INDUSTRIAL IN TRUK

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3/1/'85

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INDUSTRIES IN TRUK

Today, in any big store in Pohnpei, a person can purchase shampoo, laundry soap, shower soap, body oil (Marekeiso) and perfume which are all produced locally by the Copra Plant in Madelenihmw at the Ponape Agriculture and Trade School (P.A.T.S). "Tomorrow", the same person could go inside any big store in Truk and buy the same type of local products from the Copra Processing Plant at South field, Moen. Tomorrow, Solar powered wells could replace the majority of machine driven wells in Truk. Right now, there are already Solar powered wells in most of the outer islands of Truk. They are relatively inexpensive, especially with the combined financial help provided by the community to pay for their expenses. These wells use solar power to draw water from the ground and then purified so that it may be used for showering, cooking, and drinking. These examples of the Copra Industry and the Alternative Energy Industry illustrate the potential for large industries in Truk at this time. Most of the industries in Truk are controlled by the Department of Resources and Development. Some of these potentially large industries which come under the Department of Resources and Development include: Coconut Processing and Production, Marine Resources, Tourism, and Small Industries. The Department of Resources and Development is not currently involved in the extensive development of Alternative Energy Resources. But, the natural resources for Alternative En-

ergy Development are available as the production of Solar powered wells indicate. These industries have the potential to develop, expand and make money and could become a thriving support to Truk's Economic Base through Self Sufficiency. These industries under Resources and Development are gradually improving; however, these industries need more financial assistance, improved management and more qualified personnel on all levels, in order for them to become productive to the point of helping support the economy of Truk State. Also, the further development of Alternative Energy Resources seems to be a viable option for the further energy industry of Truk State.

COCONUT PROCESSING AND PRODUCTION

The Coconut Processing Plant, under the Department of Resources and Development, was completed in March of 1982. It started with a two year fiscal budget of one-hundred thousand dollars, funded by the Truk State Legislature, for the construction of the operating Plant, in 1981. About ninety thousand dollars was spent and the rest of the money was put into the general fund. The machines for the Plant, manufactured in the Philippines, were funded by the Federated States of Micronesia (FSM) congress. The FSM congress funded one-hundred thousand dollars, but only fifty-five thousand dollars was used. The rest was refunded to the National Government.

A recent Resources and Development report of December 1984, explains fully the functions, purpose, and financial stability of the Coconut Processing Plant:

> "The completion of such a plant is very significant for the economic development of Truk State as it signifies its capability to now enter into the processing of its major export crop. Such a project is in line with Truk States' development objective of promoting small to medium scale industries throughout the state, particularly those industries which would utilize the states' natural resources to maximize the economic benefits of such resource to its local people. For the first time under the U.S Ad-

ministration, Truk can now be able to locally produce laundry soaps and other coconut by-products from its own copra for its own use. It is estimated that the plants' current production capacity is to crush up to approximately 250 tons of copra anually yielding about 115 tons of laundry soaps. Plans are being made to expand this plants capacity to crush a larger portion, if not all, Truk's annual copra production. Although the Coconut Processing Plant can only produce laundry soaps at the present, plans are now being made to enable the plant to go into the production of other coconut by products which are commonly used by the local people - i.e. bath soap, cooking oil, body oil, etc. In fact, the five year development program for Truk's Coconut Processing Plant calls for the production of the following coconut and non-coconut products in addition to laundry soap:

(1) Shower soap
(2) All purpose liquid detergent
(3) Shampoo
(4) Cologne/after shave lotion
(5) Body/hair oil
(6) Cooking oil
(7) Toilet disinfectants

A capital investiment of about one-hundred seventy five thousand dollars is required for this year's development program and Resources and Development is in the process of requesting the Truk State Legislature as well as the Congress of the Federated States of Micronesia for this amount. The five year development program is expected to bring in revenue of approximately $650,000 and a domestic savings (foreign exchange earnings) of about four-hundred fifty thousand dollars per annum and a direct employment for a minimum of twenty five people will be created."

For the past three years, when the machines started running in late 1982, the Coconut Processing Plant has made great achievements in making laundry soap, from the copra oil and some other ingredients. Today, a person can just go into any store on Truk and buy a locally produced bar of laundry soap at a cheaper price than buying a box or bag of laundry powder soap that is imported, which is relatively expensive. But with the cultural changes and the lifestyle of the Trukese people, by the influence of other states and countries, peo-

ple prefer buying powdered laundry soap at a higher price, because most people, at least on Moen, have washing machines. So it is difficult to market the locally made laundry soaps on Moen; however some people, especially those who live on islands other than Moen, buy these local product laundry soaps, because they are cheaper and besides, they do not have electricity nor can they afford a washing machine.

Though it is hard to market the locally made laundry soaps, it is worthwhile to sell them because it at least help those who cannot afford buying expensive laundry soaps.

The Coconut Processing Plant, as of now is progressing, such that it is maintaining its production of laundry soaps. It is run by ten employees most of whom are only elementary school graduates. The manager, Nelson Killion, is looking forward in getting PATS students as employees; they are his first priority with personel. Though the Coconut Processing Plant is still maintaining its work, it needs other machines to produce different local products other than laundry soaps. Financing these machines is a problem. One machine, which is called the Refinery machine, is able to refine the oil to produce shampoo, body/hair oil, perfume, cologne and other similar products. Killion has said that he needs about ninety thousand dollars to get the Refinery machine, and more machines. With the machines, the Coconut Processing Plant could make other products, and not only that, it could compete with imported shampoo, body/hair oil, cologne, perfume and other products.

The Coconut Processing Plant right now is purchasing perfume for the production of laundry soap. If the Coconut Processing Plant could make its own perfume, overhead cost would be cut, thereby saving money.

The Coconut Processing Plant, ever since it started producing laundry soaps, has been getting its copra supply from Transportation Company (Trans. Co.) where all the islands of Truk

bring their dried copra for twenty dollars a bag of 105 lbs. The price for the bags has risen from ten dollars to twenty dollars in 1985. After draining out the oil from the copra, the "waste material" or left over product from the copra, is good for pigs food. The Coconut Processing Plant sell the "waste material" for three dollars and fifty cents a bag. It is called copra cake.

Trans.Co. for many years now has been exporting copra to Japan and some other places. The irony of this is that Japan buys the copra from Truk, refines it, produces coconut products, and then exports the goods back to Truk, where the people, some of whom originally sold the dried copra, buy them from the stores. The goal of Coconut Processing Plant is to have Truk produce such products within their own state.

The Coconut Processing Plant (CPP), is improving; but it needs a "push" to become a stable and profitable industry in Truk. A "push" in the sense that plans are already made to make the CPP products competitive in the Truk market place, but things are being done slowly. CPP needs new machines to produce other products, but right now there aren't any, because money is not available for capital investment. CPP also needs experienced personnel to work in the Plant, or at least workers who have studied about the operation. This could also lead to new and improved techniques for the Plant's operation. With the new machines and qualified personnel, the CPP has a better chance to produce its own local products and sell the goods in stores on Truk, or maybe even export the goods to other states and countries for a profit. Since it is a nonprofitable organization, this profit, as retained earnings, can be used to finance the Plant, thereby eliminating the continual drain on the government for support. However, it will initially take money to earn money, but only if it is well invested by knowledgable people. The CPP is a great industry for Truk but it is still in its infancy. With patience, determination and luck, it may someday be profitable for all of the Trukese people involve in its development.

MARINE RESOURCES

Fishing has always played an essential role in the lives of the Trukese people. There are two main fishing organizations operting in Truk today: the Fisheries, which is under Marine Resources and a government agency, and the Truk Federation Fishing Cooperation. These two organizations are trying to exploit the resources of the sea and develop the fishing potential of the Truk Islands. For, there are certain groups of Trukese who believe that the sea can provide with more than a protein diet; it also offers ways to earn a monetary income other than by making copra or taking a government job. The sea for the Trukese is a source of livelihood, a means of supporting themselves.

The Division of Marine Resources is "mainly responsible for the exploration, identification, exploitation and management of the State's Marine Resources to increase the use of marine products as an economic asset. It is also responsible for the training of personel to carry out such functions" stated a recent Resources and Development report on December, 1984. The development of the Marine Resources' fishing sector has been identified as holding the major potential for the State's economic growth. During the past few years, Marine Resources has initiated and expanded various government supported fisheries development programs which are potentially viable and would serve as a basis of a budding fisheries industry. The major fisheries development program includes the Dublon Fisheries Complex, Tuna Fisheries Training Program and Lagoon Baitfish Production.

The Dublon Fisheries Complex which includes a dock with fuel and water lines was constructed by the Maeda Construction Co., Ltd./Maeda Road Construction Co.,Ltd.(JV) on South east of Dublon Island. The Complex was started in November 17, 1979 and was completed in March 4, 1982; however, the idea came up in 1971. Such infrastructure costs approximately $2.3 million and was funded out of the state's regular Capital Improvement Project (CIP) funding source. It is stated in the report from Resources and Develop-

ment that "in combination, with this particular project, a request was submitted by the F.S.M National Government to the Japanese Government under the Japanese Foreign Aid Assistance Program for the acquisition of a five hundred ton cold storage facilitary along with other supporting on-shore facility to be placed at the Dublon Fisheries Complex dock." This request has already been approved by the Japanese Government and that the construction of such infrastructure will begin sometimes this year. If the request becomes a reality, Resources and Development would need to provide funding for the provision of fuel tank storage as well as for improvement of the water system to support such a Complex.

The approximate cost for the whole storage of the Fisheries Complex if completed is seven to eight million dollars. The facility will be owned by the State of Truk, but can be a joint venture with outside businessmen. It will provide employment to numerous Trukese and will encourage the local people to help out in the development of a new industry. "The completion of the Fisheries Complex in Dublon will be a major economic improvement in Truk", stated Redley Killion, manager of Resources and Development.

Awaiting the Dublon Fisheries Complex, the Division of Marine Resources has initiated and expanded the Tuna Fisheries Training Program over the past years. The funding of the project or program comes from Marine Resources' regular funds as well as funds from the various United States Federal Programs, particularly the Pacific Development Foundation. The Marine Resources' objective has been to increase local participation in the fishing activities, for the foreign fishing nations will be increased in Truk's or F.S.M's territorial waters. Therefore, Truk Marine Resources should require more of its local people on those foreign fishing boats licened to fish in the F.S.M Extended Fisheries Zone.

The Lagoon Baitfish Production Project was thus fulfilled with a sixteen thousand dollar grant from the Pacific Fisheries Development Foundation (P.F.D.F). Its objective is to demonstrate the effi-

cient method and system of production of bait fish, needed to support Truk's local tuna pole and line fishing fleet. There are five bait fishing groups of ten to fifteen people who are under the direct supervision and monitoring of Marine Resources Division. The project was very successful during the eight months, for these five bait fishing groups produced a combined total of about six thousand buckets, with a total value of eighteen thousand dollars. All of the bait caught was used for the two government-owned pole and line fishing boats. The outcome of this project has been very encouraging and has proven that bait production could be made into commercial operation from which the local people could benefit.

Dynamiting fish is one of the obstacles that the Truk Marine Resources is now trying to avoid and control. Dynamiting is a very damaging, but effective short term method of fishing. For one thing, it destroys many young schools of fish that are wasted. It also destroys the basic chain of life which sustains the bigger fish in the lagoon starting with the coral reefs.

The other obstacle is that Marine Resources needs trained or skilled men, especially engineers for the maintenance and operation of their boats, and other machines.

The Division of Marine Resources is now trying to increase the Tuna Baitfish Production, train fishermen for deep fishing methods and also work on a sea cucumber project which is to be made into fertilizer for farming. These are all Marine Resources' future plans and prospects.

Truk's Federation Fishing Cooperation

One example of a small industy which could be very productive is the Truk's Federation Fishing Cooperation. This industry was started in 1962. The people from Piis Island, under the supervision of a Jesuit priest named Fr. Fogelsanger, began the first small fishing operation in the Truk lagoon with twelve nylon fishing lines and their own canoes. They named this industry the Piis Fishermen's Cooperation. In 1966, a great leap toward a bigger fishing opera-

tion in Truk was taken. The membership in this Coop was extended to the people of other islands in Truk through the sales of shares in the Coop at ten dollars per share. The goal of this newly founded Coop was to organize the local fishermen in Truk and set up a market for their catch. With some financial aid, the new Coop began its fishing operation. In 1980, this industry was renamed Truk's Federation Fishing Cooperation.

Truk's Federation Fishing Cooperation at the present time has eleven employees who are paid by-weekly, at the rate of seventy-five cents an hour. There are more than five-hundred fishermen who contribute by selling their catch to the Coop. It exports its fish mainly to Guam and Saipan; however, there are some fish samples that are sent to Hawaii for potential buyers to review. With a positive response, the Truk's Federation Fishing Cooperation will probably start exporting its goods to Hawaii this year. The money they earned for 1984 was approximately forty-thousand dollars. The money was mostly made in July, being the busiest fishing time of the year when more fish are received at the Coop and exported to the outside.

The Truk's Federation Fishing Cooperation's resources are: one 36 feet long boat for the outer islands, with a very old and inefficient motor that usually breaks down. They also have fishing equipment which they sell for a cheap price, such as nets, lines and hooks.

There are some obstacles in running the Truk's Federation Fishing Coop. They do not have enough containers or coolers for the fish to be put in before exportation. They also have to wait for a long time for the outlet in Guam to send the coolers. This is because, Continental Airlines is unable to accept the coolers to be exported back to Truk because they do not have enough room on the plane. The Coop's boat continually breaks down. They also need money to build a new commercial building for the replacement of the one in which they now operate, which is too old.

Aside from these obstacles, there are some future plans which show this business to be a promising one. Now that Truk State has been declared "cholera-free", this Fishing Coop has started exporting fish to Guam and Saipan. Plans are already made to export fish displays to improve the exportation scale with Hawaii and hopefully the United States of America. The Truk's Federation Fishing Cooperation's main need is capital. They need money for construction of a new commercial building and to buy a new boat that is more efficient. The building which they use now is in need of repairs, and will require money to fix. It looks like the Fishing Coop could continue at an average rate, no matter if they are able to improve their capacity for export or not. However, they will certainly not be able to support many more families of fishermen without being able to reach out to new markets. However, the markets in Hawaii and the continental United States would be challenging to meet and it is uncertain whether this Fishing Coop can do it alone.

SMALL INDUSTRIES

Small Industries is a non profitable organization, a division of Resources and Development that is funded by the state's legislature. It has a yearly budget of about thirty-six thousand dollars ($36,000). This is the least amount of money that Resources and Development gives Small Industries each year, and they can be given more, but no less.

The purpose of Small Industries is to establish new industries that will either (1) increase export (such as handicrafts) or (2) reduce imports (such as furniture making).

It helps people who are interested in such work to start a business through loans and then pay later. However, Small Industries must make sure that the people they're helping have the necessary skills and knowledge to make their business worthwhile. Once participant groups have been sucessfully started they become nearly autonomous from Small Industries. Advice is given, but direct aid

is withdrawn. The manager at Small Industries is now trying to encourage his workers to make traditional handicrafts such as lavalavas, fishing traps, wood carvings, etc. Small Industries has a fund to encourage local handicraft makers. "In a recent project report on Small Industries said that The Small Industries commerical account (revolving fund) was established by the Truk State Legislature for the purpose of marketing handicrafts, other crafts items and seashells."

The quality of Trukese handicrafts has improved so markedly, especially over the past year, that Small Industries has recently entered its Trukese handicrafts in the competitive overseas market. In a recent Resources and Development report, it says, "The market outlets contacted outside of Truk have increased their request for Trukese handicrafts to the point where Small Industries can hardly meet such demands."

Like handicrafts, the marketing outlook for quality seashells is very promising, as Small Industries has made and established business contacts in Hawaii as well as the United State mainland. With the large reef area in Truk State and with the people's demonstrated willingness to collect shells, Resources and Development recently reports: "Small Industries is optimistic that the seashells industry will expand in the immediate future and will provide additional income to the Trukese people."

Small Industries, with all of its enterprises, is generating a substitutional amount of money for those Trukese workers that are associated with this non-profitable organization. The Resources and Development report also states, "the Small Industries Center during the past few has continued its intense effort in developing and expanding the various industries which were initiated during the past one to two years." They include the following: 1) Welding Shop, 2) Furniture Making, 3) Jewelry Making, 4) Storyboard Crafting, and 5) Electrical installation and appliance repair. In addition to these projects, new projects were fulfilled during the past two years which will further support

Small Industrie's effort in strengthening the private sector. Such new projects includes: 1)Handicraft Marketing, 2)Seashells Marketing, 3)Machine Shop, 4)Boat building, and 5)Rock Crushing. A 1984 updating Resources and Development report and Tim McCullough, the manager of Small Industries, say that the above activities have generated for the Trukese involved some two-hundred thousand dollars. Small Industries bought and sold about sixty-thousand handicrafts and got approximately three-thousand dollars in retained earnings. This money will be reinvested in Small Industries. Small Industries exports its handicrafts to Kwajelein, Hawaii and some parts of the United States. According to Resources and Development, "Small Industries has the greatest income to expenditure ratio in any of the State's development agencies." There are two major activities that generated the above two-hundred thousand dollars. They are either in items exported, or through import substitution. Small Industries uses the theory of import substitution to improve its income to expenditures ratio. Import substitution means that the products that are imported into Truk State are now made locally and need not to be imported.

Another new project which the Small Industries Center initiated recently is the Truk Machine Shop, which offers a wide variety of machinery capabilities that were proviously unavailable to the Trukese on a regular basis. Numerous parts for machines that would proviously have to be ordered from outside of Truk can now be made here in Truk at a great saving of time and money.

While Small Industries has established a fair number of economically important projects in the past, many are yet to be undertaken. These include: bleach making; charcoal production and aluminum pot casting. They would like to construct barge, marine slipway; boat building shop and a black smithing shop. They would like to find new styles and markets for their handicrafts and add to their furniture construction capacity. They would also like to establish food processing other than breadfruit flour.

One of the most successful handicfafts makers is Andon Billy. He makes story boards, table boards and puzzles. He sells the handicrafts that he makes to Small Industries and Lomongo's Handicrafts shop. He does special orders and custom work. In two weeks, he sometimes makes nine to ten regular story boards and in return gets about two hundred and eighty-eight dollars. In one week, he can make one coffee table which sells for about one hundred and seventy-five dollars. The amount of money he gets in one month is now averaging more than five-hundred dollars. He gets his wood, such as Mohokery and Mangrove from Fefan and Faichuk. This is one person who was started by Small Industries.

Small Industries has been very helpful to many of the people in Truk and it seems to have a very promising future. They have helped establish Trukese people in their own businesses and hopefully will continue to do so in the future. At the present time, with Small Industries doing so well, it seems only natural that they should continue to be profitable for Trukese people. With more than minimum assistance, who knows how far that incredible "expendenditure to income ratio" can take the Trukese people who are interested?

ALTERNATIVE ENERGY RESOURCES

In 1984, a new advance design of wells that uses sunlight as its main source of energy was developed. This design, called the "WERI well" was developed as part of a program to better utilize fresh water supplies in different places in Truk State. This program, which is sponsored by the Rural Sanitation Program on Truk, received five-hundred and twenty-five thousand dollars from the Truk State Government for the construction of one-hundred and fifty solar pumps and other related projects. This money was the remainder of the entire budget received by the Truk government to fund the programs which were established to eradicate the cholera epidemic. This entire budget was sent directly from the United States.

These solar powered wells were designed for the use on atoll islands or on low flat sandy coastal areas of high islands. The idea to begin the project started in 1973. Actual work began in 1984 after suitable places were found. A WERI well must be in a place where it is open to the sky and of course, where there is enough water in the ground. Someday these wells could replace the machine driven wells in Truk. Right now, there are already solar powered wells in different places in Truk. These wells are important to the Trukese people because they help simplify the process of obtaining clean, drinkable water by utilizing solar power to run their system. This system is also economical-it saves more and more money as time goes on. These solar powered wells are relatively inexpensive especially with the combined financial help provided by the community to pay for their costs.

According to a previous report (Winter, McCleary, and Walters, 1983), it states that these kind of wells contain a small submersible marine bilge pump which is attached to two thirty-watt modules. The pumping design for these solar powered wells is one gallon per minute at sixteen feet head (from water table to top of storage tank). They do not need batteries, generators or any other machines to run them. All they need is the solar power from the sunlight which gemerates electricity for the whole system.

Within the past year approximately fifty solar powered wells have been put to use throughout the outer islands of Truk. In general, these wells have performed satisfactorally. However, significant problems occured during installation. The problems are the following: 1. Many pumps have failed, sometimes as soon as three months after putting to use., 2. The wells were relatively expensive primarily because two solar modules were required in order to achieve the desired head., and 3. Installation sometimes takes considerable time because of difficulty in obtaining the required amount of aggregate for backfilling the well.

In an effort to find solution to these problems, a program

of laboratory and field testing was initiated. As a result of this program, certain recommendations have been made to improve the design of the WERI wells. Efforts were also made to keep the design of the wells extremely simple, both to minimize the need for maintenance and to simplify the installation. Only two pumps, the Rule and Teel, are usable for a WERI well. The Teel pump however, has a very poor life expectation, leaving only the Rule as a better canditate for use in the WERI well. Since the Rule is the pump that is used these days and its failure rate is already too high, additional methods of extending its life expectation must be considered. One method is to simply set up a switch in the system, so that when water is not required or when the storage tank is full, the system can be easily turned off. It has been proven that it is possible to deliver sufficient head with only one module. Therefore, in order to decrease the expense of a well formation, a careful preceding measurement should be made of the vertical distance from the water table to the top of the storage tank, to which water will be pumped. A solar module should then be chosen that is capable to suit this pumping requirement. Finally, in an attempt to reduce installation time, a well casing has been designed, such that the hole for the well could be filled with excavated materials rather than aggregate.

In August of 1982, during the cholera epidemic, one-point six-million dollars was sent by the United States Congress for the development of water seal toilets and water catchment tanks, which are important to the usage of WERI wells. This project was also sponsored by the Rural Sanitation Program on Truk. It involved the approximately five-thousand, five-hundred families in Truk and provided eleven people from Ponape Agriculture and Trade School (P.A.T.S) and Micronesian Occupation Center (M.O.C). All the necessary equipment that required expenses was handled by this program. Labor or man power was provided by members of each family under the supervision of a Rural Sanitation team member. As of January 31, 1984, three-hundred and twenty-eight water catchment

tanks and one hundred and thirteen water seal toilets were completed and put into use. Now, more water catchment tanks and water seal toilets have been completed and are now in use. One reason for the construction of water catchment tanks is to improve the WERI wells. These water catchment tanks were built in such a way that when they are full, the pumping rate of the WERI well is low and when they are empty, the pumping rate is high. Moreover, a faucet is connected to each tank so that when water needed, water can be easily drawn. These water catchment tanks are very helpful because water can be collected and stored from the WERI well and also from the rain.

Beside solar power,wind is another energy resource which may be developed further. A windmill uses the force of the wind to produce electricity. Wind is used as a main source of energy. A windmill consists of a wheel which is usually mounted on a tower or mast, at least twenty feet high, above surrounding obstructions. The wheel is held with its face toward the wind by a vane, or rudder. The wind strikes the blades of the windmill at an angle and forces the wheel to revolve. The wind mill gets the full force of the wind by being mounted on the tower. In general, windmills are used to pump water and drive electric generators for lighting and charging storage batteries.

An example of a windmill that is constructed in Truk is the one at Xavier High School. This windmill is a wind-electric plant. It has a propeller type wheel, with three blades, which turns at a high speed. The wheel is mounted on a tower and connected to an electric generator through gears. This windmill was built in late August of 1983 by John Crouch with help from the Electrical Construction Company of Guam (ECCG). It is used to provide electricity to help cut down the amount of electricity that Xavier uses from the island power on Moen. The maximum amount of electricity that this windmill procures at a time on a windy day is ten kilo watts is the average. Right now, Xavier High School uses the island power on Moen, its generators and the windmill to supply the

school's energy needs.

The program of Alternative Energy Resources, established mainly to amend the water supplies and extirpate the cholera epidemic, is an example to the Trukese people of how modern technology can save money, time and labor costs. This program introduces solar powered wells which only need sunlight as their main source of energy. No generators, batteries or any other machines are needed to run these solar systems. These wells use solar power to draw water from the ground and then purify it so that the water from the well may be used for showering, cooking and drinking. The introduction of windmills that utilizes the power of the wind to do work has great potential on mountainous Truk, especially with the prevailing Trade Winds that come annually. Alternative Energy Resources' seem to be calling Truk to a cleaner, brighter and more economical future.

TOURISM AND COMMERCE

An old Hawaiian stated, "look at us Hawaiians - we do not have future, because of foreigners taking over. Develop your own land carefully." Today in Truk, tourism is being developed. People come to Truk because of the Truk Lagoon. The lagoon is full of World War II artifacts, beautiful coral and colorful varieties of fish. The tropical climate adds to this attraction. Japanese come to pay respect to their lost relatives and loved ones, most of whom rest on the bottom of the lagoon. While here, they can see the remain of the Japanese occupation prior to and during World War II. Others around the world come to Truk mainly to scuba diving. They are interested in diving to see the Japanese wrecks and more recently, to see and photograph the coral which is growing on wrecks and fish which come to feed off the coral and each other. There is a service on Truk industry for these tourists. This service industry is adequate in serving tourists' needs, yet more could certainly be done to attract and satisfy future tourists,

as well as increasing the amount of revenue tourism creates for Truk State.

The Tourist Industry is the most profitable industry in Truk. As recently calculated in 1982, by a research group from the graduating class of 1982 at Xavier High School, the tourist industry generated 70% of one-point zero-two million dollars ($1.02 million) in 1981. More than three-quarters of this one million came from tourists alone, not including non-tourists. At that time, tourists were increasing in numbers each year, until recently, in late 1982, when the "cholera epidemic" hit Truk State. The epidemic decreased the expanding tourist trade dramatically. Aid was called in urgently. In mid-1983, signs of relief began to show. Programs were proposed to "offset the adverse impact the cholera had on Truk and to encourage a recent surge in tourist entries in the state as the epidemic had subsided." One of these programs is called, "the Historic Preservation Program to assume the responsibility of coordingting Historic Preservation Areas" like protecting the "sunken ships, World War II artifacts and remains, and any traditional commemoration sites," to attract tourists. This program is beneficial to Truk tourist attraction and has kept tourists from taking most of what they can carry from the lagoon home with them.

A serious threat to the lagoon and its attraction for tourists is the dynamiting of fish. People have been dynamiting fish randomly in Truk lagoon to catch larger quantities of fish at a time. They inadvertently dynamite and destroy the beautiful coral on which the small fish feed. Logically, if the coral is destroyed, then it will be more difficult for small fish to survive. The bigger fish will also find it more difficult to get enough food. Basically, the food chain is being destroyed and in the long run, beside the damage being done to the fishing industry, the tourist trade will suffer because of the destruction of coral and fish. Tourists will not fly ten thousand miles or more to look at dead coral and very few fish.

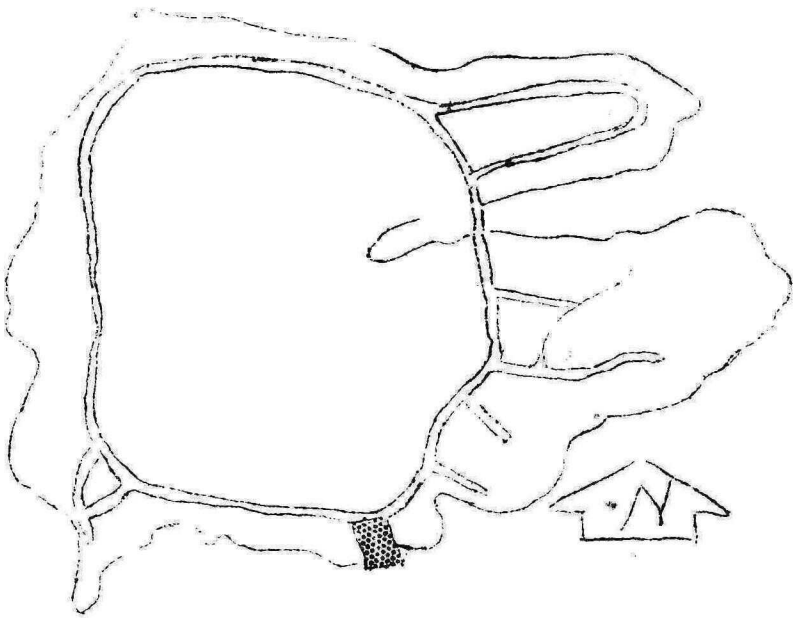
Project Title: Truk Marine Resources (T-402)

Contract Number: N62766-77-C-0218

Contractor: Maeda Construction Co., Ltd./Maeda Road Construction Co., Ltd. (JV)

Awarded Date: 17 Nov, 79

Completion Date: 4 Mar 82



DUBLON ISLAND FISHERIES DOCK

Scope: Construct fisheries dock on south east side of Dublon Island including following identifiable portions:

a) Construct 61,500 square feet of coral filled and concrete paved dock.

b) Construct 1,050 feet of coral capped access jetty to dock.

c) Dredge 54,200 cubic yards of coral in front of dock - depths of - 16 and -24 feet.

Status: Completed Punch List June 83

BOD 4 Mar 82

On island services, there are two major hotels: the Christopher Inn, owned and managed by Trukese, and the Continental Hotel, a business subsidiary of Continental Airlines. These two hotels are managed perfectly. However, at certain times like Christmas and winter months in general, when the amount of tourists increases, these two hotels are not able to accomodate the numbers of tourists coming to Truk. Many tourists are simply turned away because of a lack of space in Trukese hotels.

The Continental Hotel is a relatively luxurious hotel situated near an "inviting beach," its rooms are decorated tastefully, the dining room is air-conditioned, the food is satisfactory, but the prices for the majority of their menu items are unreasonable. For example, on the breakfast menu, a single doughnut sells for one dollar and twenty-five cents. On the lunch menu, a cup of Iced tea sells for one dollar and twenty-five cents and a cheese burger for five dollars and fifty cents. On the dinner menu, it is strange to order a half of a papaya for three dollars and fifty cents, or two pork chops with soup or salad and rice for ten dollars and ninety-five cents. The problem for tourists staying at the Continental is that they do not have any other options for eating. Just as dynamiting fish produces big yields in the short run, so too does charging high prices that tourists must pay to eat. However, these tourists will probably leave Truk with a feeling that they have been taken advantage of. This will hurt the tourist industry in the long run, as word will spread. As the saying goes;"Fool me once, shame on you, fool me twice, shame on me." Someone should open a restaurant at south field and sell the same type of food for a more reasonable price and it will be just like "racing against a snail."

The air-services that serve in the tourist trade are Continental Airlines and Air Nauru. Air Nauru makes only two trips in a week to Truk. Continental comes to Truk daily. Continental Airlines takes advantage of its monopoly on the Pacific Route Through the Marshall and Caroline Islands. People find it hard to bear with the high air-fares of Continental. According to Gabriel Mori, manager of Continental Air-Micronesia, Truk station, the only problem they

have is the terminal which is too small to hold a plane-ful of passengers. This certainly is true, but the terminal is not often full because of such air-fares as those charged for flights from Truk to Palau, Truk to Yap, and Truk to Majuro, or vice-versa, which go for (one way) $382.00, $337.00, and $363.00.

Dive shops have played an important role in brining tourists to the best diving spots in the Blue Lagoon and Micronesian Aquatics. Kimio Aisek owns the Blue Lagoon and Clark Graham owns Micronesian Aquatics. These two men compete in a unique way that each admittingly call, "freindly competition." It is friendly in a way that they help each other when necessary. Their dive shops have been due to the knowledge and skills that each man brings to the industry.

In mid-1984, Clark and Kimio showed their friendship when they jointly filed a suit against a new commercial-passenger ship operating between Truk and Pohnpei.

This ship, the Thor-finn is the newest branch of the Truk tourist trade. Clark and Kimio are opposed to the ship because the dividing of the money is not fair. According to Clark's and Kimio's calculation the Thorfinn's profits after three years, Mr. Higgs, owner and captain of the Thorfinn, will acquire approximately $300,000.00. Mr. Higgs own 49% of the stock. His share is $10,174.85 plus a charter fee of $290,000.00 which will exceed a total of $300,000.00 The problem is that the Micronesian stockholders will acquire only $10,174.85 to share among themselves.

It seemed that none heard Clark and Kimio on November 8, 1984 when they had a public hearing. On January 3, 1985, the Thor-finn started business taking passengers on its Truk and Pohnpei route. Kimio later stated, "the hearing was a waste of time," because the Thorfinn had started its route.

The Thorfinn on the otherhand, is an attraction to tourists who want a luxurious sea adventure. Therefore, will at least attract and expand the tourist trade to benefit the Truk State's most profitable industry.

However, the proportion of money that the Micronesians are recieving in comparison to the Canadian ship-owner seems out of balance.

Diving Truk lagoon should be advertized and promoted outside of Micronesia. People who are in cold parts of the world during the winter months might come to Truk if they were made aware of what Truk lagoon has to offer them. If a special deal on air-fares could be offered during a brief period of time in the winter, these could be advertized in the U.S. with the hope of attracting new people to Truk. At least, some kind of advertising should be done to let people know that Truk does exist has something they might like.

Industries in Truk must result in greater production and should be participatory for all Trukese people. Each industry must have the potential to participate and develope in Truk's economic growth. The goal of industrial developement must be to work towards self sufficiency, and then increased productivity. "Ordinary people in the villages must have input into planning and into deciding what is or is not produced," stated a 1984 conferance report on economic development in Micronesia as past achievments and future possibilities. It is also important for Truk's industries, no matter what stage of developement they are in, to continue expanding and developing. To stand still is to lose ground. If Truk has learned from the mistakes of other island peoples, it will remember that it must take care of its own so that it may remain autonomous and free to respond to the needs of its own people.

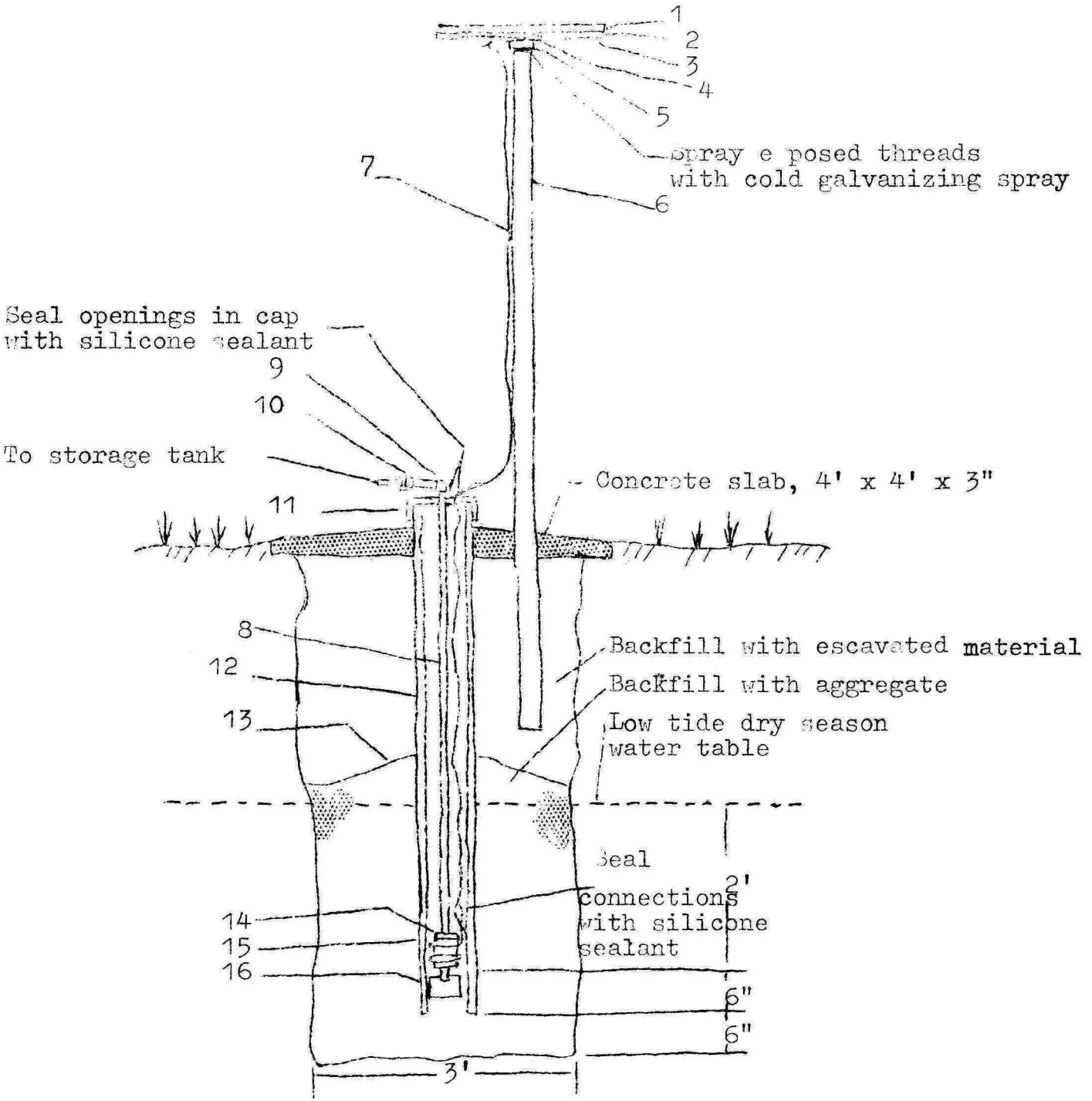
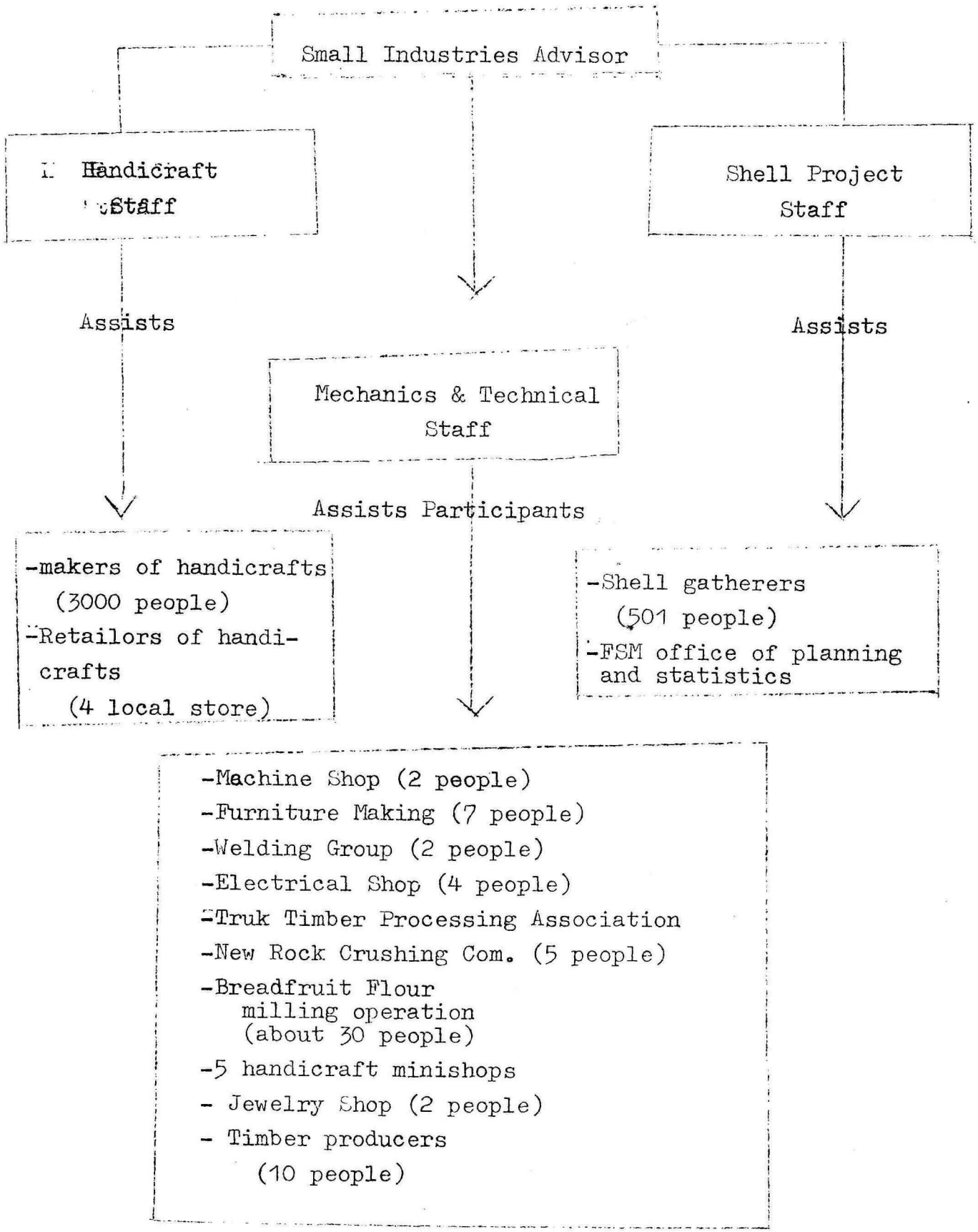


Figure 1. Assembly drawing of the "WERI Well" (not to scale). Refer to Table 1 for a descriptional of parts of the well.

Table 1. List of material for the " RI ell".

Item No.	Quantity	Description	Function
1	2	28 watt solar module, ARCO M3160-12	generates 12v electricity from sunlight
2	1	2'x4'x¾" marine plywood, treated & painted	mounting for solar modules
3	8	¼" x 20 x 1" long, aluminum hex head cap screws, nuts, and washers	fastens solar modules to plywood mounting
4	5	¼" x 20 x 1½" long glavanized carriage bolts, nuts, and washers	fastens plywood mounting to flange
5	1	2" galvanized steel floor flange	connects 2" pipe to solar module assembly
6	10' provided	2" galvanized steel water pipe (threaded on one end)	support for solar module assembly
7	20' provided	16-2 stranded wire	connects pump and solar module
8	40' provided	½" PVC water pipe	connects pump to storage tank (not shown)
9	6 provided	½" PVC elbow (socket ends)	provides for changes in pipe direction
10	1	½" PVC union (socket ends)	permits easy assembly and disassembly of well
11	1	6" PVC end cap	protects well from contamination
12	10' provided	6" PVC pipe	well casing
13	1	plastic sheet	prevents sand from entering aggregate
14	1	1" diameter x 6" long rubber hose	connects pump to ½" PVC pipe
15	2	1" stainless steel hose clamp	clamps hose to pipe and pump
16	1	Rule 400 gph pump	pumps water from well


Small Industries Advisor
Handicraft Staff
Shell Project Staff
Assists
Assists
Mechanics & Technical Staff
Assists Participants
-makers of handicrafts (3000 people)
-Retailors of handicrafts (4 local store)
-Shell gatherers (501 people)
-FSM office of planning and statistics
-Machine Shop (2 people)
-Furniture Making (7 people)
-Welding Group (2 people)
-Electrical Shop (4 people)
-Truk Timber Processing Association
-New Rock Crushing Com. (5 people)
-Breadfruit Flour milling operation (about 30 people)
-5 handicraft minishops
- Jewelry Shop (2 people)
- Timber producers (10 people)