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Vanuatu: Solutions for the World's Smallholders

Vanuatu; a tourist attraction and honeymooner's heaven. The landscape is reminiscent of the islands of Hawaii. It is a nation composed of a string of more than eighty picturesque volcanic islands. Many of the mountains of Vanuatu are covered with tropical rainforests. In fact, James Michener used the islands of Vanuatu as the fictional setting of Bali Hai in his collection of short stories *Tales of the South Pacific*. However, that is not the whole truth. Vanuatu is also a poor, developing nation in need of safe, potable water and proper education on sanitation and hygiene to eliminate the food and waterborne illnesses affecting the nation. It is part of the Pacific Ring of Fire, having more than fifteen active volcanoes, and it experiences many earthquakes and tsunamis. Vanuatu is a Y-shaped archipelago spanning 560 miles (900 kilometers). Sixty-five of Vanuatu's eighty plus islands are inhabited. This chain of islands is two-thirds of the way between Hawaii and Sydney, Australia. It is about 1826.37 miles (2939.26 kilometers) north of New Zealand and 831.3 miles (1337.85 kilometers) west of Fiji. The total land area is 4710 square miles (12,200 square kilometers). Vanuatu is an isolated nation and has limited natural resources other than copra (the dried flesh of coconuts), fish, hardwood forests and manganese. It has no known petroleum reserves.

According to a 2005 survey of Vanuatu, 91.39% of the land is unusable as forests, beaches, and mountains. Of the remaining 9.61%; 1.64% is arable and 6.97% is permanent crop land. The permanent crops in Vanuatu consist of coconuts, kava, bananas, avocados, breadfruit, chestnuts, limes, oranges, mangos, and many other local fruit trees. Agriculture is more important to Vanuatu's economy than any other Pacific economy because it does not have the mineral resources or the quality of forests of neighboring nations. With 75% of Vanuatu's population living in villages, subsistence agriculture is a major part of the national economy. Food crops produced include yams, kumara (sweet potato), and a great range of fruit and vegetables.

Vanuatu's climate varies from tropical in the northern islands to subtropical in the southern islands. The average temperatures over a twelve month period in the northern province of Torba ranged from 75.6°F to 79.9°F. In the southern most province of Tafea, the average monthly temperatures ranged from 68.5°F to 79.7°F. The dry season, May through October, has sunny days and cool nights with fresh southeasterly breezes. The wet season, November through April, brings higher temperatures, heavy rainfall, and periodic cyclones. The average annual rainfall can vary from 70 inches to over 182 inches of rain on some of the larger, rural islands. The northern provinces of Vanuatu get more annual rainfall than southern provinces. For instance, the province of Torba received 181.83 inches between the months of June 2006 to May 2007.

The rural population of Vanuatu totaled 184,126 (75% of the total population) in the 2009 census. The rural population is estimated to be growing at a rate of 2.4% each year. The average rural household size in 2009 was 5.3 persons. This varied from 4.8 persons in Penama province to 6.2 persons in Tafea province. The average household has one or two cattle, several chickens (an average of 16), and possibly a small pig herd. These are for personal consumption. A significant number of households gather timber from the forest to repair or build their houses and use as firewood.

The most recent economic data from the Vanuatu National Statistics Office (VNSO) shows that agriculture, forestry, and fishing contributed 14% of Vanuatu's Gross Domestic Product (GDP) in 2007 according to the VNSO. Industry contributed 9% and services, tourism, banking, health care, and

government accounted for 77% of the GDP. Data from 1995 shows that subsistence agriculture made up about a third of the agriculture sector, forestry and logging another third, and the rest made up of commercial agriculture, particularly copra and beef production.

Copra, coconut oil, kava, and beef account for 75% of Vanuatu's agricultural exports. Copra makes up 35% of the country's exports and can be produced by individual households and on large-scale plantations. Copra exports were extremely varied depending on weather from the years 1999 to 2008. The annual percentage of agricultural exports that consisted of copra, varied from a low of 4% to slightly over 48%. For the rural smallholders it is an important cash crop, but like many agricultural commodities, it is variable depending on the weather. The other agricultural commodities showed similar ranges in variation. According to the 2010 census of agriculture, copra provides significant income to a number of rural households. Statistics available from the World Bank show there has been a general downward trend in agricultural production. The main copra producing islands in the country are Malekula, Ambae, and Santo. The report also shows that while the number of households planting and raising coconuts has grown, the number making copra has actually shrunk from 72% in 1990 to 45% in 2007. One reason for this is the income generated has declined since the early 1980s.

After copra, the second most important agricultural product is coconut oil. This is followed by kava with 15% of the agricultural commodities exported and beef and veal at 10% for the years 1999-2008. Vanuatu, today, has become a cattle nation. Vanuatu is the only significant beef exporter in the Pacific, with exports to Japan and Melanesia. Cattle are often raised under coconut trees as an extra source of income, to graze on grasses and weeds, and to fertilize the soil. However, most smallholders raise beef cattle around their homes.

Efforts to diversify the Vanuatu's agricultural economy have been made in recent years, but figures from the Vanuatu National Statistics Office indicate this effort has not met with success. A large amount of effort and money went into promoting cocoa but in the years 1999-2008 the greatest percentage of agricultural exports was slightly over 11%. It peaked in 2003 and the latest figures in 2008 indicate only 6.8% of the agricultural exports.

Vanuatu shares many of the same water quality issues as many of the small island nations of the Pacific region. One of the issues that rural small-scale agricultural families have is reliable access to safe, clean, potable water. 90% of Vanuatu's rural population has difficulties obtaining safe, potable drinking water. An estimated 50% of Vanuatu's rural population does not have access to a fully functioning water source. Another 40% only has access to a system that is in need of repair. Adding to the problem are cyclones that frequently hit Vanuatu. Cyclones often destroy crops, roads, homes and pollute the drinking water and waterways. The smaller Pacific islands, including many of those in Vanuatu, experience difficult and sometimes life threatening deficiencies of clean, potable water supplies year-round. Diarrhea kills around 2.2 million people around the world each year, but it affects mostly children in developing countries like Vanuatu. After pneumonia, it is estimated that diarrhea is the number one killer for children under five in Vanuatu. It is estimated that sanitation could reduce the child death rate by more than one-third.

Typhoid fever, leptospirosis, and cholera are three of the more serious waterborne diseases in the Pacific islands. There was an outbreak of typhoid fever in Vanuatu during December 2000. Typhoid fever is caused by the bacteria *Salmonella typhi*. It is caused by consuming food or drink contaminated with the bacteria. Humans can be chronic carriers, which mean they spread the bacteria but are not affected themselves, however they can spread the bacterium so they should not prepare food for others. Typhoid fever does not affect animals. The best way to prevent the spread of typhoid fever is the frequent washing of hands and using safe water. In 1997 an outbreak of leptospirosis plagued the nation. Leptosiposis is caused by several strains of a bacterium called *Leptosira*. Unlike typhoid fever, leptospirosis can be

transmitted between infected animals and humans. It can also be a waterborne disease transmitted by the consumption of contaminated water. To prevent the spread of leptospirosis, good personal hygiene and prevention of contamination of water sources is important. Even though there hasn't been an outbreak of cholera in Vanuatu, there were outbreaks in the Marshall Islands and the Federated States of Micronesia in 2000. With modern air travel, disease transmission between the Pacific Islands is very likely.

The main sources of water in Vanuatu are wells, springs, rivers, and rain water. Many of these sources of water are conveniently located near homes or villages. Wells, rivers and springs account for 26.0%, shared piped water is 19.3%, community water tanks 18.6%, and household water tanks with catchments is 15.9% of the nation's rural water supply. Even when people find clean water, there usually isn't enough for drinking, bathing, and home use. The quality of rural water supplies is more variable than the quality of urban water supplies.

One issue unique to Vanuatu is that many unprotected drinking water sources are sometimes contaminated by volcanic ash and gas emissions. One specific issue is excess fluoride contamination of rainwater by volcanic activity. A common problem of high fluoride concentrations in drinking water is dental fluorosis. This is the weakening of the dental enamel due to excess fluoride exposure. On one island, it was prevalent in 85% of the children and on another island, rarely affected by volcanic emissions, the prevalence was still high at 36%. Drinking water samples from the western part of the island of Ambrym, in central Vanuatu, contained high fluoride levels with 99% exceeding the recommended concentration limit of 1.0 ppm (parts per million).

A significant source of drinking water contamination in Vanuatu comes from poorly designed and monitored latrines. Natural surface water used for drinking and bathing is sometimes used as latrines. The *Rural Water Supply and Sanitation Program* started in 1994 and increased the access to safe drinking water to 53% of the rural population. The *Rural Sanitation Project* started in 1989 and, supported by UNICEF, provided 15,000 latrines which improved the source of drinking water throughout Vanuatu. This initiative provided 52% of the population of Vanuatu with adequate toilet facilities.

Another issue that Vanuatu has is the lack of water quality monitoring. Rural drinking water is monitored only sporadically. Just a single area is selected for monitoring each year and approximately 12 sites are sampled from this area. Currently, the government is monitoring for coliform and E-coli contamination only. Testing is done at a laboratory in Port Vila or onsite for the outer islands. The laboratory has a portable incubator for analysis on the outer islands.

A surprising benefit of improved access to potable water is the improvement in relationships between wives and husbands. This removed a previous friction point that led to family arguments. These disputes often arose when the wife requested assistance from her husband to help in carrying the daily household water supply. Sometimes these disputes resulted in violence between spouses; as new sources of clean water have become available it is reported that arguments and domestic violence were dramatically reduced. This was the result of only one small sample in one community, but as water quality and availability continues to improve, this trend will hopefully continue as well. One other benefit to more convenient water is women have more time as family care takers to see to sanitation and hygiene in their family's daily life.

In addition to water quality, access to uncontaminated food has also been recognized as an important health issue in Vanuatu. In 2001 the Government Ministries of Vanuatu created and promoted the nationwide campaign "*Year of Island Foods.*" This is an effort to promote consumption of the locally grown fruits and vegetables and to significantly cut the overuse of expensive imported foods.

Information on food-borne illnesses in Vanuatu is rather sketchy. Laboratories that do food analysis are limited in the country, and there is no official food monitoring program. Laboratory facilities are

available through the hospital laboratory, and it may perform microbiological analysis if requested. Training of personnel in food sanitation and food sciences is unavailable in the country.

Control of the food supply in Vanuatu, under the Food Control Act of 1981, is administered jointly through the Ministry of Health and the Ministry of Agriculture. The laws are enforced by health inspectors and veterinary officers. This act was passed to prevent the sale of unsafe food for human consumption. It permits a health inspector to enter any area where food is stored, has been sold, or is displayed for sale. The health inspector can take samples for analysis and place an embargo on the sale of food. After reviewing the laboratory report, the Director of Health may declare the food items unfit and unsafe for consumption by people. The director can further instruct that the food be sold for animal consumption only or order it to be destroyed. However, this act does not cover any other aspects of food safety such as nutrition labeling, date marking, imported foods, food advertising, or health control of food handlers. In other words, if someone has a communicable disease, there is no legal requirement that they cannot work and they do not have to report their illness. It makes it extremely difficult to see just how badly the nation is affected by food borne diseases because there are no nationwide statistics. Throughout the country of Vanuatu, statistics need to be gathered and monitored before real change can be made.

There are only two health inspectors available for the entire rural area of Vanuatu to enforce the Food Control Act of 1981. They enforce the food safety legislation in addition to their other duties which include environmental monitoring, occupational health, and disease control. Approximately seventeen village sanitarians and three health inspectors are involved in public health sanitation services which include sanitation education and food health.

Control of the inspection of meat is the responsibility of the chief veterinary officer and is governed by the Abattoir Regulation and Joint Regulation Number 19 of 1977. Meat inspection is done by three veterinary officers and three meat inspectors. One of the requirements of the regulations is that those people involved in the butchery trade must have an annual medical examination. Other aspects of the regulations include the storage, inspection, and transportation of meat within the country. The regulation also sets fines and penalties for offenses. It does not regulate meat that is at the smallholder's level; thus, possible contamination is more likely.

Vanuatu's issues with clean drinking water and safe food are not unique. Almost every other Pacific Island nation has problems with adequate safe drinking water. They also have trouble properly controlling and monitoring their food supply. It is especially difficult for Vanuatu because many of the islands are isolated and do not have access to monitoring facilities or laboratories. The government of Vanuatu needs to attack its unique problem of volcanic contamination of water supplies by monitoring and shielding the most susceptible water sources. Vanuatu has a goal of reducing those without access to safe water by 50% by the year 2015. They hope to achieve this goal by installing safe water catchments, fencing off lakes and streams that are used as water sources, and by educating the rural public on proper hygiene and sanitation, including washing of hands and educating about how various waterborne illnesses are transmitted. The 2015 goal is ambitious especially with the current economic situation, but they are still pursuing it. It is believed by many that safe drinking water is a basic human right that is essential for the full enjoyment of life. Vanuatu's rural population has access to a wide variety of good food. Due to lack of funding and personnel it really isn't known how safe the food supply is in the rural provinces. If the government of Vanuatu wishes to improve the safety of the country's food supply, it will need to increase the availability of not just inspectors but monitoring equipment as well. The government of Vanuatu needs a nation-wide set of data on food borne illnesses to properly control and improve the food supply. The government will also need to support sanitation and hygiene education. The best way is to do this along with the education of improved water quality. So, even though Vanuatu is an island paradise, it has health problems that need serious attention to be resolved.

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