Samoa’s Tree of Life

A Study of the Roles of Coconut Products in the Samoan Economy, Past and Present

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Abstract

This focus of this paper is the role that coconut products have played in Samoa’s cash economy, past and present. This paper begins with a brief history of the use of coconut products in Samoa before independence. Next, the decline of the copra and copra oil industries in the 1980s and 1990s is highlighted, and several causes for this decline are explained. The current roles of coconut products such as copra oil, virgin coconut oil, whole coconuts sold locally, coconut cream, coconut shell handicrafts, and coconut wood are then analyzed. Specific attention is given to the potential role of copra oil as a bio-fuel alternative to imported diesel fuel, and to the expanding export-oriented virgin coconut oil industry. The products’ current contributions to Samoa’s economy are presented, and important research currently being done on coconut products is also analyzed. Finally, this paper’s conclusion focuses on the future of these industries, and what needs to be done to ensure that the coconut tree’s potential economic benefits are reaped in the years to come.
I dedicate this paper to several individuals who embody the essence of courage and have helped me in innumerable ways: Colin Kiley, for his elephant-sized spirit; Warren Jopling, for making me look carefully; Dr. Jagdish Bhati, for making me listen carefully; Seru Tagivakatini, for always giving me a hand; John Mayer, for helping me with my Samoan pronunciation; Praneet Goundar, for helping me with my Fiji-Hindi pronunciation; Nicky Jackie, for reminding me that you have to crawl before you walk; and of course M. Brooke Capps, for inspiring me with a spirit of truly wanting to understand.
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List of Abbreviations

DME..............................................Direct Micro Expelling
EPC..............................................Electric Power Corporation
PCOC..........................................Pure Coconut Oil Company
PCP..............................................Paradise Coconut Products
POC..............................................Pacific Oil Company
RDIS..........................................Research and Development Institute of Samoa
ST..............................................Samoan Tall (coconut tree subspecies)
STEC............................................Samoa Trust Estate Corporation
STPL............................................Samoa Tropical Products Limited
USD.............................................United States Dollar
VCO.............................................Virgin Coconut Oil
WIBDI..........................................Women in Business Development Inc.
I. Introduction

In Samoa, the coconut tree (cocos nucifera) has often been called “the tree of life.” Perhaps more than any other single plant, the coconut tree has helped to sustain life in the Samoan Islands. Easily cultivated, highly adaptive, stalwart, and quite at home in Samoa’s tropical climate, the coconut tree was certainly crucial to Samoans in pre-European times. Nearly every part of the plant could be used by the islanders; the trunks, leaves, mid ribs, husks, husk fibres, shells, and nuts themselves were all utilized for sustenance (Crocombe, *The South Pacific*, 2001: 324). So extensive was the Samoans’ use of the coconut tree that by one estimate there are over 85 words in the Samoan language referring to the tree or its parts, ranging from amo (to separate the fibres of the husk by plucking) to u’u (scented coconut oil) to gutu (the soft hole of the coconut) to niufetepulu (a coconut with a large husk and small kernel) [Kramer, *The Samoa Islands*, 1995: 180]. Truly, the coconut tree was a central part of pre-European subsistence in Samoa.

This importance certainly did not decrease in colonial times. The coconut tree continued with its central role in village subsistence, a central role that continues to this day. However, a new role for coconut products emerged: a role in the cash economy. The colonial powers’ main interests in Samoa included the production of copra, the dried meat of the mature

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1 Missionaries first arrived in Samoa in 1830. From shortly thereafter until 1889, European, Asian, and North American countries, most notable Germany, the United States and Great Britain, used Samoa as a Pacific trading post. In 1889, the treaty of Berlin was signed, guaranteeing Samoa’s independence. However, this treaty was annulled in 1889 and what is now the Independent State of Samoa was ceded to Germany. It remained a German colony until 1914, when New Zealand gained control. New Zealand remained the colonial power until 1962, when Samoa became the first Pacific nation to gain independence.

2 The myriad of ways that coconut products have been used by and continue to be used by villagers on the subsistence level will not be addressed in this paper. Such a topic is certainly worthy of extensive discussion and analysis elsewhere, but this paper will only examine the role of coconut products in Samoa’s cash economy.
coconut. This interest, in fact, went a long way to promoting the coconut tree to an even more widespread role in Samoa. In pre-European times, only a small number of coconut palms were needed to satisfy the Samoans’ needs. The trees grew easily on their own; planting was not generally necessary. However, when whale oil became scarce in the industrializing world in the early part of the 19th century, coconut oil became an attractive alternative for making soaps, cosmetics, and cooking oils. The result was a massive increase in coconut planting throughout the Pacific, including in Samoa. Furthermore, large areas of land were bought by colonial powers to serve as coconut plantations. Thus, the 19th century in Samoa saw a dramatic increase in the number of coconut trees throughout the islands (Crocombe, 324).

The height of the copra industry in Samoa was from the mid-19th century to the early 1980s. As coconut trees bear fruit year-round, coconuts were an extremely reliable crop for the colonial powers. Furthermore, the options for alternative sources of oil were extremely limited. Copra, coconut cream3, and even whole coconuts were exported from Samoa in such numbers so as to dominate the agricultural exports sector. In 1981, for example, the total value of the coconut products exported from Samoa was USD $8,500,000. All other exports totaled USD $6,040,000. By value, coconuts products accounted for over 58% of Samoa’s exports that year (Fairbairn, Island Economies, 1985: 41).

However, the last 25 years have been very difficult on the coconut products industries in Samoa. The 1980s and 1990s saw coconut production and export fall dramatically, to the point of near collapse around the turn of the 21st century. Once the centerpiece of Samoa’s overall export industry, the coconut sector was surpassed by other exports and reduced to a mere supporting role in the Samoan national economy. However, the current coconut situation

3 Coconut cream is the thick, white liquid squeezed out from a mixture of grated coconut and water.
in Samoa is not nearly as bleak. New coconut-related industries are emerging, and industries that had faded are beginning to reemerge as viable economic contributors. The coconut tree is being reexamined as a source of economic livelihood.

This paper will begin with a brief analysis of the relative downfall of the coconut products industries in the 1980s and 1990s. Several key contributing factors that led to this downfall can be identified, and an analysis of these factors will lead to a more thorough understanding of the current coconut situation in Samoa. This paper’s main focus will be on the current situation, with an emphasis on the economics of coconut-related industries. These industries will be examined, and their potential economic contributions highlighted. As will be seen, the possible impacts of these industries are extremely uncertain in Samoa, and a careful appraisal of the present situation will help lead to this paper’s ultimate goal: an analysis of the economic future of the tree of life in Samoa.

II. Methodology

This study began as an attempt to analyze, in depth, all of the economic niches that coconut products fill in modern-day Samoa. However, as the research progressed, it became evident that an analysis of the recent histories of these products was needed, as the current coconut situation has been defined to such a large extent by these histories. As a result, interviews were scheduled with experts about the evolution of the coconut products industries over the past 25 years in Samoa. In particular, professionals at the Ministry of Agriculture, the Crops Division of the Ministry of Agriculture, the Research and Development Institute of Samoa (RDIS), and the Samoa Trust Estate Corporation were interviewed. Furthermore, secondary sources dealing with the coconut industries’ decline were also analyzed.
Next, it became clear during the early stages of research that the use of copra oil as a bio-diesel fuel is an enormous issue in contemporary Samoa. Two major new companies, the Pacific Oil Company and the Paradise Coconuts Products company, have been established in the past 24 months and are seeking to produce copra oil for use as a bio-diesel fuel, both for automobiles and electric generators. Interviews were conducted at these companies, with the use of copra oil as a bio-diesel fuel being of primary focus.

Finally, more broad-based research was conducted dealing with some of the other coconut products and their roles in Samoa’s economy. The virgin coconut oil industry was studied, primarily via interviews at the Women in Business Development Inc. headquarters in Apia. Next, coconut cream is still being exported from Samoa via the Samoa Tropical Products Limited company, and information about this operation was gathered via interview with one of the company’s accountants and via observation at the company’s factory. Major markets for popo (whole mature coconuts) and niu (young drinking coconuts picked from the tree), specifically at the Fugalei market in Apia, were also studied, with information coming from interviews with vendors and a bi-monthly newsletter put out by the Ministry of Agriculture. The handicrafts industry was analyzed next, as a considerable portion of the goods sold are made from coconut shells. Research in this area was conducted via interview at the Apia flea market. Finally, the coconut wood (referred to hereafter as “cocowood”) industry was studied primarily via secondary sources, as little is currently being done in Samoa with local cocowood.

Inherent in this study were two notable limitations. First of all, there are quite simply too many different coconut products with some role in Samoa’s economy for a detailed study of them all. With primary emphasis being given to the reemerging copra oil sector, more minor
industries such as the coconut shell handicrafts and cocowood industries were only studied at a basic level. Secondly, the two chief copra oil producing companies – the Pacific Oil Company and Paradise Coconuts Products – are quite young and have not been able to analyze or publish any data concerning the productivity or profitability of their activities. Information provided by these companies tended to be speculative and estimate-based. As a whole, however, this research went fairly smoothly and without major setbacks. The industries and professionals lent themselves quite readily to study.

III. Findings

Part A: Historical Analysis

As previously illustrated, coconut products comprised an enormous portion of Samoa’s export industry through the early 1980s. However, the copra and coconut industries suffered enormously in the two decades that followed. As Figure 1 illustrates (see below), the six year period from 1997 to 2003 in particular saw a dramatic fall in the export volumes of several coconut products. Interestingly, global copra oil prices were not to blame. As Figure 2 illustrates, copra oil prices actually increased from 1986 to 2000, albeit with substantial fluctuations from year to year. This suggests that other factors were at play.
One key explanation for the industry’s decline is the rise of powerful global competition, especially in Asia. The Philippines, Thailand, Malaysia, Indonesia, and India in particular all feature booming coconut industries; in fact, these five countries are all among the top ten global coconut producers (Fa’amau, Interview: 14 November 2008). Ray Fa’amau, a research supervisor at the RDIS, suggests that a number of factors were at play in these
Asian countries’ jumps to the top of the global coconut industry. First of all, these countries are all much larger than Samoa in terms of land area, and simply outgrow Samoa in coconuts by tens of millions. As a result, they can export in much greater bulk, allowing them to sell their products at lower prices. Samoa’s export prices (chiefly to New Zealand and Australia) were simply underbid. Next, to this day, Samoa continues to export coconut cream from the Samoa Tropical Products Limited (STPL) company in tin cans, while Asian competitors use larger, cheaper plastic containers such as those that dairy products are commonly sold in. The tin cans are more expensive than the plastic alternatives, and do not preserve their contents as well. Finally, Asian countries generally refrigerate their exports better than Samoa, as they have better and cheaper access to large commercial ocean liners. One of the chief reasons for the fall of Samoa’s coconut products industry was undoubtedly the rise of powerful competition in Asia.

Another key explanation for this fall is the extreme lack of new coconut planting in Samoa since independence. Coconut trees become relatively unproductive upon reaching roughly sixty years of age. They do not bear nearly as many coconuts as younger trees, and the coconuts are generally smaller. Trees past optimal production age are often referred to as “senile” (Matalavea, Interview: 13 November 2008). As previously described, the colonial era in Samoa saw considerable large-scale coconut planting. However, many of trees planted during this time have become senile; “at least 40 percent of coconut acreage supports low-bearing senescent palms in … Samoa” (Fairbairn, 73). Large-scale replanting became sorely needed in the 1990s and remains a top priority to this day. However, replanting has been impeded in a number of ways.
First of all, the Samoan government owns numerous coconut plantations scattered around the island of Upolu; the Samoa Trust Estate Corporation (STEC) is the governmental organization responsible for controlling this land, which totals over 6,900 acres (Matalavea Interview). This land was inherited by the Samoan government upon independence in 1962. However, many villages in modern Samoa do not view Germany’s acquisition of this land as legal, since all the Germans gave the villages for it was tobacco, metal tools, alcohol, and other European products otherwise unavailable to Samoan villages at that time (Matalavea Interview). Thus, some villages such as Vailu’utai and Fuailolo’o believe the coconut plantation land was illegally taken from them by the Germans and should have been returned when Samoa gained independence in 1962 (Laiti Interview). Instead, the land came under the control of the STEC. This land has been and continues to be in dire need of replanting, but the villages claiming ownership of the land have protested vehemently and made such replanting extremely difficult. The STEC spends a considerable portion of its time attempting to work out land disputes, and large undertakings such as replanting have not been a big priority. The STEC has been content to simply “use the coconuts [it has], instead of striving for a more efficient operation” (Laiti, Interview: 12 November 2008). Figure 3 (below) illustrates the drop in coconuts produced on STEC land from 1997 to 2004.
The copra and whole coconuts that were exported from Samoa in such steady numbers up until the early 1980s came mostly from villagers, who sold them to the government-owned copra mill and export company. The prices villagers received for these products were high enough to justify their labor, so the supply of copra/coconuts was not a problem. However, the 1990s saw a decrease in the price paid for these products relative to the cost of living, and many villagers stopped collecting extra coconuts and cutting and selling copra, as the returns no longer justified the labor. The payments earned for “the hard work of coconut collection, copra cutting and drying are low and payments in recent years have not been reliable and prompt, so that laborers tend to see [selling copra/coconuts] as an income of ‘last resort’” (“Feasibility Study,” 2005: 15). As a result, copra production and copra/coconut sales fell, further harming the coconut industries in Samoa.

One final explanation for the coconut products industry’s decline was the damage inflicted by cyclones Ofa and Val in 1990 and 1991. These were enormous storms, classified on the Australian Tropical Cyclone Intensity Scale as category 5 storms (the strongest category), featuring wind gusts in excess of 250 km/h. They destroyed, according to an
estimate by the Ministry of Agriculture, over 20 percent of the coconut trees under single or mixed cropping in Samoa; that is, they destroyed over 9,200 acres of coconut trees (“The Local Coconut Situation,” May-June 2008: 1). Needless to say, this severely damaged Samoa’s coconut product export industry. Thus, international competition, failure to adequately replant, low prices paid to villagers for copra/coconuts, and the 1990-1991 cyclones are some examples of key reasons for the weakening of the coconut industries in Samoa over the last 25 years.

**Part B: Copra Oil as a Bio-Diesel Fuel in Contemporary Samoa**

Of all the roles that coconut products have in the contemporary Samoan economy, surely one of the most significant is copra oil’s role as a potential bio-fuel, alleviating some of Samoa’s dependence on imported diesel fuel. In 2007, the government-owned Electric Power Corporation (EPC) spent over $50,000,000⁴ on imported diesel fuel purely for power-production purposes (Fa’amau Interview). If some of this cost could be alleviated by implementing the use of locally-produced copra oil, the Samoan economy would receive an enormous boost. Preliminary production of copra oil by private companies and research into the feasibility of this undertaking are major current issues.

The last 24 months have seen the development of two new private companies producing copra oil. The Paradise Coconut Products company (PCP) has for nearly two years now been converting copra oil into cooking oil, which is worth an average of $15 per liter. Currently, coconut oil-based bio-diesel fuel is only worth roughly $3 per liter (“The Local Coconut Situation,” 2). Nevertheless, the market for bio-diesel fuel in Samoa has such potential that

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⁴ The Samoan currency is the *tala*. One United States dollar represents roughly 2.9 *tala*, as of November 2008. In this paper, the “$” symbol will be used for the *tala*.
the PCP is currently experimenting with producing bio-diesel fuel in addition to cooking oil. The PCP uses whole coconuts bought from both villagers and the STEC. The company pays fifteen sene\(^5\) per whole coconut (including the husk, which is burned as a fuel to reduce operation costs) and collects from villagers free of charge; the company also has a contract with the STEC to buy 40,000 coconuts per week (Laiti, Interview: 12 November 2008). However, STEC General Manager Tu’ulima Laiti claims that this is “only one truckload…[the STEC] could provide ten truckloads a week” (Laiti Interview). Thus, if the bio-diesel industry proves worthwhile, the PCP could substantially increase their production, generating more income for the government via its STEC holdings. The Samoan government would receive a considerable economic boost.

Another new company (started early in 2008) is the Pacific Oil Company (POC), which produces oil from copra cut by villagers around the island. The POC collects the copra in 100-pound sacks. Depending on the quality, the POC pays $36-40 per 100-pound sack. POC General Manager Tupuola Tautala Sua admits that this is a very low price given the amount of labor required, and villagers only sell copra to the POC if they are desperate for extra income. Supply is currently a problem at the POC, but the company expects to be able to increase their offer for 100-pound sacks once their contract with the EPC is finalized, thus increasing the amount of copra that villagers will be willing to produce and sell. In terms of the aforementioned contract, the POC would like to sell the EPC 100,000 liters of copra oil per week. Currently, the POC is only producing 50,000 liters per week, but a finalization of the contract would mean the POC would be able to pay villagers more for their copra and thus increase their supply and double their current production (Sua, Interview: 13 November

\(^5\) The sene is the Samoan equivalent of the “cent.” One hundred sene equals one tala.
Clearly, proof that bio-diesel fuel would function as a diesel alternative would lead to substantially increased production by the PCP and POC, boosting the coconut’s importance in the Samoan economy.

Given this fact, research into bio-diesel’s potential in Samoa becomes extremely important. One organization doing such exploration is the government-funded Research and Development Institute of Samoa (RDIS). Given how much the EPC pays to import diesel fuel for its generators, the government places enormous importance on the RDIS, and expects prompt results from its research. The government has made it clear that if the RDIS cannot publish reports leading to the utilization of bio-diesel fuel by the EPC by June of 2009, funding will be cut off (Fa’amau Interview). In addition to other, non coconut-related projects such as the conversion of cassava into ethanol fuel, the RDIS studies the various properties of various coconut oil and diesel blends, and analyzes their compatibilities with engines and generators. Currently, most generators can function on bio-diesel fuel for short periods of time, but the problem is that, running on bio-diesel only, they deteriorate and become dysfunctional much more rapidly than if they are fueled with pure diesel. In order to make the generators compatible for the long-run, either the generators themselves or the bio-diesel blends need to be altered so that extended use is possible (Fa’amau Interview). This is a key issue currently being examined by the RDIS, a truly critical research establishment.

Another important research organization is the Crops Division of the Ministry of Agriculture. One of the Crops Division’s biggest projects is the development and study of different varieties of the coconut tree. For example, several subspecies of the tree are the

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For example, the “standard” bio-diesel blend that is currently seeing very minor use (such as in a handful or automobiles) is 15% coconut oil, 85% diesel. Increasing the percentage of coconut oil in these blends is an obvious goal.
‘Samoan Tall,’ ‘Malaysian Dwarf,’ and ‘Solomon Tall’ varieties. In addition, these subspecies all interbreed and hybrids have been developed with certain desirable qualities selected for. Hybrids were first developed in Samoa in 1990, and they have been campaigned for in replanting efforts for over ten years now. The hybrids have several features that make them beneficial, and it is noteworthy that some of these features would make for better bio-diesel blends. First of all, the hybrids produce more nuts than the Samoan Tall (ST) variety traditionally present in Samoa. The hybrids generally produce 80-100 nuts per year, while the ST trees average 50-70 nuts per year. Next, the hybrids start bearing nuts just 3-4 years after being planted, while the ST trees do not bear nuts until reaching 6-10 years of age (Matalavea Interview). Thus, the hybrids produce more coconuts more quickly, and could provide the supply needed for large-scale bio-diesel production.

However, the planting of hybrids has faced considerable difficulties. They have not been planted on STEC land, as the previously mentioned disputes between the STEC and villages over land ownership have put a halt on all replanting operations. Hybrid planting on communal village land has also been slow. The Ministry of Agriculture’s official opinion, according to Market Information Officer Taimalietane Matatamua, is that hybrid coconuts should be available to villagers for replanting free of cost, but this is not practical because the villagers who take the free coconuts from the Crops Division often “forget” to plant them and instead simply use them to make coconut cream or as animal feed (Matalavea Interview). Thus, Parate Matalavea, a Senior Research Officer at the Crops Division, advocates charging something small – perhaps ten sene – for each coconut so that only the people actually interested in planting coconuts will take them home. Furthermore, he suggests waiting until
the coconuts have sprouted shoots at least two feet high before selling them, again deterring
the wasteful practice of using the coconuts as food.

Overall, the production of copra oil by the PCP and POC, coupled with the research
being done by such organizations as the RDIS and Crops Division, make the emerging bio-
diesel fuel industry a critical part of the current and future Samoan economies. If villagers
have the economic motivation to supply copra and coconuts, if the PCP and POC can reliably
produce copra oil and turn it into bio-diesel fuel, and if the technology to successfully use bio-
diesel fuel develops and is implemented by the EPC and other fuel-requiring operations, then
the coconut will again have found a major economic niche in Samoa.

**Part C: Virgin Coconut Oil from Women in Business Development Inc.**

While copra oil can be used in producing bio-diesel fuels, virgin coconut oil (VCO) is
much more valuable and can be processed into soaps, perfumes, body lotions, insect
repellants, and other so called “value-added products.”

Initiated in 1996, the non-profit
Women in Business Development Inc. (WIBDI) organization’s VCO operation is currently
the only export-oriented VCO operation in Samoa. Eight villages in the country have been
provided by the WIBDI with Direct Micro Expelling (DME) presses to extract VCO straight
from freshly opened coconuts. The DME process was developed at the Australian National
University in the 1990s and can produce VCO from whole coconuts in just one hour. The

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7 Here it is important to make the distinction between “copra oil” – formerly known simply as “coconut oil” –
and “virgin coconut oil.” The former is extracted from copra that has been dried over a period of days by
heating or so-called “solvent extraction processes.” Raw copra oil is generally unclean and in need of refining,
bleaching, and deodorizing before it can be used for human consumption. It is often referred to as “low grade
coco nut oil.” Virgin coconut oil, in contrast, is procured directly from fresh coconut meat via a process of
pressing and separation of water. Virgin coconut oil in purer, cleaner, and worth much more than copra oil, and
can be processed into soaps, cosmetics, or cooking oils without any large-scale manufacturing. In discussions of
bio-fuel or diesel alternatives, copra oil is the preference.
mature coconut meat is grated and left to dry on special solar-thermal dryers fueled by the coconut husks. Specially-designed hand presses are then used to extract valuable VCO (Cretney, “Tradition, Trade, and Technology: Virgin Coconut Oil in Samoa,” 2004: 8).

The WIBDI collects the VCO from the villages where it is produced and sells roughly three (metric) tonnes every two months to the Pure Coconut Oil Company (PCOC), a small operation which works with the WIBDI and does the actual exporting. The VCO is sold to the London Body Shop, a major international beauty-products company. The current international price of VCO is $14 per kilogram, meaning that in one year $252,000 worth of VCO is exported. Additionally, roughly one tonne of VCO is sold locally by the WIBDI every year, netting an additional $14,000 (Mapusua, Interview: 19 November 2008). While there are certainly a number of administrative and export costs, a high percentage of this annual $266,000 goes to the rural villagers actually producing the oil. No large-scale factory production is needed. This money forms an incredible boost to the rural Samoan economy, and doubtlessly helps to sustain dozens of livelihoods.

A key step for the WIBDI was obtaining international certification from the National Association for Sustainable Agriculture of Australia as an organic VCO producer. As many larger-scale VCO producers in Asia are not organic-certified, the WIBDI has a big advantage in terms of attracting buyers. In addition to the contract with the London Body Shop, the WIBDI is currently negotiating a contract with a New Zealand beauty-supply company to supply one tonne of VCO every month. Such a contract would increase the WIBDI’s VCO operation by 67%. A United States-based company has also shown interest in becoming a

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8 Some of this VCO is used in the local manufacture of products such as soaps and perfumes. For example, the Malielani company makes VCO-based souvenir soaps that are generally sold to tourists on a small-scale basis.
WIBDI customer (Mapusua Interview). In short, the VCO business is very strong and rapidly expanding. The WIBDI has imported twelve new DME presses in addition to the eight that are already in use, and new villages are being trained in VCO operation. This is a very sustainable business that is expanding rapidly; VCO production already nets over a quarter of a million tala per year in Samoa, and this number will likely increase dramatically in the coming years. As it is a rural-based, small-scale operation, it brings an enormous amount of money into rural Samoan communities and helps boost the national economy from the bottom-up.

**Part D: Coconut Sold in Apia’s Fugalei Market**

While whole coconuts – both *popo* (mature coconuts) and *niu* (drinking coconuts) – are sold in many places throughout Samoa, by far the greatest concentration of these sales occurs at the Fugalei market in Apia. For many Apia residents without locally available coconut plantations, the market provides an efficient means of obtaining *popo* for daily needs. Apart from on Sundays or public holidays, there are usually hundreds of coconuts available for sale at the market. Data from the Ministry of Agriculture indicates that 23,500 pounds of *popo* were sold at the market in 2007, at an average price of 17.5 *sene* per pound (“The Local Coconut Situation,” 2). This equates to over $4,100 generated in one year. While this may be small compared to other economic sectors, there is reason to believe that this number will grow in the years to come. In 2003, only about $1,500 was generated by *popo* sales in the market, and this number was still only about $2,200 in 2006. Thus, 2007 represented a substantial increase in *popo* sales. Furthermore, it should be noted that *popo* is sold almost exclusively by villagers looking for extra sources of cash income (Sitele, Interview: 14
October 2008). Although $4,100 may not be a huge amount of money to some, it represents important income to Samoans who need it most.

Niu (drinking coconuts) are also sold at the Fugalei market. While vendors who sell a wide assortment of fruits may also sell a dozen or so niu, the vast majority are sold by a tight-knit group of vendors who exclusively sell niu out of large coolers at the very front of the market. This group of vendors essentially has a monopoly on the trade, and it runs as a fairly large-scale operation (Sitele Interview). The group collects niu from several villages, most notably Leulumoega near Faleolo International Airport on the northwest coast of Upolu, and transports them to the Fugalei market where they are cut, chilled, and generally sold the same day they are picked from the tree. The vendors generally pay the villagers who supply the niu about $0.50 per nut, and typically sell the nuts at the market for $1.00-$1.50. The vendors themselves estimate that, in total, they sell between 500 and 1,000 niu every day (Sitele Interview). Assuming an average price of $1.25 per nut and a sales volume of 750 nuts would mean that the vendors earn about $560 every day in net profit. Discounting Sundays and other public holidays, the sales thus total over $175,000 in one year. This total represents a steady source of income for the collectors and vendors associated with this business and the villages involved in supplying the coconuts, and can have a substantial effect on Samoa’s domestic economy.

This operation appears to be quite sustainable; there are enough coconuts in Samoa to support it. Assuming an average density of 50 coconut trees per acre, an annual yield of 50 coconuts per tree, and an estimated 51,072 acres of coconut plantations, Samoa currently produces roughly 127,680,000 coconuts per year (“The Local Coconut Situation,” 2). With
such a large supply of coconuts, the *niu* industry is quite sustainable and does not over-exploit Samoa’s coconut supply.

Finally, it is worth briefly noting that the vendors usually sell *niu* from hybrid coconut trees developed at the RDIS. These coconuts are larger than ‘Samoan Tall’ nuts, and can thus be sold for $1.50 as opposed to $1.00, netting an extra $0.50 per nut. The villages that provide these vendors with coconuts have undertaken hybrid replanting initiatives since the early 1990s, and the result has been a steady source of income (Matalavea Interview). Overall, the sales of *popo* and *niu* at the Fugalei market in Apia represent another important economic niche held by coconuts.

**Part E: Other Economic Sectors Related to Coconut Products**

In addition to such coconut products as copra and coconut oil, a major industry in Samoa since the 1970s has been the production and export of coconut cream. In this industrial process, large mechanized shredders grate coconut meat, and then water is added before large presses squeeze out the cream, which is also known as coconut milk. Currently in Samoa, the only company producing coconut cream for export is the Samoa Tropical Products Limited (STPL) company. Made up of a combined 85 factory and management employees, the company exports their cream exclusively to New Zealand and Australia. Currently, the STPL exports one shipment of cream every two weeks, with each shipment being worth between $40,000 and $80,000 depending on size (Lino, Interview: 19 November 2008). Extrapolating these numbers, the STPL makes between one and two million *tala* per year from exported cream. In addition, between $100,000 and $200,000 worth of cream is sold locally every year.
Although these sums are large, the STPL is struggling. The coconut cream export industry in Samoa has steadily declined over the past ten years, as is illustrated in Figure 4 (see below). The STPC is currently exporting less than half of what it was value-wise in 1997.

![Graph showing coconut cream exports over time](image)

**Figure 4.** Coconut Cream Exports. *Source: Samoa National Export Strategy 2008.*

The most notable cause of this decline is the previously-addressed inefficiency of the STPC’s use of tin cans and the inadequate revenue villagers earn by selling whole coconuts to the STPC. Currently, the STPC pays ten *sene* per coconut that they collect, and fifteen *sene* per coconut if the nuts are brought to the STPC factory (Lino Interview). Given these low prices, the supply of coconuts available to the STPC has waned considerably. According to an RDIS expert, “the price of coconuts must be at least 25 *sene* or [the villagers] will not bother to sell,” (Fa’amau Interview) and without a sufficient supply of nuts the coconut cream industry will die. While still a major economic force, the coconut cream industry in Samoa is in decline and its future remains uncertain.

Another coconut-related industry of note is the use of coconut shells in making handicrafts and souvenirs. Coconut shells are hard, durable, and can be polished and carved into bowls, vases, jewelry, and other items. In Samoa, these handicrafts are generally carved
by several moderately large-scale producers and then sold to souvenir shops or vendors in the Apia flea market (Lafaele, Interview: 17 November 2008). Oliana Lafaele, a vendor with a stall in the flea market, estimates that she sells about ten pairs of coconut shell earrings per day, perhaps in addition to a bigger coconut shell product such as a hair pin or a decorative bowl as well. The earrings are sold at an average of five to ten tala per pair. Each day the handicraft makers sell their products to the vendors, who add about twenty percent to the price. In an average day, the handicraft makers earn between $300 and $500 selling coconut shell products to the vendors (Lafaele Interview). Expanded to one year, this total comes to $90,000 - $150,000. This is in addition to the money that comes from sales in numerous souvenir shops scattered around the Apia area. Tourists are responsible for a large proportion of these purchases, something attributable in part to the fact that coconut shell handicrafts are fairly unique to Samoa within the Pacific region. Neighboring countries such as Tonga, Kiribati, and Tokelau do not produce anywhere near as many of these products, and tourists in Samoa often find them unusual and unique (Lafaele Interview). However, competition from Southeast Asian nations such as Thailand, Indonesia, and the Philippines is growing, and Samoa’s stronghold on this market may weaken in the coming decades.

One final coconut product industry is the use of cocowood for furniture and decorative carvings. Cocowood use has many benefits, and the cocowood industry could seemingly be developed. Thousands of senile coconut trees in Samoa are simply left to rot; that is, there is an enormous supply of cheap cocowood available to lumber companies in need of wood. Cocowood also has some attractive qualities: it is a durable wood that grows very straight and has an attractive color (“Focus on Coconut Wood,” October 2007). In addition, the use of cocowood is extremely environmentally friendly and lessens lumber companies’ needs to
destroy Samoa’s remaining areas of primary rainforest for the purpose of harvesting tropical hardwoods. Given all of these advantages, it would seem that the cocowood industry should be substantial in contemporary Samoa. However, this is not the case. There is very little being done with cocowood at large lumber companies; only occasionally do special consumer requests or special projects prompt companies to buy coconut trunks. Even then, it is usually only a very small number of trees that is needed. For example, Tu’ulima Laiti of the STEC reports that last year the Bluebird Lumber Company placed an order for five coconut trunks (Laiti Interview). While this may be better than nothing, such minor use of cocowood means an extreme under-utilization of this potentially strong market. Nevertheless, the future looks bright for the cocowood industry in Samoa; numerous organizations such as the Australian Centre for International Agricultural Research are campaigning for the more widespread use of coconut wood. With the cost of tropical hardwood alternatives being so high, the market for cocowood in Samoa should increase in the coming years and have an impact on the national economy. Just how significant this impact will be is quite uncertain.

IV. Analysis and Conclusion

When looking at the overall picture of coconut products in Samoa’s economy, it is clear that the roles of some coconut products are on the rise while others are declining. The future of copra oil as a bio-diesel fuel is very bright. If organizations such as the EPC, PCP, POC, and RDIS can produce a functional framework for the implementation of bio-diesel as a fuel for the EPC’s generators, the boost to Samoa’s economy could easily reach seven figures annually. Samoa could even become an exporter of bio-fuel to nations such as Australia and New Zealand if the technology develops throughout the entire Pacific. Whereas the past 150
years saw copra and copra oil as Samoa’s chief exports to Australia and New Zealand, the future might bear witness to bio-fuel taking over this leading role. Much would have to be done before this possibility could be realized; nation-wide replanting efforts to reduce numbers of senile trees, large-scale development of additional copra oil factories, the introduction of bio-diesel production centers, and the development of technology that would allow bio-fuel to be used in colder climates than Samoa’s would all be needed before bio-diesel export would be possible. However, given the world’s growing population and the world’s finite supply of diesel fuel, the bio-diesel industry will likely continue to rise in importance over the coming decades and Samoa must retain its favorable attitude towards bio-diesel exploration. Research organizations such as the RDIS and Crops Division of the Ministry of Agriculture must be given continual government-funding, as their work could have enormous economic value in the future. The bio-diesel industry has a bright future, and whatever is necessary must be done to ensure that this future is realized.

The future of the WIBDI’s VCO operation is also very hopeful. The market for beauty-products in growing around the world, and VCO is an extremely high-grade oil that is useful in the production of a wide variety of products. The WIBDI’s operation is well-run, productive, and rising in economic importance. Whatever needs to be done must be done to ensure that this operation continues to grow. The money it generates works its way into the hands of Samoan villages, and the operation is quite sustainable. While it is admirable that twenty DME presses will soon be in use, there is no reason that the total number of presses in Samoa could not exceed forty or fifty within five years. If such an increase in production would mean that the WIBDI would have to hire additional management or that the PCOC would have to develop into a larger company, then these changes should be made. The VCO
industry can and should continue to grow and contribute to Samoa’s economy, and the WIBDI should retain its pro-expansion stance.

The future also looks good for several other coconut product industries, although they function on a smaller economic scale than the aforementioned bio-diesel and VCO industries. The local sales of *popo* and *niu* will likely be steady, and little needs to be done to ensure this stability. The same is true for coconut shell handicrafts; this industry will likely maintain its economic importance without too much effort. In fact, the rising number of tourists that visit Samoa should mean that sales of these handicrafts will steadily increase in the coming years.

The implementation of cocowood as a lumber source is currently a slow-moving process, and more should be done by the government to encourage cocowood furniture production and purchases. This is a market that is currently under-utilized, and a more aggressive approach to its development by the government and large lumber companies would provide another economic boost. If this development is pushed, cocowood’s future looks strong.

Several notable coconut product industries face a bleak future. It seems unlikely that the export of copra or whole coconuts will make a comeback in Samoa; competition from Tropical Asia is simply too strong and still growing. Furthermore, the high cost of fuel means that the transportation of these products from Samoa to far-away destinations such as China, Japan, the United States, and Australia has become uneconomical. Similarly, the coconut cream industry faces a bleak future. It is likely that some export of the cream to Australia and New Zealand will continue, but the STPL company is shrinking. Once again, competition from Asia and transportation costs are – and will continue to be – limiting factors. The coming decades will likely see a continued decrease in coconut cream production.
Overall, when looking at the places of coconut products in Samoa’s economy, it is evident that the current picture is different from that of the past. The coconut products industries are continually changing, and their economic contributions change as well. It is quite likely that the picture ten years from now will have changed again, and future studies of these industries will be important. More in-depth studies of the cocowood and coconut shell handicraft industries would also be worthwhile, and other, quite minor coconut products such as coconut candies, coconut toddy, and coconut husks as a fuel source could also be analyzed. With the continued study and use of coconut products, the coconut tree will continue to support life in Samoa in the foreseeable future.
Interviews:


Lecture:

Bhati, Dr. Jagdish. Lecturer in Agricultural Economics. The University of the South Pacific at Alafua. Alafua, Samoa. 1 October 2008.
Printed Materials:


Internet Sites:


Glossary of Samoan Words

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>amo</td>
<td>to separate the fibres of the husk by plucking</td>
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<tr>
<td>gutu</td>
<td>the soft hole of the coconut</td>
</tr>
<tr>
<td>niu</td>
<td>young drinking coconuts picked from the tree</td>
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<tr>
<td>niufetepulu</td>
<td>a coconut with a large husk and small kernel</td>
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<tr>
<td>popo</td>
<td>whole mature coconuts</td>
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<tr>
<td>sene</td>
<td>the Samoan equivalent of the “cent.” One hundred sene equals one tala</td>
</tr>
<tr>
<td>tala</td>
<td>the Samoan form of currency. One US dollar ~ 2.9 tala, as of 11/2008</td>
</tr>
<tr>
<td>u’u</td>
<td>scented coconut oil</td>
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