

## Palau: Reflections of a Volunteer Entomologist

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### Abstract

This report examines the issues related to agricultural production in Palau and attempts to provide a realistic assessment of the many problems which are limiting production and how these problems can be overcome.

All agricultural production in Palau is for the local market and almost none of the farm production is exported except minor ones. The staple food in Palau is taro. The soil of Babeldaob Island, on which there are many farms, is very acid and lacking in nutrients. Soil improvement is necessary to sustain agricultural production. Many insect pests, diseases and weeds have been introduced into Palau and these have a negative impact on agriculture. This invasion is accelerating with the increased importation of products and the movement of people to and from the islands. Measures to prevent the arrival of insects, diseases and weeds are ineffectual and the control of them once established is very difficult. The diet is rapidly Americanizing and in the supermarket of Koror there are many farm products and canned foods imported from the USA and other countries. The change in diet along with a change from rural to urban lifestyle is resulting in serious health problems including obesity and diabetes.

Many of the projects aimed at enhancing agriculture as well as other aspects of the economy and lifestyle of Palau have been poorly conceived and have been of limited success or have failed to achieve their aims. The predicted value of projects and the investment required to fund them has frequently been poorly estimated. This major shortcoming needs to be addressed to ensure that future projects will contribute to enhancing agricultural production in Palau.

**Key words:** Palau, agriculture

## Geography

### 1. Location

The Republic of Palau is located in the North Pacific Ocean, south west of Philippines, north latitude 2° to 8° and east longitude 131° to 135°. The total area is 488 km<sup>2</sup>. Palau belongs to the tropical maritime climate. The average temperature and humidity is 27.9°C and 82 %, while the average total rain fall is 3,784 mm. Palau has more than 350 islands of which Babeldaob Island is the biggest.

The Palau Islands arose on the circum-Pacific volcanic belt, where the Pacific plate slips

under the Philippines plate. Although many of the islands are of volcanic origin there are no active volcanoes in Palau. The soil of Babeldaob Island, which has many field crops, is very acid. There are also many rocky coral islands. The islands of Palau are oceanic and have never been connected to continents or big islands, a feature they have in common with the Galapagos and Bonin Islands.

## 2. Fauna and flora of Palau

The fauna and flora of Oceanic islands have several features in common: adaptive radiation (the evolution of an ancestral species into many diverse species, each adapted to a different habitat), founder effects (many species have a narrow gene pool having arisen from just a few ancestral members) as well as a bottle neck effect (the population has experienced a nearly extinction in the past). There are many closely related species, each of which is confined to just one or a small number of the Palau Islands. The ecosystems of the islands are very fragile and many of the endemic species are endangered.

The fauna and flora of Palau has arisen following migration to the islands. This migration followed by reproductive isolation and adaptation has resulted in a very high number of endemic species.

Sea currents have played an important role in this migration. There are two currents that have an impact on Palau; the North Equatorial Current from east to west in the north of Palau, and the Equatorial Countercurrent from west to east in the south of Palau. Most of the ancestral species came from the Philippines and PNG with the Equatorial Countercurrent. An important plant species that arrived by being carried with ocean currents was the coconut palm.

Another method of migration has been by flying. Some of the plant species will have arrived by this method, being carried by birds. In recent times however, the arrival of humans has played a huge role in the development of the fauna and flora. All the many species of mammals present on Palau, with the exception of some bats, were brought by humans. Most of the many insect pests, diseases and weeds have arrived through the movement of people. The number of pests, diseases and weeds is rapidly increasing with the increase of transportation arriving in the country.

## 3. Terrestrial fauna

The biggest group of the terrestrial fauna is insects. Some 700-900 species of insects are present in Palau, a low number compared with that present on continental islands. The main order of the insects of Palau is Coleoptera with around 350 species being recognized. The Palau Islands are rich with members of the Curculionidae which spread to these islands in logs carried by currents. There are 3 species of snakes and 10 species of lizards in Palau. Only one of these reptiles is endemic, the lizard *Gehyra brevipalmata*. The presence of an endemic frog, *Platymantis pelewensis*, in Palau is of particular interest as endemic frogs are rare on oceanic islands. Many mammals are established in Palau, including rats, cats and dogs where once mammals were represented only by bats.

#### 4. Oceanic life

Although there are many species in the ocean, especially in coral reefs, the number of endemic species is low as is the concentration of marine life.

### A short history of Palau

The Mongolian ancestors of the indigenous Palauan people came from Indonesia around 1000 BC. They arrived in outrigger canoes along with taro, dogs, pigs, chickens and earthenware utensils. The natural environment suffered severe damage following the arrival of man. Bird populations were severely reduced. Slash-and-burn farming along with tree felling reduced the forest cover resulting in the inland regions of large islands becoming barren. The soil that had covered the surface of the cleared areas moved down to the lowlands, which then became productive for taro cultivation. Over time, many plant and animal species were introduced into Palau. Contact with the western world began with the arrival of Captain Draig in 1579, and trade between western countries and Palau started in the late 18th century.

In the late 19th Century Palau became ruled by a succession of foreign powers. From 1885 to 1899 Palau was under Spanish rule. Missionaries during this time converted much of the population to Christianity. In 1899 Palau passed in the control of Germany following being sold by Spain. Mining of phosphate ore began on Angaur Island in 1909. The phosphate ore was the main export from Palau until the end of the First World War. In 1914 to the end of the Second World War Palau was under Japan rule. The central government office of the Japanese south pacific territory was in Koror. Many industries were encouraged and the Palauan people received a Japanese style education. Many Japanese moved to Palau during this period and comprised three times the population of the indigenous Palauan people. The Japanese were employed in the mining of phosphate and bauxite ore, agriculture and fishery.

The end of the Second World War saw Palau move under the rule of the USA. The USA government strengthened the education and medical systems. However, during this period little was done to strengthen the local economy, develop self sufficiency and move the economy away from a hand-out dependency. On October 1, 1994, Palau became a constitutional government in free association with the USA. The development of Babeldaob Island, funded by USA aid, commenced followed the arrival of self government.

### Politics

Palau has a presidential constitutional government in free association with the USA. There are no political parties. The president and the deputy president are elected by direct election. The Parliament consists of the Senate (nine members) and the House of Delegates (sixteen seats). There are eight ministries. The tribal chiefs still have big powers. There are sixteen states in Palau and they have their own governors, state constitutions and state legislatures. There are no regular military forces, the defense of Palau being the responsibility of the USA.

There is a large Government administration. This has been possible by the size of the grants from the USA, but with the size of the grants now reducing, there is a problem with the funding

of this large infrastructure. As many government agencies are involved with policy development and administration, this can result in problems relating to decision making.

## Society

The population of Palau is around 20,000 of which approximately one third are foreigners. Many of these are Filipino, Chinese and Bangladeshi. Eighty percent of the population lives in the Koror State and the surrounding district. The average life expectancy of men is 64 years old and 67 years for women. Eighty percent of the total population is Christian. Palau has a matriarchal society and the mutual aid system provided within families is strong. The chieftain system is still strong and has much authority.

Education, based on the US 8-4 system, is compulsory for twelve years. There is a community college but the students who wish to attend university have to go abroad. The health system is established around health clinics in rural districts, with a national and a private hospital in Koror. There are three newspaper publishing companies, a radio station and a TV station. The official languages are Palauan and English, except in the south west islands where the languages are Sonsoralese, Tobi and English.

The proportion of the population engaged in farming is decreasing. People are leaving the rural areas and the traditional way of life and have moved into an urban life style. This change in life style is contributing to many social problems present in Palau. There is an increasing gap in the income of people, with the gap between people in Koror and in the rural areas being large. Many homes have Filipino room maids. The use of drugs is a problem and there are many people with an addiction problem. There is a custom to chew beetle nuts and also tobacco. Marijuana use is widespread.

Due to a move away from traditional to American type food much of the population is overweight and many are obese. Lifestyle related diseases such as diabetes have become a serious problem.

## Economy

The economy of Palau is based around tourism, subsistence agriculture and fishing. At present production of primary products plays a small part in the economy and although copra was exported during the period of Japanese rule, there are now almost no exports of farm or horticultural products from Palau except minor ones. Mining and other land based industries largely ceased following the end of the Second World War. Forestry plays little part in the economy, although it does supply some wood for housing. Fishing is an earner of foreign currency mainly from the sale of concessions to foreign countries to fish, mainly for tuna, in territorial waters. The manufacture of goods is of small scale and consumer goods including most foods are imported.

The country receives much aid, a large part from the USA and Taiwan. A contributing factor for the supplying of aid money to Palau appears to be the bargaining power it has by having a vote in the United Nations. The aid money that Palau receives is an important source of

revenue. However, the financial aid that Palau receives from the USA is due to end in 2009. Japan has also contributed much aid and outcomes of this are a major bridge, an airport and the electricity network. Palau has resisted the temptation to raise money by selling off assets and foreign companies and people are prevented from buying land and property.

The principal energy source in Palau is imported petroleum fuel. This is a big cost to the economy as now most families in Koror have cars and there are also families that have boats.

In recent years the economy has become increasingly dependant on experienced Filipino workers including in the professions. However, policies in place give indigenous Palauans economic advantages and a high proportion of the officials are Palauan.

In rural areas the lifestyle is still traditional but increasingly in Palau people are moving to the capital Koror and the gap in the lifestyle and living standards of people is rapidly widening. In the statistics of 2000, the average annual earnings per family is 12,845 US dollars. The annual income per resident is 3,726 dollars. The unemployment rate is 2.3 %. Many people, 27.7 %, are employed as officials in government positions.

## Agriculture

### 1. Overview

Taro has been the staple food and is grown in all regions of Palau. The cultivation of cassava (tapioca) and cooking bananas is also common. Mango, star fruit and mountain apple are planted around houses for the occupants' own consumption. Around Koror are farms producing crops for small local markets. Almost none of the products grown in Palau are exported. The soil of Babeldaob Island, the location of many farms, is very acid and is lacking in nutrients. The application of lime and fertilizer is essential to overcome the soil acidity and nutrient deficiencies.

### 2. Insect pests, diseases and weeds

There are few endemic insect pests on Oceanic islands. With the frequent arrival of ships and planes now occurring many insect pests including the fruit fly *Bactrocera philippinensis*, have become established in Palau. With few exceptions, such as a scale insect that has effective natural enemies, control of the introduced insects is difficult. Once a new pest reaches Palau it is very difficult to control. The spread of pest insects, diseases and weeds usually starts on Koror State, the site of an international port. Quarantine measures are poorly funded and have not been effective in stopping the arrival and spread of these threats to agricultural production and which also can harm native fauna and flora.

### 3. Change of diet

Many farm products and canned foods imported from the USA and other countries are now widely consumed, resulting in a rapidly Americanizing diet. Much of the population is overweight and many are obese. Lifestyle related diseases such as diabetes have become a serious problem.

Much of the food consumed in Palau is now imported with the supermarket in Koror selling

farm products including canned food obtained from the USA and other countries. The diet is Americanizing and adult diet-related diseases are becoming a big problem.

#### **4. Structure of the agricultural bureaucracy**

The Bureau of Agriculture of Palau consists of four sections: forestry, quarantine, horticulture and livestock. Around twenty officers work in this Bureau. The budget is largely spent on staff salaries and money is frequently not available for the purchase of essentials such as fuel or the delivery of mail.

### **The future outlook**

#### **1. Environment**

In their efforts to survive on the islands of Palau, people cleared the original forests and so now, with the exception of some small rocky islands, all of the forest is secondary modified growth. The term natural habitat now refers to what has regenerated after the destruction caused by the early settlers. Thus, any sense of belonging of the people with the native flora and fauna of the Islands has been lost. There is now almost no consideration given to the preservation of the endemic land fauna and flora of Palau, unlike what happens in the Galapagos and Bonin Islands. Environmental concerns have received a low priority in the budgets. An example of this is the big problem now being caused by the disposal of waste including sewerage.

With rapid development set to continue there is an urgent need for scientific surveys to monitor the effects that the developments will have on the environment. It is certain that extinction of some of the endemic fauna and flora will continue in Palau. However, measures to preserve the environment will be hard to develop and enforce as the measures will be viewed as stopping progress and which will be perceived as resulting in hardship for people.

#### **2. Problems facing Palau**

The way of life and the way of thinking is very different in Palau from developed countries. There is a sense that the tide of globalization will soon go away. The people fail to understand the severity of the problems faced by the Islands and the urgent need for action. At times fine words are spoken about the need for action but these fail to result in appropriate meaningful action. When plans that may be of benefit in overcoming environmental problems are made they invariably fail. The economic aid provided from other countries is too poorly directed to undertake effective action. Corruption is common and aid money is frequently diverted. Measures to improve the economy are not seriously considered apart from the issue of obtaining additional aid money from donor countries.

The sense of “problem” does not seem to exist in Palau. An example of this is the prevailing attitude on self-sufficiency. Rather than being seen as being dependant on aid the local people think of themselves as being self sufficient, and benefiting from aid obtained by targeted use of the UN voting right is seen as evidence of this self sufficiency. Efforts to make the administration strive to become truly self-sufficient are unlikely to succeed. Many reports and declarations are prepared, but these typically do not lead to effective action to overcome

problems.

One can get the feeling that the only problem that is perceived is how to get aid money from other countries.

A serious problem being faced relates to the projects being funded by aid schemes. Many projects including ones involving agriculture have been carried out in Palau. Most of these projects have been poorly conceived, and although perhaps well intentioned they have failed to show an understanding of the situation that prevails in this island country. For projects to succeed they need to be better planned and take a realistic view of the likelihood of a successful outcome. Unless this is done further large amounts of money will be wasted and the situation of the people will not improve. An additional outcome will be the loss of morale of those competent people sent in to work on projects that are doomed to fail and an increase of cynicism in local people and a reinforcement of the attitude of some local people that the projects are just a source of income.

The justification for aid projects being carried out in Palau can be placed into three categories. The first is those with political aims. The main aim of these projects is purely political, to show that a country is providing aid. The outcome of these projects is not important and typically there is no follow-up once a project is finished. The second aim is to enhance the economy of Palau. Due to the lack of natural resources it is difficult to plan and successfully carry out such projects. The third aim is the benevolent aim of making a difference. This includes projects run by often highly motivated and idealistic individuals or groups of people, often volunteers. Those doing these types of projects often gain much satisfaction but the real outcome is typically very poor.

## Conclusion

The problems involved in enhancing agricultural/primary production in Palau are considerable. Soil fertility is one serious issue as is the continuing establishment of many insect pests, diseases and weeds. The fragile nature of the ecosystems needs to be considered and there will be difficulties achieving a balance between maintaining the already degraded flora and fauna and enhancing economic and agricultural development. Poor planning of aid projects to overcome problems facing Palau has frequently lead to poor outcomes. Unless future aid projects are realistically reviewed and there is a change in attitude of officials as to the purpose of aid, it is unlikely that agricultural productivity can be enhanced.

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