

AGRICULTURAL  
EXPERIMENT  
STATION  
COLLEGE OF MICRONESIA-FSM  
YAP CAMPUS  
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# AgKnowledge

Quarterly Newsletter

*For island communities, family farming is much more than an agrarian economic model; it is the basis of sustainable food production ...*

*Read more ...*

## Family Farming and Food Security in Small Islands

Throughout history, island communities have been developing and testing their own harmonious culture with the natural environment surrounding them. In this context, family farming – a productive unit rooted in the profound links between a piece of land and the family that owns it – represents an area of great symbolic and strategic value because of its economic, social, cultural, environmental, and territorial functions.

For island communities, family farming (such as agroforestry, home gardens, livestock) is much more than an agrarian

economic model; it is the basis of sustainable food production aimed towards food security, of environmental management of land and its biodiversity. It is also the root of the local culture. Deplorably, the existing reality is marked by the existence of poverty, suffered by many inhabitants. In spite of many programs implemented over the years, poverty continues to exist.

The Household Income and Expenditure Analysis Survey Report of the Federated States of Micronesia show many people in the FSM face hardship and poverty. The average inci-

dence of basic needs poverty, as measured by the Head Count Index over all households, is estimated at 22.4%, accounting for 29.9% of the population. Within the national average, Yap has a poverty level index of 11.4% of households and 19.4% of the population. The report also estimates that around one-in-five households and almost one-in-three of the population of FSM lives below the national minimum cost of living or basic needs poverty line. While the people of FSM have “enjoyed” a higher level of per capita GDP than most of their Pacific

*Contd...on page 3*

## Volcanic Soils: Farmers' Challenge

Soils are not randomly distributed across the landscape.

Due to differences in soil formation factors (parent material, climate, organisms, relief, time and human influence) there are different soils distributed in a pattern across landscapes. These soils have unique properties that

behave differently and, therefore, need special management practices.

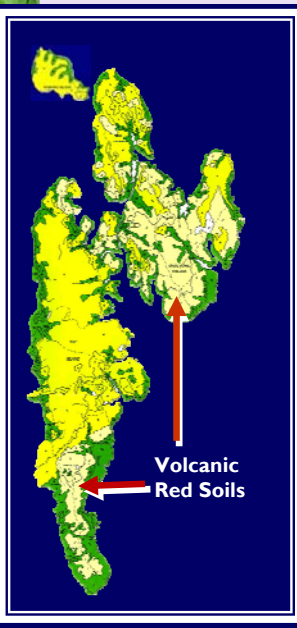
According to the published soil survey map of the Natural Resources Conservation Service, U.S. Department of Agriculture, there are two predominant upland soil types on Yap proper. They are: (i) Upland soils underlain by volcanic material (red soil, light yellow shaded regions in the map) and Upland soils (greenish clay soil, yellow shaded regions in the map) underlain by schist (a metamorphic rock).

**Upland soils underlain by volcanic material:** These are generally deep and well drained soils developed from the underlying volcanic breccia (a kind of sedimentary rock) and tuff mixed organic material. They cover

the volcanic plateaus and hillsides of Yap and seen in Gagil-Tomil region and south of Yap proper. These are the most degraded and the least fertile soils in Yap. Currently more fertile areas support agroforests while the remaining areas are largely covered with grassland, deeply eroded in some areas. About 23.5 percent of Yap proper has volcanic soils.

**Upland soils underlain by schist:** Almost half of the islands' soils developed from the upheaval of ancient rocks thrust up to form Yap Proper. The soils occur over a range of slopes, from flat plains to steep hills, and are shallow to moderately deep. These soils are made up of a particular type of shrink/swell clay particles. It becomes sticky when wet and hard when dry. When wet, the rate of

General Soil Map - Yap Proper





*Volcanic soils... contd.*

water movement in the soil slows down and may become difficult to grow certain crops. However, these soils have desirable soil acidity range (5.8 to 6.5) and they have reasonably high capacity to hold on to nutrients.

Our Outreach project sites are situated in the Gagil-Tomil plateau, where volcanic red soils are predominant. Soluble aluminum is high in this type of soil (see box, page 3) that makes it highly acidic and less in nutrients. Lack of organic contents makes this soil unsuitable for field cultivation. We

promote small farm models based on container gardening and raised-bed gardening in these areas while providing the community with necessary advice on volcanic soil management to develop and enrich top soil.

Natural Resources Conservation Science, Guam assisted us in conducting a series of workshops focusing on sustainable management practices for volcanic soils. Early this month, Dr. Bob Gavenda Senior Soil Resources Scientist facilitated three workshops at Gargey settlement. Hon. Peter Prahar, US Ambassador to the FSM, who hap-

pened to be in Yap around this time, was a surprise participant on the first day of the workshop. He also toured the project area along with Dr. Gavenda. As an ardent supporter of agriculture programs in the FSM, Hon. Prahar praised the efforts of NRCS' assistance to the College of Micronesia-FSM and other government agencies. NRCS prepared a flyer on 'Managing Yap's Volcanic Soils,' which we translated into four local dialects for wider acceptance among the neighboring island communities. Post evaluations reveal that workshop contents were well accepted by the participants.



## Community Members Participated in Southern SAWG Conference

Two neighboring islands community members from Yap attended the 20<sup>th</sup> edition of Southern Sustainable Agriculture Working Group (Southern SAWG) 'Practical Tools and Solutions for Sustaining Family Farms' Conference in Chattanooga, Tennessee between January 19 and 22. Southern SAWG is the region's nonprofit leader for sustainable agriculture. Its mission is to empower and inspire farmers, individuals, and communities to create an agricultural system that is ecologically viable, socially just, and humane. South-

ern SAWG provides unmatched learning and networking opportunities for farmers, agricultural professionals and community activities. Southern SAWG's areas of work include Sustainable Farming Enterprise Development, Community Food Systems, Farm Policy Education, Training and Organizing and Annual Conference.

Practical Tools and Solutions for Sustaining Family Farms Annual Conference is the leading forum for learning about organic and sustainable farming techniques, direct marketing strategies, community food systems and federal farm policies and programs that promote sustainable agriculture. This event provides producers, researchers, information providers, concerned consumers and community organizers the opportunity to learn, build networks, strengthen alliances and celebrate achievements.

As mandated by the Outreach Project's program of work, two community members were given the opportunity to learn from short courses, workshops, lectures, exhibition, networking and 'taste of Tennessee dinner.' Especially, the participants were tasked to attend an intensive short course on 'Start-Up Organic Vegetable Production and Marketing.' This course enabled them to learn about basics of organic farming, organic certification, soil health and management, cover crops and crop rotations, irrigation, plant production, pest and disease management, tools and equipment, harvest and post-harvest handling, record keeping, marketing and business management. One of the participants, Christino Yemanglig, commented, "This conference provided an in-depth opportunity to learn about sustainable agriculture. More community members should be chosen to attend, learn and gain skills from similar events in the future."



*Family farming... contd*

neighbors, the high cost of living in FSM, largely resulting from the very high reliance on imports have adversely affected the overall living standards of those without regular cash income, especially the most vulnerable groups. Poverty and hardship have become more relevant in the recent years as the impact of rising fuel and food prices have had serious implications for the island population.

Households with income below the basic needs poverty do not necessarily go hungry, although their diet is likely to be poor in nutrition. It is more likely that they are struggling to meet their daily/weekly living expenses, particularly those that require cash payments (power, water, transport, housing etc.). These families will be constantly trying to balance their incomes with their expenditure and frequently something has to be given up. Often a trade-off

will have to be made between one bill and another, food or fees.

Although those households experiencing food poverty may not necessarily be going hungry, they are likely to be consuming a poor diet with inadequate nutrition. Thus they are more likely to experience health problems as a result. These health problems then translate into lowered learning abilities in children at school and less likelihood of adults getting employment. This continues the cycle of hardship and poverty. There are reported increases of non-communicable diseases, many of which are related to diet (diabetes, hypertension etc.). This suggests that many households do indeed have a poor level of nutrition whilst at the same time having plenty to eat.

Vegetables are important protective food and highly beneficial for the maintenance of health and prevention of diseases. They contain valuable

nutrients which can be successfully utilized to build up and repair the body. Small family farms have the potential to improve the livelihoods of island population by incorporating an array of nutritious vegetables for healthy living. It will also directly contribute to 1<sup>st</sup> Millennium Development Goal - to eradicate extreme poverty and hunger. During a participatory assessment of hardship conducted by the Asian Development Bank in 2003, access to income generation opportunities was a common priority identified by men, women, and youth consulted in Yap. Our standardized small farm models make agriculture accessible to anyone, anywhere. Participate, engage, contribute and benefit from small scale family farming.

*"Small family farms have the potential to improve the livelihoods of island population by incorporating an array of nutritious vegetables for healthy living"*

Because of heavy rainfall and warm climate, many of Yap's soils have been depleted of nutrients and become highly acidic. Under such environmental conditions, soils weather quickly and basic elements such as calcium, and potassium (which are essential for living organisms) leached from soil profile. Leaching of nutrients causes residual buildup of iron and aluminum in many of the soils, giving them a reddish color (when oxidized) and often producing a hard crust beneath the surface. The red color indicates a high amount of iron, in the form of iron oxide that coats the particles of the soil. The

iron oxide forms as a result of intense weathering over a longer period of time. The removal of soluble bases, also through leaching, causes soils to become acidic. Many of Yap's older soils have a pH between 4.5 and 6.0. Acid soils have many problems that adversely affect crop growth. Most important of these problems is aluminum toxicity. Aluminum is more soluble under acidic conditions and high aluminum levels are toxic to plants. Aluminum toxicity usually damages the root system. The affected roots become stunted and swollen.

Volcanic red soils are highly degraded with very low soil fertility. Loss of topsoil causes soil degradation and can lead to uncontrollable erosion (figure). Such degraded lands lack nutrients and possess high acidity that prevents plants from growing (except ferns) and are challenging to farm or grow trees. Volcanic red soils are found in Gagil-Tomil plateau and southern Yap.



Photo courtesy: Dr. Bob Gavenda, NRCGS

**Volcanic red soils are the least fertile and most degraded soils in Yap**



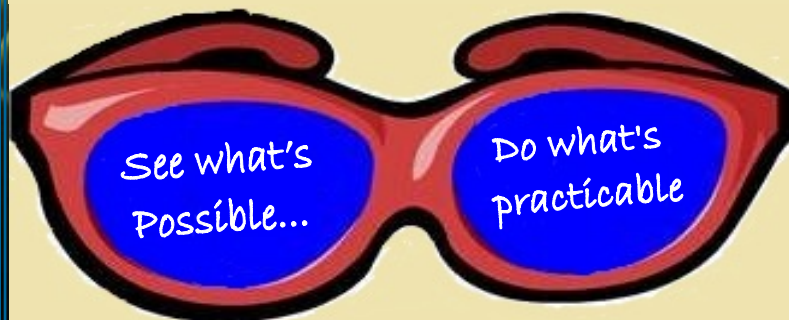
**Free copies of this flyer are available from Agricultural Experiment Station**



# TURN YOUR SMALL GARDEN INTO A FOOD FACTORY!

Creating a more sustainable world is not just about turning any stuff into green stuff. It also involves changing people's habits and behaviors. In the case of food, that means reorienting current production system to one that is more local, easier to control and monitor that contributes positively to the environment and food security.

Whether it is part-time or full-time, working alone or with family and friends, you can fit food production into your life. Ask us, we will show you how to turn your garden into a food factory! Wear a pair of 'small farm glasses' and start seeing food production happening all around your home!



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