Growing coconut palms in the Pacific Islands: Colliding knowledge and values
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From the 1840s, Europeans began to seek coconut oil as an ingredient in candle making, the demand soon accelerated by its use in soap production. Europe’s burgeoning population during the industrial revolution needed more oils than the tallow factories or olive groves could produce. Pacific Islanders undertook sporadic oil and copra making from coconuts to trade with Europeans for imported goods and, in some areas, to support churches. Copra, the desiccated endosperm of the nut, can be crushed for its oil, the residue used as cattle feed. In the late nineteenth century, Pacific colonial administrations in search of exports and revenues, encouraged coconut plantation development by European settlers. To the European mind, if palms were regularly spaced and of uniform height, they would get maximum sunlight and not compete for root space, resulting in more nuts and thus more copra. Weeding of undergrowth was needed so the palms could absorb more nutriment and produce more nuts. Additionally, once palms were bearing after six to eight years, it would be easier to collect mature, fallen coconuts before they took root. While coconut plantations were being developed in the tropical Pacific, several administrations urged Indigenous growers to emulate this European plantation husbandry in their existing groves and new plantings.

Among Indigenous growers there was passive resistance for half a century to all or some of these desiderata; most growers did not regularly cut down secondary growth or prevent all fallen nuts from taking root among the mature palms, for example. Few colonial governments, moreover, had the personnel to regularly police or punish such visible neglect. As coconuts became commodities, why did Pacific Islanders not produce according to the apparent potential of their groves, leaving many nuts to take root or rot? Why did resistance persist when Indigenous needs for cash increased? Were other factors at play, inbuilt in the Indigenous understanding of their societies and environments? Before Westerners encouraged ‘plantation forests’ based on their ‘science’, what purpose - other than markers of land boundaries, memorials of important events, as well as sources of food, drink, cosmetics, fibre, wood, utensils and medicine for Islanders - did coconut palms serve in coastal ecological systems?

Europeans viewing tropical landscape

Pacific traditions attest to the coconuts’ ubiquity, revealing their presence on most inhabited islands in the tropical Pacific (Map 1), as does the archaeological record dating back at least 5000 years. Coconuts were of particular significance to atoll dwellers, since few other food

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1 ‘European’ and ‘Western’ are generic terms and include people of European ethnicity, such as Americans.

crops thrived. Consisting of dead coral deposited over thousands of years as reefs atop submerged old volcanos, most atolls have little elevation above sea level beyond two or three metres. They have no soil, simply coral dust and rock with a thin humic layer from decaying vegetation. Inhabitants dug wells to tap the fresh water lens, but relied on the coconut in times of drought when the coconut’s ‘water’ provided drink and the kernel, food. European explorers noted groves of coconut palms as part of the mixed atoll forest with some more privileged near villages as food and leaf sources.³

In contrast, high islands with more varied topography are volcanic in origin, with a defined soil profile supportive of many food crops, diverse vegetation and usually potable surface water. In the late eighteenth century, explorer James Cook noted coconuts and took many on board for his crewmen to consume. At Tahiti, he was impressed by their number and size: A contrast to the inferior ones of the New Hebrides.⁴ Yet, several high islands had only scattered palms. Cook as well as Louis de Bougainville coming from eastern Polynesia recorded some on several islands of the New Hebrides including Santo, Ambae (Aoba), Tanna and Malakula, but they were not as prolific as on Tahiti. Even in 1890, Maewo and Pentecost, for example, had very few palms, as did, Samarai, British New Guinea in 1885 (Maps 2, 7, 10).⁵

<Map 1: The Pacific Islands with main geographical regions>

Across the islands were various systems of agroforestry, as there had been across the world and in the parts of Europe until the Middle Ages.⁶ They demonstrate ‘the deliberate incorporation of trees into, or protection of trees within, an agricultural system or agricultural land use philosophy, in order to ensure short-and long-term productivity, cultural utility, and ecological stability’.⁷ Accounts of Polynesia attest to plotted, ordered agroforests whose appearance appealed to the European viewer. Cook appreciated Tonga’s agroforests’ abundance and neat design.⁸ Others had similar impressions of Tahiti’s fruitfulness.⁹ Straight lines and regular spacing heightened the appeal of Rarotonga’s landscape (Map 7) in 1827 to missionary John Williams - an agroforest with boundaries of Tahitian chestnut trees (Inocarpus fagifer):

The whole island was in a high state of cultivation…. there are rows of superb chestnut-trees planted at equal distances, and stretching from mountain’s base to the sea, with a space between each row of about half a mile wide. This space is divided into small taro

⁵ Sydney Morning Herald, 5 Feb. 1885.
⁹ Oliver, Ancient Tahitian, 42-6, 253.
beds, which are dug four feet deep, and can be irrigated at pleasure...about half an acre each. The embankments round each bed are thrown up with a slope. The lowest parts are planted with Taro... and the sides...with Kape or gigantic [taro] while on the top... at regular intervals small beautifully shaded bread-fruit trees. 10

What drew Europeans to such vistas was familiarity. Much of European agriculture by the late eighteenth and early nineteenth centuries, along with ‘scientific’ forestry’s emerging practices were based on grid patterns. Such geometric configurations ‘recall the symmetry of old world nurseries’ while ‘their ordered rows are pleasing to the eye’. 11 Polynesian tropical agroforestry signified a level of civilization that many Europeans, such as Cook, understood, for little land seemed ‘idle’. 12

When Europeans first viewed western Melanesia, however, they recorded few ordered gardens and extensive cultivation (Map 2). The islands appeared populated, but cultivation was rarely on the coastal fringe. In 1774, Cook said of south Malakula, a high island in the New Hebrides (Vanuatu), ‘The country is luxuriantly clothed with wood from the Sea Shore to the Summits’ with on the east ‘a fine Coast covered in trees’, as was north Santo (Map 11). Dotted among the ‘woods’ inland were gardens made by shifting cultivation. 12 Unlike the mountain-to-the sea slice of territorial chiefdoms often found in tropical Polynesia, most Melanesian islands, with their small groupings of related peoples and localised leadership had small inland settlements. Melanesian coasts, because of intergroup conflicts and malarial mosquitoes, were generally avoided as residential sites until missionaries and colonial administrations drew them down. 13

<Map 2: Melanesia>

Shifting cultivation in Melanesia saw small areas of old forest cleared and cultivated and thus clan land claims established, with more recent occupancy visible in the form of valued trees and other vegetation typical of plantings around households and dispersed gardens. These included breadfruit, nuts, pandanus, sugar cane, coconut palms and local fig - and plum - type fruits, often amid pioneer species saplings near abandoned village sites. Actively cultivated gardens included shorter-term staples such as taro, yams and sweet potatoes along with bananas, plantains and green-leaf vegetables. While there was ordered spacing within the various crops, they were separated by tree-trunks or rocks, sometimes with rough terraces and low fences of felled saplings, to decay within a year or two. Melanesians rarely wasted energy on laying out large squares in transient gardens. There might be two to four gardens

for one household well apart at various stages - one being cleared and planted, the next producing the first harvest, the third with maybe a second, less abundant harvest and another with just the tree crops under fallow. The pre-European forest was a living patchwork of scattered gardens and ‘wild’ species sourced for medicines, building material, clothing, dyes, and magic. Certain areas had sacred connotations. While some islands had richer soils, all had their fertility renewed by humus accumulating from vegetation, a slow, efficient process of bush fallow of seven to 25 years. In some high islands, soil fertility was sometimes aided by systems of terraced irrigation.  

Atoll peoples’ knowledge of fertility renewal was particularly deep. Their science of cumulative observations in the Gilbert Islands (Kirbati), for example, showed that fallen leaves from particular endemic trees or shrubs, such as te kaura (*Sida fallax*), te uri (*Guettarda speciose*) and te mao (*Scaevola serica*), placed around the staple swamp tuber or babai (*Cyrtosperma chamissonis*) in pits hewn from the coral rock and grit, created a richer humus than others (Map 10).  

Humanised landscapes are mirrors of human input into the ecology. Before Europeans came, Islanders had extirpated several bird species and reduced in-shore and lagoon species. Although the high island forests were rich and, closer to the Asian archipelagos, diverse, they were susceptible to human impact. Less numerous vegetative species characterised islands further east in the Pacific. Those that survived oceanic distances or were carried by people thrived, creating a modified but fruitful ecology. Burning to clear for cultivation, exacerbated by low rainfall in El Niño periods and shortened bush fallow, induced savannah in some leeward regions such as west New Caledonia and Futuna Islands (Maps 1, 7). Some grasslands though, seem to have originated in the AD 1300 event of transition between the Medieval Warm Period and the Little Ice age which accelerated storminess and erosion.  

Centuries of experience taught the limits of the environment. Processes for conserving certain species during certain times, or who could consume certain foods, as well as limiting population growth developed, so that there was a balance between food supply and people.  


Indigenous knowledge, often in the form of a ban or *rahui* on certain sea and land food sources for a time, was more for accumulation, not sustainability. Islands too are labile, open to severe weather events and tectonic activity, so at times the people suffered and numbers fluctuated.

**Valuing the coconut**

Until coconuts were traded, Indigenous planting was sporadic. Some were planted as land boundaries and to mark significant social events, such as peace-making or a victory in battle. On some atolls where the coconut was an essential to life, if numbers of people increased, more palms were planted. In many societies, the umbilical cord of a newly born infant was buried and a coconut planted over it. One estimate for Melanesian islands is ten nuts planted for a household’s needs. Most coconuts, however, came from self-seeded palms, established where they fell, a part of the coastal plant ecosystem.

Foreign ships arrived bringing Christianity, continental diseases, and novel goods. The people bartered for these goods with local products, including coconut oil from as early as the 1810s, but more widely by 1840 to the 1870s and then for copra. The London Missionary Society was the first to encourage local production on Tahiti to support the mission with plantings of coconuts increasing under the chief, Pomare II in the 1820s. The coconut kernel could produce valuable oil, initially *in situ* but, by the late 1860s and 1870s, the dried kernel or copra was exported to Europe’s factories for processing into oil for candles but mainly soap and animal feed. Islanders, desirous of the new goods, turned to coconuts to trade, not just for subsistence. Labour migration from the 1860s to 1910s earned cash for some Pacific workers in Queensland, Hawai‘i, Fiji, and Samoa (Map 1). Continental diseases and migrations of people for work, not all of whom returned, drastically reduced populations, weakening communities.

Depopulation left vacant ecological niches and declining demand on natural resources, including coconuts. By the 1860s, the newcomers had ideas of filling

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these spaces. Depopulation, loss of knowledge, social upheavals, and Christianity’s challenges to ancient beliefs often meant less ability to resist European demands for land.\textsuperscript{24}

\textless Figure 1: Solomon Island workers making copra, Samoa, c. 1918. (From the album of Alfred James Tattersall, Te Papa (O.041889), Wellington)\textgreater

Particularly in western Melanesia, when the Europeans saw the coasts, because there were few regular patterns in dispersed gardens, the landscape appeared to be little disturbed primary forest; such lands offered economic opportunities. Elsewhere, Europeans had early transposed their favoured ‘Euclidean grids’ to the sugar plantations they had established from the sixteenth century in the Caribbean Islands and later to the tea, coffee, rubber, tobacco and coconut plantations of Southern Asia, the Americas and Africa. Such transposed landscapes were monocultures, designed for efficiency and minimum labour costs. That template came to the Pacific Islands, for cotton but simultaneously for coconut palms in the 1860s.

Yet among the Pacific’s Europeans there was little networking of knowledge of visible ecological degradation in other tropical regions, long the sites of imperial agricultural imprints.\textsuperscript{25} This ‘ecological innocence’ or ignorance characterised plantation agriculture.\textsuperscript{26} Because the coconut palm thrived best along the coast, the space of ecological change associated with its intensification was confined. There was another kind of ignorance. The initial economic success of plantation agriculture beyond the Pacific was based on a cheap, compliant labour force, mainly using slaves, or a landless proletariat, tenant farmers or indentured labour, far removed from their homes. The last option would prevail on European coconut plantations in the Pacific.

In the 1870s, when trader Eduard Hernsheim first viewed the Bismarck Archipelago (Map 2) he dreamed of ‘how the virgin forest would be replaced by plantations.’\textsuperscript{27} This dream was shared by many from Europe, parts of which had undergone an agrarian revolution, the enclosure of smallholdings and the expansion of industrialised farming. The equating of uncivilized people with wilderness contrasted with Europe’s civilised and cultivated landscapes and remained a deeply embedded binary in European thinking.\textsuperscript{28} Land-hungry migrants were steeped in its agricultural traditions where ‘idle’ land was anathema, so their visions of ordered plantations could be realised in this seemingly underused vastness. Such dreams survived downward prices for copra in the 1880s and 1890s, and re-asserted in the

\textsuperscript{27} Peter Sack and Dymphna Clark (eds and trans), Eduard Hernsheim: South Sea Merchant (Boroko: University of Papua New Guinea, 1983), p. 77.
first decade of the twentieth century as prices recovered. A planters’ guide, The Cult of the Coconut, encapsulated the dream: ‘The wealth of tropical trees, of tropical forest and vegetation - only a small fraction of which is yet utilised by man - is incalculable and indisputable’.29

Europeans soon imposed ordered plantations. In 1865, French authorities in New Caledonia (Map 2) were the first in the Pacific to recommend systematic planting of coconuts at seven metres (about 23 feet) apart, on the quinconce (quincunx) of alternate rows, creating a ground pattern of equilateral triangles. A few years later, wide spacing prevailed among German plantations in west Samoa with ten metres (30-32 feet) between palms (Map 9).30 Fiji’s Taveuni’s coast was still ‘patched with coconut groves’ in 1865.31 By 1879, with Fiji ceded to Britain in 1874, officials on Viti Levu were ‘encouraging’ settlers to plant coconuts in place of cotton after its price fell, as USA production recovered (Map 3).32 Some adopted one of the spacings recommended: 20 feet x 20 feet, 27 x 27, or 30 x 30 apart with 50-100 nuts per acre, depending on soils.33

MAP 3. Fijian Islands

Pushing planting

The British, wary of rapid change, maintained Fijian social structures or at least the idealised version that Arthur Gordon, governor from 1875 to 1880 consolidated, in co-operation with the chiefs.34 Given this policy of keeping rural Fijian society intact, the British gathered tax in kind, usually copra. They ensured this by introducing Indian labour for the planters and a vigorous campaign in 1897-99 to increase Fijian plantings. By 1898, they instructed the buli (magistrates) to see that all mataqali (land-holding social units with a common ancestor) planted 20 coconuts per person per annum, spaced 36 feet apart to be weeded three times each year.35 One observant official, however, noted an ecological difference between the European plantations and the ‘wild’ patterns of Fijians’ groves in 1898:

Experience shows that young coconuts… can stand a good deal of apparent neglect without being damaged, though they are better for a little weeding about their roots for

32 Thiercelin, Travels; 41; Thurston to Wilson, 23 Nov. 1879, Set 15, Vol. 5, Outwards correspondence, Cakobau and interim governments, National Archives of Fiji (hereafter NAF), Suva.
33 Sydney Mail and New South Wales Advertiser, 18 Sept. 1875; John Horne, A Year in Fiji or an Enquiry into the Botanical, Agricultural, and Economical Resources of the Colony (London: Stanford, 1881), pp. 171-74.
35 Circular to Buli, 11 Nov. 1897, reproduced in Na Mata, Dec. 1897, 180; June 1898, 82. I thank Paul Geraghty for his translation of the Fijian and for finding further references in Na Mata for 1897 and 1898.
the first few years after planting. The native owned coconut trees on Taviuni [Taveuni] for instance, scattered as they are along the coast with a considerable deal of undergrowth about their roots bear better than the carefully weeded plantations of many of the European settlers which are laid down in Thurston and Buffalo grass. The above is noticeable in other coconut districts of the Colony. In fact, some of the plantations alluded to above have… been ruined by being laid down in grass. The brushwood keeps the roots of the trees cool and they bear better when cleared.36

The planters’ clean, grassed surroundings of the palm had not cooled the earth as much as leafy understory did, so moisture escaped, stressing the palm, reducing the crop. Fiji’s planting drive yielded many thousands of palms, however.37 Fijians, nonetheless, preferred what their experience had taught them. Although the government continued to urge them to maintain weeded plantations along spaced patterns, the goal was not easily achieved. In 1909, the commissioner of Lau bemoaned the Fijians’ ‘laziness’: ‘they will not see that is they plant 25 trees in 50 sq yards (as I have actually counted at Moala) they will not get 25 mature trees, or even three, and the whole land will be wasted…. it is pitiful thing to compare the well-ordered rows of a European plantation with the wasted lands of the people…’38

A few officials understood the Indigenous social imperatives, common across the Pacific: …native owned coconut plantations compare very unfavourably with European owned. The latter are managed by people whose business in life is to make money out of copra and who devote all their time and energies to doing so. The Fijian… merely regards his coconut plantation as the source of what money he has to find for his Taxes and such small purchases as he may desire to make. He does not regard the care of his coconuts as the main end of his life, and…he has many other calls on his time.39

With minimum labour input and social cost, Islanders could collect coconuts from their groves when they had need of imported items or to pay tax. They were able to remain among the security of the wider family in their own place and satisfy their needs, a process the economists call ‘satisficing’, a Pacific cultural economy contrasting to the optimization of labour and capital on which the plantation economy was based.40

Yet, not all European plantations fitted the ‘scientific’ ideal of ordered rows of palms of uniform age, separated by grassed spaces, as a leading official in Fiji, William Macgregor had noted in Taveuni in 1887 (Map 3).41 Lawyer Edward Jacomb observed the same in the Anglo-French Condominium of New Hebrides (Vanuatu) in the 1910s.42 While often due to neglect, labour shortage was a perennial problem. The Condominium did not encourage

36 Re Scheme suggested by J. Borron, 1 July 1898, Draft Circular for councils, CSO 2561/1898, NAF.
37 See files CSO 2030/1898; CSO 2561/1898; Return of coconuts, 1900, CSO 1712/1900, NAF.
38 St Johnson, to Colonial Secretary, 10 July 1915, citing Report of Native Commissioner, 1909, CSO 6315/15, NAF.
39 Allardyce to Colonial Office, 27 July 1915, Minutes, CSO 6315/15, NAF.
41 MacGregor, Report, Vanua Levu and Taveuni, n.d., 1887, CSO 116/1888, NAF.
Indigenous planting because European planters needed local workers. Some missionaries, particularly the Presbyterians, seeing the demoralising effects of plantations on indentured labour, urged their followers to plant their own coconuts and so remain independent, reasserting their claim to seemingly unoccupied land. Almost all denominations encouraged some planting in most islands, in part to give some income to the people as well as to support the mission’s work.43

The New Hebrides’ imperial rivalry was such that the two home governments allocated administrative funds, so neither made significant efforts to encourage more ‘native’ copra production for revenue until after World War Two. Yet, in the 1930s Depression, when planters could not afford labour, they traded for ‘native’ copra to on-sell to merchants, stimulating local planting. Here and elsewhere, while an Indigenous family had usage rights to plant short term crops such as yams and taro on clan land, once the harvest was done, their right to it lapsed. Planting coconut palms with their productive life of 70 years removed land from use by other clan members, becoming an enduring claim. In most areas land was imbued with spiritual meaning, but erosion of old cosmologies by Christianity and capitalism, saw the potency of the link between community and spirits weaken. Slowly, land was becoming more a commodity, a process that could challenge social cohesion. This pattern of land eating was evident elsewhere, fragmenting clan lands, such as on Rotuma (Map 7). By World War Two, it was a potential source of tension, unless dealt with by customary transfer.44

In 1894, the first administrator of British New Guinea, William Macgregor, required the people plant coconut palms, with little effect because of minimal administrative structures. After Australia took over this region, renamed Papua in 1902, the administration from 1910 required villagers to plant coconuts along paths or on plots of land bought by the government. Enforcement on scattered settlements often proved too much for a single district officer in these more egalitarian societies, unlike Fiji with its hierarchies of compliant chiefs. Often too, the lands Papuans sold to the government were unsuitable for coconuts.45 A few enthusiastic officers managed to get many palms planted but rarely in regular grids. Difficulties arose in the Trobriand Islands where coconuts were a prestige food belonging to the paramount chief who opposed the planting, so the officers struggled for years to achieve the government’s aims.46 Elsewhere in Papua, ‘model’ government plantations to demonstrate how coconut

palms should be laid out had little effect, other than to provide opportunities for men to work off their tax debts (Map 2).47

In northeast New Guinea, the chartered German New Guinea Company (1885-1898) which effectively ran the territory, had tried growing cotton, sisal, and tobacco and eventually, coconut palms, the last the best earner.48 On New Britain, the Indigenous Tolai faced stark choices. The Company and independent planters had alienated much coastal land, often through questionable deals. Tolai realised the consequences as planters began to develop their holdings in the early 1890s. When Albert Hahl took over the administration from the chartered company in 1898 for the German government, he offered to return disputed land claimed by ‘Queen’ Emma Coe Forsayth from Samoa, if the people planted cash crops. A local leader, Abaram To Bobo had suggested this scheme in 1896 to recover lands for his people at Vunamami (Map 2). ‘[I]ndefatigable in planting coconuts,’ he also worked to lower customary ‘bride price’, encouraging early marriage to produce more children to fill the spaces emptied by previous conflicts and diseases and so keep the land from appearing ‘idle’. Within a decade, production for the Vunamami region had doubled. Hahl knew that the people produced most copra and that some had already planted coconuts for sale.49 Hahl also encouraged the first ‘village’ plantation with ‘proper spacing’, the proceeds to go to the people. Another leader, To Kinkin took up this suggestion. Village production was stimulated by a native head tax that could be met by cash or four weeks’ labour for the government. Making copra was more appealing than digging roads. Nonetheless, the majority did not tend their plantations, space palms, or plant them to the German ideal.50 On the eve of the Australian wartime occupation of German New Guinea, in 1913-14, at least 34 per cent of copra came from New Guineans.51

In German Micronesia’s atolls and small high islands, catastrophic hurricanes in 1905 and 1907 induced famine on several and the relocation of people (Map 4). Under administrative ‘guidance’, the ‘vacant’ lands then were planted with coconuts grid-style, much the same as German planters had practised in Samoa four decades before, led by Theodor Weber of Godeffroy and Son, who planted coconuts between rows of cotton. At least one Indigenous grower, Henry Nanpei on Ant atoll, Caroline Islands, by 1890 had adopted Western

47 Francis West, Hubert Murray: The Australian Pro-Consul (Melbourne: Oxford University, 1968), p. 232; Jackman, Copra, 56.
49 Richard F. Salisbury, Vunamami: Economic transformation in a traditional society (Melbourne: Melbourne University, 1970), pp. 115-8, 316-7; Peter Hempenstall, Pacific Islanders under German Rule: A study in the meaning of colonial resistance (Canberra: Australian National University, 1978), pp. 128-34. For interpretations of To Bobo, see Klaus Neumann, Not the Way it really Was: Constructing the Tolai past (Honolulu: University of Hawai’i, 1992), pp. 125-40.
50 Peter Cahill, ‘“An obsession of coconut planting”: Expropriated plantations on the Gazelle Peninsula of the Mandated Territory of New Guinea, 1914-1942’ (Ph.D. diss., University of Queensland, 1987), 47.
'scientific' planting, deploying his social relationships to obtain labour from former land holders (Map 1). Hurricanes and famine, however, had seen German policy made material in forests of coconuts, planted ‘nine metres’ apart, across parts of Micronesia, to extend to more atolls under the Japanese Mandate of the League of Nations from 1920, after Germany’s defeat in World War One (Map 5). Export copra increased threefold between 1922 and 1935. For these and other atoll peoples, with little else to trade, ‘Coconuts are their chief food, but - in the form of copra – their only kind of wealth – their money token, their only means of barter, and of their dealings with non-natives’.

Not only colonial administrations encouraged conversion of mixed atoll forests to coconut plantations: A single part-Samoan family, the Jennings, in fifteen years covered Swain’s Island’s 370 acres with palms by the 1870s. The Catholic priests in the Tuamotu atolls from 1870s convinced the people to plant 350,000 coconuts. On the larger French Polynesian islands such as Tahiti, Europeans and local growers produced much copra but usually as part of a range of cash crops from smallholdings (Map 7). Though the atolls in the region contributed a disproportionate volume of copra among exports in the 1880s, French Polynesia was exporting only about half that of Tonga and not as much as Samoa. On many other atolls of the Pacific, people gradually planted more coconuts as a result of contact with traders from about the 1880s on, reducing the density of strand tree species. Traders brought in goods which became part of Islanders’ lives and comforts, such as tinned meat, flour, tea, sugar, rice, metal axes, knives, fish hooks, tobacco and by the 1900s, timber to build boats.

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55 High Commissioner to Secretary of State, 3 Sept. 1908, WPHC 4/iv, copy in KNA.


In the Solomon Islands, the first British commissioner’s interest in Indigenous copra was its value to European traders and planters (Map 6). Charles Woodford in 1896 was convinced that an economic leap forward beyond the trade was needed to sustain the administration. The most reliable crop was the coconut. He offered huge areas of ‘waste’ land for coconuts to soap-makers, Lever Brothers. A European plantation economy was under way when Woodford retired in 1914. Any indirect government support for ‘native’ production was by imposition of a male head tax in 1921-22, creating need for cash to pay it, though the Methodist mission encouraged followers to make their own copra.60

One astute observer understood some of the demands on the environment from coconut plantations, an understanding largely ignored for another 50 years. In 1908, Walter Henry Lucas, the shrewd islands manager of Burns, Philp Co. Ltd, merchants and shippers, was sent to inspect their subsidiary planting companies in Solomon Islands. When on Long Island, south Choiseul he offered rare insightful ecological advice, modifying the European obsession with the symmetry of grids.

In these islands it is apparently quite unnecessary to burn off the felled scrub as on mainland plantations. The raw sandy soil is not likely to breed pests or fungus whilst the cover to the ground is of immense advantage in keeping the tropical sun from scorching the roots of the young plants.

The mistake made … in clearing from the water’s edge is very apparent in places, the absence of binding roots have allowed washaways during gales and high tides [sic].… I am of the opinion that it would be profitable to plant the outer line of trees [i.e. palms] fringing the water three times as closely (say 10 ft). With their roots in the saltwater and their heads in the sunlight they would flourish and also protect each other from wind and sea. The symmetrical appearance of the planted Islets would suffer, but there would be a solid cash gain.61

Lucas extended this in German New Guinea, on the Choiseul Plantations Ltd., a Burns Philp subsidiary at Sorakan, Bougainville where, in 1913, he ensured the fringing coastal trees and understory remained between the sea and the land under cultivation (Map 6).62 The nearest some other planters in the Solomon Islands came to this was to clear all shoreline vegetation except any existing mature coconut palms.63

Samoans, like most Pacific peoples, practiced agroforestry; crops of root staples, such as taro and yam, as well as bananas, sugar cane, and kava were grown among food trees, mainly coconut palms, breadfruit, and pandanus. Gardens were on the inland side of settlements but

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60 Bennett, Wealth, 162-4, 193-8.
61 Lucas to Managing Director, 28 July 1908, Burns Philp records, Butlin Archives, Australian National University, Canberra.
63 Bennett, Pacific Forest, 52.
bigger ones were often in the foothills where the microclimate and soils suited certain crops. When Germany gained control in 1900 the administration required each western Samoan matai (extended family head) to plant 50 coconuts yearly on unused land. Samoans made poor copra, so in 1908, the administration imposed sanctions, resulting in improved sun-dried export copra ratio by ton of 3:2 to foreign plantations. West Samoans by 1909-1910 owned 800,000 palms, planting 25,000 to 30,000 per year. Most were planted about six to eight metres apart (20-26 feet), usually intermixed with existing food trees and crops. In American Samoa by 1912, the naval governors urged more planting, regular spaced palms and weeding, but most Samoans politely resisted (Map 9).

Elsewhere in Polynesia, coconut plantations in uniform rows and age were less common. Hawai‘i with its milder climate was never a great producer while land alienation after the 1848 saw sugar cane dominate. New Caledonia’s promising early production, some from the Polynesian Loyalty Islands, was soon overshadowed by mining (Map 2). Small, less fertile Wallis and Futuna did not attract European planters though the French administration urged the people to make more copra; even in 1905, begrudging them the consumption of young coconuts (Map 1). The Cook Islands’ New Zealand administrator in 1902 bewailed the few palms along Rarotonga’s coast and urged more planting throughout the group. He also instructed the Manihiki people, under pain of fines, to reduce their presentations of coconuts at celebrations to stop the waste of many ‘thousands’ (Map 7). Agriculture specialists lauded the few small European coconut plantations ‘laid out rows’ in ‘marked contrast to the want of system in Native plantations’. By the 1910s, on Niue, New Zealand encouraged more coconut planting and introduced water tanks and roofing to guarantee a water supply, in part to reduce coconut consumption for drinking, so more copra could be made.

Tonga’s King Tupou I, advised by Methodist missionaries, early prevented alienation of land. Outsiders could obtain 1000 acres, only on lease, unattractive to foreign growers for a long-term crop. Almost all coconut oil, then copra sprang from royal decree in the 1850s that, for every coconut palm cut down, three coconuts be planted in its place by each first-born male.

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64 Krämer, The Samoa, 157; The Economist, 27 June 1908, 1345-6; Samoanische Zietung, 22 June 1918, 4; Annual Fono, 1912, Records of Governor’s office, microfilm 18, American Samoa, RG 284, San Bruno, USA; Hempenstall, Pacific Islanders, 35, 51, 69-70; Governor of American Samoa to Secretary of the Navy, 27 July 1926, Papers of Secretary of Native Affairs, microfilm 2, RG 284.


70 Margaret Pointer, Niue 1774-1974: 200 years of Contact and Change (Dunedin, Otago University Press, 2015), 186,189.
Following a civil war in 1852, the king urged more planting of coconuts, systematised in 1882 with about half of each adult taxpayer’s leased land under palms, with food crops among these. Yet on Vavau, in the 1900s, Tongans showed ‘no attempt at cultivation or clearing’ of palms, a contrast to a couple of ‘white traders’ whose leased land, had ‘plantations planted out’ (Map 7).

Before Britain declared a protectorate in 1892, some Gilbertese had likely intensified their coconut planting because the rulers of Butaritari and the kings of Abamama, and their dominions, Kuria and Aranuka were heavily involved in trading, exacting produce from their subjects. Even so, Captain Davis when declaring the protectorate urged Butaritari’s ruler to plant more (Map 10). To earn revenue, the colonial government continued to support production. By the early 1900s, prisoners were used to ‘reclaim’ swamp lands by planting coconuts, with villagers encouraged to extend plantings to meet the copra tax.

**Learning slowly amid external forces**

Thus, from as early as the 1850s in one, but certainly by 1910s in most areas, governments, Indigenous and foreign, as well as most Christian missions either directly or indirectly had required the extension of land under coconut palms. Some of this was in foreign hands but the bulk still in Indigenous ownership. Many Indigenous people co-operated, mainly for needed trade goods, but often as a visible claim to the land itself and self-determination. Whoever’s land it was or became, what was occurring was concentration on a monoculture in coastal areas that earlier were covered with mixed vegetation.

From 1900s to the mid 1920s, copra prices were generally high on European and American markets, especially during World War One when most went to the western USA, due to shipping limitations to Europe. Though prices had tapered off somewhat in 1926, copra was still ‘king’ and planting was extended as people saw ‘copra means money’. The coconut and other cash crops were diminishing forest cover associated with gardens. Still, few Indigenous growers devoted much time to husbandry: In British Fiji: ‘[C]oconut groves are

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74 Davis to Commander in Chief, 9 Aug. 1892, RNAS xvii, KNA.

75 Report, Gilbert and Ellice Islands, 1901-1906, WPHC 28/1908, Western Pacific Archives (hereafter WPA), University of Auckland Library, Auckland.

76 Report to Native Commissioner, 1909, CSO 6315/15, NAF.
overcrowded with useless trees and undergrowth': In French Wallis and Futuna: Groves were ‘without management and care’ (Map 1). 

Several administrations increasingly had focused on the copra’s quality because by the 1900s more was used in margarine manufacture. Most ‘South Seas’ copra was the lowest grade and lowest paid, requiring expensive refinement, often ending up as just soap. Moreover, significant other oil sources, such as soy, were abundant and competitive. Some administrations, such as Fiji and Western Samoa, were concerned about coconut pests, the Achilles heel of any monoculture, prompting scientific research. Once New Zealand administered Western Samoa as a League of Nations Mandate from 1920 (Map 5), the former German emphasis on weeding continued with the help of inspectors, but crushers in Europe complained about inferior copra. 

The governor of American Samoa declared in 1930 that almost 30 years of government recommendations and regulations to increase production by replanting, removing old palms, wide spacing, weeding, and regular collection of nuts, had seen minor improvements in some regions but could ‘not be fully enforced unless the people are in sympathy with them’. 

Given that from 1870 to 1930 coconut palms planted are estimated to have been 80 to 100 times their prior numbers, not only garden land, coastal vegetation, and wider forest products were reduced. Many varieties of coconut with non-copra uses, such as those having strong fibres for making sennit, were in danger of being lost to the Pacific’s people, because of emphasis on best copra nuts. Planting slowed with the Depression from 1929, beginning a decade of low copra prices. Few Indigenous producers could understand the world glut of comparable oils. To assert some control, some ceased making copra, such as in the Trobriand Islands, while most made the same or more to compensate for reduced income (Map 2); others in Fiji just sold ‘green’ copra (undried nuts) to traders (Map 3). In 1935, a destructive cyclone in Malu’a, American Samoa prompted the government to require each taxpayer to plant 100 coconuts, a drive that produced 75,000 palms. Yet, with almost no returns, the care of plantations was the last thing on most growers’ minds. Rather than maintain them, the New Zealand Mandate government in Western Samoa returned or leased some ex-German lands (Reparation Estates) to the Samoans who then were growing 80-100 nuts per acre with little spacing (Maps 5 and 9). 

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77 Report for Native Affairs, 1917, CSO 6800/18, NAF: Translation, Revel to the Minister of Colonies, 25 May 1922, Dossier 33, SGWF 2, AFFECO Carton 874, ANOM, Aix-en-Provence, France. I thank Kate Stevens for the Wallis and Futuna reference.
78 Report of the Royal Commission concerning the administration of Western Samoa, 1928, AJHR 1928, A-4B, xxvii.
79 Annual Fono, 1930, Records of the Governor’s Office, Microfilm 19, American Samoa.
81 Connelly, ‘Counting’, 174; Resolution of the Council of Chiefs, Bau 1930, CSO F2/144 Part 1, NAF.
82 Annual Fono, 1937, 1938, Records of the Governor’s Office, Microfilm 19, American Samoa.
83 Report, Soils and Agriculture of Samoa, 604, ABLS W4689 6828 Box 17, Archives New Zealand (hereafter ANZ), Wellington.
Intensifying production and marketing

Prices soared in World War Two, though shipping difficulties hindered exports. In 1942, the British Ministry of Food took most Pacific copra at a contracted price for seven years, which gave producers some security while the Free French territories found a market in the United States. But change was on several fronts (Map 8). The US bases dotted across the Pacific from 1942-1945 had accelerated Islanders’ desire for foreign goods, particularly foods, a desire already embedded among many from the last decades of nineteenth century when imported foods became part of the dietary. Many areas lost hundreds of palms to war damage or Allied occupation. Indigenous agroforestry had become less valued where outside contact, changes in governance and food preferences, and increasing population had been more extensive and cash cropping more intensive. Soils eroded as well as knowledge associated with subsistence crops. In the late 1940s, a nutritionist observed, that in Rarotonga (Map 7), the average person was:

…forgetting how, or omitting, to grow many of the varieties of food, such as taro, that his ancestors grew. He lacks the traditional native directive authority for the proper growing and conservation of his natural-food crops, e.g. the coconut, which is fast dying out from lack of replanting.

These losses had not permeated less modernised regions, such as parts of the New Hebrides and Papua New Guinea, but were spreading and, with increasing imports of refined foods, were producing health deficits.

Prompted by post-war United Nations’ pressure to decolonise, colonial powers turned to developing new resources, such as timber and minerals, as well as coconuts, to make future economies viable. This took time. In some islands such as British Gilbert (Kiribati) and Ellice (Tuvalu) colony (Map 10) and the north coast of mainland New Guinea (Map 2) there was a need to replant coconut palms destroyed in wartime, yet this was not to be achieved until the late 1940s and 1950s.

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88 Registration of Coconuts destroyed, Funafuti, c. 1945, Tuv 7 (IV) Item 10; Acting District officer to Sec to government, 8 July 1947, Tuv 8/1, F7-1-2; Coconut tree Planting Campaign,
Several administrations had set up wartime copra boards organising the marketing and quality of copra. Post-war, these continued, largely to the benefit of growers. Many Islanders - by instruction via agricultural field workers, introduction of new coconut varieties, publications, especially W. Pieris’s *Wealth from the Coconut* (1955) in several Pacific languages, and by observing European plantations - had begun to lay out their plantations in more grid-like patterns and improve copra quality, a pattern also urged on Micronesians in the war-devastated American UN Trust of Micronesia, a decade later. Improved quality was not universal. New Hebrides copra, dried over smoky fires, remained the Pacific’s worst, long protected by high tariffs against non-French copra exported to France.  

A new generation of foreign advisors began to listen and learn. Indigenous knowledge was partly recognised by R. Catala in his 1951 coconut survey in the Gilbert Islands:

> In the coconut groves, too thorough cleaning of the ground, tending to keep it free of all fallen palm leaves would in our opinion be a mistake. In addition to the physical usefulness of this careless ‘mulching’, which reduces evaporation, the plant fragments strewn on the soil under the coconut palms are a considerable source of organic matter and fertilizing elements, although their decomposition is sometimes slow.

To pass from the present state of affairs to the exact opposite [of tidy plantations] would mean upsetting the existing balance…. one should refrain during the early stages from completely clearing the ground as is done in [European] plantations. Clearing away all elements with a fertilizer value such as rotting trunks, coconut husks, and old leaves, should be avoided. Shrub-like species, such as te uri, te nao [mao], and te ren should not be systematically destroyed for the sake of tidiness; this applies even more to low plants which are often of considerable value, especially in areas where the palms do not grow very densely.

Yet Catala was ambivalent, if not contradictory at times:

> …each owner… should also destroy the self-sown palms grown from fallen nuts creating a dense tangle of useless and unproductive plants…. He should make more frequent inspections of his land to collect fallen nuts…. Suitable areas abandoned … should be replanted. Pending the day when real selections can be effected, seed nuts should be taken from palms offering a combination of favourable characteristics (the natives know the best ones).  

In Catala’s opinion, ‘experts’ elsewhere would make ‘real selections’ of superior seed nuts. He did not want the Gilbertese getting new varieties, ‘at random’, disregarding Indigenous selections over generations, including at least 100 years of making coconut oil and then copra

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Funafuti Island Council, 1949, Tuv 4(1)/VIII, Item 2, National Archives of Tuvalu, Funafuti; Action plans for Copra, 1954, NAA [4], A452, 1958/919, NAA.


for sale. These atoll people certainly knew ‘the best ones.’ Given their mobility, they had already brought large kernel seed nuts from Samoa and British Rotuma. \(^{92}\) These, however, would eventually produce hybrids with local palms.

When dealing with colonial officials’ urgings to produce more coconuts, Gilbertese growers sometimes adapted methods associated with the cultivation of the large tuber, *babai*. One man on Nikunau, rather than let old vegetation slowly rot on the surface, had cut it into small pieces and planted his seed nuts ‘like a plantation and buried much compost and now has the best coconuts and pandanus fruit on the island and they bore even in time of drought’. Most Gilbertese continued the custom of planting when the moon was full. Not all custom suited changing demands, however. The district commissioner in 1957 believed that the ‘people…already know how to look after their trees, but due to their custom refuse to pass on the knowledge’. Indeed, some Indigenous knowledge of land and sea and all therein - such as ways to improve the soil’s productivity - was the property of certain families and was not shared because it was a source of power. Because of increasing population and needs, the administration urged passing it on to others. This custom here and elsewhere continues to pose challenges to dialogue and transmission to those trying to maximise the potential of food sources. \(^{93}\)

Other groups had asserted agency by adjusting ancient concepts of *rahui*. *Rahui*, in most Polynesian societies, meant that resources were set aside, not to be harvested or used for a set time or by certain people. Usually imposed by chiefs, this was not done to conserve species, but for social and prestige purposes. \(^{94}\) It also was applied when the coconut became significant for trade to allow this resource to replenish after a major harvest; a common pattern in French Polynesia and the Cook Islands. \(^{95}\) On occasions, however, a chief would put a *rahui* on an unharvested crop to be sold to a trader for his own benefit, even though the people had done the work. \(^{96}\) Yet in the 1920s, in some places such as Rotuma and Wallis islands, the chiefs invoked *rahui* to deny traders the coconuts (Map 7). Because growers bought goods with copra cash from the traders, the *rahui* meant traders lost income. Such resistance was successful in British Rotuma but saw the French imprison leaders in Wallis Island. In Fiji, in the 1930s, Fijian leaders such as Ratu Sukuna, invoked *tabu* to set aside copra for tax but also to circumvent low prices offered by a merchant company. The *tabu* on copra, for group projects rather than for individuals, continued into the 1950s in Fiji, as in the

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\(^{92}\) Minutes, Colony conference, 27 Oct. 1957, GEIC 2 F18/1, Vols 1 and II, WPA.


\(^{96}\) Crocombe, *Land*, 93-94.
Tokelau atolls (Map 7). Rahui or its equivalent was both a means to marshal resources and to assert Indigenous control - at one level or another.97

Soon after the war, the French official on Santo, New Hebrides remarked that from the sea, plantations of coconuts in regular lines in clearings stood out amid dense coastal vegetation (Map 11).98 Such order remained absent in most Indigenous groves. By the 1950s, with all of the New Hebrides under administrative control, the security resulted in more Indigenous planting and production, making up 40 to 60 per cent of export copra.99 In 1959, a French coconut expert, M. Y. Fremond articulated the importance of this as well as its seeming flaws, so deplored in colonial discourse:

…the Kanakas are becoming more flexible, and, through working on plantations, they develop a desire to improve and to become good stable farmers. As a crop, the coconut has great appeal for them…. The planting of native groves is haphazard, and overcrowded and very little maintenance is carried out… planting should be done in triangles of 9 m [30 feet] a side, since on European plantations it is customary to plant at 9 or 10 m sq.

Fremond realised the ‘soil in the New Hebrides needs protecting with organic matter’, yet failed to see that the continuous leaf-fall and decay of vegetation in Indigenous groves served that purpose. He and other Europeans deplored the people’s failure to use all fallen coconuts for copra and the ‘wild’ undergrowth that concealed them.100 No outsider had bothered to ask why the people persisted in this.

< Map 11: The New Hebrides (Vanuatu)>

Britain’s J. S.G. Wilson conducted an economic survey in 1958-59 when the dozing colonial Pacific was just beginning to be brushed by political ‘winds of change’. He probed New Hebrideans’ planting patterns and, a rarity, actually noted his local experts:

As in the Shepherd Islands coconut palms in Tanna are planted without any attempt at spacing lines, etc. Self-seeding is always allowed, and so in any area the coconut palms will be of many different ages and heights. Nakomaha told me that this is justified since, if there is a hurricane, only the tallest coconut palms are stripped, and the lower ones are protected and retain some fruit. Plantations … are usually slightly overgrown but one does not see any that are completely abandoned….101

For a week or so, kinsmen would collect nuts to make copra and, while they moved through their groves, cut down the high undergrowth, repeated when they later needed more coconuts.

100 Fremond, Report (translation), Oct. 1959, re setting up research institute, NHBS, 9, 16/164/1, No 2, WPA; Patrick to Secretary to High Commissioner, Apia, 11 Oct. 1950 and enclosures, IT 1 W2439 125, ANZ.
101 Nakomaha, in Wilson, Economic survey of the New Hebrides, draft, WPHC, NHBS, 4/11, WPA.
Wilson notes that many groves had palms close together, around 18 feet (5.5 metres) apart. The people explained that the nuts though smaller were more numerous. The resulting restrictions on sunlight, as the palms grew, reduced weed growth and kept the soil cool in droughts, though it meant the younger ones would not get optimal light and expend energy elongating their trunks and thus produce fewer nuts, as the people knew. Wilson noted that, unlike the European plantations with cattle grazing to control ‘weeds’, there was less loss of fertility on Indigenous plantations, yet he favoured wider palm spacing.102 A French authority went further in 1962, recognizing the importance of the humus cover: ‘The practice of clearing vegetation and burning it is to be deplored because this interferes with the biological life of the soil by destruction of useful bacteria and humus, of which tropical soils are deficient’.103

Although self-seeding continued, more Pacific growers followed spacing on the square, 28 feet by 28 feet (8.5 metres), recommended by experts. This was an outcome of government oversight facilitated by the agricultural advisors of the post-war South Pacific Commission based at Noumea, New Caledonia and high prices renewed by the British Ministry of Food from 1949 to 1957 in Fiji, Tonga, Western Samoa, Gilbert and Ellice Islands, Papua and New Guinea and the Solomon Islands, along with increased monetization of their economies (Map 1).

In some dependencies, the emphasis on collection and marketing of copra had not been matched immediately by new planting. After a spurt of post-war remediation planting in the Gilbert and Ellice Islands, little had been done, despite Catala’s recommendations for the establishment of an agricultural service. With decolonisation looming, further surveys resulted in a plan for 1964-68, replacing senescent palms, thinning and weeding, along ‘scientific’ guidelines from 1969 to the independence of Tuvalu (Ellice) in 1978.104 Similar developments went on in Papua New Guinea (PNG) by means of a copra stabilisation fund from the mid 1950s for monitored replanting. American Micronesia also initiated a stabilisation fund to even out annual copra incomes. In Fiji, from 1960, subsidies encouraged new plantings, reinforced by the government extension of co-operatives. Fijians, though often just added new plants to existing untidy groves of mixed age palms. The co-operative movement in the New Hebrides also stimulated more Indigenous planting.105 Yet in some places such as Longana, Ambae, the directions of an agricultural field worker were quietly ignored re weeding and spacing of young palms.106 American Micronesia revived copra

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102 Wilson, Economic, 22.
103 Cohic, Text of Broadcast, 26 Apr. 1962, Control of Axiagastus coconut pest, NHBS 9, 294/163/1, WPA.
production by the 1970s but not in all islands. Replacing old palms was not encouraged despite increasing population and US aid dependency (Map 1).107

Overseas prices generally held steady until the late 1980s, then declined, to revive in the late 2000s but, with economic diversification including mining, logging, cacao and coffee production, and tourism, copra was no longer dominant, though virgin coconut oil is enjoying a renaissance currently. Several large and small mills across the islands cater for a range of growers. The coconut’s continuing importance is also reflected in the research institutes in the Pacific, opened in the 1960s, working with universities and agricultural ministries along with recent aid grants to set up a planned coconut gene bank.108

As part of a more holistic approach to ‘development’ in the post-colonial Pacific of the 1970s and 1980s, scholars, such as Randy Thaman and William Clarke, publicised old knowledge about agroforestry still practiced in several places, such as parts of Tonga and PNG. Yet a further blow to re-establishing agroforest systems has been the rampant deforestation across western Melanesia since political independence. Much Western Samoan forest fell to taro farms to cater to Islanders living overseas while the varied crops of Tonga’s smallholdings were often simplified to grow export bananas after World War Two and, from 1987, squash. Their forests, like Samoa’s, had taken a battering in the 1940s because fruit exports demanded wood for packing cases.109 Until the early 1960s, coconut palms had not swamped Tongan agroforestry, yet for decades had brought cash to Tongans (Maps 1, 5). As a Western observer noted,

Farms are unfenced and about half a typical farm consists of an unkempt area in permanent coconuts, the remainder having a number of small plots cleared from bush and weeds. Roughly one-third is cultivated, the rest being in ‘bush fallow’.110

Hurricanes in 1961 and 1963 hit Tonga’s aging palms. About a third needed replacing. In 1966, with an adverse trade balance and expanding population, King Tupou IV’s government embarked on a replanting scheme in linear grids created by tractors, part of a five-year development plan. A numerical success at 40,000 palms planted between 1966 and 1981, this form of cultivation cemented tractor ploughing in Tongan farming practices. In some areas, deforestation, the use of tractors, pesticides and artificial fertilisers for export crops, the soils hardened and lost their fertility, spelling the shrinkage of agroforestry that had incorporated bush fallow.111

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Not for food alone

Scientists now recognise that a thick layer of mixed vegetation, including various-sized coconut palms and trees, creates a skin or flexible armour to cover the ground and greatly limits the damage that storms and high tides do to atolls and the coasts of high islands. Doubtless, a hurricane, with winds of force 10 to 12 on the Beaufort scale (equal to or exceeding 48 [58 mph/88 kph] to 64 knots [74 mph/118 kph]) or above, as in Cyclone Winston in 2016, will wreak havoc. Yet a cover of mixed native vegetation can moderate this in the lower wind force range, with a supple coconut often surviving while the old and very young ones, if not crowded in with more mature ones, would fall. Many Islanders behaved accordingly since, like Nakomaha in the New Hebrides, they knew this from their ancestors and from observation.

Recent Western research into this coastal ‘bioshield’ in storm surges and tsunamis in Samoa and Hawai’i has supported some of this old knowledge (Map 1). The number of stems - of native wooden species and understory plants - is proportionate to the ability of the shield to absorb the energy generated in the seas. The vegetation also limits the debris sucked back into the sea as water recedes.\(^{112}\) Return to older knowledge of endemic coastal plant ecologies is proving useful to communities.\(^{113}\) Away from the foreshore, a middle way has also emerged among Indigenous growers and advisors, with a couple of coconut palm rows being used as wind breaks to shelter lower food crops as well as, in larger coconut plots, inter-planting of short term food crops, depending on the height of the palms and shade.\(^{114}\) There is now an appreciation of forests world-wide as CO\(_2\) retainers.\(^{115}\) And the ancient practice of agroforestry is finding new champions, such as Fred Pearce, who has shown that these methods can restore barren soils to fertility.\(^{116}\)

A more respectful approach by Western scientists and scholars has revealed the value of local knowledge of agroforests, resulting in a middle way for food and export crops to thrive. Such adaptations are bastions of hope, amid unrelenting storms - outside demands, expanding desires for the modern, Western education, and burgeoning populations - that threaten


generational wisdom in the Pacific.\textsuperscript{117} Paradoxically, Western higher education has brought some back to old knowledge which their elders now pass on by books and other means in local languages.\textsuperscript{118} Not always easy to achieve, this needs national as well as local input, such as on the French atolls where French and Tahitian scientists are propagating many varieties of coconut with diverse characteristics within an ecologically sensitive context.\textsuperscript{119} In all this, too, some communities value the old cultural economy, their attachment to place and people, more than accumulating cash. Immediate needs can be still met by making copra. Given the hardiness of palms, they do not occupy all the energies of their owners, even if, in the eyes of some, their full productive potential may remain unexploited.

\textbf{Conclusion}

Indigenous knowledge was and is rarely conveyed in the scientific terminology of the West, but its worth is demonstrated in the behaviour and experience of many Pacific people. For decades after Europeans colonised Oceania, Pacific coconut growers, having cons of empirical knowledge, resisted pressures to fully conform to colonial knowledge of what a commercial plantation should be. Mixed endemic coastal forests had the ability to survive storms and even cyclones and droughts, so most Islanders let their coconut palms grow ‘wild’ amid undergrowth and trees, much to the frustration of colonial administrations. The persistent Indigenous patterns of planting or allowing nuts to self-plant reveal a balance between allowing for storm resistance, humus and shade cover, and the Indigenous cultural economy. Yet, as need for cash has increased especially since the 1960s, many growers have adopted Western ‘scientific’ methods to maximize planting and production but have increased risks in severe weather events. Others persisted with their custom of mixed-aged groves or coconuts interplanted with other food crops and trees, a form of agroforestry attuned to older patterns of clan and community living, harmonizing ecological and human values.

In the last fifty years, the inundation and salinization of land along island coasts have been attributed to climate change due to global warming from greenhouse gases, a result of the developed world’s history of burning fossil fuels; beyond the control of the Islanders, though in their contribution to deforestation they are hardly bystanders. Even so, island people have considerable local knowledge of coping with such changes, but still are generally ignored by foreign ‘experts’.\textsuperscript{120} Their ability to adapt to climate change has not been helped by monocultures, however. On land, coconuts were the pioneer but enduring species in this

\begin{itemize}
\item \textsuperscript{117} See for example, K. Sanga, J. Niroa, K. Matai, and L. Crowl (eds), \textit{Rethinking Vanuatu education together} (Port Vila, Vanuatu: Ministry of Education; Suva, Fiji: Institute of Pacific Studies: 2004).
\item \textsuperscript{118} Tony Jansen and Myknee Qusa Sirikolo (comps and eds), \textit{The Forest Foods of Lauru} (Honiara: Kastom Gaden Association, 2010).
\item \textsuperscript{120} Jon Barnett and John Campbell, \textit{Climate Change and Small Island states: Power, Knowledge and the South Pacific} (London; Earthscan, 2010), pp. 21-51,175-84; Jennifer Bryant-Tokalau, \textit{Indigenous Pacific approaches to climate change: Pacific Island countries}. (Cham, Switzerland: Palgrave, 2018).
\end{itemize}
momentous ecological change. On one island or another, cotton, sisal, coffee, tobacco, cacao, coffee, bananas, oranges, pineapples, sugar cane, oil palms, kava, ginger, vanilla, and squash have followed the coconut. Such monocultures, most dedicated to export crops, not only reduce local food production capacity and increase dependence on imports; they also create more vulnerability to severe weather events, erosion, reef siltation with effects only just being realised on lagoon ecology, along with depleted soil fertility, need for artificial fertilisers, and outbreaks of pests. In sum, monocultures undermine ‘ecological stability’.

Long ago, Pacific people learned to harmonise their numbers and needs with the sustaining capacity of the land and sea. Now, population and needs have expanded to put lands and seas under great stress. This case study of the coconut can to teach us much about dialogue or the lack of it between the possibilities of local level Indigenous knowledge of place and Western science.\(^{121}\) It also tells of human values and the integration of social and community wellbeing and obligations with work. There can be no return to the past, but this study points the importance of exchanging and adapting knowledge and values from all Oceania’s ancestors and adopting a more holistic environmental perspective. In so doing, the peoples who live in the Pacific, though unable alone to stop climate change, have the means to more successfully address some of its effects.

\(^{121}\) Barnett and Campbell, *Climate*, 80-1,111-36.
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Abstract:

Coconuts provided commodities for the West in the form of coconut oil and copra. Once colonial governments established control of the tropical Pacific Islands, they needed revenue so urged European settlers to establish coconut plantations. For some decades most copra came from Indigenous growers. Administrations constantly urged the people to thin old groves and plant new ones like plantations, in grid patterns, regularly spaced and weeded. Local growers were instructed to collect all fallen coconuts for copra from their groves. For half a century, the administrations’ requirements met with Indigenous passive resistance. This paper examines the underlying reasons for this, elucidating Indigenous ecological and social values, based on experiential knowledge, knowledge that clashed with Western scientific values.

Key words. Coconuts, copra, coconut oil, Indigenous knowledge, ecology, resistance, science.