea market. Payless is the largest retail chain, but each store manager can buy local products independently. The new Chamorro Village project strives, in part, to offer a more consistent market rather than one open only on weekends. Commissaries import produce and don't charge shipping and handling, so can be a major competitor. However, they purchase certain local crops.

Most farmers sell directly to retailers. Cash on delivery is the usual practice, except for restaurants and DOE. DOE is a major actual and potential market, but marketing is more difficult because contracts are needed and payments lag delivery by 1-3 months.

There seem to be several market-related problems.

- Buyers need a consistent, reliable supply of produce. However, production is frequently disrupted by typhoons, and agriculture is a second income source for most farmers so many growers are intermittent.
- There seems to be some barrier to market adjustments when supply increases. As a result, there may be production gluts with beans, eggplant, green onion, cucumber, watermelon, tomato, and papaya. Some advocate processing as a possible solution.

The Guam Department of Commerce (DOC), Guam Department of Agriculture (DOA), and University of Guam-Land Grant/Cooperative Extension Service (UOG-LG/CES) are the main units involved in agricultural and related statistics.

DOA has a clear idea of items and quantities needed by DOE and the hotels. DOE is also a potential source of volume data.

California prices are available on the Internet. California produce prices can be 1/2 of local prices.

DOC is the lead agency in Guam for the agricultural census. Surveys are mailed from the US, with personal and telephone follow-ups. Since it is the Census Bureau, the list is probably not available by statute.

There are 6-7 major importers, but detailed import statistics are currently not available. The DOC assumed responsibility for import statistics from the US (Federal) Dept. of Commerce, was

overwhelmed in the '81-'83 economic boom, and stopped collecting information in '87-'88 (partly due to business opposition). Several other factors complicate import statistics:

- The system is not computerized, and thousands of documents need to be processed daily.
- There is extreme aggregation in import manifests. Freight carriers themselves do not know what is being carried just from manifest information.
- As part of the US, interstate cargo is not recorded, and there is a significant volume of "suitcase imports" (actually ice chests) from Micronesia. Produce and fish are brought in, chicken is taken out.

The number of farmers varies widely. There is no formal definition of farms, partly due to political reasons as to who to include in a definition. Under a previous definition, 600 growers had been making over \$5,000 annually. However, due to retirement benefits coupled with tax considerations, only 5 reported a Schedule F on recent tax returns. Over 700 applied for subsidized agricultural water rates, but most were obviously not commercial farmers. There were nearly 600 applicants for disaster relief after the most recent hurricane, but many were questionable claims. New rules concerning registration for disaster aid define farmers as those who register, with a follow-up visit by DOA for verification. Registration is now a little over 200.

There is a cooperative program between UOG-LG/CES and DOA for data collection and some processing. DOA has agents in different districts, and has agreed to let UOG-LG/CES use them for 2-3 days per month. Personnel from both organizations typically go out together to collect data, but DOA person often has conflicts with other, primary duties. Both have similar computer hardware and software.

Agricultural statistics date back to at least the eighties and probably earlier. Since 1994, primary emphasis has been placed on monthly crop forecasts, with production statistics being secondary. 40 to 110 farmers per month are recorded. The goal is to cover all registered producers.

Farmers are poor record keepers, so field visits (drive-by observations) form the basis for production estimates. Projected yields are based on rows seen ready to harvest within 3 weeks. UOG-LG/CES has started yield sampling for some crops, partly to update/verify yield constants.

Outlook

Guam is unique in the project region (excluding Hawaii) as the only jurisdiction to have a four-year Land-Grant University. There was an attempt in the seventies to start a Market News Program with NASS assistance via the Hawaii office. Although it was not successful, we note that some of the recommendations were implemented. Guam also has the infrastructure necessary to develop a data collection program using a list frame. UOG-LG/CES is well-networked, and their involvement seems to be a key.

There is a recognized need and strong support for agricultural statistics. Some examples:

- Participation in Federal programs such as crop insurance were adversely affected by Guam's lack of data on production and sales.
- CES helps growers prepare loan applications and Chamorro land leases.
- Farmers need information, but market information--projections--are more important than annual statistics. New farmers are especially likely to use information.

- Buyers suffer too, especially from over-production, so have a need for information. In the past, timeliness and perceptions of inaccuracy were concerns.

Bottlenecks

1. No insurmountable problems were identified.
2. Reference was made to politics. For example, it was noted that there is an opportunity at every election for many changes, with the change of administration. A more pressing issue was farmers' concerns with confidentiality, in particular that their information would be available to competitors as well as the "wrong" government agencies. This was their number one concern. The Federal confidentiality statutes that govern NASS activities would address this concern, so ADAP's involvement could play a critical role.
3. UOG-LG/CES and DOA currently make separate, sometimes conflicting reports. This aggravated negative perceptions by potential users. The problem arises from different estimation methods used with drive-by field observations. We suggested using actual measurements to verify one or the other, or otherwise reaching agreement between the two agencies. We also suggested that actual production be included as a comparison to past estimates.
4. For surveys and publications, timely mail delivery is a major problem. Our contacts agreed that a Pacific Daily News column is a good alternative. In the past, there was a daily farm report on the radio. Tele-tapes were also mentioned as a possibility.
5. Finally, it was mentioned that we were the fourth group recently looking at agricultural data. To the extent possible, a combined/coordinated effort would be a more efficient use of resources, and would enhance a programs chances of success (e.g., by not alienating producers with duplicate requests for information).

Evaluation of Agr Statistics for the CNMI

Background

Interviews and some field tours were conducted with representatives of CNMI Land Grant from Saipan, Tinian, and Rota, CNMI Department of Land and Natural Resources on Saipan and Rota, and Government executives. These were organized by Ray MacDuff and Antonio Santos. Hardy Richards facilitated interviews on Rota.

The Commonwealth of the Northern Mariana Islands (CNMI) consists of a group of islands immediately to the north of Guam. However, most of the population and agriculture are located on Saipan, Tinian, and Rota. The Commonwealth is economically developed. Tourism is the main industry and caters to Japanese nationals, since Japan is just two and a half hours away by jumbo jet. Most development is on Saipan. Tinian and Rota are predominantly rural, but heavily influenced by activities on Guam and especially Saipan. As a side note, water is already a problem on Saipan, given competition by tourism and a poor distribution system.

Rota is apparently wetter than both Saipan and Tinian. There is an eight square mile mesa called the Sabana, 1,400 feet in elevation, where land is available to nearly anyone who wants to farm. Some farmers bring in foreign labor to work their farm, and there seems to be some sharing of large farm equipment (possibly DLNR land clearing program). Island population is about 3,000. There are more people and farmers on Rota than on Tinian.

Current Status and Resources

Commercial agriculture on a small scale exists on the three islands. The frequency of typhoons in the region discourages much fruit tree planting, so vegetable and melon production and especially root crops predominate. There is an interest in developing tourist and possibly export markets with pineapples.

Depending on farm definition, Saipan has 80 to 120 full-time growers. This includes growers in a government subsidized area, similar to an agriculture park, in Kagman that is only used during the rainy season due to lack of irrigation. There are about 100 growers on Rota and 40 commercial farmers on Tinian.

The prevailing sentiment is that Tinian's market is Saipan while Rota's is Guam because of geographical distances. Tinian production was reported as 75 percent for Saipan and fishing boats. After visiting Rota, however, it seems they may all be competing for the Saipan market, as Guam was a major market until Guam production increased. The major disincentive to production on Rota is the marketability of products. Now, typhoons that destroy Guam's crops provide the main opportunity for sales. The money crops are taro and sweet potatoes. Taro is needed for customary or ceremonial purposes.

The College of the Northern Marianas Land Grant (CNM-LG and CNMI Department of Land and Natural Resources (DLNR) are the main institutions dealing with agriculture. Both Land-Grant and CNMI extension personnel are located on all three islands, although most of these resources appear to be on Saipan. The distribution of personnel as well as their duties varies among islands. The main campus of the CNM-LG as well as DLNR headquarters are located on Saipan.

DLNR's Plant Industry Division originally handled agriculture extension before it was transferred to the college. Plant Industry handles growers on the Kagman farm plots (soon to expand to Marpi), while Land-Grant services the outside. On Rota, Land-Grant is under the DLNR liaison officer, so agents work according to their instructions. On Tinian, they are separated.

There were problems with consistency of data in the past. CNMI Dept. of Commerce and Labor has been collecting information for over 40 years. Land-Grant used to collect information from farmers markets, and DLNR had a similar program 20 years ago. DLNR does crop damage assessment and encourages farmers to join Soil and Water Conservation programs and be cooperators. Farmers' receipts are used (as supporting documentation) for USDA ASCS grants. Quarantine and Customs have trade information, but certain data, such as fisheries, is lacking.

An interesting feature of the CNMI is legislation that specifies for every dollar spent on food stamps, participants must spend 25 percent on local produce including fish, and locally processed goods such as bread. Hotels also participate, apparently related to food for hotel staff. This would be a good source of produce production data.

There is an incentive for growers to under-report, given that many are retirees and retirees are taxed only on income over \$20,000. This is not as much a problem for full time growers, as records can be used for loans in CNMI Commercial Development Association (CDA) and disaster loss documentation.

A procedure and format for data collection, processing and dissemination has been developed for truck crops. This is an ongoing program on Tinian that produces a very comprehensive report with only minor adjustments needed to be a top notch program. Data are collected and reported on a monthly basis with emphasis on production forecasts. Agents report that forecasts are usually 80-90 percent accurate. Data are collected personally, taking about one week for the 40 farms. Individual information is currently reported except for estimated yield in part because of inability to fully use computers for summarization. The reported results for producers were stabilized production and higher prices. This system has been in place since 1989.

On Saipan, DLNR already works closely with farmers in the Commonwealth's Agriculture Park to collect data but that data are only for internal use. Staff shortfalls in DLNR and CNM-LG have reduced data collection and processing efforts in Rota and Saipan. It appears that Tinian is the only island with available staff to run a full program.

Outlook and Bottlenecks

1. The need for and desirability of agricultural statistics were widely recognized and endorsed. Agricultural statistics would be useful in grower education programs on Rota. On Tinian, a seed company showed interest, but no data were available for market potential. Agricultural statistics might also help correct some misconceptions and unrealistic expectations, as well as aid some apparent market distortions. For example, there was a proposal for a \$4.25 minimum wage, although newspaper ads indicated current wages to be in the \$2.00/hr. range. On one island, the price for locally produced taro was quoted at 2.5 times the price of imported taro. Thus, a valid concern is that any statistics should be in a form that farmers can use i.e., reports should have simplicity and usable content.
2. A basic data collection and dissemination effort is currently operational on Tinian, but the need for data collectors and processors seems to be holding up implementation on Saipan and Rota. There are apparently good working relationships between CNM-LG and DLNR on several activities, but heavy workloads are a factor. Coordination between both institutions and training in how to edit, summarize and process the data may be all that is needed to implement a bona fide estimating program. A good telephone system, mail service, up-to-date microcomputers, and a skilled labor supply are available.
3. Management style is very much top-down, so policy direction as well as personnel might change with change at the top. That is, continuity from administration to administration may be a factor.

This has also led to Tinian and Rota feeling ignored relative to Saipan. Land-Grant may be a stabilizing factor in this regard.