



**AGRICULTURE AND  
CULTIVATED PLACES**



Agriculture has always been the main activity of the ni-Vanuatu – the one around which all other activities are ordered. Nowadays 80% of the population still leads a rural way of life, and among those, three quarters are engaged in agriculture.

This agriculture is first and foremost a subsistence horticulture<sup>6</sup> which provides the population with its staple foods for subsistence, with yam, taro, sweet potato and cassava being the four main cultivated root crops. Yam, which likes warmth and well-drained soils, is mainly grown on sunny banks and terraces in coastal areas. Taro, which likes humidity, is planted on the whole in inland areas, at least when it is not irrigated. Sweet potato and cassava, which are introduced plants that are less demanding, are grown equally in coastal or inland areas, generally on soils of moderate fertility. Each cultural group has available an area of land with varied environmental characteristics, and grows a wide range of food plants there. Nevertheless, the choice of staple food (taro or yam) depends on both environmental and socio-cultural factors. One community may specialise in the cultivation of a root crop of high status, though not to the exclusion of all other root crops. The root crop of status is often the one that grows best in the land that they occupy. Thus people in leeward areas mostly grow yams, while those in windward and inland areas grow taro, whether or not they belong to the same cultural group.

Since earlier times, the plant with high status, which nowadays is not necessarily the one most eaten every day, is utilised in all the ceremonies and rituals of the community. These feasts provide an opportunity for huge quantities of root crops or their products to be brought forward, in amazing forms such as the elongate yams that can reach 2m in length. Those in the community who are able to offer either a large quantity of roots or roots of rare shapes are highly regarded, and although they do not become wealthy from this, they gain long-lasting prestige. These gifted agriculturalists, who bring honour to their entire community

<sup>6</sup> Barrau (1967: p.286) emphasises "the important contrast between horticulture and agriculture, between the enclosed area of the *hortus* or garden and the open expanse of the *ager*, between the agricultural crops sown by seeds and harvested with a scythe and the horticultural crops planted one by one, pricked out or propagated by suckers, and lavished with individual attention". This distinction has been criticised by many authors, particularly because the term horticulture may have a number of meanings and is also used for work undertaken in recreational areas in which it would not be practicable to produce subsistence crops. We use the term agriculture in a general and neutral sense, for the growing of domesticated plant species, and the term horticulture in the narrower sense of the cultivation of edible root crops within a garden. The term arboriculture will be used for the cultivation of trees.



and to the memory of their ancestors, profit greatly through their high social recognition.

Further, this plant of high status, the culture of which engages the full and careful attention of the entire community, becomes a sort of identifying mark of the village group and becomes a valuable asset for exchange. The networks for non-commercial exchange, around which food plants circulate, spread beyond the limits of a single island and may stretch over very long distances. The act of growing food plants is thus tightly linked to the foundations of society's culture, and beyond its function as food the plant plays a role in the political, social and economic spheres of the society. To be a grower of crops is thus not just a type of work, it is a career to which one devotes one's total work effort, energy, imagination, powers of adaptability and talent.

Because people live above all in an area of land that they organise and move around in according to their needs, their constraints, their use of time and their culture, we will present here their activities in producing food crops according to the types of space in which they have chosen to do that. The annual species, climbing plants and herbaceous species occupy the main part of the garden, while the perennial plants, shrubs and trees are spread around the gardens or along tracks. We should emphasise, however, that over the course of time one type of space will succeed another.

## Gardens

Two main types of garden exist in Vanuatu: slash-and-burn gardens and irrigated gardens. The former are most often associated with yams and the latter with taro, though this division is not entirely fixed. In addition there are sweet potato gardens, banana plots and mixed gardens, not forgetting also the urban kitchen gardens.

### Rainfed gardens and cultivation of burnt areas

Cultivation of burnt areas is the oldest system and the most frequently practised. In a given area of land whose boundaries are often rather vague, all the farmers who have the right to do so will each year clear an area of land that will be cultivated for three years, and then abandoned for a longer or shorter time before being once more cleared and cultivated. In the north of the archipelago this land is passed from generation to generation along a patrilineal line, i.e. from father to eldest son from the time of the first clearance. In the south a system of entitlement that is both flexible and intricate sees each man receive a parcel of land, the guardian or keeper of which is the most direct descendant of the first man to have settled on and utilised that land, in mythological times. In whichever case, it is not true

ownership of the land but usually a right of usage allocated in a proper manner among all members of the community.

Within this general framework, rights to the land vary from one group to another according to diverse factors.

The typical crop on slash-and-burn land is the yam, one of the two most important ritual plants of Vanuatu together with taro.

But this system of culture is also used for taro and for sweet potato.

### The yam garden

Yams play a particular role in the calendar of communities because, in contrast to other crops in the garden, they have an internal biological clock which determines the rhythm of the associated cultural activities: preparation of the soil, planting, maintenance and harvesting. The tubers of these annual plants regularly go into dormancy, and the cycle of growing can only begin when the temperature becomes very warm and the tubers start shooting – generally from August to November which are the dates for planting them in soil in new gardens. This is followed by a phase of strong vegetative growth during which work on the crop is minimal, then a stage of harvesting which extends, according to variety and species, from April to July. This rhythm of the yams is also that of the traditional society which organises itself around these activities.

The parcel of land allocated to the head of a family is often subdivided into smaller lots that are cultivated by each member of the nuclear family – husband, wife and children near the end of their schooling. In certain islands, such as in the interior of Pentecost, this portion of land supports three to four cropping cycles, the first being obligatorily kept for yams, which require a rich soil. Elsewhere, such as in Torres, the piece of land is only cultivated for a single season.

In such islands the land is then abandoned for more than thirty years, while the average fallow is ten or so years. Each individual simultaneously cultivates several patches of land of different types. Nowadays, when the land is more and more subdivided and the population is increasing, the size of family gardens has a tendency to decrease and the number of patches of land cultivated by each family tends to grow. Each community possesses semi-permanent areas for cultivation or short rotation, and spaces for cultivation that are somewhat moveable and are aimed at keeping alive the proprietary rights over that land.

Traditionally, each portion of land picked according to the appearance of its secondary vegetation is cleared of scrub and cleaned up in order to leave the soil as suitable as possible: tall trees are felled, or left in place to serve as supports for yams to grow on, and the brushwood is cut with a machete and piled in small heaps around the field or patch of land. On very

steep land the trunks of large trees are placed along contour lines to prevent soil erosion. Barriers are then constructed to protect the crops from roaming wild pigs, though nowadays these are less and less used. When everything is dry the females scour the soil, clearing out large stones so as to leave bare soil. Then they burn it all and spread the ash over the whole plot of land. Cultivation can then start.

Preparation of the soil is minimal; it is broken up with a digging stick, but only in the centre of the garden where the ceremonial yams are planted, and in places at the edge where the women plant the subsistence yams.

The planting of yams destined for rituals requires careful work. The hole is deep, enriched with compost and ash, and then covered over with a mound that may be a metre high as in Tanna or Malekula. The seed material is lightly buried in the top of this hillock. Round subsistence yams are easier to cultivate. The hole is much shallower, sometimes hardly a hole at all, and the height of the mound, if it exists, is only 20 cm or so. In the majority of islands, as soon as the vines begin to shoot the yams are staked with bamboo, slender lengths placed against the burnt tree-trunks or driven into the soil. The stakes for the greater yams, tall in size and made of wild canes, have a variable structure according to island. The finest and most elaborate are seen on Tanna. These are large, slanted structures skilfully made of reeds spliced

together. In the centre of Pentecost yams are not staked and the vines run freely over the ground. In the northeast islands of Malekula and Malo and in various other parts of the archipelago, the tall trunks of dead trees (for example *Dracontomelon vitiense*, *Spondias cytherea*) are used as supports for certain species of yam (*Dioscorea nummularia* amongst others).

The new yam garden is then supplemented with other plants usually planted around the edge of the garden or between the bases of the current yams: kava (*Piper methysticum*), island cabbage (aibika or bele: *Abelmoschus manihot*), tannia (macabo or cocoyam; *Xanthosoma sagittifolium*), naviso or pitpit (*Saccharum edule*), maize and cassava.

The spatial distribution of these species within the garden and the degree of mixing of the plants varies from one island to another and from one community to another, ranging from a strict monoculture of yams on Malo to no segregation of species at all on Malekula. So it is very difficult to paint a general picture of a Vanuatu garden, each farmer having his particular techniques and know-how. However, one can say that this first-year garden will be succeeded by gardens of the second and third years in which the diversity of plants will be greater.

The planting material used is whole, healthy and undamaged yams for the ceremonial yams, and small yams or even fragments

Village of Tassiriki (Santo).



## OPEN AREAS AND CROPS

Village of Valeteruru (Santo).





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Water-filled pond planted with young taro plants. Maize is being grown on the banks.



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On the west coast of Santo irrigated taro gardens are sometimes put in under coconuts.



Yam garden (*Dioscorea alata*).



When they move to a new area of residence the ni-Vanuatu begin by planting trees, even before building their own dwelling.



Stones are heated by a wood fire, and foods are then placed in this oven to cook.



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Root crops, meat or a *lap-lap* are cooked in ovens of hot stones.



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*Lap-lap* is a paste of root crop, breadfruit or banana, obtained after the plant material has been finely ground with a hand-made grater. This fresh paste is spread out on leaves of *lap-lap* (*Heliconia indica*), then carefully wrapped up before being cooked in a traditional oven of hot stones.

## PREPARATION OF *LAP-LAP*, A NATIONAL DISH OF VANUATU



Large leaves of *lap-lap* for sale in Port Vila market.



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Port Vila and Luganville are the two large markets of Vanuatu.



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Taro grown in Santo is sold in bunches in the Luganville market.



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The big urban markets, such as this one in Port Vila, offer the majority of food plants that are produced in the country.



© V. Lebot



Small *lap-lap* parcels ready to cook.



In the market one may find all sorts of ready-prepared dishes, made and sold by the women of nearby villages.



A selection of different types of *lap-lap* for sale in the market.

Small parcels of *lap-lap* (*tuluk*) cooked in leaves of *Heliconia*.



© D. Greindl

of root for the others. Great variability may be seen even within a single garden. Different species lie next to one another, and even among those a great diversity of cultivars is utilised. Each community has its particular clones, with their own vernacular names, and each individual has his own particular collection. The shades of green and variations in shape of the leaves and the colour of the young shoots give the garden an attractive appearance. Planted in July, the yams begin to be harvested in April when the vines start to dry out. The average yield of ceremonial yams is about 25 tonnes per hectare and that of the day-to-day yams is about 15 tonnes per hectare. The yams do not keep in the soil, but are stored for several months in small huts constructed for the purpose (Pentecost) or on beds of bamboo (Santo). This seasonal cultivation is particularly prone to climatic hazards, especially cyclones which break the vines.

### Taro gardens

Taro is grown in forest clearings prepared in the same way as those for yams. To prevent soil erosion, logs of wood are placed across the slope. The planting of rainfed taro takes place every three months, and on each occasion a new patch of land is cleared, each of which can support an average of three cropping cycles.

The taros are planted one by one with a digging stick in small holes about 1m apart. At the end of three months the area of land

is weeded, and the hole around the plant is cleaned of small stones and undesirable detritus and then enriched with compost. After that any suckers are removed, and these are then replanted in a new patch of land. The suckers are not the only planting material utilised. The crown of a harvested taro plant is often replanted in the same hole or in another patch of land to make ready for a new harvest. The taro is thus grown and harvested over a period of a year, on one patch of land or another. As a general rule no other plants are cultivated in this garden, though island cabbage (*Abelmoschus manihot*) may be planted around its periphery. The yield from a garden of rainfed taro is about 10 tonnes per hectare, which is less than that of yams over a comparable growing period. Rainfed cultivation of taro is very widespread in Vanuatu, and is practised in all inland areas, to a lesser extent at higher altitudes.

## Irrigated cultivation of taro

Irrigated cultivation of taro is practised in almost all the islands of Vanuatu, by various different methods. The most simple consists of planting small pieces of taro in the beds of little streams, at the points of emergence of springs or in the wet edges of water-courses. Some of these places may be artificially enlarged.



Boggy areas and low, swampy ground are likewise used for cultivation of taro (*Pentecost*). This is drained cultivation where the level of free ground water is controlled, whether in upland areas or in lower plains, in order to maintain the correct moisture levels in the raised beds. While taro grows well in moisture, it dies in stagnant waters because its roots rot. In this type of cultivation, the taro is planted in dry banks of earth separated by a complete network of drainage channels. The best clones – those that are reserved for ceremonial exchanges – are placed at the edges of these areas close to the channels, while the taro for everyday consumption is planted at the centre. The area is mulched and weeded three times between planting and harvest. Such an area supports on average two cropping cycles, the first a monoculture and the second mixed (with banana, kava and other plants). The planting material is suckers and crowns from taros planted in the same area or another one.

Large complexes of these *tarodières* or taro gardens with irrigated basins are established in the wet islands of the north (Torres and the west coast of Vanua Lava), Santo, Maewo, *Pentecost* and *Ambae*, as well as in the islands of *Futuna* and *Anatom* (*Aneityum*). Ready water is assured from a permanent river by constructing a dam of stones which diverts water into a main irrigation channel. This may either be cut into the soil or it may be an aerial channel

made from bamboo. The channel carries water to the first basin, from where it flows from basin to basin down to the last at the bottom of the slope. Earth walls, tree trunks or stones demarcate the set of pits in the water, in the insides of which the taro planting material is set. The largest allow the taro growers to move around in them, and all are provided with openings to allow the water to flow from one basin to another.

The organisation of the hydraulic network may show several variations in regard to the topography of the area and the cultivation practices. The land on which such a taro garden is laid out belongs to one man who has the responsibility for upkeep of the hydraulic network. Each taro garden is used by several taro growers who progressively construct, cultivate and maintain their own basins, and each owns several basins in different taro gardens. New basins are planted with suckers previously set aside from other basins. Then, once the taros reach maturity they are harvested as they are needed, and the basins are immediately replanted with the crowns of the harvested taros. The cultivation of irrigated taro is thus a permanent cultivation, except in certain places where the seasonal availability of water leads to cultivation that is equally seasonal (*Wusi* on the west coast of Santo, for example). One of these taro gardens may be used continuously for a period of twenty or so years before being abandoned for a similar length of time, then restored. It is an area for poly-



culture with spatial separation of the species. In the interior of the basins is grown the taro; on the supporting walls all sorts of subsistence crop plants may grow, and some fruit trees: cut nut (*Barringtonia*), orange, banana, coconut. These last, planted along the lines of the walls, become after a number of years a sort of plantation. The yields of the irrigated taro gardens are high, and reach on average 25–30 tonnes per hectare — sometimes even more.

On Anatom a special type of taro garden is found, that consists of small furrows cut along the slope, between which the taro is planted. The water flow is thus divided at the point of intake of water into strip irrigation.

## Other types of garden

Cultivation of sweet potato, which is not a prestigious root crop, is increasing in importance in the subsistence cropping systems of Vanuatu. It is easy to grow, and all families have several plots of this crop. In former times it was produced entirely for consumption in the home that grew it, but nowadays it tends to be produced for sale. It is adapted to various soils, climates and altitudes, and can thus be exploited virtually everywhere. The crop is planted in land that has been covered by secondary vegetation, then slashed and burned. It may also be replanted in patches of land in the second year after yams have been grown in the

first year, or it may be mixed with other species in a garden of the second or third year. Multiplied by 20–40 cm long cuttings or by fragments of the tuber, it is planted directly into the soil or mounded up in small hummocks or ridges. According to variety, sweet potato reaches maturity after 3–6 months, is available throughout the year and requires little upkeep apart from frequent weeding when it is beginning to grow. A number of cultivars of sweet potato exist, but they are much less numerous than those of yams and taros. Sweet potato, which does not feature in any form of ritual, is always a secondary root crop except in the northeast region of Santo where, introduced around the 16<sup>th</sup> century, it has always been dominant.

Banana is an ancient crop of Vanuatu, augmented since European contact by numerous introduced varieties. The two local species are *Musa troglodytarum*, or fehi banana, and cultivars of *Musa* spp. (*M. acuminata* x *M. balbisiana*) that comprise plantains and bananas. These two species have always provided an important supplementary food and are nowadays sold as commercial crops in urban markets. Banana is adapted to different soils and altitudes, and likes exposure to sun, humidity and spaces that are protected from the wind. It is generally cultivated amongst other plants in the food garden, or around the gardens, in isolated semi-permanent plantations, or even planted sometimes in a patch of land cleared each

year (Pentecost) or grown during the second year after yams (southeast of Malo). Isolated clumps are also found near foot-paths and in garden areas. The plant is propagated vegetatively, using young shoots that come up around the bases of full-grown plants. After one year the plant is mature, and growth continues for a number of years through successive maturity of suckers. Upkeep is minimal, and fruits are continually available. Each community has available from ten to twenty different cultivars. As the banana plots are small and always isolated one from another, transmission of pests and diseases is relatively well controlled, which is certainly not the case with the very large plantations grown commercially.

Yam, taro, sweet potato and banana are thus planted alone in particular gardens, even if numerous subsistence plants later come to grow alongside them. But in this case there is always a certain hierarchy to the plantings within the garden.

Traditionally, mixed gardens were established on plots of the second rotation after yams. In certain places, such as the northeast of Malekula, these gardens were always planted – right from the first year – alongside patches of yams in monoculture. Nowadays, through lack of space and also because yams have lost some of their ritual significance, these mixed gardens are becoming more and more frequent.

## Fruit arboriculture<sup>7</sup>

Arboriculture in the broad sense, that is the planting and upkeep of trees of practical use, is the second cornerstone of Oceanian agriculture in general and Melanesian agriculture in particular. It appears to have developed first of all in Solomon Islands, then in Vanuatu, as groups of people progressively left the large land-mass of New Guinea in order to penetrate island Oceania. In Melanesia it involves numerous species with sexual reproduction, while in Polynesia there is a smaller number of species, some with vegetative propagation such as breadfruit. Melanesia can be considered to have played a major role in the domestication of these species, and is still today an important storehouse of these genetic resources.

In Vanuatu, a tree belongs to the person who planted it. In that respect arboriculture does not differ significantly from horticulture. But a tree is a perennial plant that occupies the patch of soil in which it is growing for several generations, while the soil of a garden returns to the entire community after it has been used for a crop. This individual possession of a tree has led to a particular way of managing this type of cultivation, at the spatial level and in the development of a particular form of inheritance. A tree is thus used to identify a particular piece of land and serve as evidence

<sup>7</sup> This section has been extracted from the work of Walter and Sam (1999) – *Fruits d'Océanie*. Paris, IRD Éditions (English version – *Fruits of Oceania*. ACIAR Monograph 85, 2002). Here we reproduce the main points.

in disputes over land that are so common nowadays. This practice is unfortunately tending to increase thanks to coconut palms, whose shade and powerful root systems interfere with development of intercrops, particularly subsistence crops.

Trees of practical use, and particularly fruit trees, are planted as a priority in the private land belonging to a family: around the house and around the garden. They can thus continue to use the trees during periods of fallow and sometimes beyond if the land then has to be cultivated afresh. Trees are also planted in spaces situated near a village that are kept for that purpose. In this case the land used continues to be the property of the whole community. They are also grown along tracks, along footpaths leading to gardens and in large plantations of coconuts which themselves are nowadays mostly managed collectively. Fruit trees are also found in the forests, where they provide indications of ancient settlements or are markers of territory. Quite often the original ownership of these trees has been forgotten, and they then come to be the property of the whole community.

In earlier times, but only rarely nowadays, fruit trees of a dead person were partly destroyed by the descendants in order to avoid having the area of land locked up. Some farmers try to appropriate pieces of land by planting trees on them, but this practice, which is disapproved of by the community, generally leads to conflict over the land's

ownership. It is thus very difficult for an individual to establish a small plantation of fruit trees for commercial purposes on any land whatsoever. This type of orchard when it is established generally belongs not to a single individual but to a family grouping or a group of individuals who are related and joined together by a social agreement ("*cooptation*").

The harvest from a fruit tree as a rule belongs to the owner of the tree, but anyone may pick fruits as long as they are for their own consumption and not for sale. Commercial exploitation of fruit trees is contentious, even if the yield of the trees is enough to satisfy both domestic consumption and market supply. If the owner of some trees wishes to sell the harvest from those trees, he fastens leaves of *Cordyline* to the trunks to forbid anyone to pick any fruits. Such a ban is generally respected by all.

Regardless of this anyone may, at any time of day, pick for themselves a few fruits situated in their immediate proximity.

## Trees of the village

Within a village, trees are planted in large numbers, creating a feeling of abundance and well-being that captivates and impresses a visitor. They add an aesthetic note to which the ni-Vanuatu are very sensitive. When a family or a group residing in a place decides to move to another site to dwell, they begin by

planting trees. Then they build one or more houses. Later the domestic area is augmented with new trees until they achieve the magnificent village orchards that may be seen in coastal areas and in the small islands.

Cultivated and selected species that are planted within the village are usually small and not bulky or obstructive. One may find cut nut (*Barringtonia*) trees, and orange, grapefruit and breadfruit trees. A little nearer the edge will be sea almond (*Terminalia catappa*), Tahitian chestnut, golden apple, mangoes and certainly coconuts. All these trees, with the exception of breadfruit and sometimes golden apple, are propagated by seeds or at least by transplantation of small seedlings that have germinated at the foot of adult trees. The seedlings are carefully weeded, sometimes watered, and protected from cavalcades of children and wandering domestic animals (chickens, dogs and even pigs). As soon as the tree has reached maturity, no further care is necessary apart from regular pruning to prevent the tree becoming too tall, which would make harvesting the fruits difficult. Later on it is no longer necessary to weed because the ground is constantly trampled by people picking the fruits.

The village and its immediate environs thus constitute a nutritious area with plentiful fresh fruits and nuts and also starchy fruits such as breadfruit. This storehouse of nutrition is intended in the first place for children who, when their parents

are in the gardens, entertain themselves by picking nuts, cracking them with a stone and nibbling them. It is also useful for the community as a whole, who can on rainy days pick breadfruits and prepare meals without having to go into the gardens.

The village orchards also constitute good collections of varieties. Not everyone has a passion for plants, but the majority of ni-Vanuatu nevertheless harbour a desire to collect together different types of certain fruit trees on their own piece of land. One can thus find the majority of known cultivars in quite a restricted area. Each farmer plants one or two trees in the course of his life, except when a new village is being established. The multiplication of these individual small acts results in selection and protection of the better cultivars – those with the largest fruits, or the juiciest, sweetest and least fibrous, or whose nuts are tender and easy to open.

## Paths and tracks

The edges of roads, pathways and tracks leading to gardens are the spaces that provide the greatest density of fruit trees. Trees planted here are smaller and have thirst-quenching fruits such as mandarins, oranges, grapefruits and golden apples. Mangoes with their large crowns give permanent shade and sweet fruits. They are particularly abundant on the dry, leeward coasts such as the west coast of Santo. Also found are numerous

self-sown papayas, normally used for feeding pigs because those intended for young children are grown in the gardens or near the houses. Finally custard apples, bullock's hearts and passionfruits are also planted in these much-frequented places. Nut trees such as canarium nut are also common along paths.

Some of these trees are planted; others appear spontaneously, but are looked after by those who utilise them. They are exploited for several consecutive years, because even though the cultivated plots of land may shift from year to year, the same footpath is used to access them. In going out to the garden or returning, the farmers, (particularly the women farmers) make frequent stops to peel some mangoes, shell some nuts or divide up a papaya. The gardens provide the staple foods, rich in starches, while the fruits that are cultivated or looked after provide essential vitamins, always eaten outside mealtimes.

## Commercial plantations

### Coconut

Since colonisation, certain fruiting trees have become the objects of commercial production. The best known among these is definitely the coconut<sup>8</sup>, exploited for copra. Coconut is a local species, but before the establishment of the large coconut plantations it was not produced very

abundantly in Vanuatu where people had plentiful sources of fresh water for drinking. It was nevertheless cultivated, but with little selection, among the other species on the land set aside for arboriculture. It was used for its nuts, nibbled just as they were, the milk of the nuts which was used in sauces, for its wood, or for its leaves which were used to make matting. It was certainly not planted in rows, nor grouped into big patches except perhaps on the coastline. When Vanuatu entered the world of commercial production, many communities brought together land that was available to them along the coastline, in order to plant and exploit the coconut that was able to provide them with a cash income. Nowadays there are huge coconut plantations whose profitability varies considerably from place to place. Copra, whose price has dropped, does however remain one of the main export commodities. For local people, coconut is an important tree for food, regularly used for its coconut water, its milk, its pulp and even its germinated seed. It also provides an important food for pigs, and it is estimated that several thousands of tonnes are eaten each year by humans and animals.

### Coffee

This commercial crop, introduced by European colonists to satisfy export markets, was accompanied at Independence (1980) by numerous development projects. Arabica coffee grows mainly in

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<sup>8</sup> This book is dedicated to food species of Vanuatu, and we will not present a long account of coconut and copra since some

already exist – in particular Weightman (1989: 121-162) has provided comprehensive information.

the centre of the island of Tanna, whose low temperatures favour its expansion, and Robusta coffee is grown on the island of Santo. Vanuatu produced about 80 tonnes of coffee at Independence, but 20 years later, despite support from European development agencies, coffee is in jeopardy and does not enthuse the Melanesian horticulturists who find its cultivation calendar very constraining.

## Cocoa

The history of cocoa in Vanuatu is similar to that of coffee; it was one of the major colonial crops destined for export and encouraged by multiple development projects financed by western agencies, but it does not seem to enthuse smallholders who find it has many constraints and poor financial returns. Production is decreasing and rats are devastating the plantations. One project is attempting to reverse the trend by finding markets for organic and aromatic cocoa. The perennial nature of the price speculation is a real constraint when pressure on land is great. The cultivation system based on a long fallow is nowadays greatly limited by population pressure. Access to new land is difficult because of the absence of roads into the interior of islands, and poor upkeep of tracks opened by forest exploitation.

## Kava

The main source of income nowadays for farmers is kava. The great majority of the trade is in the domestic market, but an export market is also developing. It is a recent phenomenon, having begun at Independence thanks to a search for a Melanesian identity and to the acceptance by the people of a product that is ready to use: the fresh extract sold ready to drink in kava bars. Sales have nowadays reached about 10,000 tonnes per year, of which two thirds are consumed locally. This remarkable development has happened entirely through the private sector.

Many other plants, local and introduced but all part of the subsistence cropping system, are nowadays planted for commercial purposes. Alongside the annual crops such as ginger, peanut, pepper, vanilla, sweet potato and taro that supply the local markets and some export markets, certain trees also appear promising. Canarium nuts, cut nuts and sea almonds (*Terminalia catappa*) are sold in groceries as dried nuts, and international markets for these products appear to be opening up. All the crops that previously had market potential are now being grown for sale, but their development is often temporary and depends more on market demand than on the true potential for cultivation. Each certainly encounters cultivational or environmental constraints that are specific to them.

## Urban markets and places for foraging

The towns and the forests are two other areas that are rich in food plants. In the former, markets and urban gardens allow town-dwellers to retain a diet that is based on local ingredients. The latter gives rural populations an important selection of plants to complement their diet and extra resources, carefully looked after, that can be utilised in case of food shortage caused by a natural disaster (consecutive droughts caused by the El Niño phenomenon and seasonal cyclones are the main ones).

### Urban markets

Two large markets exist in Vanuatu – one in Luganville in Santo and the other in Port Vila in Efate. They are open every morning except Sunday, and through their operation they provide an opportunity, specific to the calendar of each town, for people from the villages of these islands to sell their produce. These are mainly women, who come year-round to offer the produce from their gardens on their stalls. The produce is grown without fertilisers or insecticides, and is seasonal, abundant and very fresh. In these markets may be found the entire range of food plants produced in the country, but because those who buy from the

markets are urban dwellers and often from elsewhere, the main offerings in the market are introduced plants that are usually bought by Europeans and Asians. Sometimes the vendors say that they themselves do not know the taste of the products that they sell. Traditional products from the gardens may also be bought there, grown beyond the needs of a household in order to sell the surplus. Some, such as island cabbage (*Abelmoschus manihot*) and sweet potato, are sold throughout the year, while others, such as breadfruit and yam, are sold seasonally as they are harvested.

These products are not sold by weight but by the piece, in packets, small bags and bunches that are not of any standard size. The price per unit weight may thus vary greatly according to the nature of the unit purchased. On the other hand there is little competition between the sellers who, depending on the day, may be from the same village and agree beforehand on the price of a product. A cucumber, a bunch of chives or a basket of oranges all have approximately the same price on all the stalls. Purchases are most often made according to social relationships that the buyer may maintain with one or another of the sellers. Prices do not fluctuate according to the season, or with the time of day. Likewise strange is that prices do not appear to vary according to whether the product is abundant or scarce, or whether the market is just opening or near to closing.

In Port Vila, where the food products are regularly dearer than in Santo, a slight rise in cost may be seen on Saturdays which is the day when the central market is frequented by the majority of expatriates.

Town-dwellers may also buy ready prepared dishes, sold by women from nearby villages: all sorts of *lap-lap*<sup>9</sup>, fritters and baked meats.

## Urban gardens

Urban populations, in Luganville and even more in Port Vila regularly grow all sorts of food products around their houses or on land close by, without which they would certainly not be able to maintain a healthy diet. These gardens, worked during rest days or kept up by one member of the family, most often contain a range of vegetables and fruits essential for preparation of meals and not very costly. The families also buy rice, bread and other groceries as the main food, and then complete a meal with small dishes made from the products grown around the home. Many people say that without this home produce they would not be able to feed their family. Urban gardens have the greatest number of different plants, but the least number of varieties in each. Commercial seeds, imported every year by Chinese grocers, are very popular among the ni-Vanuatu, who quickly experiment with new arrivals according to what is received, with greater or lesser degrees of success.

## Foraging

Finally, townspeople and villagers eat a great diversity of species collected from the forests. All are used in small quantities: ferns, *Ficus* leaves and wild fruits are continually eaten as snacks by children and adults. All these species also provide a reserve of foodstuffs that can be used in times of food scarcity, and they are therefore carefully maintained and protected. Exceptional trees are quickly noted, and although vegetative multiplication is not possible, any of their seedlings that come up in the wild are dug up and replanted somewhere more favourable where they can be watched over. Wherever they go, the rural dwellers of Vanuatu know that they will always be able to find something to eat when they roam freely through the great forests. One single spot may in turn be a garden, a patch of secondary forest, a village, then again a forest and so on. The cultivated spaces that we have just described are thus not fixed and immutable, and over a long period of time vegetable growing, arboriculture and foraging may all succeed one another at a single place. As a consequence, over two thousand years the primary forest has been reshaped by human activity, which has progressively replaced the wild species with species of practical use.

<sup>9</sup> A national dish of Vanuatu, *lap-lap* is a sort of thick cake or pudding made from plantain bananas, breadfruit or various roots and tubers, made by

grating the root or fruit. The grated puree is then packaged up in strong and pliable leaves and cooked in an oven.



## Note

The inventory that follows is presented by major botanical grouping: roots and tubers, trees, climbing plants and herbaceous species. Within each of these sections, the genera are presented in alphabetical order in the form of dossiers or capsule summaries on each.

An introductory box records the name of the family to which the genus belongs, indicates the number of species in the genus, and specifies those that are present and eaten in Vanuatu. For each genus the main references are given, cross-referenced to the main bibliography in the CD-ROM that accompanies this book.

References in **bold type** indicate the latest revision of the genus or at least the most recent that we were able to consult. These references are very selective and essentially refer the reader to reference works that provide full bibliographies and botanical or ethnobotanical articles focused particularly on the Oceanian region.

Each species present in Vanuatu is then covered in alphabetical order, treated under the following headings: history, botanical description, morphological variability, cultivation and production, uses for food, and other uses.

The history of the plant indicates its origin, its utilisation by people in ancient times, its migrations and its arrival in Vanuatu.

The botanical descriptions, all concise, allow quick identification of the plant. These are complemented by colour photos gathered together in the grouped colour plate sections.

The morphological variability is that which can be observed in Vanuatu. It can be very large for some species, such as yams and taros, and the reader will find abundant illustration of these in the CD-ROM.

Finally the book presents (in sequence) the manner in which the plant is grown in Vanuatu, its uses for food, and (where such exist) its other uses.

In addition, for each species the book classifies where the plant fits in the diet, as follows:

- staple food plant: eaten regularly and forming the main ingredient of a meal;
- complementary food plant: eaten frequently as an accompaniment to a meal;
- plant occasionally eaten: only rarely eaten;
- plant eaten in times of scarcity: only eaten in times of famine.

