Urban Gardening on the Small Islands of the Pacific

Pacific Island countries historically have been almost entirely dependent on subsistence and commercial agricultural, wildland and fisheries production in rural areas as the foundation for sustainable development. Today, however, these small-island states are among the most rapidly urbanising areas of the world.

Urban gardening is seen as perhaps the most culturally and cost-effective means of simultaneously addressing many of the economic, cultural, nutritional and environmental problems arising out of urbanisation and globalisation.

Increasingly large proportions of the population no longer have access to their traditional inherited holdings. As a result, most Pacific Island countries are

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increasingly, and dangerously, dependent on imports. Food security is a major concern in all of the independent island states and the people of the Pacific Islands have some of the highest rates of nutrition-related non-communicable diseases. Furthermore, trees, cropland and coastal and mangrove forests are cleared for urban expansion, leading to the loss of fuelwood reserves and a wide range of medicinal plants, destruction of habitats for many animals and increased vulnerability to erosion, saltwater incursion and flooding.

This study is based on several other studies conducted over the past twenty years (Thaman 1988, 2002) in Papua New Guinea, Fiji, Tonga, Kiribati and Nauru, New Caledonia, Solomon Islands, Vanuatu, Samoa, Niue, the Cook Islands, Tuvalu and French Polynesia.

The two main types of Pacific Island urban gardening are categorised here as 1) “houseyard” gardening adjacent to residences, and 2) gardening on idle or undeveloped land within urban areas, but usually at a distance from the residence. The term gardening is used, rather than “agriculture”, because the focus is more on production for subsistence, although some periurban agricultrists plant crops, such as seasonal vegetables, taro and cassava, on a larger scale for commercial sale.

HOUSEYARD GARDENING

“Houseyard” or “dooryard” urban gardening is a ubiquitous feature of almost all Pacific Island urban landscapes, even in very densely settled urban areas in the atoll micro-states, such as urbanised South Tarawa in Kiribati or Fogafale Islet on Funafuti Atoll. Even in areas not renowned for agricultural diversity, such as Kiribati, Tuvalu and Nauru, urban gardens contain a wide range of food trees, non-tree staple and supplementary food plants, and non-food plants (see Thaman, 1995).

Random surveys of home gardens in Port Moresby, Papua New Guinea; Suva, Fiji; Nuku’alofa, Tonga; South Tarawa, Kiribati; Nauru Island; and “Location”, the contract-worker settlement on Nauru, indicated that at least 85, 114, 79, 61, 33, and 65 different species or distinct types of food plants, respectively, were cultivated in home gardens in these areas. These plants included: staple root crops, supplementary non-tree fruits and vegetables, a great variety of food trees, spice plants and beverage, stimulant, and depressant plants. Many of these plants were found to be present in a majority of home gardens.

In addition to these plants, there is an almost endless variety of useful non-food plants found in home gardens. These include important handicraft plants such as Pandanus cultivars, the leaves of which are treated and used to make mats, thatching, baskets, hats and a wide range of other plaited ware; paper mulberry (Broussonetia papyrifera), the treated bast fibre of which is used for bark cloth or tapa cloth; annatto (Bixa orellana) and Java cedar (Bischofia javanica) (both sources of dyes); Leucaena leucocephala, an important renewable fuelwood resource; a great range of medicinal plants; plus countless other plants of considerable technological, economic, social, ecological, and ornamental value. There is a great cultivar diversity among

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Planting taro under coconut and bananas in a small clearing near Pago Pago, Tutuila, American Samoa.

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the more important food and handicraft plants. As stressed by Soemarwoto et al. (1985) in their study of Javanese home gardens, true plant diversity is far greater than indicated by species differences, since many species are represented by numerous cultivars. In Tonga, for example, there are numerous distinctly named breadfruit cultivars, the commonest of which are ma’o’ala, maopo, pou, loutoko, kea and ‘aveloa. There is similarly great cultivar diversity among other crops such as coconuts, mangoes, yams, and sweet potatoes all of which add economic, ecological and nutritional stability to urban gardening systems. There are also countless “weed” species, which are important components of urban agroforestry.

The most common plants, in terms of cover abundance, are often traditionally important staple root crops. These include taro (Colocasia esculenta), cassava (Manihot esculenta), tannia or cocoyam (Xanthosoma spp.), sweet potato (Ipomoea batatas), greater yam (Dioscorea alata) and sweet yam (D. esculenta), giant taro (Alocasia macrorrhiza), and giant swamp taro (Cyrtosperma chamissonis). Colocasia aro is particularly well suited to urban conditions because it can be grown on small plots, either as a staple for its corms, or for its leaves, which constitute the most common leafy vegetable or “spinach” in many areas. Cassava, by far the most common plant in urban Suva and the most important locally-produced staple food in Fiji, is abundant in houseyard gardens, open lots and along road frontages.

Supplementary non-tree food crops are also extremely diverse in Pacific Island houseyard gardens. They include vegetables, beans, sugarcane and corn and constitute a critical nutritional and economic resource. In some areas more temperate vegetables, such as lettuce (Lactuca sativa), radishes (Raphanus sativus) and carrots (Daucus carota) are occasionally cultivated, during the cooler months.

Although staple root crops are most numerous and cover the largest area in most gardens, food trees and other useful trees are commonly the dominant and most permanent plants of urban garden lands especially in long-settled areas. An exception would be at Location, the contract-worker settlement in Nauru, where little or no space for gardening exists, let alone tree cropping, and where a high proportion of plants are grown in artificial boxed beds or containers. Apart from bananas and scattered coconut palms, other trees found there are commonly non-bearing juveniles.

Trees constitute a particularly important economic and nutritional resource on small, low-lying islands, such as the atolls of Kiribati, Tuvalu and the Marshall Islands, where, apart from giant swamp taro (Cyrtosperma chamissonis), generally reserved for special occasions, the main staples are all tree crops: coconut, breadfruit, banana or plantain clones, pandanus, and the native fig (Ficus tinctoria). Trees are also very important in home gardens on high islands as well. Falanruw (1985) reports that on Yap, “tree gardens” developed by ancestors of the current generation “for the planting of food and other useful trees about homesteads, and in the drained areas created by the excavation of taro patches and construction of paths between homes and villages involved about 50 species of food trees alone.”

Trees of particular importance to the Indian population of Fiji (mostly descendants of indentured labourers, who currently make up over 40% of Fiji’s population) include jackfruit (Artocarpus heterophyllus), horseradish or drumstick tree (Moringa oleifera), curry leaf or Indian bay (Murraya koenigii), and tamarind (Tamarindus indica). In addition, they also plant most of the other common fruit trees in towns and in houseyard gardens on smallholder cane farms.

Fruit trees that are common to occasional in houseyard gardens in Papeete, Tahiti and in urban villages on some atolls in the Tuamotu Archipelago in French Polynesia, in New Caledonia and in Port Vila, Vanuatu (where there has been French and Chinese influence), but not normally found elsewhere in Pacific Island urban areas are litchi (Litchi sinensis), Spanish lime (Melicocca bijuga), longan (Dimocarpus longan), inga (Inga edulis) and Otahiti gooseberry (Phytilanthus acidus). A wide array of non-food plants used for handicrafts, fuel, medicines, fibre, dyes, perfumes and animal feed, livestock feed, shade, construction materials and other purposes are also important components of urban gardens. Medicinal plants, for example, are a critical economic, health and cultural resource, given the extremely high, and rapidly increasing, costs and unavailability of some imported medicines. Particularly on the smaller, more densely-populated islands of Tonga and Kiribati most medicinal plants can be found cultivated or protected in home gardens. The importance of sacred or perfumed plants in urban gardens is also considerable. Of some 49 species considered by Tongans to be sacred plants (skau kakala), 36 were found present in a survey of home gardens in the capital of Nuku’alofa. In addition to their sacredness, such plants constitute a very significant economic resource. Their flowers, leaves, fruits and bark are used in leis and ornamentation for the expanding tourism industry, and they are the main scents used in body oil (coconut oil), perfumes and deodorants, for which there is a rapidly expanding export market. The imported substitutes for these scented products are also extremely expensive and often not culturally acceptable.

Urban agroforestry systems yield firewood, building materials, dyes, livestock feed, insect repellents, handicrafts, fish poison, etc. Of particular note in urban Apia, the capital of Samoa, is the poumuli tree (Flueggea flexuosa), a fast-growing tree favoured for use as houseposts in traditional Samoan houses (fale), which can be found in a majority of houseyard gardens.

CRoPPING PRACTICES

In terms of actual area under food crops and their spatial distribution, there is great diversity. Whereas some households have only a few scattered...
fruit trees and vegetables, many cultivate food crops on over 50% of their allotments. Trees become increasingly dominant in long-settled areas, as cash incomes increase, soils decline in fertility, and tree seedlings mature and increasingly shade garden areas. Oramentals are commonly planted closest to the home, often in front yards, as well as in containers, often on front porches. Medicinal plants, sacred or fragrant plants, and other culturally valuable, commonly multipurpose plants, are scattered amongst the food plants and ornamentals.

**URBAN GARDENING ON UNDEVELOPED LAND**

Cultivation on idle or undeveloped land in urban areas is also very widespread in the Pacific Islands and provides an important source of produce, including limited commercial production. Undeveloped or idle lands in urban and periurban areas are important sources of food and products such as timber, fence posts, fuelwood, handicrafts medicines, leaves, flowers, fruits and nuts. Such areas include road frontages, empty allotments, river banks and valleys, right-of-ways for proposed or existing paths and roads, and open land in general, including hillside, swampland, etc.

The most common species in “undeveloped areas” are again the staple root crops. Along road frontages, fruit trees, such as mangoes and coconuts are common, but ornamental and shade trees, many of which are systematically planted by city councils or the government, as well as by individual households, are dominant. Living fences of fruit trees and other useful species, such as *Polyscias spp.*, *Leucaena leucocephala*, *Erythrina variegata*, *Hibiscus tiliaceus*, *Hibiscus rosa-sinensis*, *Casuarina equisetifolia*, and the recently introduced madre de cacao (*Gliricidia sepium*) are harvested, pruned, pollarded, or “grazed” and constitute important sources of food, fodder, firewood, medicines, and flowers, as well as being of considerable ecological importance.

It must be stressed, however, that despite the current importance of gardening on undeveloped urban and periurban land, it is these areas that are most severely affected by wanton deforestation because of insecure tenure and undefined ownership. This scramble for wood and associated deforestation is clearly visible and rapidly increasing in Pacific Island urban areas.

**IMPORTANCE AND CONSTRAINTS**

Despite the considerable importance of urban gardening in the Pacific Islands, there are a number of problems faced by urban gardeners. Unfavourable climate, poor soils, cost and availability of land and water, insufficient time and labour, theft, and lack of government assistance were most commonly mentioned by those surveyed.

The problems relating to drought include the high cost of water, distance to community faucets, water cancellations and fear of City Council regulations against the use of water for gardening purposes. The atolls are also periodically affected by prolonged droughts, which commonly lead to the death of a significant proportion of breadfruit and citrus trees and other trees and food plants that are only marginally suited to the atoll environment. Urban gardeners commonly have to contend with infertile poor soils. Continual cropping on small urban plots also leads to declining fertility and loss of soil structure, unless ameliorative measures are taken. Both water shortage and poor soils, however, often make trees a more attractive proposition than short-term ground crops which require water and higher soil fertility.

Insufficient land and insecurity of tenure are problems in most areas. Insecurity of tenure seems to be a major problem and a strong disincentive to urban gardening. City Council regulations, although not strictly upheld, were also considered to be a disincentive and they discourage cultivation of ground crops and trees along road frontages. Other problems include diseases, insects, birds, rats, dogs, mongooses and noxious weeds; theft of produce, especially of banana bunches and tree fruit.

The importance of urban gardening and its implications for planning are not clearly understood by most planners and policy makers in the Pacific Islands because of a lack of quantitative data on its nature, extent, and cultural and ecological significance. However, increasing interest has recently been shown by some city planners and administrators, like in Vanuatu, Tonga, Kiribati, Tuvalu, the Federated States of Micronesia, and the Marshall Islands, where urban food dependency and increasing incidences of nutritional disorders have become serious problems.

**REFERENCES**


