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The significance of Coconuts in the Polynesian Kingdom of Tonga

Die Bedeutung der Kokusnuß für das polynesische Königreich Tonga

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1 Introduction

Of all traditional Tongan products the coconut palm is used for the widest variety of functions, both in the kitchen and outside it. This tree does not only occupy an important function among the majority of different means of subsistence in Tonga (the fruit is used as a commodity and as cattle fodder, the wood is used as a material for the construction of houses, the leaves are used for network fish enclosures, mats, baskets and barkcloth moulds, etc.). It is also a supplier of human food and drink and of firewood for cooking. The importance of the coconut palm for Tongan life is reflected in Tongan mythology (see GIFFORD 1924: 181-183; POSESI FONUA 1985: 25-26), and it is also expressed in the way in which the various stages of the tree are classified. I shall discuss the classification here because it illustrates the use value of a typically Tongan product which also has an extremely important exchange value for Tongans. Both aspects will be treated in this paper.

The Kingdom of Tonga in Western Polynesia encompasses 150 islands, 36 of which are inhabited by some 100,000 persons. The Tongan islands, situated between Fiji, Samoa and – at a larger distance – New Zealand, have a total surface area of 699 km^2. Between 1900 and 1970 Tonga was a British protectorate. At present, Tonga is the only lasting Polynesian kingdom. This island kingdom is divided into three parts for administrative purposes: the Tongatapu, Ha'apai and Vava'u groups. The Tongatapu Group is in the south and is named after its main island Tongatapu. Nowadays two-thirds of the population of Tonga live on this island, which also contains the capital, Nuku'alofa. The Ha'apai Group is 150 km and the Vava'u Group is 300 km to the north of Tongatapu.[2]

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2 Tongan classification of the coconut palm

The native classification recognizes fourteen stages of the palm (a to n). The bud *(lali)* (a) appears six or seven years after the planting of the seed, a coconut. When it opens out into a flower (b), it is known as *fisi*. Soon after the blossom has withered away a young nut appears (c), the *poniu*, to be followed soon afterwards by the *niu ngono* (d), a stage marked by the formation of coconut milk which only tastes like water at this stage. With the *niu matangono* (e) the milk has become sweeter and a thin, moist fruit layer develops on the inside of the shell, a process which is continued in the *niu matavelivali* (f).

The coconut milk of the *niu mata* (g) is at its sweetest, while the flesh is growing thicker at the pointed end of the shell; at the rounded end with the three eyes *(mata)*, however, it is still a moist, jelly-like layer. The green nuts, the *niu matavelivali* and the *niu mata* play an important part in the diet of nursing mothers. The nut is baked in an oven in the ground, and the flesh and milk of the *veifua*, as the nut is then called, which have been subjected to this process are believed to improve the quality of the breast milk considerably. It is supposed to accelerate the production of breast milk and to increase its quantity, particularly when a mother gives birth to her first child. The drinking of the sweet juice *(ha'aniu)* of the green nut is also rated highly by adults in general. Often the nut is cut open afterwards, a piece of the husk is removed at the pointed end *(pelu)*, and this is used to spoon out the jelly-like substance inside (*kanoiniu*).

The teeth are not used in any of the previous stages, but they are necessary to eat the fruit of the *niu matahihiloku* (h), especially at the pointed end (*take*). The *take* is first stripped off its shell. A knife is used to cut a circle around the point of the shell, which can then be removed like a lid (this operation is called *sitake*). The eating of this kind of nut, which is a meal in itself, is known as *hihiloke*. Half of the milk of the nut is drunk first, and then a sharp stick is used to scrape out the flesh, which is eaten while the rest of the milk is consumed.

The flesh of the *niu matamoto* (i) is thick. The juice causes a slight tingling in the mouth, as pepper does. The flesh of the *niu motomoto* (j) is hard, and a splashing sound can be heard if the nut is shaken to and fro. The ripe nut which falls from the tree by itself is called *niu motu'u* (k). It consists of very hard flesh and little milk; the husk has a brown colour. Of all the stages it is the *niu motu'u* which is used most in food preparation, either raw or baked in the oven. The shell is removed with a pointed stick or a machete, and the nut is then divided in two. The eating of the flesh of the *niu motu'u* in combination with tuberous vegetables, bread fruit, or fruit such as papaya, oranges and ripe bananas is called *kataki*.

The *niu motu'u* is also used as baby food. After the husk has been removed and the nut has been roasted on an open fire, the flesh is scraped out of the shell and chewed. The mother wraps a mouthful of coconut in a piece of unpainted barkcloth *(tapa)* after chewing it finely and gives it to the baby to suck. This is the first food *(namoa)* that the baby receives. It has a laxative effect and after the first excretion *(te'evao)* the baby is ready to drink breast milk. An older female informant complained that the doctors and nurses in the regional hospital

no longer allow this. They simply give the baby a little water in its mouth before putting it to the breast.

The last three stages in the native classification of the coconut palm, the *niu matasili* (l), the *niu 'uto* (m) and the *niu 'uto papanaki* (n) are all connected with the development of a new palm tree from the coconut lying on the ground and refer respectively to the start of a shoot on the largest of the three eyes, the formation of plant and roots and the further growth of the plant, and the development inside it of a white ball (the *'uto*), which resembles a ball of wool, in the spot where the coconut milk was. At this stage there is nothing more to be seen of the flesh. The *'uto* is covered by a greasy layer *('ipi'ipi)*. If the *'uto* is baked in the oven, shell and all, it tastes like a ripe pear and has a sweeter flavour than the raw *'uto*, which is rated everywhere as a delicacy.

There are five other features of the nut which are distinguished (o to s), which are connected with the fourteen stages. The *mata'ali* (o) is an unripe nut which has fallen from the tree in a storm or from some other natural cause. It is unfit for consumption because it often has a rancid flavour and there is no oil in the fruit. The *takalekale* (p) is also an unripe nut which has fallen from the tree, but which has been lying so long on the ground that its shell is wrinkled; it is used as fuel. The *pelupelu* (q) are the pieces of a green nut which has been emptied of its milk, cut into pieces and left to dry in the sun for a long time; it is also used as fuel. The *pupu* (r) is emptied of its milk, disposed of completely (but without the *take*) and dried; it is also used as fuel. The *niu nginingini* (s) looks like a ripe nut, but it has dried up fruit and no milk; it can be consumed and is also used for the important commercial product copra.

A 30 cm long iron strip *(hakalo)* is used to scrape the raw flesh from the shell of the *niu motu'u*. Apart from the protruding serrated edge, this strip is mounted on a plank and set on a raised platform, where people then sit down. They take hold of half of the coconut shell in both hands and vigorously scrape the hard flesh on the inside to and fro across the serrated edge of the strip. This is called *heka hoosi* (horse-riding), because it resembles that activity. The grated coconut *(niu vau)* is one of the ingredients of the favourite fruit drink, *'otai*. It is also processed to make coconut cream *(niu hu'i)*. The grated coconut is then pressed in the shell of the nut which has been crushed and thus stripped of its cork, resulting in a sort of creamy milk. In its undiluted form this cream is called *niu taufau*. Coconut cream is used in many Tongan recipes. The pulp that is left *(penu'i niu kota)* is sometimes allowed to ferment, after which it is baked and eaten, but generally speaking it is used as fodder for the chickens and pigs.

3 The production of copra oil

To make copra the ripe coconuts which have fallen from the tree (the *niu motu'u*) are cut in two with an axe or machete and left to dry with the inside facing the sun for two days. The fruit is then removed from the shell with a special knife (a 30 cm long knife called *hele hihi niu*) and dried for 24 hours on a grill above an open fire. This is carried out in a copra kiln

(fale faka-momoa niu), a hut with the walls and roof made of woven coconut palm leaves, housing a perforated old oil drum, with a fire of coconut shells and bark underneath, which give off a lot of heat and little smoke. Afterwards each piece of fruit is cut into four and left in the sun for another two days. The copra *(mata kamomoa)* is now ready to be sold to the Tonga Copra Board, the government body which has the legal monopoly for trading in copra. In many cases the fruit is only dried in the sun, which results in a low-quality copra and a poor yield. Sometimes the processing takes place in the yard. However, if the distance between the coconut palms and the house is too large, or there is not suitable transport available (horse, horse and cart, truck or boat), the process is performed on the plot where the palms grow, and the copra kiln will be situated there.[3]

Copra was the main export product of Tonga until a few years ago. However, a small factory was opened in Ma'ofanga near Nuku'alofa for the processing of copra into oil in 1978. Copra oil brings in considerably more than copra on the international market, even when the costs of production are deducted. There were 15 workers in the factory in 1985 and 1989. It is owned by the Commodities Board, a government body. The export of copra has now stopped completely; all Tongan copra is channelled by the Tonga Copra Board to the factory to be processed into oil. In fact, the factory imports copra from other countries. In 1984, for example, it imported some 1,000 tons from the Christmas Islands and the Phoenix Islands, and in 1988 800 tons were imported from the Christmas Islands. Their copra is of a lower quality than Tongan copra, so the copra oil is first mixed with Tongan oil before it is exported.

In 1984 the total turnover of oil of the factory was around 5,000 tons, which brought in 6 million T$. In 1988 a good 1,900 tons of oil were produced and slightly less than 1,000 tons of ground coconut. Employees in the factory blamed the low copra production in 1988 on the hot, dry weather in that year and on the hurricane which had hit Tonga in 1987. Table 1 shows the price per ton of copra from 1974 to 1991 (no figures were available for 1981 or 1982).

Table 1: Price per ton of copra (in T$)[4]

1974	123	1980	253	1986	217
1975	89	1981	?	1987	243
1976	107	1982	?	1988	298
1977	242	1983	450	1989	281
1978	250	1984	442	1990	231
1979	348	1985	361	1991	275

[3] See for a general discussion on Tongan agriculture: Delforce 1988; Van der Grijp 1988; Rathey 1984; Seminar für Landwirtschaftliche Entwicklung 1983; Wiemer 1985.

[4] The source for the 1974-80 statistics is Tongan Government 1983: p. 147. The statistics for 1983 are taken from the coconut oil factory administration; those for 1984 and 1985 are taken from the Commodities Board on Vava'u and those for 1986 to (June) 1991 inclusive from the Commodities Board on Tongatapu. The prices listed are for first grade copra; the price for second grade copra

Table 1 clearly indicates the enormous fluctuations in the price of copra. In fact, this was also the case within a period of twelve months. In 1985, for instance, the prices were as follows (in T$):

Table 2: Price fluctuation of copra in 1985[5]

January	470
February	388
April	428
June	362
September	298
October	274
December	300

Tongans still did not know exactly how much they would get for their products. The reason for the price fluctuation on the world market is a complete mystery to most of them. It seems to be an anonymous manipulator on which they are dependent. The usual reaction to a fall in prices is a drop in production. The factory tries to compensate falls of this kind by importing copra from other countries in the Pacific.

Copra oil is exported to Europe, New Zealand and Australia, where most of it is processed into margarine. A small fraction is sold directly as edible oil, and an even smaller percentage is used as an ingredient in making soap. Only 0.5% of the oil produced in the factory is sold in Tonga itself and used in food preparation and the production of scented skin oil *(lolo kahoa)*. There is a Tongan soap factory in the village of Havelulotu in the south of Nuku'alofa, which buys eight tons of oil a month when the copra factory is in production. 100 tons of copra yield 63 tons of oil and 33 tons of ground copra; the rest is water. The subsidiary product ground copra was exported as cattle fodder and artificial fertilizer in 1985, but in 1989 all the ground copra was used in Tonga itself as fodder for pigs and cattle.

4 Adaptation of planting techniques and extent of coconut plantings

Despite the large role played by the coconut palm in the Tongan economy, tending the tree has traditionally been viewed with a certain degree of nonchalance. The palms are often not stripped of secondary growth, the lower regions of the trunks are damaged by the slash-and-burn cultivation, old trees are not replaced by new ones, the coconuts are left lying on the ground to be eaten by rats, and hardly anything is done about the rhinoceros beetle, which intrudes the leave axils, or about the other insects which eat the leaves. This situation is not

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was T$ 12 less per ton. The difference between the two grades lies mainly in the size of the pieces and the absence of mould and suchlike on them. For first grade copra the flesh of each nut is cut into eight pieces, while the pieces for second grade copra are much smaller. The purchase prices were given per ton. In fact, however, the farmers are paid by the kilogram.

[5] Source: Commodities Board Vava'u.

just a recent phenomenon, as can be seen from the statement of a German anthropologist in the early fifties:

'The Tongans are little concerned with the cultivation of the coconut palm. They hardly ever clear a larger area for systematic planting' (KOCH, 1955: p. 163).

The persistence of this situation in the sixties led the Tongan government to cooperate with the British Overseas Department in taking a number of measures. A replanting project for coconut palms was set up in 1966 and a subsidy project in 1967. Interested parties on Tongatapu could borrow agricultural machinery from the Tongan government free of charge to remove the undergrowth and to plough the ground. Since then there has also been a large-scale distribution of quality seeds and complementary artificial fertilizer. From 1970 an average of 1,100 hectares a year were planted with coconut palms from these seeds. Those who managed to comply with the criteria laid down by the government in planting their new trees also received an annual subsidy of T$ 3.75 per acre for the first two years. In 1970 the sum of T$ 21,000 was paid in subsidies (CRANE, 1979: 31), but by the early eighties this had risen to an annual figure of T$ 100,000 (personal communication by V. TIOLLIER, Nuku'alofa, 1983).[6]

During the initial years of the replanting project, in the late sixties and early seventies, the coconut palms had to be planted in rows with a distance of 9 metres between trees. Garth Rogers, who carried out fieldwork on Niuatoputapu at this time, mentions an informant who told him that his father used to plant the trees 20 m apart, so that he was able to plant more food crops of a different kind. Since Rogers' informant had been following the state guidelines, like the others, he was forced to produce a larger volume of copra in order to be able to purchase flour, sugar and canned fish. 'My father', the man sighed, 'was stronger than my sons will be' (in ROGERS, 1975: 1, n.1).

Since then the regulations have been changed. The distance between trees in a row is now supposed to be (and often is) 9 metres, but the distance between the rows is 18 metres. This change is connected with the changes in the world market for copra and coconut oil: 'the copra price is now low and there is more emphasis on intercrops than on the coconut palms' (idem TIOLLIER). The palms are only closer together on the Ha'apai islands. The guidelines for the replanting project are followed all over Tonga, but not by everybody. In practice, however, people seem to be more strongly motivated by the subsidies than by the desire to be able to produce more copra. One of the reasons for this attitude has already been mentioned: the price fluctuations on the world market for copra and copra oil and the constant uncertainty which the Tongans share about how much they will be paid for their product.

Another reason is due to the fact that the systematic planting of coconut plants is a new element in Tongan culture and agriculture. This should not be taken to imply that the number

[6] Today all the money that is paid in subsidies comes from development funds in New Zealand; in the early stage of the project, when Tonga was still a British protectorate, it came from Great Britain.

of palms must have been low in the past. Fourty years ago, for example, the number of coconut palms in Tonga was estimated at three million, while in the eighteenth century James Cook had also called the number of coconut palms on the Tongan islands 'remarkable' (KOCH 1955: p. 163). Recently, the government estimate of the number of palms was 4.9 million.[7] This is quite a lot, if one considers that the total surface of all the Tongan islands is only 699 km^2.

5 Summary

In this Polynesian society coconuts have a very important use value and exchange value. The use value has been illustrated by the classification of the nuts and their development into mature palms. In the past copra was Tonga's main export product. Since 1978 Tonga has its own factory for the processing of copra into oil. The oil is exported to Western countries as raw material for margarine. One of the main problems for Tongan farmers is the instable price of copra and related products on the world market. A drop in the price is usually followed by a drop in production. Tongan history shows a wide variety of government measures to increase production.

Zusammenfassung

In dieser polynesischen Kultur hat die Kokosnuß einen hohen Gebrauchs- und Tauschwert. Der Wert wurde anhand der Klassifikation der Nüsse und der Entwicklung zu tragenden Palmen dargestellt. In der Vergangenheit war Kopra Tongas Hauptexportprodukt. Seit 1978 hat Tonga eine eigene Fabrik um aus Kopra Oel zu gewinnen. Dieses Oel wird in westlichen Ländern als Rohmaterial für Margarine exportiert. Eines der Hauptprobleme für die Bauern auf Tonga ist der instabile Weltmarktpreis für Kopra und die davon abhänigigen Produkte. Einem Preisverfall folgt gewöhnlich eine Reduzierung der Produktion. Die Geschichte Tongas zeigt ein breites Spektrum von staatlichen Maßnahmen um die Produktion zu steigern.

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[7] The latter estimate was arrived at as follows. Coconut palms grow on around 98,000 acres of land; the estimated density of the palms is 50 per acre (MAKIN 1984). KOCH (1955) did not mention the sources and/or methods on which his estimate is based.

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