Traditional Tongan Farming System: Past and Present

Finau Savelio Pole

Hina e mo Sinilau
Ui a mu'a ho'omo fanau
Ke faka'ali'ali e fa'ahita'u
Kuonga mu'a ia mo 'ene lau

(Oh! Hina and Sinilau
Please call in your children
For a display of the seasons
The olden days and their ways)[1]

—Manu Faupula

INTRODUCTION

The traditional farming system in Tonga can be described by a number of terms such as subsistence, shifting cultivation, fallow, and intercropping. Initially, traditional farming in Tonga was based on subsistence, meaning that farming was only for providing food for the family. However, history states that, eventually, traditional farming in Tonga evolved to be centered on yam production aimed at presentation to kings and nobles. There was no market element. This gradually changed over the years when semi-subsistence farming emerged, at which time, while the farmers still produced for family needs, the surplus did go to the market.

1. From the sung composition *Lau Mahina Faka-Tonga* (*The Traditional Tongan Calendar*) composed by the late Manu Faupula, a longtime head tutor of Queen Salote College until she retired. Translated by Mrs. Tapukitea L. Rokolekutu in 2014. This song metaphorically refers to the thirteen traditional Tongan months as the children of the legendary figures Hina and Sinilau. Each month is referred to as their children, and the song consists of thirteen stanzas, each representing a month.

Traditional Tongan Agriculture

The traditional Tongan farming system was quite unique in how it reflected social rank and social cohesion, which seem to have been more extensive than in other island countries. History tells us that true traditional Tongan agriculture was very much influenced by the kings and nobility and was centered on yam (*Dioscorea alata*) production. Yam was considered the noblest crop, produced mainly for presentation to kings and nobles and for traditional feasts and festivals, such as the annual festival called Inasi, the festival for presenting the first yam harvest to kings and nobles before common consumption. Thus, Tongan farming activities were first and foremost aimed at supplying and satisfying the kings' and nobles' needs, especially for the Inasi.

In this way, it can be seen that, up until a century and a half ago, Tongan agriculture was mainly centered on yam production.

An important component of the traditional Tongan farming system was shifting cultivation and fallowing. These were very important parts of the farming system because they show scientific reasoning in the farmers' practices. A farmer would move to a new area of land every year, preferably under forest cover, and grow a number of crops in different mixtures. After some years of harvesting these crops, the farmer would leave the first area fallow (uncultivated) for a maximum number of years to allow the area to undergo forest cover, thus allowing regeneration of nutrients in that area before farming there again. This is the practice known as shifting cultivation and fallowing.

The Tongan Calendar

Another significant element of traditional Tongan farming was use of the Tongan calendar, which was strongly related to many activities including farming and fishing. The Tongan calendar was very much associated with yam production, beginning from preparing and cutting planting materials and moving on to the time of planting, tuber initiation, climate, rainfall, harvest, and storage. The Tongan word *ta'u*, meaning "year," was also the term used for a crop of yam.

The Tongan calendar had thirteen months, each placing some significance in the moon phase, which was closely related to farming and fishing activities including yam production. It was known that it took twenty-eight days for the moon to travel around the world, so there were twenty-eight days per month in the Tongan calendar and, as such, thirteen months a year. Table1 gives full details of the Tongan calendar, explaining what each month means and its significance to various activities, including the yam production process. The Tongan calendar started from around late October to the first half of November.

TONGAN MONTH	APPROXIMATE START DATE	NOTABLE EVENTS
Lihamu'a	6 November	First month of the Tongan calendar, bringing warm weather. Plants start to produce buds and flowers in this month.
Lihamui	6 December	Much warmer weather, with fruit trees bearing fruits; enjoyed by birds.
Vaimu'a	16 January	Beginning of the rainy season; most welcomed by farmers.
Vaimui	15 February	Latter half of the rainy season, bringing wind and rain, which worries farmers because yam leaves have intertwined. Too much rain can cause fungal disease to the yam leaves, which can kill the plant.
Faka'afumo'ui	16 March	The coming of the cyclone season. Yam crops start producing secondary tubers, which are good planting materials.
Faka'afumate	15 April	Vegetative growth begins to stop producing new growth, including the yam crop. This indicates crop maturity and that harvest is coming.
Hilingakelekele	14 May	This is the harvest time for the yams. The name refers to the newly harvested yams with soil attached to the tubers, which are stored on wooden platforms.
Hilingamea'a	13 June	The farmer is proud to be feeding from his yam store by now.
'Ao'ao	12 July	For the yam crop, this month forbids any cutting of yam tubers for planting materials because the yam pieces will rot (*hau'aoa*). Thus, no cutting of planting materials occurs during this month.
Fu'ufu'unekinanga	10 August	Flushing of new growth in plants takes place, especially in early yam crops, which begin new vegetative growth.
'Uluenga	8 September	Early yam crop tubers develop; yam leaves yellow.
Tanumanga	8 October	This is the time when secondary yam tubers push their heads above ground, at which time the farmer covers them with soil.
'O'oamofangongo	Last half of October to first half of November	This is the month of food and water shortages; therefore, careful use of food and water is very important to avoid problems.

Table 1: The Tongan Traditional Calendar

TRADITIONAL FARMING SYSTEMS IN TONGA

Subsistence Shifting Cultivation Method

The farming system practiced in Tonga is what is commonly known today as subsistence shifting cultivation, using mixed cropping. This system was most commonly used in the past because there was low population density and abundant land available for farming. In this system, the farmer moved to a new piece of land every year, cleared it, and immediately began by planting a number of food crops, as these are the main steps of the cropping cycle. The first crops grown are yams, which are almost always intercropped with giant taro and bananas or plantains (*Musa spp.*). The first crop to be harvested is yam, which matures in less than a year. The other crops will remain in the soil for more than a year. The giant taro is harvested after one year while the plantains can remain in the soil for several years because they produce a number of ratoon crops that can be harvested more than once.[2]

2. A ratoon crop refers to a plantain or banana crop in which the same plant produces a number of suckers, resulting in multiple harvests from the same crop.

1 A mixed farming plot of giant taro, *Xanthosoma*, and bananas. © Koliniasi Fuko

2 A multiple cropping plot with giant taro, yams, and *Colocasia* taro. © Koliniasi Fuko

During the next year's planting season, the farmer moves to a new piece of land (preferably under forest cover), clears it by a slash and burn method, which is a process of cutting small trees and shrubs and burning them after a few days, and repeats the same activities as the previous year. In the meantime, after the crops from the previous plot are harvested, the area is left fallow for the maximum period possible. Initially, when this farming system was first practiced, this fallow period may have reached more than ten years, by which time the area would have become well covered with forest and ready for the next cropping cycle.

In this manner, the farmer moves to a new piece of land every year, and while this was the traditional farming system practiced for many years in Tonga, it was so demanding and wasteful of land resources

3 A mixed farming plot showing yam holes already being harvested. © Koliniasi Fuko

4 A traditional mixed farming system as seen today with yams already harvested. © Koliniasi Fuko

(especially forest, which was cut and had to re-grow) that eventually it had come to the point of exhausting the forests. Thus, today, very few farmers have access to any forest fallow area. Figure ⑤ shows a plot of forest fallow area found today, though it is very hard to find such areas, especially in Tongatapu, the largest island in Tonga. This is because the shifting cultivation practice moved to a new area covered with forest every year.

Slash and Burn Method

Usually, a crop rotation begins with the farmer selecting a new piece of family-owned land that has been inherited through generations. This area has typically been under forest cover for a number of years. The farmer clears the new land by slash and burn.

Although yam is the main crop in the crop rotation cycle, the first crops to be planted are giant taro and plantain or bananas, which are planted straight after clearing; in the meantime, the yam planting material is being pre-germinated before field planting. Before yams are planted in the field, holes are dug at specific spacing and dimensions. Spacing for yams is about 1.5 meters by 1.0 to 1.2 meters, with holes dug per plant at a depth of 1.0 to 1.2 meters. Thus, during the first year of rotation, the main crops in the field are yams, giant taro, and plantain or bananas. Some farmers prefer to plant a few more crops once these main crops are established, which may include corn, *bele* (an edible leaf plant), a few papaya trees, sugar cane, and so on according to the farmer's preference.

Yam is the first crop to be harvested at eight to ten months from planting. This early yam crop, which was planted between May and July, is ready for harvest between December and February. In preparation for the harvest, the yam crop is "killed" by removing

⑤, ⑥ Plots under forest fallow ready for clearing. © Koliniasi Fuko

the vegetative growth about four to six weeks before harvest. This is a traditional process of forcing the yam crop to mature before harvesting. The giant taro is harvested after twelve months, and the plantain can remain in the area for a number of years because harvesting can be repeated from ratoon crops. Thus, in the first cropping cycle, yams, giant taro, and plantain, being the main crops, remain in the area for different times. As the system develops, a greater variety of crops are planted in the cropping cycle.

When the yam is harvested, sweet potato is planted in the yam holes and harvested six months later. When giant taro is harvested twelve months after planting, *Xanthosoma* or *Colocasia esculenta* (*Colocasia* taro) can be planted to replace it. The last crop in the cycle, then, is cassava, which will remain in the soil for six to ten months (Figure 7).[3] During all this time, the plantain crop will still be producing at least one crop every year. When this cycle is completed, the area is then left fallow to allow regeneration of nutrients. It is noteworthy that cassava is the last crop in this cropping cycle before the land is left fallow because cassava is known to do better in less fertile soils than other food crops.

A Typical Crop Rotation Practiced in Tonga

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CHANGE AND TRANSITION IN THE PRESENT FARMING SYSTEMS

From ancient times to present, farming has changed. Today, the agricultural systems reflect the changes of Tonga. A study of the types of farming systems practiced in Tonga recorded in the *Farm Management Handbook* recorded that the traditional agricultural systems of Tonga involved intercropping with various crop sequences and also incorporated fallow periods.[4] These systems developed to ensure a stable and productive environment on farms. This manual also listed a number of the types of farming systems found in Tonga, including:[5]

3. H.O. Fa'anunu, "Traditional Aspects of Root Crop Production in The Kingdom of Tonga" (paper for the SPC Root Crop Conference, Suva, Fiji, November 24–29, 1975).
4. *A Training Manual on Farm Management for Young Farmers of Tonga—A Farm Management Handbook* (2005), 1-15.
5. Ibid.

7 A typical five-to-six-year crop rotation generally practiced in Tonga, showing the types of crops grown and the length of time each crop stayed in the rotation.

1. Predominantly subsistence root crop-based farming system
2. Paper mulberry-based farming system—Figure (8)
3. Predominantly commercial small crop-based farming system—Figure (9)
4. Predominantly commercial vanilla-based farming system
5. Predominantly commercial squash-based farming system
6. Predominantly commercial kava and pineapple farming system
7. Predominantly commercial semi-intensive pig farming system

In the past, the shifting cultivation sector of the Tongan farming system was very suitable because the farm sizes were small, and based on subsistence, and the population pressure on the land was low. However, with the increasing population and the introduction of cash crops for both local and export markets, farm sizes greatly increased and more areas opened for farming. Coupled with that was the rapid increase in population while the land area remained unchanged. This resulted in a gradual change in the shifting cultivation method. Farming was forced to be more permanent, with more crops being added to the cropping cycle and lasting for a longer period. The system has undergone major changes, such that, at the end of the nineteenth century, the subsistence and shifting elements of the system were no longer dominant. The system practiced then was known as "semi-permanent," in which the cash crop was slowly taking over the subsistence crops and the cropping was becoming more permanent. In addition, the fallow period became shorter, and thus, in most cases it was no longer possible for the fallow area to produce any forests.

8 A predominantly paper mulberry farming system. © Koliniasi Fuko

9 A predominantly commercial small crop farming system of *bele*, taro, and giant taro. © Koliniasi Fuko

Today, the fallow period has been kept to a minimum, with the danger of continuous cropping in many cases. It can be seen that in places where the problem of land shortage is very serious, farmers have introduced a minimum fallow period of only a few months, using legume species as the fallow crop. This has become common practice in many areas where, after continually cropping for a number of years, some legume seeds are sown in the area and plowed in after about three to four months, before the legume flowers, to ready the area for the next cropping cycle. Figure (10) shows a plot of legume bean fallow.

CONCLUSION

As can be seen, modern farming systems recorded here differ greatly from the real Tongan traditional farming systems recorded earlier in this paper. This shows that most of the farming systems have lost the main characteristics of the traditional farming system, which are subsistence, shifting cultivation, fallowing, and focusing mainly on yam and mixed food crops. This also shows that the true traditional farming system in Tonga has lost its original characteristics and nature due to changes in different circumstances and more commercial crops being introduced into the farming system. Also, the shifting cultivation nature has been changed to more permanent cultivation. This is a real picture of the changes that have occurred in the Tongan traditional farming system, as reflected in the list of the types of farming systems recorded in the *Farm Management Manual* as shown above.[6]

6. Ibid.

10 Plots under legume bean fallow, ready to "plow in." © Koliniasi Fuko

Glossary

1. **Bele or Aibika (*Abelmoschus manihot*):** A very common green leaf vegetable consumed throughout the Pacific islands.
2. **Fallowing:** The period when a piece of land, after being cropped for a number of years, is left under grass or forest cover to return nutrients to the soil.
3. **Hau'aoa:** Rotting of yam planting materials when cut in August.
4. **Inasi:** Tongan traditional festival in which the first harvest of yam crop is presented to the king and nobles before it can be consumed by commoners.
5. **Intercropping:** A farming practice in which more than one crop is growing at the same time although crops are harvested at different times.
6. **Killing of yam crop:** Process of forcing yam crop to mature early by removing or cutting the vegetative growth about 4-6 weeks before harvest.
7. **Plow in:** Process of plowing an area under legume cover, to be used for cropping.
8. **Pre-germination:** A practice in yam production in which the yam tubers used for planting materials are cut and buried in a large hole outside of the yam plot to allow them to germinate before they are planted inside the yam plot.
9. **Ratoon crop:** Plantain or banana crop in which the same plant produces a number of suckers, resulting in multiple harvests from the same crop.
10. **Regeneration:** A process in which nutrients are returned to the soil when an area is left under fallow, using forest or legume cover.
11. **Semi-permanent:** Term used to describe a farming practice in which the farmer farms an area of land for a longer period of time instead of moving to a new area almost every year.
12. **Semi-subsistence farming:** System allowing the farmer to produce primarily for family needs, with any surplus going to market.
13. **Shifting cultivation:** Farming system allowing the farmer to move to a new piece of land every year, clear it, and plant a number of crops. In the next year, he moves to a new piece of land and repeats the same process again.
14. **Slash and burn:** A manual land-clearing process used by the farmer during shifting cultivation farming. This involves cutting of shrubs and small trees with bush knives and burning to clear the area for cropping.
15. **Subsistence farming:** Farming system in which the farmer produces crops only for family consumption.
16. **Ta'u:** Tongan term for "year," also referring to a crop of yam in farming terms.

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