



SOLOMON ISLANDS:

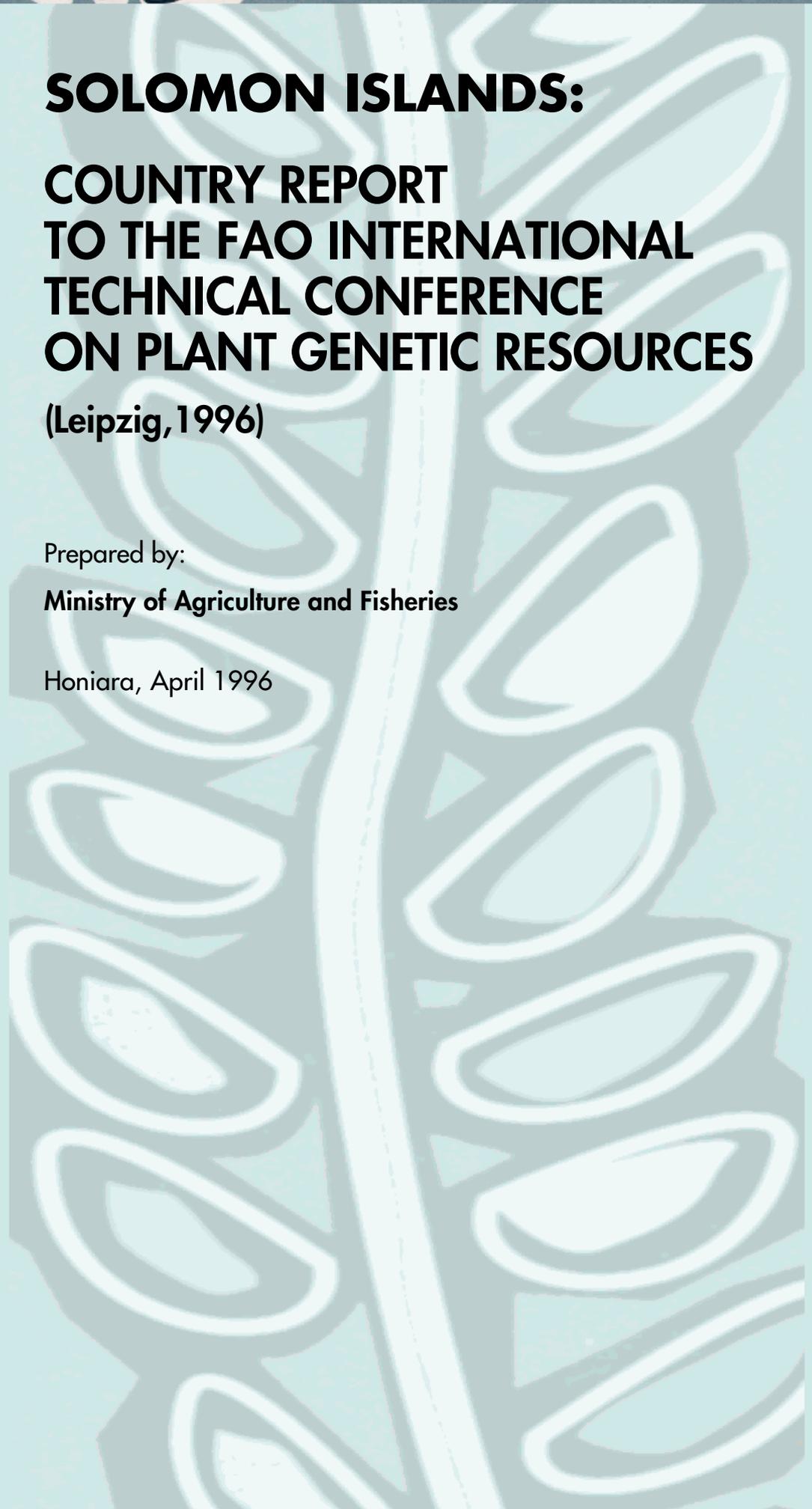
COUNTRY REPORT TO THE FAO INTERNATIONAL TECHNICAL CONFERENCE ON PLANT GENETIC RESOURCES

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Note by FAO

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Table of contents

CHAPTER 1	
INTRODUCTION TO THE SOLOMON ISLANDS AND ITS AGRICULTURAL SECTOR	4
1.1 VEGETATION	4
1.2 FARMING SYSTEMS, THE AGRICULTURAL ECONOMY AND FOOD PRODUCTION TREND	8
<hr/>	
CHAPTER 2	
INDIGENOUS PLANT GENETIC RESOURCES	10
2.1 FOREST GENETIC RESOURCES, OTHER WILD SPECIES AND WILD RELATIVES OF CROP PLANTS	10
2.2 LANDRACES (FARMERS' VARIETIES) AND OLD CULTIVARS	18
<hr/>	
CHAPTER 3	
NATIONAL CONSERVATION ACTIVITIES	21
3.1 <i>IN SITU</i> CONSERVATION ACTIVITIES	21
3.2 <i>EX SITU</i> COLLECTIONS	21
<hr/>	
CHAPTER 4	
NATIONAL GOALS, POLICIES, PROGRAMMES AND LEGISLATION	24
4.1 CUSTOMARY LAND OWNERSHIP AND PROPERTY RIGHTS	24
4.2 DIVERSIFICATION	25



CHAPTER 1

Introduction to the Solomon Islands and Its Agricultural Sector

The Solomon Islands consists of a double chain of about 990 islands, mainly of volcanic origin, and extending from about 155 - 170° E to 5 - 12° S and therefore lie well inside the geographical tropics. The country has a total land area of 28,000 km². It is bounded on the west by Papua New Guinea, on the southwest by Australia, and by the islands of Gilbert, Ellice, Fiji and New Caledonia on the south and east. There are eight provinces, each comprising a major group of islands. The 1986 census recorded the population at 285,000 with an annual growth rate of 3.5%; the projected population in 1993 is 350,142 (Office of Statistics, 1993). Majority of the population is Melanesian. Polynesians and Micronesians make up the other minority groups. There are 88 distinct languages spoken in the country including English and Pidgin.

With the exception of the area from northern Guadalcanal to the Floridas and southern Santa Isabel, the Solomon Islands can be classed as continuously wet (Fitzpatrick *et al.*, 1966), with most land areas having a mean annual rainfall of 3,000 to 4,000 mm. Temperatures range from 22 to 29° C in the lowlands to within a few degrees of freezing point in the highest mountains (2,400 m) in Guadalcanal.

1.1 VEGETATION

Since the European discovery of the Solomon Islands in 1968, visitors have commented upon the dense forest cover. Today, most of the islands present a picture of dark green, densely forested hills and mountains broken by the lighter green appearance of small garden clearings or the more orderly arrangement of coconut estates along the coasts. In the past, the forest provided the Solomon Islander with most of his requirements. His clothing and shelter were obtained from the forest, a large proportion of his protein requirements were met by hunting birds and animals of the forest, the trees provided him with fruits and nuts to supplement the carbohydrate diet provided by his subsistence gardens, and his intimate knowledge of the forest enabled him to utilize trees and plants for both medicinal and spiritual purposes. As the forest was omnipresent and impinged upon so many facets of



his existence, there was the incentive and necessity for him to be able to identify the vegetation, not just at a superficial level but down to the recognition of the individual species. The reliability of the islander's identification has been recognized by most visiting botanists, and lists of plant names in the vernacular from different islands have been compiled at various times by foresters and botanists working in the Solomons.

The Spaniards were the first visitors to record some of the plants they encountered, and within days of their discovery of the islands were utilizing the forests. Visiting ships continued to use Solomons' timber for repairing vessels.

The earliest record of plant collecting in the country is the visit of W.G. Milne to San Cristobal in 1855. A collection of ferns was made by Comins from 1882 to 1884. Guppy made extensive collections in the islands. A brief report on the forests of the islands was made in an appendix to a report to the Legislative Council, Fiji, in 1928. The first detailed collection of plants was obtained in 1931, and the first assessment of the forest resources of the Solomon Islands was made in 1948.

Whitmore (1969) said that the flora of the Solomons is remarkably uniform from island to island, although several vegetation formations can be distinguished from each other by and floristic composition. Disturbance, probably due to the main ecological factor determining floristic differentiation. Other factors features (soil type, salinity, acidity, fertility, water table), variation in the rainfall pattern, and variation in the geographical distribution of the species.

The vegetation communities of the Solomon Islands can be classified into the following types:

a) Grasslands and heaths: These types of vegetation are dominated by *Themeda australis*, *Imperata cylindrica* and *Dicranopteris linearis*. Commonly occurring are *Cheilanthes tenuifolia*, *Desmodium triquetrum*, *Dianella ensifolia*, *Lindsaea ensifolia*, *Melastoma polyanthum*, *Mimosa invisa*, *Pennisetum polystachyon*, and *Spathoglottis plicata*. Other species normally present include *Agathis macrophylla*, *Casuarina equisetifolia*, *Cuarina papuana*, *Colona scabra*, *Commersonia bartramia*, *Crotolaria striata*, *Cyperus spp.*, *Emilia sonchifolia*, *Flagelaria gigantea*, *Flagellaria idica*, *Gulubia hombronii*, *Hamalium tatambense*, *Lycopodium cernuum*, *Morinda citrifolia*, *Pandanus spp.*, *Polygala paniculata*, *Phragmites karka*, *Premna corymbosa*, *Saccharum spontaneum*, *Timonius timon*, *Trichospermum psilocladum*, *Uria lagopodioides* and *Xanthostemon sp.*



There are few truly indigenous grasses or legumes in the grasslands and heaths of the Solomon Islands and many are of recent introduction. All grasslands are fired infrequently, usually at least once a year, and the intensity of the burn is greater if firing occurs at the end of the dry season.

- b) Swaline swamps:** Mangrove forests occur on most islands and cover large coastal areas. The forests are characteristically species-poor and the most widespread genera are *Rizophora* and *Bruguiera* while *Avicennia* occurs locally but not in large stands. Saline swamps commonly merge inland into freshwater swamp forests. The coral platforms of the submerged offshore bars and the seaward edge of most mangrove swamps are colonized by *Rhizophora apiculata*, *R. stylosa* and *Bruguiera spp.* Other commonly occurring species include *Acanthus ebracteatus*, *Calophyllum inophyllum*, *Ceriops tagal*, *Dolichandrone spathacea*, *Fagraea racemosa*, ferns, *Heritiera littoralis*, *Intsia bijuga*, *Lumnitzera littorea*, *Nypa fruticans*, *Pandanus spp.*, *Sonneratia sp.*, and *Xylocarpus granatum*.
- c) Mixed herbaceous swamps:** These may occur as waterlogged vegetation mat in the central part of peat swamps, or may be found in swales behind beaches and in the abandoned meanders of the larger rivers. These swamps may be dominated by *Hanguna malayana*, *Stenochlaena palustris* and *Phragmites karka*. Other species present are *Acrostichum aureum*, *Baumea crassa*, *Epipremnum spp.*, *Dicranopteris linearis*, *Inocarpus fagiferus*, *Marsilea sp.*, *Metroxylon sagu* and *Pandanus spp.*
- d) Palm swamps:** These are groves of palms with a ground cover of ferns rather than grasses. Large stands of *Metroxylon salomonense* occur along foothill margins of several islands where streams from the foothills drain into swamps or poorly drained areas.

Scattered trees of *Erythrina orientalis*, *Eugenia tierneyana*, *inocarpus fagiferus* and *Pandanus spp.* are commonly associated with the sago. On Guadalcanal some of the larger swamps contain almost pure stands of *Metroxylon sagu*. Under deep, permanent swamp conditions the undergrowth consists of herbaceous creepers and *Hanguana malayana* but in drier areas these are replaced by sedges, ferns and aroids.

- e) Pandan swamps:** Small areas of *Pandanus* dominated swamp are found in Guadalcanal, while extensive areas of swamp forest with *Pandanus* dominating the shrub layer in all the larger islands. The associated species are *Barringtonia racemosa*, *Calophyllum vexans*, *Casuarina equisetifolia*, *Eugenia effusa*, *Hibiscus tiliacus*, *Horsfieldia spicata*, *Pterocarpus indicus*, *Quassia indica* and *Terminalia brassii*.
- f) Swamp forests:** Most islands contain considerable areas of freshwater swamps where the watertable is at or close to the surface throughout the year. Some of these swamps carry a distinctive vegetation formation characteristically dominated by a single species and they tend to be species-



poor. The dominant species can be any of the following: *Camptosperma brevipetiolatum*, *Casuarina papuana*, *Eugenia tierneyana*, *Inocarpus fagiferus* and *Terminalia brassii*. Other commonly occurring species are aroids, *Barringtonia racemosa*, *Calophyllum pseudovitiense*, *Calophyllum vexans*, *Elastostema sp.*, *Eugenia effusa*, *Eugenia spp.*, *Fagraea gracillipes*, *Fagraea racemosa*, *Ficus spp.*, *Flagellaria sp.*, *Gynotroches axillaris*, *Heritiera littoralis*, *Horsfieldia spicata*, *Intsia bijuga*, *Neonauclea sp.*, *Neoscortechinia forbesii*, *Pandanus spp.*, *Pterocarpus indicus*, *Quassia indica*, *Raphidophora spp.*, *Semecarpus sp.* and *Stenochlaena spp.*

- g) Lowland rain forests:** This can be considered as the climatic climax vegetation over much of the Solomon Islands. It is a species-rich formation described by Whitmore (1969) as floristically similar to that of Malaysia but having fewer families, genera and species, and containing distinctive groups of Pacific and local Melanesian genera. The flora is uniform from island to island and no regional differences have been detected. There are, however, local floristic and structural variations in the vegetation.

The lowland forests contain fewer large tree species than for example the forests of southeastern Malaya, and of the 60 or so common big trees only 12 are very common within the canopy. They are *Calophyllum peekalii*, *Calphyllum pseudovitiense*, *Camptosperma brevipetiolatum*, *Dillenia salomonensis*, *Elaeocarpus sphaericus*, *Endospermum medullosum*, *Gmelina moluccana*, *Maranthes corymbosa*, *Parinari salomonensis*, *Pometia pinnata*, *Schizomeria serrata* and *Terminalia calamansanai*.

The lowland rain forest is seldom structurally homogeneous over large areas and it is locally broken with gaps filled with regrowth species. Cyclones and man's influence have disturbed the forests to a considerable degree and the high incidence of regrowth and secondary species may well reflect such events. Commonly occurring within the lowland forests are *Vitex cofassus* and *Canarium spp.*, all of which are evidence of past disturbance, as *Vitex* in particular establishes itself in secondary forests.

Commonly occurring within the lowland forests are *Agathis macrophylla*, *Aglaia sp.*, *Alangium javanicum*, *Albizia salomomnensis*, *Archidendron oblongum*, *Areca catechu*, bamboos, *Barringtonia papeh*, *Boerlagiodendron spp.*, *Burckella obovata*, *Calamus spp.*, *Casuarina papuana*, *Celtis pp.*, *Chelonespermum banikiense*, *Cyathea brackendridgei*, *Dacrydium sp.*, *Dysoxylum sp.*, *Elatostema sp.*, *Epipremnum amplissimum*, *Eugenia sp.*, *Fagraea gracillipes*, *Ficus spp.*, *Flagellaria sp.*, *Freycinetia sp.*, ginger, *Gonystylus sp.*, *Gulubia hombronii*, *Hernandia sp.*, *Heterospathe woodfordiana*, *Leea indica*, *Licala lautherbachii*, *Neonauclea sp.*, *Neoscortechinia forbesii*, *Pandanus spp.*, *Pimelodendron amboinicum*, *Planchonella thyrsoidea*, *Pothos spp.*, *Pterocarpus indicus*, *Raphidophora spp.*, *Scindapsus spp.*, *Selaginella sp.*



Strongylocarium latius, *Syzygium sp.*, *Tapeinosperma spp.*, *Tysmanniodendron ahernianum* and *Xanthostemon sp.*

- h) **Beach forests:** Beach forests have been described in Bougainville, Jaghi Island, and on small islands off Guadalcanal. In other areas, they have been replaced by plantations. Among the species commonly represented are *Barringtonia asiatica*, *Calophyllum inophyllum*, *Casuarina equisetifolia*, *Cerbera manghas*, *Diospyros sp.*, *Ficus australis*, ginger, *Heritiera littoralis*, *Hibiscus tiliaceus*, *Intsia bijuga*, *Kleinhovia hospita*, *Morinda citrifolia*, orchids, *Pandanus sp.*, *Pometia sp.*, *Premna corymbosa*, *Terminalia catappa* and *Vitex sp.*
- i) **Mixed deciduous forests:** Much of northern Guadalcanal lies within a distinctive seasonally dry area and the vegetation is affected by water stress. In this area, vegetation reflects a complex relationship between topography and moisture availability resulting in a mixture of fire disclimax grasslands and a disturbed lowland high content of semi-deciduous tree species. Coastal plain forests of this type are rapidly cleared for cultivation. The common species in this type of forest are *Antiaris toxicaria*, bamboos, *Buchanania arborescens*, *Calamus sp.*, *Cananga odorata*, *Colona scabra*, *Ficus spp.*, *Hibiscus tiliaceus*, *Kleinhovia hospita*, *Pometia pinnata*, *Pterocarpus idicus*, *Rehderophoenix subdisticha*, *Semecarpus sp.*, *Sterculia sp.*, *Strongylocarium latius* and *Vitex cofassus*.
- j) **Upland forests:** It has been suggested that the upper limit of lowland rain forest in the tropics is about 1,000 m. However, in the Solomon islands it is evident that the forest changes rapidly with elevation and in places becomes both floristically and structurally similar to lower montane forest at much lower altitudes. The dominant canopy-forming species are *Callophyllum pseudovitiense*, *Dacrydium sp.* and *Eugenia spp.* Associated species include *Ascarina maheshwarii*, *Astronia sp.*, *Belliolum haplopus*, *Cyathea brackenridgei*, *Dipteris sp.*, *Garcinia sessilis*, *Gleichinia kajewskii*, *Homallium tatambense*, orchids, *Pandanus spp.*, *Pemphis acidula*, *Podocarpus pilgeri*, *Racembambos scandens*, *Sceflera sp.* and *Streblus glaber*.

1.2 FARMING SYSTEMS, THE AGRICULTURAL ECONOMY AND FOOD PRODUCTION TREND

Agricultural and horticultural practices have been the subject of considerable interest in the Solomons over recent years. There were two main areas of interest: plantation development, especially coconut, oil palm and cocoa (the major exports) and household (garden) production.



Local plantation development is important for economic, social and environmental reasons. It represents a long term commitment for villages, because it involves permanently setting aside blocks of accessible and usable land, and it also means that they become more drawn into the national economy. The three most important plantation crops in coconut (*Cocos nucifera*), oil palm (*Elaeis guineensis*) and cocoa (*Theobroma cacao*), accounted for 16% of the export earnings of the country in 1986. Copra in 1970 and 1974 contributed about half of the export earnings of the Solomons. Its importance has lately been overshadowed by the increase in the volume of and earnings from export of wood products, which accounted for 31% and 37% of all export earnings in 1986 and 1992, respectively.

Gardening is however more fundamentally important to the average rural Solomon is because 90% of the population relies on subsistence horticulture, especially the production of staple root crops from household gardens. The subsistence sector officially accounted for at least 18% of the GDP in 1989, although this is considered to be an underestimate (Roughan, 1991). Some 86% of all households had a food garden in 1986, and 34% were producing food crops for cash (Statistics Office, 1988). Household gardening is carried out on a shifting basis, generally using the "slash and burn" or swidden method, in which land is cleared, cultivated for a short period, then left fallow to naturally regenerate while other gardens are developed. On the average there is 0.04 ha of food garden per person. If the approximate number of rural households in 1986 (approximately 37,500) is taken, the amount of land actually under cultivation by households would have been about 36,500 ha.

Along with population pressure, changes in crops, cropping methods, land use and life style have combined to intensify the use of garden land, which may lead to further and more damaging forest clearing Hibberd and Schenk (1991) reported that expansion of garden areas to more mountainous terrain has also meant that soil erosion, land slips and susceptibility to cyclone damage is increasing. They also noted that the area cleared for village gardens and under cultivation appears to have substantially increased in recent times.

The development of strategies for the management of the natural forest resources of the Solomon Islands will need to address the issue of supply of land for smallholder and other production, and how much forest should be reserved for smallholder food (and other forest) production in the future.



CHAPTER 2

Indigenous Plant Genetic Resources

2.1 FOREST GENETIC RESOURCES, OTHER WILD SPECIES AND WILD RELATIVES OF CROP PLANTS

Most of the nation's people live in rural villages located in or near forests. Those who live inland depend heavily on the resources of the forest, while in the coastal areas people make use of both forest and marine resources. However, utilization of these coastal and marine resources requires drawing on the forest for materials, e.g. special trees for canoes. For the majority of the Solomon Islanders, the forest is their home and their larder. They take from it directly, in the form of nourishment, shelter, energy, tools, and indirectly, in the form of their social and cultural identity.

Whitmore (1966) in his 'Guide to the Forests of the British Solomon Islands' listed a total plant species in the country. This listing is considered deficient in the identification of herbaceous plants, the author being a forest botanist. Henderson and Hancock (1988) listed 3,172 species of angiosperms found in the Solomon Islands. The authors estimated that there are well over 4,500 indigenous plant species in the country, with the shortfall being made up mainly by indigenous herbaceous species, palms, epiphytes (mainly orchids) and ferns. In addition to the indigenous species, another 300 to 400 recently introduced exotic plants must be included in the estimated total, these being mainly ornamentals. For a long time the Solomon Islands has been and will continue to be, a rich source of new exotic ornamental plant material for the rest of the world. It is important that this fact is recognized, and that the country as a whole benefits from the dissemination of this information and material.

Henderson and Hancock (1988) also indicated the various uses to which a particular plant is put. The listing is presented in Table 1.

Staple foods: Before the introduction of cassava (*Manihot esculenta*), sweetpotato (*Ipomoea batatas*) and Hongkong taro (*Xanthosoma spp.*), which have now become popular food staples, people were generally dependent upon the endemic yams (*Dioscorea alata*, *D. esculenta*, *D. Bulbifera*, *D. nummularia* and *D. pentaphylla*), taros (*Colocasia esculenta* and *Cyrtosperma chamissonis*) and in some islands, breadfruit (*Artocarpus altilis*).



Many other species traditionally supply dietary carbohydrates, e.g. *Amorphophallus campanulatus*, *Tacca leontopetaloides*, sago (*Metroxylon sagum*, *M. bougainvillense* and *M. salomonense*) the Polynesian or Tahitian chestnut (*Inocarpus fagiferus*), *Haplolobus floribundus* and *Corynocarpus sp.* Some of these plants are still important food sources in certain areas, but they generally only provide seasonal or occasional food.

Fruits: There are plenty of species endemic or indigenous to the Solomon Islands for which the edible fruit is of prime importance. All can be described as multipurpose trees and therefore may have uses that some people may consider more important than the edible fruit. The list is presented in Table 2.

Table 1: Uses of indigenous plant species in the Solomon Islands

Use	Description	Number of species
Food		
Staple	includes fruits that provide mainly dietary carbohydrate	22
Vegetable	includes edible foliages, fruits and stems	72
Fruit	edible fruits	45
Nut	edible nuts	18
Herb/Spice	includes leaves eaten with betel nut, wrapping/oven leaves	12
Traditional	foods only eaten in times of shortage	11
Miscellaneous	all others, including cash crops	38
Agriculture		
Multi-purpose tree	trees potentially suitable for nutrient cycling, alley cropping, shade, live fences etc.	39
Cover crop	used for live and dead mulch, soil protection	2
Pasture	pasture species, including grasses and legumes	25
Weed	all agriculturally important weed species	205
Miscellaneous	plants with pesticidal properties, other species of minor importance, including trees used as 'live ladders'	69
Timber		
Export	all trees of export quality	63
Local	locally used construction timber and fencing materials	145



Use	Description	Number of species
Canoe	timbers used in boat construction	28
Custom uses		
Firewood	slow and fast burning wood	79
Rope	rope/cordage for house building, nets, line, thread and temporary strapping	33
Wood	for all carved items including ornaments, curios, weapons, tools, bowls and other utensils''	58
Leaves	for sealing fish/meats to be stone-oven cooked as well as for scaling the oven themselves; for wrapping goods	35
Handicrafts	including plants used for mats, baskets, dyes, hats, fans and musical instruments	29
Miscellaneous	all other uses, such as decoration for dance, custom clothing, fish poisons and children's toys	105
Ornamental	used for ornamental purposes, as in- and outdoor plants	159
Medicinal	local medicinal plants	140

There are minor fruits and berries that are picked or occasionally gathered, and others which bear edible fruits which are eaten in times of scarcity. These are *Corynocarpus cribbeanus*, *Eugenia aqueum*, *Eugenia nutans*, *Hornstedtia lycostoma*, *Passiflora foetida*, *Pouteria maclayana* and *Rubus moluccanus*.

Over time there has been a successful influx of exotic tropical fruits into the Solomons, examples being water melon (*Citrullus lanatus*), pineapple (*Ananas comosus*), carambola (*Averrhoa carambola*), passion fruit (*Passiflora edulis*) giant granadilla (*Passiflora quadrangularis*), soursop (*Annona muricata*) rock/sweet melon (*Cucumis melo*), several *Citrus* species, mango (*Mangifera indica*) and pawpaw (*Carica papaya*). In most instances these are characterized by lack of vernacular names, though some species, such as *Mangifera indica* have adopted the same name as their indigenous relatives (e.g. *M. minor*).



Table 2: List of species for which the edible fruit is of prime importance in the Solomon Islands

Species	Common name	Distribution
<i>Archidendron sp.</i>	'Nyia Nwadolou'	Reef Islands
<i>Burckella obovata</i>	'Kona'	lowlands, throughout; common
<i>Burckella sorei</i>	'Kona'	lowlands, throughout, rare
<i>Eugenia malaccensis</i>	Malay or Rose apple	throughout
<i>Morinda citrifolia</i>	Indian mulberry	throughout
<i>Parartocarpus venenosa</i>	'Rakwan', 'Rakwana'	throughout, occasional
<i>Pometia pinnata</i>	Oceanic lychee	throughout
<i>Spondias cytherea</i>	Golden apple	throughout, occasional
<i>Terminalia salomonensis</i>	'To'oma'	throughout

Nuts: Nut trees have played an important role in the social history of many peoples of the Solomons. In the Western Province, one community was based inland. Though danger of attack from tribal raiding parties prevented permanent settlement on the coast, nevertheless people mountain dwellings and venture to the coast and lowlands for several months the 'ngali' nut (*Canarium sp.*). Similarly in Rennell, the kernel of the 'gemugi' nut (*Haplobus spp*) was a food of such importance in Rennellese custom that to damage tree without permission was, and still is, such a serious offense that kind of compensation repayment.

In general, more investigative work could be made about the nut trees of the Solomon Islands with a view to exploiting their potential, either as an export commodity for confectionery and/or oils, or to meet local food demands. The important endemic or indigenous nut trees of the Solomons are presented in Table 3.

Table 3: The important indigenous or endemic fruit and nut species in the Solomon Islands

Species	Common name	Distribution
<i>Barringtonia inedulis</i>	Cut nut	throughout
<i>Barringtonia neidenzuana</i>	Cut nut	throughout
<i>Barringtonia novae-hiberniae</i>	Cut nut	throughout
<i>Barringtonia procera</i>	Cut nut	throughout
<i>Canarium harveyi</i>	'Ngali'	Temotu Province



Species	Common name	Distribution
<i>Canarium indicum</i>	Ngali'	throughout
<i>Canarium salomonense</i>	'Adoa', 'Andoa'	lowland, throughout
<i>Finschia waterhousiana</i>	'Akama'	lowland rain forest. throughout
<i>Gnetum latifolium</i>	'Kwalo uku'	throughout
<i>Omphalea queenslandieae</i>	'Kwalo falake'	rare
<i>Pandanus compressus</i>	Screw pine	throughout
<i>Terminalia catappa</i>	Sea/Indian almond	throughout
<i>Terminalia kaernbachii</i>	'Alita fasia'	rare

Vegetables: The diet of all communities in the Solomons traditionally includes a large number of leafy vegetables that are collected from a range of both cultivated and wild plant foods are termed 'cabbage' in Solomons Pidgin and they constitute the majority of vegetable foods eaten in the country. Sources of such 'cabbages' include ferns, climbers', shrubs and trees.

It is important to realize that the diversity in usage of the various wild and cultivated 'cabbages' in the Solomons is far greater than the customary range in usage of leafy vegetables elsewhere. For example, certain 'cabbages' are specifically cooked with certain meats and viceversa. The reason may concern customary tabus, though usually factors such as complementary flavours, absorption of fats, and availability of the plant are involved. Only very rarely are 'cabbages' or non-leafy vegetables cooked separately from the other foods of the meal. Often there is not meat or fish to complement a meal, in which case 'cabbage' provides the relish or major protein component. Previously, the 'cabbage'/vegetable would wither have been cooked in a stone oven or in green bamboo along with the other foods of the meal. At present, it is very often boiled in a soup containing coconut.

The important endemic or indigenous vegetable species of the Solomon Islands are presented in Table 4.

Chines cabbage (*Brassica pekinensis*) has recently been introduced and is now one of the most successful exotic vegetables crops grown in the Solomon Islands. Apart from growing well, one reason for its success (and similarly the success of shallot, *Allium cepa*), is that these foods are also leafy vegetables, and are therefore acceptable to the tastes and culinary practices of the people. From the other successfully introduced vegetables, snake bean (*Vigna unguiculata ssp. sesquipedalis*), snake gourd (*Trichosanthes cucumerina*), cucumber (*Cucumis sativus*) and green pepper (*Capsicum annum*) are also popular, probably for the same reason. Other introduced vegetables that are of importance within the Solomons are pumpkin (*Cucurbita moschata*),



tomato (*Lycopersicon esculentum*), winged bean (*Psophocarpus tetragonolobus*) and eggplant (*Solanum melongena*).

Scarcity foods: This type of plants includes species that are only used for food in times of crop failure. Solomon Islands is prone to cyclones, earthquakes and subsequent outbreaks of crop pests and diseases, all of which can have traumatic effects upon local agriculture. When crop failure occurs, rural Solomon Islanders are better equipped to overcome the adversity than peoples elsewhere in the world, because they possess the knowledge of the useful and edible plants around them.

Many foods presently regarded as scarcity foods formerly were major constituents of the diet. Such foods therefore must be classed as traditional foods, and part of a Solomon Islander's heritage. The change in their usage was brought about by several factors, in particular the advent of sweetpotato and other new crops and improved varieties which increased the productivity of the food gardens. A second important factor was that most of these traditionally gathered foods require laborious harvest, preparation and/or detoxification, and therefore are only considered for use in times of stress.

Cycas rumphii, commonly known as Malayan palm-fern, is occasionally cultivated around houses and towns as an ornamental. In Rennell, the sour hard-shelled nuts are eaten, albeit seldom these days. The sourness derives from hydrocyanic acid, and is removed by wrapping the seeds in the leaf of a fern, *Microsorium scolopendria*, and soaking them in water for five days or more. Detoxified seeds are then pulverized and cooked by the same method as that employed for most traditional puddings. In north Malaita and the Reef islands, the bark sap is used as a traditional wood glue for such items as carvings and toy ukeleles the fruit pulp is also used as a medicine for treating a stomach ailment and a type of tropical ulcer affecting the lower limbs.

Table 4: The endemic or indigenous plant species used as vegetables in the Solomon Islands

Species	Parts used	Description
<i>Abelmoschus manihot</i>	young leaves	throughout
<i>Bruguiera gymnorrhiza</i>	fruit	throughout
<i>Cucurbita sp.</i>	fruit	throughout (forest)
<i>Cyathea vittata</i>	stem core, young fronds	throughout
<i>Cyathea brackrenridgei</i>	young leaves and fronds	throughout
<i>Cyathea hornei</i>	young foliage	Roviana
<i>Cyclosorus magnificus</i>	shoots, young leaves	throughout



Species	Parts used	Description
<i>Dennstaedtia samoensis</i>	shoots, young fronds	throughout
<i>Diplazium esculentum</i>	stems, leaflets	throughout
<i>Diplazium proliferum</i>	shoots, leaves	occasional, throughout
<i>Diplazium stipitipinnula</i>	leaflets	throughout
<i>Ficus wassa</i>	young leaves, fruits	lowland
<i>Ficus copiosa</i>	young leaves, fruits	lowland
<i>Ficus edelfeltii</i> ssp. <i>bougainvillei</i>	young leaves	lowland
<i>Ficus prassinicarpa</i>	young leaves	Rennell, Santa Ana
<i>Geniostoma rupestris</i>	young shoots	occasional
<i>Gnetum gnemon</i>	leaves, fruits	lowland forest
<i>Marsdenia tenaciosina</i>	young leaves	throughout
<i>Pisonia grandis</i>	young leaves and shoots	coastal
<i>Polyscias fruticosa</i>	young leaves	throughout
<i>Polyscias macgrillivayi</i>	young leaves	throughout
<i>Polyscias scutellaria</i>	young leaves	Temotu, throughout
<i>Polyscias verticillata</i>	young leaves	throughout
<i>Pseuderanthmum</i> sp.	young leaves and shoots	coastal and inland
<i>Saccharum edule</i>	unopened flower	throughout
<i>Sauropus androgynus</i>	young leaves, tops, flowers	introduced
<i>Solanum verbascifolium</i>	fruit, leaves	throughout
<i>Stenochlaena laurifolia</i>	immature fronds	throughout

The exocarp of *Corynocarpus cribbeanus*, known locally as 'ibo kwao' and 'ibo bala', is used as food after cooking. The large fruits are made edible by pounding them until soft. The fruits of *Pouteria maclaycma*, locally called 'ngiduiafa', was described by Whitmore (1966) as having an edible yellow flesh and are cooked before they are eaten.

Certain species which were once considered as staple foods are now regarded by Solomon Islanders as scarcity foods. Examples as certain *Dioscorea* species of the forest, swamp and wild taros, *Haplobus* sp., *Inocarpus fagicerus* and *Tacca leontopetaloides*.

Plants used as narcotics, flavours, and source of grubs: There are some species of plants with assorted usage whose individual importance should not be underestimated. The betel nut (*Areca catechu*) is a significant item among the



locally grown and consumed agricultural products, and has a considerable effect on the local economy. The nut is used as a masticatory usually in combination with the leaf of *Piper betle* and with a little lime. It acts as a stimulant. In much of the Solomon Islands betel nut chewing is a ritual when meeting people and at gatherings. As with other pabils, the outer wood of the trunk is used for walling, flooring or battens. The juice of the betel nut husk is used to treat conjunctivitis, toothache, dysentery, diarrhea and stomachaches (Powell, 1976).

Piper betle is an economically important plant in some areas of foliage, fruit and occasionally pieces of stem are sold in local markets as a masticatory to chew with betel nut. The leaf has a hot flavour and acts as a gentle stimulant.

During times of betel nut scarcity, the fruits of *Rhopalobla elegans*, locally known as 'fa'i dai'i-kwai', are used as a substitute. The trunk is more commonly used for construction. Since the species is abundant and found in dense forest, the leaves are often used for roofing of temporary shelters.

The trunks of *Caryota rumphiana* are used to culture the larvae of a large palm-tree eating beetle, probably *Rhynocaphorus* sp. In certain households, the essential part of the diet. *Bruguiera parviflora* is used as source of protein from crustaceans, shellfish, and bivalve molluscs that inhabit the fallen trees in magrove areas.

Agriculturally important plants: In the traditional agriculture of the Reef Islands, certain trees are encouraged or deliberately left unfelled on the periphery of food gardens, because people believe that the leaf fall on the garden increases the goodness of the ground. Trees reported as valuable for maintaining garden fertility are *Ficus benjamina*, *Hibiscus tiliaceus*, *Pterocarpus indicus*, *Schleinitzia novo-guineensis* and *Spondias cytherea*.

Many species of plants are traditionally used as live fences because pig rearing, and the damage wild or uncontrolled pigs can cause, is very significant in rural Solomon Islands. Despite various cattle development projects, pig livestock remains the foremost livestock activity of the rural areas Fencing is therefore important to control the movement of pigs. The species used fences in the Solomons are *Barringtonia araiorhachis*, *Barringtonia racemosa*, *Euodia hortensis*, *Fagraea racemosa*, *Nastus productus*, *Phyllanthus ciccoides*, *Pisonia cauliflora*, *Premna corymbosa* and *Pterocarpus indicus*.

With the exception of some densely populated areas, firewood is plentiful in Solomon Islands. Firewood is generally the only domestic cooking fuel used in the rural areas, also being essential for the drying of copra and cocoa. Though almost any tree can be used for firewood, the small, fast growing trees of secondary regrowth in old gardens are a common source. The most



commonly used species for firewood are *Eugenia clusiifolia*, *Schleinitzia novoguineensis* and many mangrove tree species.

Materials for construction, canoes, cordage and carving. One of the main assets of rural life within Solomon Islands is that people can build comfortable, safe and durable housing, and wooden canoes from the plant materials that surround them. This facility derives from the knowledge Solomon Islanders have both of the durable timber tree species and the vines, palms, tree ferns and bamboos in the forest. The species used as building materials, cordage/ropes, canoe timber and carving in the Solomon Islands are presented in Table 5.

Customary uses. Many plants in the Solomon Islands are used in the making of traditional articles such as putty, woven materials, dyes, tools, carved household receptacles, weapons, and fishing apparatus. The physical properties of leaves are also exploited in many traditional Solomon Island practices for which a flexible, watertight or insulating lamina is required. The most common and important use of leaves is for roofing and walling, with the other uses being for insulating stone ovens, sealing food within ovens, and for parcelling all manner of items. Plants are also used as perfume, and as items for personal adornment for custom dancing, festivities and ceremonies. Still other indigenous plant species are traditionally employed as fish poisons. The plant species with customary uses in the Solomon Islands are presented in Table 6.

2.2 LANDRACES (FARMERS' VARIETIES) AND OLD CULTIVARS

It is only in the last two hundred years or so that there has been significant contact with countries outside the Solomons, and a consequential import and export of plant species. A great majority of the 217 useful species are indigenous to the country, and have traditionally been collected from the forests or grown in the home gardens. It is therefore to be expected that a great deal of traditional farmers' varieties and landraces of staple food plants, fruit and nut trees, vegetables, spices and plants for customary uses that the Solomon Islanders have been cultivating for generations still exist and are maintained in the rural communities of the Solomon Islands.


Table 5: Species used as building materials in the Solomon Islands

Species	Family	Uses
<i>Alstonia scholaris</i>	Apocynaceae	commercial timber
<i>Areca macrocalyx</i>	Arecaceae	house timber
<i>Bambusa vulgaris</i>	Poaceae	construction, container
<i>Bambusa blumeana</i>	Poaceae	construction, tongs
<i>Calamus stipitatis</i>	Arecaceae	cane, cordage
<i>Calamus vestitus</i>	Arecaceae	cane, cordage
<i>Calamus hollrungii</i>	Arecaceae	cane, cordage
<i>Calophyllum inophyllum</i>	Clusiaceae	canoe and house timber
<i>Calophyllum vitiense</i>	Clusiaceae	commercial timber
<i>Calophyllum kajewskii</i>	Clusiaceae	commercial timber
<i>Camptosperma brevipetiolata</i>	Anacardiaceae	commercial timber
<i>Canarium salomonense</i>	Burseraceae	commercial timber
<i>Commersonia bertramia</i>	Sterculiaceae	house timber, rope (bark)
<i>Cordia subcordata</i>	Ehretiaceae	carving
<i>Cyathea whitmorei</i>	Cyatheaceae	house timber, spears
<i>Cyathea alta</i>	Cyatheaceae	house timber, fence
<i>Dillenia salomonensis</i>	Dilleniaceae	commercial timber
<i>Elaeocarpus sphaericus</i>	Elaeocarpaceae	commercial timber
<i>Endospermum medullosum</i>	Euphorbiaceae	commercial timber
<i>Flagellaria indica</i>	Flagellariaceae	cordage
<i>Flagellaria gigantea</i>	Flagellariaceae	cordage, decoration
<i>Gmelina moluccana</i>	Verbenaceae	canoe and house timber
<i>Gomphandra montana</i>	Icacinaceae	house timber
<i>Gulubia macrospadix</i>	Arecaceae	flooring material
<i>Intsia bijuga</i>	Caesalpiniaceae	house timber, fence
<i>Macaranga similis</i>	Euphorbiaceae	house timber, firewood
<i>Macaranga urophylla</i>	Euphorbiaceae	house timber, firewood
<i>Nastus obtusus</i>	Poaceae	construction, container
<i>Palaquium sp.</i>	Sapotaceae	commercial timber
<i>Pometia pinnata</i>	Sapindaceae	commercial timber
<i>Schizomeria serrata</i>	Cunoniaceae	commercial timber
<i>Schizostachyum tessellatum</i>	Poaceae	construction, poles
<i>Scindapsu cuscuaria</i>	Araceae	cordage
<i>Scindapsus altissimus</i>	Araceae	cordage



Species	Family	Uses
<i>Securinega flexuosa</i>	Euphorbiaceae	house timber
<i>Terminalia brassii</i>	Combretaceae	commercial timber
<i>Terminalia calamansanai</i>	Combretaceae	commercial timber
<i>Vitex cofassus</i>	Verbenaceae	house timber
<i>Xanthostemon sp.</i>	Myrtaceae	carving, posts

**Table 6: Indigenous plant species with customary uses
in Solomon Islands**

Species	Family	Customary uses
<i>Barringtonia asiatica</i>	Barringtoniaceae	fish poison
<i>Calophyllum inophyllum</i>	C1usiaceae	perfume
<i>Cananga odorata</i>	Annonaceae	perfume, adornment (flowers)
<i>Coix lachryma-jobi</i>	Poaceae	necklaces
<i>Derris heferophylla</i>	Papilionaceae	fish poison (salt water)
<i>Derris sp.</i>	Papilionaceae	fish poison (fresh water)
<i>Euphorbia plumeroides</i>	Euphorbiaceae	fish poison
<i>Ficus variegata</i>	Moraceae	custom clothing
<i>Guillainia purpurata</i>	Zingiberaceae	wrapping, packaging
<i>Heliconia salomonensis</i>	Heliconiaceae	sealing stone ovens, roofing
<i>Hibiscus rosa-sinensis</i>	Malvaceae	adornment (flowers)
<i>Hydrocotyle javanica</i>	Hydrocharitaceae	fish poison
<i>Pandanus ysabelensis</i>	Pandanaceae	mats
<i>Pandanus sp.</i>	Pandanaceae	mats, baskets, purses, rope
<i>Pandanus sp.</i>	Pandanaceae	rain capes
<i>Pangium edule</i>	Flacourtiaceae	bangles, rattles (for dances)
<i>Parinari glaberrima</i>	Chrysobalanaceae	putty
<i>Plumeria spp.</i>	Apocynaceae	perfume
<i>Polygala paniculata</i>	Polygalaceae	perfume
<i>Rhus taitensis</i>	Anacardiaceae	black dye
<i>Selaginella sp.</i>	Selacinellaceae	decoration



CHAPTER 3

National Conservation Activities

3.1 *IN SITU* CONSERVATION ACTIVITIES

We have no information on this.

3.2 *EX SITU* COLLECTIONS

The national germplasm collections in Solomon Islands are maintained by the Ministry of Agriculture and Fisheries in Dodo Creek Research Station, Honiara and in the ten Field Experimental Stations scattered in the major islands of the country. Reflecting the emphasis that the country puts on vegetatively reproducing species, the collection root crops, fruit and nut trees, plantation crops and spices maintained in field genebanks. The seed collections of the few species maintained by the Ministry are kept in short-term storage facilities.

The philosophy subscribed to in collecting and maintenance of crop genetic resources is that the materials must have potential for utilization and release to the farmers of the country. Maintenance of genetic variability *per se* is only of secondary importance.

Root crops: A number of expeditions to collect root crops germplasm were mounted over the years, resulting in the assembly of; among others, over 400 accessions each of sweetpotato (*Ipomonea batatas*) and greater yam (*Dioscorea alata*) 30 of lesser yam (*D. esculenta*) 167 of *Colocasia esculenta*, 40 of cassava (*Manihot esculenta*) and a few of *Dioscorea bulbifera*, *D. Pentaphylla*, *D. nummularia*, *Alocasia sp.* *Xanthosoma sagittifolia* and *Amorphophallus campanulatus*. The collected material consists entirely of materials. Due to the difficulties associated with the maintenance of living collections in field genebanks, a large percentage of the collection was lost over the years. Re-collecting of crops germplasm is planned in the future as part of the national initiative. The current status of the root crops collection is outlined in Table 7



Fruit and nut trees: The indigenous fruits of the Solomon Islands are part of the staple of the rural folks. Much of the genetic diversity in these species can still be found in the islands of the country, and at present the species are part of the natural forest vegetation or are maintained in the traditional gardens. There is however the worry that continued deforestation and the introduction of exotic fruit species may be leading to genetic erosion and the cutting down of indigenous fruit trees.

Of the 63 indigenous species utilized as fruits and nuts in the Solomon Islands, germplasm collections are maintained only in the following, species: *Artocarpus altilis* (40 accessions), *Barringtonia edulis* (16 accessions), *Burckella obovata* (one accession), *Canarium indicum* (37 accessions), *Canarium salomonense* (one accession), *Canarium harveyi* (35 accessions), *Eugenia malaccensis* (one accession), *Facourtia inermis* (one accession), *Inocarpus fagiferus* (one accession), *Pometia pinnata* (one accession), and *Terminalia catappa* and *Terminalia salomonense* (8 accessions).

Table 7: Current status of the root crops collection in the Solomon Islands

Species	Number of accessions collected	Number of accessions left as of 1995
<i>Alocasia sp.</i>	5	--
<i>Amorphophallus campanulatus</i>	2	--
<i>Cyrtosperma sp.</i>	1	--
<i>Dioscorea alata</i>	400+	20
<i>Dioscorea bulbifera</i>	23	--
<i>Dioscorea esculenta</i>	30	22
<i>Dioscorea pentaphylla</i>	3	--
<i>Ipomoea batatas</i>	421	36
<i>Manihot esculenta</i>	40	37
<i>Xanthosoma sagittifolia</i>	8	--

Among the introduced fruit trees in the country, a significant total of 59 cultivars of mango (*Mangifera indica*) are maintained in 10 experimental stations all over the Solomon Islands. The mango germplasm consists of 25 cultivars previously introduced into the country, while the rest were recent introductions from Fiji, Cook Islands and Australia. Local germplasm of *M.M. indica*, *M. minor*, *M. mucronulata* and *M. salomonensis* is available but has not been collected.



A few accessions each of the following introduced fruit species are also maintained: *Annona cherimola* x, *A. squamosa*, *A. muricata*, *A. squamosa*, *Artocarpus heterophyllus*, *Averroha carambola* (915 varieties), *Carica papaya*, *Chrysophyllum cainito*, *Citrofortunella microcarpa*, *Citrus aurantifolia*, *C. aurantium*, *C. maxima*, *C. limon*, *C. medica*, *C. paradisi*, *C. Reticulata*, *C. sinensis*, *Durio zibethinus*, *Garcinia mangostana*, *macadamia integrifolia*, *malthigia glabra*, *Manilkara sapota*, *Morus alba*, *Nephelium lappaceum* (10 varieties), *Passiflora edulis*, *P. quadrangularis*, *Persea gratissima*, *Psidium guajava*, *Rollinia deliciosa* and *Vitis vinifera*.

Plantation crops: A germplasm collection of coconut (*Cocos nucifera*) consisting of -- accessions is maintained in --. The collection contains materials from the national as well as regional and international collections.

About

20% of the material is from the Solomon Islands, and not all of the local variability in the crop has been sampled. Further collection is planned to fill in gaps in the collection, as well as to obtain materials possessing characteristics desired by the farmers of the Solomon Islands.

A total of 25 hybrids of *Theobroma cacao* initially from Sabah and several 'Amelonado' clones are maintained. The traditional 'Trinitario' clones in the country were wiped out by canker and so are not represented in the collection. Also maintained are 13 clones of *Coffea robusta*, and four strains of variety 'Catimo' and one of 'San Rimon' of *C. arabica*.

Vegetables: There are no germplasm collections maintained of the 72 indigenous or endemic species used as vegetables in the Solomon Islands. A collection of 45 accessions of *Abelmoschus manihot*, representing a significant proportion of the variability of the species in the country, has been made in the past. Eight accessions are maintained in Cote d' Ivoire, while the been lost.

Spice crops. Although the Solomon Islanders traditionally use 12 indigenous species of herbs and spices, only one variety of one species, turmeric, is maintained in the germplasm collection. However, farmers' cultivars are still maintained by the rural folks in their home gardens, or are still part of the natural forest vegetation. Germplasm collections of the following introduced spice species are maintained: vanilla (one variety), chillies (three varieties), cardamom and *Zingiber officinale*.



CHAPTER 4

National Goals, Policies, Programmes and Legislation

4.1 CUSTOMARY LAND OWNERSHIP AND PROPERTY RIGHTS

The state recognizes the sovereignty of the traditional owners over the resources. Under the Forest Resources and Timber Utilisation Act of 1969, granting of commercial logging rights is subject to both the approval of the state and the province, then require the consent of the traditional land-owners before agreement is prepared. The act requires the companies to identify areas which should be excluded from the logging agreement on the grounds of environmental and social values.

Customary land tenure provides no formal written title to land vested in or groups of owners. Local people, nevertheless, acknowledge that identifiable tracts of land belong to particular clans or clan segments. The system of land rights is not codified, defined by commonly accepted attitudes and practices.

The key decisions over access to the forest resource are in the hands of the resource owners - the customary land-owners. The government's role is largely in financial vetting of a company's investment proposals and stipulating conditions. The government also insures that the company has correctly identified the owners of the forest resource in various practices involved in logging and sawmilling. It also collects taxes from logging and other forestry sector operators.

The Solomon Islands Government developed a more comprehensive forest policy in 1989, namely "encouraging large scale reforestation, control of harmful logging practises, market study and diversification, ensuring that the government and landowners receive a fair return, and the development of local processing capability". Failure to achieve these aims was attributed to shortcomings in the forestry legislation, institutional weakness and lack of public awareness and participation. The new policy developed from the review identified six imperatives for forests: protection of the forests and forest ecosystems and related cultural values; sustainable use; meeting basic needs of the population; participation between the government and the owners; and fair distribution of forest-derived benefits. Six objectives were formulated in the policy review including: the requirement for post-logging development as part of logging licences; sustained yield management to be implemented by



the provincial governments; encouragement of domestic processing of timber and discouraging log exports; creation of a reforestation agency with a control and planning role; fostering of cooperation in the forestry sector; and protection of environmentally and culturally sensitive and valuable areas through establishment of reserves.

While on the surface such policies would appear capable of achieving a more manageable exploitation of the forests, in reality constraints are far too great for the Solomon Islands Government to implement the policies, at least in the immediate future. The government lacks the resources to efficiently manage its forestry sector. There are insufficient trained forestry personnel in government at all levels to carry out regulatory responsibilities with respect to the activities of the private companies. The constraints to achieving the policy goals identified by government itself are lack of authority over customary land; lack of finance to establish effective and investment in reforestation; lack of appropriately trained people at all levels; and lack of know-how and technology, including knowledge of the extent of the resource.

4.2 DIVERSIFICATION

The current agricultural policy of the government calls for diversification in the species cultivated by farmers. The growing of high value cash crops is recommended, for the purpose of improving nutritional availability, for their export potential, and for the needs of the burgeoning tourist industry. The species recommended for the diversification program are *Canarium indicum*, *Capsicum annum*, *Terminalia catappa*, *Terminalia kaernbachii* and exotic and indigenous fruit trees.