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Diversification of Foods and their Values: Pacific Foodscapes

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Diversification of foods and gastronomic habits has been an ongoing process for Pacific settlers. Following the World Summit on Sustainable Development (2002), authors of a recent study of dietary diversity have proposed that understanding the relationship between biodiversity and dietary diversity is vital to assessing ways of sustaining health in both developed and developing countries (Johns and Sthapit 2004). A reconstruction of such dietary diversity across the Pacific can contribute to understanding how Pacific communities have maintained their well-being within challenging island environments. But a variety of food choices can have a downside, if the necessary cash to buy food is scarce. In this chapter, I provide an overview of how Pacific communities have managed plant diversity in the face of ‘tides of innovation’ that added commercial foods to the inventory.

The first settlers brought some food plants as they journeyed from the west out into the Pacific; these constituted their idea of ‘good food’. Some 6,000 years later a new group of settlers, mainly missionaries and colonialists from Europe and America, introduced their own ideas of ‘good foods’ that dismissed local foods as ‘uncivilised’. The third innovation occurred after World War II when ideas of ‘good food’ arrived from both the west and the east of the Pacific. Each set of concepts of

good food expanded the gastronomy by adding new values to foodways. The range of choices has been vastly increased as have the moral precepts of 'good food'.

Choice between familiar and unfamiliar introduced foods has marked the history of humanity as omnivorous, as Claude Fischler (2001) has developed the concept. Though humans have been designated as biologically able to eat anything, cultural precepts handed down from the ancestors have dominated choices. Cultural heritages include gastronomic developments of both food plants and foodways that have long necessitated a balance between finding 'familiar' foods known to be healthy and acceptable, while also tasting 'unfamiliar' foods that may not be acceptable, or considered dangerous to consumers (Fischler 2001: 61). Reconstructed Pacific Island gastronomies illustrate Fischler's model of drawing on historical data for European, mainly French, settlement societies. He demonstrates how human societies have expanded their reliance on familiar foods by adding new food resources and new ways of processing after they have been tested and tried. The dynamics of 'good food' selection is under constant management to meet new cultural and environmental limitations.

Early voyagers across the Pacific were seeking islands where they could establish a community (Kirch 2002; Matisoo-Smith 2015). Finding familiar foods necessitated adapting food plants brought with them from Southeast Asia that survived and reproduced in island environments. But islands, whether low or high, did not produce the familiar starch foods, rice or millet, that early voyagers were used to, so they had to rely on root and tree crops that they carried with them and suited the new island environments (Barrau 2012 [1961]; Lebot 2009). Subsequent 'tides' of arrivals brought new species, new varieties of taros, yams, etc., from the west over a period of some 500 or more years; they gradually increased the established array to include some 10 different root and tree starchy foods for their security (Pollock 1992). The second 'wave' of visitors, mainly European maritime explorers, whalers, missionaries and colonisers who all arrived from the east of the Pacific, brought new demands for European-type plant foods, such as wheat products, for bread and beer, cabbages, potatoes, turnips, that constituted their 'familiar' foods (Burnett 1968). Captain Cook found that the foods he encountered in Tahiti and elsewhere in 1769 differed markedly from the foods he needed to feed his (mainly British) crew; a meeting of tastes resulted (Pollock 2013). Some introduced food plants, such as potatoes in New Zealand, survived, to be added to

the food resource inventory, while many were lost. In the mid-twentieth century, new food concepts stressed the importance of meat in the diet among the introduced gastronomic variations (Smil 2013). After World War II, a third tide (almost a tsunami) has overwhelmed local Pacific food resources with a diversity of global foods, mostly prepackaged, not planted. The main value of this increasing diversity is that it can provide food security in the face of threats (typhoons, tsunamis) to crops and other local supplies. But it also introduces a new dimension—the need for cash to buy the new diversity (Simatupang and Fleming 2001). We consider the paradox that modern diets based on purchased food systems are of necessity less diverse than early subsistence diets.

Changes in the choices among food resources and early gastronomies can be reconstructed for Pacific Island settlers from a range of analytical approaches from archaeology and prehistory to ethnobotany and social ecology. We can expand Arjun Appadurai's discussion of modernity addressed through 'ethnoscapes' as anthropological reconstructions of societal concepts across time and space (1996: 65) by referring specifically to 'foodscapes' as they too emerge with globalisation in our third 'tide of innovation'. Ethnoscapes refer specifically to social patterns of food use and beliefs over time, as these have been impacted by 'global flows' essential to cultural life (*ibid.*: 33).

A previous example of a foodscape, that has close parallels with Pacific foodscapes, was constructed by Sidney Mintz for slaves transported from Africa to a new Caribbean island environment where they planted familiar root crops from their African homeland. Maintaining a familiar diet during enslavement, Mintz argues, provided the vital step towards 'tasting freedom' post-slavery abolition (Mintz 1996: 36–49). For Pacific communities, similar root crop staples have provided local resilience as a management strategy in the face of threats to food security from outsider innovations.

Foodscapes include stress on non-material values (as well as material values) of desirable foodstuffs that enable an interface between genealogy and history to be formulated. Prehistorians' reconstructions and early ethnographic and other reports provide a framework through which anthropologists can formulate how diversified diets, transported over vast spaces and time, have added a dynamic resilience to gastronomic innovations (Appadurai 1996: 65).

Reconstructions of foodways are embedded in analysts' own values. The language of food has many dimensions, based on varying theoretical persuasions (Pollock 2011a). A multitude of histories of food is emerging in the new millennium, either of specific foods such as sugar, potato or salt (Kurlansky 2010; Mintz 1985; Zuckerman 1998) or general overviews (e.g. Flandrin and Montanari 1999; Freedman 2007; or Mennell 1985). Among these overviews, four modes of presentation of 'the language of food' are outstanding (Pollock 2011a). Food has been seen as an economic component, a material good to be produced and traded for profit and wealth; early ethnographers placed food concerns in a chapter on economics (e.g. Weiner 1988 in the Holt Rinehart Case Studies in Cultural Anthropology Series; Firth 1959), but more recently have contrasted local values with introduced capitalist values (e.g. McCormack and Barclay 2013). Pacific governments' annual returns to international bodies such as the Food and Agriculture Organization of the United Nations (FAO), the International Monetary Fund (IMF) and the World Health Organization (WHO), and most recently the Millennium Development Goals (MDG), while addressing internal concerns such as 'Building Resilience to Food and Nutrition Security' (Secretariat of the Pacific Commission 2014), also consider contributions of food imports to sustainable development and health (Johns and Sthapit 2004). A second language, that of politics of traded foods, exports and imports, is addressed in food policies. A third language, that of nutrition, has provided a paradigm that has expanded exponentially since World War II (e.g. Coyne, Badcock and Taylor 1984); dietary practices have been evaluated for their contributions to biological health, and specifically to a range of non-communicable diseases (NCDs), such as diabetes (Ohtsuka and Ulijaszek 2007; Toledo and Burlingame 2006). A fourth language, that of the social ecology of food diversity, to which this chapter contributes, is also phrased in various linguistic forms; Luisa Maffi's (2001) edited volume contains papers that link language, knowledge and the environment within her argument for 'the moral imperative of diversity' for which local knowledge is a capital resource (Harmon 2001). 'Good food' is multivariant.

When we consider selections of resources for foodstuffs, traditional ecological knowledge comes under scrutiny for its contributions to a sustainable future. By addressing the question posed by Aldo Leopold and taken up by Maffi, 'How can we humanly occupy the Earth without rendering it dysfunctional?' (2008: 267), it becomes apparent that the place of biocultural diversity is being addressed from a variety of viewpoints

(Pretty et al. 2009). In this chapter, I extend consideration of biodiversity in the Pacific as a strategy that integrates traditional knowledge with cultural diversity to increase both quality and quantity of food concepts in order to sustain a healthy future (Johns and Sthapit 2004: 155).

Drawing on Marshall Sahlins's (1985) emphasis on the significance of history for understanding cultural diversity in the Pacific, I trace three 'tides of innovation' in Pacific foodscapes. Earliest settlers gradually expanded their food inventories to include several species and varieties of taros, yams and breadfruit, both seedless and seeded, by selecting planting material that best suited familiar tastes, and plants that grew well in the new island environments (Lebot 2002). In more recent times, from mid-eighteenth to mid-twentieth century, that diversification process has expanded rapidly to incorporate foods and food concepts introduced by colonists and missionaries from further afield, who also wished to replicate their familiar foods whether from European or American homelands, or from China, India and Southeast Asia. In the last 60 years, diversification has extended to include selected 'globalised' foodstuffs that have intruded into both plantations and market places. They come together with new interpretations of the concepts of 'good foods' as promoted in the media and elsewhere. These three 'tides of innovation' through reconstructed foodscapes provide a perspective on how Pacific peoples have maintained their notions of food security while also 'updating' them with new ways of thinking about food, new food concepts and new moral values to suit the modern environment. *Me'a kai* chef Robert Oliver depicts today's varied Pacific 'foodways' as they fit today's lifestyles, with elaborately illustrated recipes from Fiji, Samoa and Tonga and other parts of the Pacific designed to tempt new food uses for modern contexts, especially tourism (Oliver, Berno and Ram 2010); these variations constitute his training of Pacific Island chefs to extend their repertory of uses of island foods (Oliver 2013).

Seeking islands, seeking foods

Early settlers had to establish their food resources based on their cultural and environmental knowledge. Peopling the Pacific, whether by Austronesian speakers or earlier groups, has been much debated by prehistorians from many perspectives. Analyses of material artefacts that archaeologists have exposed has led to the construction of 'Lapita culture', a thesis constructed around evidence of pottery sherds

from sites in Vanuatu to Samoa (Kirch 2002). Dating such finds, linked with reconstructions of historical linguistic data for such artefacts, has led to an association between Lapita culture and the Austronesian family of languages, widespread across Oceania and beyond (Kirch and Hunt 1988). Prehistorians suggest that Lapita voyagers sailed from Taiwan or Southeast Asia to settle western islands (Near Oceania/Melanesia), thence further eastward to the islands of the eastern Pacific (Remote Oceania/Polynesia and Micronesia) (Kirch 2002). As they crossed the Pacific these voyagers introduced what prehistorians call ‘transported landscapes’ to refer to the modes of planting food resources, together with animals, such as rats and dogs, that accompanied them (Kirch and Hunt 1988). Familiar planting techniques, namely vegetal reproduction or irrigation, that were transferred from the homeland had the greatest success, based on hindsight. Cultural knowledge that these settlers used to select particular plants and their mode of reproduction provides a base from which to reconstruct Pacific foodscapes.

Plant foods featured prominently in early Pacific foodways, inasmuch as we can reconstruct them from recent reports of cultural practices. Plant foods constituted some 83 per cent of the diet (Barrau 2012 [1961]), with fish as the main accompaniment. Pigs featured at feasts, and celebrations, or as gifts to visitors, but were not regularly eaten by Pacific communities. Early visitors such as Joseph Banks, James Cook and missionaries noted the heavy reliance on an array of plants that featured in the everyday diet of Tahitians or Tongans; they also received these, both as direct gifts or dined on them at feasts (Banks, cited in Beaglehole 1955). Plant foods, eaten with a small accompanying piece of fish or coconut, constituted the familiar ‘good food’. That consideration marked a major difference from the visitors’ food values, as Cook noted during his first encounter in the Pacific in 1769 (Pollock 2013). For their tastes, meat constituted the main item in their daily diet, eaten with potatoes and other vegetables. This ‘meeting of tastes’ highlighted the marked difference between familiar food values that Pacific settlers had brought with them from their Southeast Asian homelands, and the familiar food values that Cook and other European visitors brought from their homeland. Root and tree foods were considered to be the ‘good foods’ in the Pacific, but they must be accompanied by a small piece of fish or coconut to satisfy the eaters.

As prehistorians draw on new techniques, such as DNA analysis, to reconstruct the place of plants and animals in early lifeways, considerations of forms of taros, yams and other food and useful plants

are linked to recent ethnographic evidence recorded by early visitors in the nineteenth and twentieth centuries; botanists and ethnographers provide a glimpse of earlier foodways of Polynesians, Fijians, Hawaiian and Māori (e.g. Barrau 2012 [1961]; Best 1925; Handy, Handy and Pukui 1972; Joseph Banks and Captain Cook in Beaglehole 1955; Seemann 1862). In the absence of ‘hard’ material from archaeological remains, other than fish and bird bones, new modes of reconstruction rely on findings from DNA and cytogenic testing of taros, yams, paper mulberry, etc., to give us ‘phylogeographic analyses of plants and animals, [that] can serve as proxies for reconstructing the pathway of colonizing canoes’ (Matisoo-Smith 2015: 2). When we consider the cultural values in which those food concepts are embedded, we raise questions about the ‘moral imperative of diversity’ (Harmon 2001) as it contributes to food security as sustainable community support.

Each canoeload of settlers brought cultural concepts of food usages that had become familiar in their homelands in Asia (Pollock 1992; Tan 2011). But they had to be innovative. Islands posed particular challenges due to the absence of familiar plant resources, particularly rice, that could be used as food, and the presence of poor soils, salt laden moisture and other climatic exposures. New arrivals had to find new ways to avoid extreme hunger while attempting to meet familiar dietary needs and tastes. Subsequent visitors were welcomed as they brought new food plants and new varieties of familiar plants. Each community had to derive ways to render those plants into edible and tasty foods. Pounding, drying, fermenting and transforming by heat were all practices they had used in their homeland that could be adapted to the root and tree starches (Pollock 2011b).

The early inventory of plant foods included *Colocasia taro*, *Dioscorea* yams, breadfruit, bananas (*musa*) and coconuts (Barrau 2012 [1961]; Pollock 1992). As far as we can reconstruct these all originated in Southeast Asia or New Guinea. All of these plants could be transported by canoe over short distances without undue loss. All were reproduced by vegetal propagation, allowing Pacific residents to choose to propagate those plants that suited their tastes and the environment. Planting calendars were developed as part of that inherited ecological knowledge (Pollock 1992). Crops were rotated, using shifting agriculture techniques to maintain a steady food supply on islands with poor soils, such as atolls and raised reefs, for example, Niue (fieldnotes July 1996: 9). Residents drew on observations of climate, storm and drought changes, and knowledge of

plant growth patterns (see Colenso 1880 for Māori planting knowledge). When food sources were destroyed by cyclones, saltwater inundations, or other climatic events, social controls such as *rahui* were imposed, as Captain Cook experienced (Pollock 2013). Communities developed these controls to placate the gods, and thus to ensure an ongoing food supply.

From those first plantings, several species and many varieties of those food plants became the major components of Pacific diets (Barrau 2012 [1961]; Pollock 1992). Four species of taro/dalo were introduced of which *Colocasia esculenta* and *Alocasia* species were the earliest, followed by the large-leafed *Cyrtosperma* species that have been the hallmark of Kiribati foodways. Xanthosoma taros were introduced much later, perhaps in the eighteenth century, and from central America; they are particularly favoured by Tongans, though produce smaller corms. Various varieties of each of these species of taro have been selectively added to island communities' foodways—some 72 varieties were recorded as used by Hawaiians in the early twentieth century (Handy, Handy and Pukui 1972). Similarly, several species of yams were added to the *Dioscorea* plantings, with several varieties being selectively chosen over time.

Breadfruit (*Artocarpus var.*), bananas (*Musa var.*) and pandanus (*P. odoratissimus*) and coconuts (*Cocos nucifera*) have also provided edible fruits for Pacific residents over several hundred years. They are seasonal, so root cuttings were selected to extend the seasons of fruiting, as well as for increased fruit size and taste, plus suitability for storage by fermentation. In her research reports Diane Ragone (2006) not only differentiates the distributions of seedless breadfruit from seeded breadfruit, but lists the names of the many varieties of these trees found in Tahiti and the eastern Pacific. Similarly, many species and varieties of bananas have provided a highly valued starchy component of the diet—especially noteworthy is the recent work of the late Lois Englberger and colleagues on the 'red' banana, known as karat in Pohnpei, which provides a vital source of Vitamin A where this variety is used (Englberger 2011). Pandanus trees have provided another source of Vitamin A, particularly on atolls with poor soils; again varieties were selected that suited local tastes and climatic environments. I recorded 26 named varieties of pandanus on Namu atoll in the northern Marshalls in 1967; some varieties were preferred for their sweet fruit 'keys', while other varieties were planted for their leaves used in thatching (fieldnotes, May–September 1967). On the raised reef of Nauru, pandanus was the only starchy food, and the only source of food,

that would grow on the limestone soils hit by periodic droughts; these plants were all removed during phosphate mining during the twentieth century (Pollock 2015). Current residents must buy all their food, imported largely from Australia.

Sweet potatoes (*Ipomoea var.*), cassava (*Manihot esculenta*) and (from the seventeenth century) potatoes (*Solanum var.*) are all later adoptions that enhanced the Pacific Island food inventory. Many scientists agree that sweet potatoes entered the Pacific from South America, initially, but the pathways by which species spread across the Pacific have been the subject of enquiry by botanists, prehistorians and others (Ballard, Brown, Bourke and Harwood 2005; Jacomb et al. 2014; Yen 1974). Distinctions between *kumara*, *camote* and *batatas*, all terms for sweet potatoes in languages across the Pacific, indicate that many varieties of the plant were selectively chosen for local attributes, including taste, local environmental suitability, a range of colours of the starch and of the skin (Ballard, Brown, Bourke and Harwood 2005). Sweet potatoes have made a major contribution to modern Pacific diets, but their provenance is proving challenging.

Coconuts (*Cocos nucifera*) have been an additional mainstay of Pacific diets, both on atolls and on high islands (Barrau 2012 [1961]). They are among ‘the staples we eat’, (Malolo, Matenga-Smith and Hughes 1999). The much quoted ‘101 uses’ of coconuts include both the fresh ‘meat’ or dried as copra for cash sales, and the very pure juice, or coconut water. Coconut cream derived from pressing the meat of mature nuts has made a major contribution as an accompaniment to the starchy root and tree fruits, and more recently to boiled rice and other recipes (Oliver, Berno and Ram 2010). Varieties of palms have been selected for the size of the fruit, their regular bearing of fruits, as well as their suitability to particular Pacific environments.

Add to these nine different species used as food plants, seasonal tubers such as arrowroot, amaranth and sago in the southwestern Pacific, and the fish they caught to accompany such base foods, it is clear that Pacific communities have developed a broad basis for their food security that is both culturally and environmentally significant.

Sharing food has been a key principle that maintained diversification that has dominated both Asian and Pacific foodways into current times (Pollock 2013; Tan 2011). Generosity is a core value by which communities support one another; it has enabled neighbours and kin

groups to provide both material and moral assistance to those who have lost crops, and homes, through typhoons or tsunamis and other environmental events. Marshallese gave me a phrase, an aphorism—‘When we go down, we go down together’—as key to their thinking about living on atolls. Any visitor passing by a house, whether on the high island of Futuna, or in a rural Fijian village, is invited to ‘Come and drink tea’, which may mean literally sharing tea, or a bowl of rice with fish. During my stay of 15 months, my personal small stock of food was rapidly depleted as I tried to return the plates of food gifts, whether breadfruit, or pancakes, that my neighbours on Namu atoll sent me. Following local custom, I tried to send the plate back with something from my food stores (fieldnotes, February–December 1967).



Figure 30. ‘Good foods’ at Talamahu market (breadfruit, *kape*, coconuts, green banana, taro leaves)

Source. Photographed by Nancy Pollock, Tonga, 1990

Feasts, as formalised means of sharing, differ with various degrees of elaboration. Those that mark yearly cycles, such as First Fruits, as recorded in detail by Captain Cook during his visit to Tonga (Beaglehole 1955), or in Fiji, include many types of plant foods, as well as pigs and fish (see Figure 30). Missionaries considered these feasts as extravagant, a waste of food that seemed to them to be in excess of ‘biological’ needs, as William Ellis (2012 [1830]) remarks for Tahiti. They did not appreciate the local values, or the extent of redistribution of foods from such events, and the social enjoyment of such occasions when everyone had ‘more than enough’ to eat. The capacity to eat large amounts of food when available, but also to not eat for several days when food was scarce marked a difference in ideologies between Pacific communities and the new arrivals. It also marked yet another disjuncture in attitudes to diversification.

Local ecological knowledge includes various forms of processing local starch foods to make them edible, and to extend their availability. All of the crops (except coconuts) had to be cooked to make them edible. The earth oven has proved to be the most efficient way of cooking (e.g. Marshall 1985; Nojima 2008), though cooking with hot stones, or in bamboo stems, or grilling breadfruit or fish in the embers are used to alter small amounts of raw roots or fruits. But the earth oven was the most widespread mode of cooking across the Pacific, whether in pits, or surface fires. Both small and large amounts of food could be well cooked using the least amount of fuel, scarce on atolls. Pottery used in parts of Southeast Asia was used to boil some foods (Guiart 1982: 82), but the earth oven was more universal (Marshall 1985). Now that prehistorians have established that Lapita pottery was used for ceremonial burial purposes rather than cooking (Sand 2014), it is clear that the earth oven was the preferred mode of cooking root vegetables.

Processing necessitated peeling and pounding to remove toxicities, especially when trying out new foods (Fischler 2001) or providing a new taste, or extending the availability of seasonal crops such as breadfruit fermentation (Pollock 1984). Fermentation practices, such as soy from tofu, or fish pastes, were carried from Southeast Asia to be transformed for use with local foods such as *poi* from taro in Hawai‘i or pit breadfruit—*mahi, masi, bwiru* across the eastern Pacific (Pollock 1984). The fermented product not only provided a means of storage of excess, but even more importantly provided an alternative taste to the fresh fruit, an additional diversification.

Pounding local roots released the starchy pith from the fibres, as Māori obtained a starch from roots of the Pteridium fern, *aruhe*, to make cakes baked in the earth oven, or Hawaiians produced *poi* from taro roots. Selected roots of the ti tree (Fankhauser 1992) were also pounded after baking in ovens in Marquesas, Tonga and New Zealand and elsewhere to release the sugary sap, which was added to other foodstuffs. Pounding kava plant roots has gradually replaced the earlier practise of chewing the roots to release the starchy sap, mixed with water that has been a major beverage across the Pacific (Pollock 2009b). Pounding tools remain in museums and other collections as evidence of the cultural importance of pounding to change the natural product into a useful form. Pounding the paper mulberry/Broussonetia plant for use in tapa cloth as under recent scrutiny by plant geneticists (e.g. Matisoo-Smith 2015), is an example of the wide applications by local residents to create cultural capital (Pigliasco, Chapter 9, this volume), particularly for wearable woven cloth (Paini, Chapter 4, this volume).

Processing foods was part of the ‘transported landscape’. Ancestors had transferred practices used in their homelands to add value to plant foodstuffs. Not only were plant foods part of the ‘transported landscape’ but they were part of the transformation of those plants to provide alternative food tastes, and thus variety. These transformation processes have made a major contribution to sustainable development in Pacific societies.

Early foodscapes illustrate how island settlers established a broad range of plant foodstuffs and processing techniques to provide a strong base to the variety of familiar foods, ‘the staples we eat’ (Malolo, Matenga-Smith and Hughes 1999). Reliance on a starch accompanied by a small side dish of fish or coconut formed the basis of gastronomic principles brought from the west, but gradually further diversified by the addition of new plant foods such as sweet potato and cassava, introduced from South America in the east. We don’t know about introductions that either failed to thrive, or were not acceptable to local tastes. A great diversity of foodways was established over some 500 years to provide security for well-being. To this familiar base other innovations have been added, with alternative values and tastes.

New foods for new tastes

In the eighteenth century, new arrivals from both the east of the Pacific and the west were seeking their own familiar foods, but could not satisfy their tastes readily with the foods that Pacific communities offered. They found that their food concepts and gastronomic satisfactions differed markedly from those utilised in Pacific host communities (e.g. Cook's searches to revictual his ships, see Pollock 2013). Newcomers introduced new foods and ways of eating that Pacific residents added gradually to their existing gastronomies. A new form of omnivores' dilemma (Pollan 2006 for the US) resulting from these dual gastronomies persisted and increased biodiversity. But it also threatened traditional forms of food security.

With the arrival of European ships circumnavigating the Pacific and missionary colonists from Europe and America in the early 1800s came new ideas for 'good foods' and how and when they should be served. Since Captain Cook and other European ships' captains had left behind in the Pacific seeds of useful foods and animals to revictual future ships and for subsequent settlers, their Pacific Island hosts became exposed to an array of unfamiliar foods, and new ways of thinking about 'good foods' (Pollock 2013). William Dampier named the tree that bore fruits 'as big as a boy's head' (*Artocarpus sp.*) the 'breadfruit' tree after the bread he was seeking, while other scientists such as Banks, Georg Forster and Jules Dumont D'Urville recorded names of local foods as botanical specimens. But sources of meat, particularly beef, were the most missed food item, to eat with grains such as flour from which to make 'proper' bread and beer. This dearth, as they considered it, could only be rectified, they considered, by planting seeds of food plants that were familiar to their European tastes. However, as Forster records of Cook's second visit to Queen Charlotte Sound, New Zealand, in 1773, local Māori had not nurtured the seeds that Cook's crew had planted so that 'the radishes and turnips had shot to seed, but cabbages and carrots still grew well, but were not harvested, and there was an abundance of parsley and onions, but the peas and beans were lost; probably destroyed by rats, and the potatoes had probably been removed by the local Maori people' (Forster in Colenso 1880: 4). These seed plants did not fit Māori concepts of food (for whom roots provided the main food), though they had discovered that visitors were keen to take potatoes and pigs in exchange for iron, knives, gunpowder and other desirables (Best 1925; Duyker 2014). As

noted of New Zealand Māori in the 1850s, 'Maori were in transition from their own to European ideas' (Forster cited in Colenso 1880: 5). Forster referred to Māori as 'great cultivators', but other European writers were less charitable. Missionaries such as Thomas Williams writing about Fiji and Fijians in the 1850s emphasised the need to change local food habits in order to 'civilise' the people (Williams 1858).

European foodways were considered vital to civilising these Pacific societies (Williams 1858). While missionary households across the Pacific Islands relied at first on gifts from their hosts of taros, yams and breadfruit in season, they were keen to introduce their ideas of 'good food' and how it should be served, and associated values. But in 1850, as Williams, a missionary in Fiji, notes, new arrivals eagerly awaited the twice yearly visits of their missionary ships to bring 'good food', such as flour, dried meat and seeds to plant their familiar foods in their gardens. Missionary wives demonstrated their gastronomic principles to local women each Sunday after church when local Fijian women were invited to share an elaborate meal, European-style, with the pastor's family. These newcomers believed that Fijian women should replace the plentiful supplies of taros, yams and other local starchy foods, with wheat flour products to make bread and cakes, but the wheat and jam, etc. had to be imported, and thus was often scarce (and full of weevils), and required people to pay with cash, which was very limited (Pollock 1989; Williams 1858). Attempts to replace readily available local starch foods by irregular supplies of imported foods established the counter positioning of subsistence reliance with cash dependency.

Throughout the nineteenth century, Pacific Island communities were increasingly exposed to imported foods, and new associated gastronomic practices and values. For the next 100 years, Fijians, ni-Vanuatu and other Pacific communities were bombarded with an ever-increasing range of imported foods, particularly rice and tinned meats, and fish, while maintaining a strong reliance on subsistence foods, particularly in rural areas and outer islands (Regenvanu 2009). Choices between making a meal from one of the various root crops growing in the gardens and local fish, or cooking some rice with a small taste of tinned meat or fish, introduced both social and economic dilemmas, as well as major clashes between cultural values (Pollock 1992). Purchasing food stood in contrast to Pacific concepts of food sharing.

Contrasts between food concepts became further elaborated by the development of plantations. Whether of coconuts for copra oil, as in Samoa and elsewhere, or of extensive fields of sugar cane in Fiji, or timber, Pacific residents lost their land and were forced to rely on buying imported foods, such as rice, with any scarce cash (see Jourdan 2012 for the Solomons). Plantation workers brought in as immigrants from India in the case of Fiji, and Indonesia in New Caledonia, brought their own food concepts; rice was their mainstay, complemented by the necessary vegetables. If they could plant their desirable foodstuffs in small gardens around their plantation accommodation, they added to the local biodiversity.

Meat as a major component of any meal, as Williams (1858) and other missionaries noted, also introduced a new set of concepts, as well as having an environmental impact. Cattle were introduced, adding new stresses on farmers' lands, and on their meagre cash incomes. Many families in Fiji, for example, could afford only one cow, or, as in the case of Western Samoa, the company managing the coconut plantations introduced cows to browse under the palm trees. Finding cattle breeds that survived in tropical environments and produced good meat was a slow process, supplemented by tinned and preserved meats imported from Australia and New Zealand. As shipments of frozen meat mainly to Europe became accessible in some Pacific communities from the 1880s onward, so demand increased. Food import bills rose dramatically in the late nineteenth century, as the Fiji Blue Books records show (Knapman 1987), but mainly to meet colonisers' needs. Since the islands had few commodities to export, other than plantation produce, balance of trade figures for small islands showed increasing reliance on imported foods, with exported goods unable to maintain a balance. With higher priority given to European introduced foods over the plentiful and varied supply of local subsistence foods, the conflict between local and imported concepts of food increased, and has continued to present times. Distinct differences between the values (social and economic) of local foods in contrast to imported foods, as material goods, has had ever-increasing significance for the well-being of Pacific communities throughout the twentieth century. Increasing variety has come at a cost to family lifestyles including health, as well as to government policies for agriculture, health and financial independence.

Market places became intermediary sites where local producers sold their food produce to the new settlers for small amounts of cash. A diverse range of produce was displayed with cabbages, tomatoes, squash and eggplants joining the taros, yams and cooking bananas, as per demand in Suva, Nuku'alofa or Tahiti (Hardaker and Fleming 1984). Sales of such foods along with any fish or shellfish families had caught, brought small cash returns, while also increasing the variety for purchasers of foods to be served at household meals. Market places in Tahiti, Suva and Apia became meeting places for both social as well as economic exchanges (*ibid.*). Small stores in each rural community brought a small income to the village owners.

Biodiversity increased with the arrival of newcomers from the west and east who introduced new food plants and new ways of eating, that is meals that fitted their concepts of 'good food' and derogated local Pacific concepts. Newcomers established an infrastructure of purchased foods that included both market places and supermarkets, and the beginnings of overseas trade, particularly food imports. Pacific Island governments and communities faced a new perspective on their food culture, with local foods such as taro and yams devalued as 'uncivilised' while purchased foods though scarce were promoted as more desirable. But local foods that continued to provide diversity that underpinned security were not easily supplanted.

Increasing options – glocalisations

Globalisation has been challenged at a theoretical level as it implies universal ideologies are paramount over local heterogeneities (Robertson 1995). The neologism 'glocal' reasserts the importance of heterogeneity, as George Ritzer suggests, as it includes traditional values in their ecological setting alongside introduced worldwide values. Local values can be seen to interpenetrate alongside new global values (Ritzer 2003; Robertson 1995). The concept of glocal reasserts the importance of maintaining local values as appropriate in globalising contexts.

Globalisation as linked to the spread of industrialised systems, including food, has been widely re-examined in the new millennium. Joseph Stiglitz' assessment of 'development that works', for example, while recognising that multinational corporations can be blamed for the 'ills of globalisation' as well as for its achievements, suggests that the 'democratic deficit',

that relates to inequalities, and alternative values has to be overcome if security, including food security, is to become a major alternative value to economic globalisation (2006: 289). Lack of cash is a major feature of what he calls the 'democratic deficit'.

Multinational corporations, such as McDonald's, Kentucky Fried Chicken (KFC), and canned soft drink companies, such as Coca-Cola (see Foster 2008) have contributed to our understanding of the diversity of food choices, particularly in urban areas of Pacific Island economies. Turkey tails and lamb flaps (Gewertz and Errington 2010), overflowing from US, New Zealand and Australian meat industries, have filled the freezers of Pacific urban supermarkets to offer tasty, highly desirable, and affordable meat products; they have become new indicators of the cash economy and status. While increased demand by customers in urban areas is welcomed by retailers, it is decried by medical experts for the negative health effects associated with these excessively fatty foods; when agencies such as the Fiji National Food and Nutrition Committee, and similar agencies in other Pacific Islands, advise governments to resist these imports, the economic rationale of profits and growth is found to be dominant over health concerns.

Whether globalised distributions of food complexes have benefited island societies' food security is the subject of many perspectives. At the island community level the range of foods available has been increasing at a rapid rate since World War II. But whether introduced food and foodways are less reliable than local foodways is debatable. As island communities experience threats of cost increases and irregular transportation links, as well as environmental devastation by cyclones, they are faced with changing perspectives of 'good foods' that necessitate juxtaposing new values against old ones. Resiliency assessment, whether at household and/or community levels, indicates that island communities have devised their own actions and reactions to managing biodiversity when threatened by extra-Pacific intrusions (Feeney 2014).

After the dramatic impacts of World War II in the Pacific on both the people and the environment, colonial economic development plans focused on agricultural production for commercial markets, while political management plans focused on the viability of various regional interactions. The Pacific Forum and Secretariat of the Pacific Community (SPC, formerly South Pacific Commission) have become intermediary to FAO and WHO recommendations (Herr 1994) as well as the Millennium

Development Goals, especially Target 1, which relates to food. Health issues were addressed by managing transitions from infectious diseases to the newly emerging occurrences of NCDs, such as coronary heart disease (CHD), type 2 diabetes and obesity (Ohtsuka and Ulijaszek 2007). The moral principles that underpinned these changes were based on differing ideologies and moral values. For Pacific Island security, resilience necessitated integrating the 'old' familiar ways with selected aspects of new ideas.

Five-year development plans, drawn up by economists contracted to Australian, British and New Zealand governments in the 1960s, recommended ways to extend cash cropping beyond copra, sugar cane and timber plantations in Fiji, Papua New Guinea and even on small islands such as Niue. Cash cropping was seen as the major development tool that would lift Pacific economies from their (strong) subsistence base into the modern trading world. Subsistence crops were not included in the initial plans of the new agricultural department policies (e.g. see Chandra and Sivan 1981). Plantation crops such as coffee and cacao, as well as copra, were promoted as better land management techniques to overcome smallholdings, and as the means for Pacific farmers to gain access to the cash needed to spur on local economies (Ward and Proctor 1980).

Rapid urbanisation, begun in the 1880s, but accelerating in the 1960s, increased the divergence between local food sufficiencies and the needs of urban settlers. Calls for support from relatives still based in the rural sector were met by extending gifting networks, and also by increasing dependency on food markets in urban areas. The Talamahu market in Tongatapu, and city markets in Suva and Papeete, provided the interface between rural producers looking for a cash return for their taros and watermelons, and their urban kin who longed for the 'familiar' foods from the land. Subsistence economies co-existed with the new superettes and market stores full of imported foodstuffs. Local food provisioning was merging with new food options sitting temptingly on store shelves.

The dietary consequences of urbanisation began to manifest in a range of NCDs, such as diabetes (e.g. Zimmet 2000). Zimmet's paper, titled 'Globalization, coca-colonization and the chronic disease epidemic', laid the blame for the increased rates of NCDs on the new (imported) foods that Pacific Islanders were consuming. This issue has escalated through to 2016 when the question of whether soft drinks should be subject to legislation or taxation is high on the health policy agenda across the

Pacific, and in New Zealand. Nutritionists' assessments of whether Pacific Island urban diets are a main contributing factor to NCDs and obesity (Coyne, Badcock and Taylor 1984) indicates the dangers attributed to health of increasing choices when limited cash is the only means of access to foods.

Migration, both internal and international, has introduced a new dimension to the effects of many choices, but it has reduced means to obtain selected foods based on health outcomes. Population movements, whether to find new lifeways, including jobs, reunification of families or education, have led to extended food transactions with overseas relatives. Tuamotuans provided their Papeete-based relatives with fresh fish in return for lettuces and some meat sent by chilly bin on the flights across French Polynesian waters (fieldnotes, June 1976). Similarly, Rarotongans welcomed the chilly bins of Kentucky Fried Chicken and chips that arrive with relatives flying in from New Zealand; in return they might send an *umu*, earth oven of cooked Pacific foods including taro, and breadfruit and fish, to their relatives based in Auckland. Such transactions serve to reinforce Pacific values of sharing food as expressions of ties to identity through tastes of foods from home (Pollock 2009a).

Regional networks designed to enhance economic and political growth through supporting linkages between island nations, such as Pacific Forum, and Forum Shipping and Forum Fisheries have provided a bridge between the colonial inputs of Australia, Britain and New Zealand in the south Pacific, and America in northern Micronesia—a bridge that was designed to bring the newly independent nations into close liaison for what was considered, by outsiders, to be similar needs (Herr 1994). In 1970, Ratu Sir Kamisese Mara, first Prime Minister of Fiji, and spokesperson on new regional concerns voiced a new regional view, the Pacific Way, that espoused alternative values based in an ideological cohesion of Pacific ideas in the face of the major tide of westernisation (Mara 2015). Regionalism has remained as a background ideology to provide mutual support between like organisations such as the Melanesian Spearhead Group formed in 1988 to provide food support after major cyclones, such as Pam in Vanuatu 2013, and Winston in Fiji 2016. International support for local food accessibility is welcomed as in FAO's root crops program.

Issues of sustainability are under the spotlight as climate change becomes a major point of discussion for Pacific nations. Anote Tong, former President of Kiribati, an atoll nation under threat, is providing leadership

to awaken European and American leaders to the imminent plight of Pacific nations (Tong 2016). Sustainability of food access at both national and community levels is a major concern for Pacific Forum leaders. But that access is heavily reliant on both jobs to access cash as well as maintenance of healthy dietary choices. That some Pacific nations are recording an inability to meet the MDG target of sufficient food at \$1 per day is an indication of an alarming trend towards food poverty.

Health concerns have been identified for Pacific communities by postcolonial programs established by WHO on an international scale, and the Secretariat of the Pacific Community on a local scale. Establishment of a nutrition sector of SPC in 1946 supported enquiries into dietary practices that had previously been deemed insignificant. Findings from dietary reports for many Pacific Islands, particularly with growing urban populations, documented the dietary options that were leading to the health transition towards increasing rates of heart disease, diabetes and cancers, particularly obesity (Coyne, Badcock and Taylor 1984). Compilations of data have extended the medical paradigm to include cultural factors (Brewis 2011). Awareness of amounts of sugar consumed in many forms, such as soft drinks, biscuits and cakes, largely hidden in 'processed foods', is highlighted in discussions of whether education or legislation is the best way for governments to control sugar intake (e.g. Egger and Swinburn 2010).

There are two very different conceptualisations of 'good food', the one that emphasises local produce such as root and tree starches is very distinct from the second, the outsiders' views of good food based in grains, meat, vegetables and sweet foods. Collaborations have benefited from a strengthening 'binary' approach, as Pacific dieticians present in *Pacific Foods: The Staples We Eat* (Malolo, Matenga-Smith and Hughes 1999). Projects that encourage households to combine root crops together with some imported foods such as rice, meat and vegetables in their food selections are gaining recognition for what they can contribute to improving a healthy diet in today's global world.

The persistence of food concepts in which the starch food is dominant, rather than protein and vegetables, challenges the options available for 'modern' consumers' views of 'good food'. From another view of globalisation, Eugene Eoyang's (2007) image of two-way mirrors, reflecting eastern and western poetics as they co-occur in the modern world, suggests that alternative views of food should be seen as

complementary rather than as opposites. Asian concepts, as early settlers transported them into the Pacific, have established particular views of food that differ from but are today mixed with a number of introduced European/western concepts. The emergence of a glocal approach embeds the food component of traditional economic knowledge as it contributes to emerging gastronomic ideology; rice and fast foods and meat have been added, as the price allows. Choices between global and local are based on several complex moral principles that must be juggled by consumers, depending on modes of accessibility and desired outcomes.

Moral concerns

Biodiversity has generally been evaluated as beneficial to the societies involved (Maffi 2008). But negative outcomes must be considered. The wide range of foodstuffs and foodways that has offered Pacific Island residents food security is under challenge in the new millennium by the range of imported foods and foodways, including processed foods and takeaways. Europeans introduced plantation agriculture in the nineteenth century, which in part replaced household food crops. More recently, the diversity of foods appearing on supermarket shelves and takeaways in Suva or Tahiti teases local consumers who don't have the means of access, namely cash. A fried chicken takeaway, or even a soda drink has become highly desirable, with strong moral concerns.

The concept of 'good food' as established in cultural values has many layers. Globalisation subsumes a universal set of values, for example, MDG Target 1 that sets a target of \$1 per day as a worldwide measure of improved food access, that is the dollar value of foods. An approach that values heterogeneity, as discussed here, contrasts Asian-based values for Pacific communities with European/American values. When we add rapid environmental changes as they affect biocultural diversity, we are faced with a range of alternative views as to how sustainability should be addressed (Maffi 2008). Food security, as the moral concern addressed here for Pacific Island communities, has become based on an integration of local and global food values.

Key moral values that have developed in the Pacific over time stress food as an integral part of cosmology and social beliefs, over and above its material elements. The cultural elements of gastronomy outweigh the biological, Claude Fischler (2001) indicates, but global thinking has

placed more stress on the biological impacts of good and bad food on health as the key to future population sustainability; while Alexandra Brewis (2011) argues obesity is a biocultural issue. Pacific communities are asserting their resilience to imposed moral concerns by choosing foods according to their own cultural heritage as it is interpreted in the modern world, as well as listening to outside advice.

Purchasing food has further increased the diversity of options alongside access to local starch staples. Where taros are more expensive than rice then urban households face difficult choices; taro and yams have become the feature of Sunday after church lunches in Tonga (Tevita Ka'ili, personal communication, 24 June 2006). As a special treat, local foods are offered to the wider social group as a taste of heritage, but at a price. Attempts to earmark the importance of local rather than imported foods, as in Fiji's 1990s overstamp 'Eat More Local Foods', are fraught by the expense of local staples. Householders have to make many choices when daily provisioning, whether from the gardens or from the stores. Deciding which is 'better' has become very complex, as messages come from many directions, whether family, media or health professionals.

New messages have been added to long-held gastronomic beliefs and practices. As missionaries and colonialists advocated replacement of local root crops by grain-based foods, and meat as more 'civilised', so outsiders' ideas about good food have continued to infiltrate Pacific societies at all levels. Healthy foods, affordable foods and tasty foods compete with the array of fast foods, processed foods, snacks and imported meats, such as turkey tails and lamb flaps, all requiring cash. Where can householders turn for the best advice? Are the major concerns economic or well-being? The range of foods available today highlights the dilemmas of diversity.

If glocalisation is 'the interpenetration of global and local, resulting in unique outcomes in different geographic settings' (Ritzer 2003: 2), then understanding gastronomic values provides a tool for consideration of such interpenetrations, in this case in Pacific societies. New values are becoming integrated with old ways, as in the promotion of breadfruit or cassava chips in snack packets. Marketers such as McDonald's in Asia have adapted their standard hamburger product to offer Asians an alternative of meat between rice patties instead of a bun (as in Hong Kong, fieldnotes, August 2009). And chefs in Pacific resort hotels are being trained to present local dishes, such as taro gnocchi, to their guests whether visitors or locals (Oliver 2013). The added value marks a 'meeting of tastes'.

Glocalisation has come to the fore as a form of resilience to socioeconomic shocks from environmental upheavals, as in Vanuatu after cyclone Pam, and now in Fiji after cyclone Winston (February 2016). Rice is the inevitable relief food, but aid to assist with rebuilding local crops and infrastructure (RNZI radio broadcast, 13 March 2016) recognises values beyond the purely material aspects of rebuilding lives, both social and material. Generosity with food still continues as a basic principle in many Pacific communities, both in the islands and in cosmopolitan settings; it transcends dollar values, but households have to constantly re-evaluate their personal situations as to what they can afford to contribute.

Those promoting biocultural diversity as an approach that incorporates human values within an environmental approach to nature (rather than as a major agent of economic growth) include a range of moral considerations (Maffi 2008). When sustainability was phrased in terms of balancing environment, society and economy, as advocated at the Rio Summit (Brundtland and WCED 1987), it strengthened a positive view of biocultural diversity. But at the same time it also addressed ‘Leopold’s challenging question: how can we humanly occupy the Earth without rendering it dysfunctional?’ (Maffi 2008: 267). Whether the diversification of foodways can continue is a key consideration. A degree of dysfunction already exists when households, communities and nations are faced with difficult decisions. Food imports, whether necessary or expedient, remain a concern for Pacific nations striving to control their own economies. Dumping foods and soft drinks by international companies, though they may be customer favourites but judged unhealthy, highlights the dysfunctionality of many options.

Traditional ecological knowledge has gained its standing as a glocal response to sustainability. By interweaving local dietary principles for well-being with outsider economic pressures, including nutritionists’ principles, emphasis on the glocal is incorporating new demands, as from climate change, while also providing the continuity of food security practices and thinking. Biodiversity-focused strategies are being formulated that build on both traditional food systems within their ecological contexts and new ventures as the main pathway to a sustainable future (Johns and Sthapit 2004). For example, research on salt-resistant taros is being undertaken by the Secretariat of the Pacific Regional Environment Programme (SPREP) to meet the impact of rising sea levels, while also having acceptable tastes and textures.

Food accessibility remains the core value. Biodiversity presents apparent options, but monetary values have intruded into dietary choices. Choices abound, but they give rise to many new moral gastronomic dilemmas. While agencies such as MDG set a target to reduce poverty by increasing food access with \$1 per day as their number 1 priority worldwide, that raises concerns such as the importance of local foods being more than their dollar value.

Moral obligations to support biodiversity in the Pacific have been taken up by various agencies addressing sustainable Pacific futures. In particular, SPREP supports national agricultural programs, while also coordinating a regionally integrated approach to international demands such as FAO. The Pacific Forum continues to adjust its role in mediating between the demands of major international organisations such as FAO, WHO and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) where local values confront international standardising values. The Forum Fisheries agency's two-fold emphasis to promote local fishery developments while also supporting local national efforts to control international fisheries' exploitation of Pacific fish stocks, provides an example of complementary approaches. Epeli Hau'ofa's oft-cited (2008) declaration of an alternative approach to the Pacific as 'a sea of islands' rather than islands in the Pacific Ocean promotes a more inclusive view of the islands' own priorities, the Pacific Way, that underlines the glocal. The values associated with local knowledge are precious *taonga* that have been threatened over the years by outsider impositions, but have resulted in strengthened local resilient responses, that is, maintaining biodiversity.

Maintaining local integrity, based on self-sufficient principles and local food concepts is basic to any glocal approach. Foodscapes can provide the cultural dimensions of changes, whether economic or 'nutrition transitions', on both gastronomic ideology and practices. Measuring food poverty by a yardstick of \$1 per day (MDG Target 1) provides only one dimension of biodiversity—foods that people can buy—but it devalues the contribution of local foods to well-being and the economy. A glocal measure is needed.

Conclusions

Diversity of foodstuffs increases gastronomic choices. But those have both positive and negative values when cash economies intervene. Waves of innovation have increased food security in the Pacific Islands over some 500 years, marked by new arrivals introducing plants that fit local gastronomic principles as well as the environment. The resulting 10 species of plant foods marked a gastronomic system transferred out of Asia, which has been adapted over time by residents to meet the challenges of varied island environments. Certain foods have been prioritised as 'good food' over others; the significance of a starch food eaten with a small accompaniment of coconut meat or fish has endured despite 200 years of alternative priorities.

An alternative foodway introduced a disjuncture, a moral dilemma, that opposes local cultural values, with the many moral concerns that abound with international assessments of foods and their uses. Even more problematic is the devaluation of local foods in favour of introduced foods and the associated gastronomies. The foodscape discussed here indicates the impact of new sets of values associated with foods and their uses as they contribute to a glocal form of food security. A secure future has become problematic in the face of globalisation, where householders must choose between a range of moral concerns every time they provide for their families. Cash does not necessarily increase the range of foods accessible to those households, or simplify moral concerns.

Biodiversity has been considered here to extend beyond the food plant resources, expanded over time and space, to include new ideologies such as economic and nutritional analyses. What is considered good food is highly variable. Some communities have chosen to include new processed foods in their diets, when they can afford them, while others struggle to offer their families more than rice eaten with a small piece of fish or coconut meat when breadfruit is out of season. Support for development of a glocal food economy is apparent in the local Fiji Food and Nutrition Committee attempts to ensure that the diversity of local foods can be sustained in the onslaught of market-oriented, multinational food intrusions, supported by outside agencies such as the root crops programmes of SPC (Malolo, Matenga-Smith and Hughes 1999). Choices between the familiar and

new, less familiar food products form a continuum with the past; the glocal combination offers greater resiliencies to future shocks, whether social or environmental, and materialist views of food. Fiji's adage to encourage its people to 'Eat More Local Foods' has Pacific-wide relevance.

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This text is taken from *Tides of Innovation in Oceania: Value, materiality and place*, edited by Elisabetta Gnechi-Ruscione and Anna Paini, published 2017 by ANU Press, The Australian National University, Canberra, Australia.