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health and horticulture in remote Aboriginal Australia

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Introduction

> Improving the health status of Aboriginal and Torres Strait Islander people is a longstanding challenge for governments in Australia. While there have been some improvements since the 1970s…overall progress has been slow and inconsistent. The inequality gap between Aboriginal and Torres Strait Islander peoples and other Australians remains wide and has not been significantly reduced. (Aboriginal and Torres Strait Islander Social Justice Commissioner 2007)

In his 2007 report, the Aboriginal and Torres Strait Islander Social Justice Commissioner framed a human rights based approach to addressing persistent health inequalities between Indigenous and other Australians. While the focus of the report relates to services, the social determinants of health status are emphasised, and it is noted that 'poor infant diet is associated with poverty and chronic disease in later life' (Aboriginal and Torres Strait Islander Social Justice Commissioner 2007: 15). For Indigenous Australians there has been a shift in vulnerability over the past four decades — in a sense, an accelerated and off-track 'epidemiological transition' (Omran 1971) — from an excess burden of mortality and morbidity from communicable diseases and conditions that reflected nutritional insufficiency to high levels of behaviourally mediated chronic diseases, prominently including those that result from smoking and poor nutrition.

Cardiovascular diseases and diabetes are now major causes of ill health and premature mortality. Professional understandings have evolved over the past five decades to include a range of social determinants to explain not only the elevated rates of these conditions for Indigenous Australians but also their intransigence to improvement (Hunter 2010). Among these are concepts such as the 'thrifty gene' (Neel 1962, 1999), which evolved through the 'thrifty phenotype' (Barker 1992, 1995) to become DOHaD — developmental origins of health and disease (Silveira et al. 2007; Waterland and Jirtle 2004) — and which foregrounds subnutrition through pregnancy and infancy and has now been demonstrated in Aboriginal communities (Singh and Hoy 2003). Acknowledging the importance of improved nutrition to reducing the burden of chronic disease in Aboriginal and Torres Strait Islander populations, the National Strategy for Food Security in Remote Indigenous Communities (COAG 2009: 5) summarised the consequences of poor nutrition:

> • It is estimated that up to nineteen per cent of the national Indigenous health gap is attributable to diet related causes, including low fruit and vegetable intake.
>
> • In remote areas, 20 per cent of Indigenous people aged 12 years and over reported no usual daily fruit intake and 15 per cent reported no usual daily intake of vegetables.
>
> • Nationally, Indigenous children aged less than four years suffer from nutritional anaemia and malnutrition at 29.6 times the rate for non-Indigenous children.

Excess vulnerability of Indigenous Australians persists even when conventional risk factors are accounted for (Wang and Hoy 2005). This has spurred theorising and research regarding psycho-social factors relating to 'control' in Indigenous settings (Hunter 2010). The research has included exploration of health-related behaviour (diet) and 'mastery' (the

degree to which individuals feel in control of their lives) in remote Aboriginal populations of the Northern Territory. It has shown age-dependent relationships between mastery and consumption of fruit and vegetables, and particularly low levels of mastery among young men (Daniel et al. 2006) who are the partners of young women and the fathers of infants and young children. Such issues take on particular importance given that conventional health promotion approaches (such as information- or 'knowledge'-based approaches) have met with limited success.

Remoteness is a key factor in food insecurity (Green, R 2009). This paper considers one approach in remote Aboriginal settings[1] that has been common wisdom for more than a century and that is now recognised for its potential to broadly impact health throughout the lifespan — increasing fruit and vegetable availability and consumption through local production. This is identified in the National Strategy for Food Security in Remote Indigenous Communities: National Healthy Eating Action Plan as one supply-based element (COAG 2010). Acknowledging the complex interplay of social and psychological layers that impact on health outcomes (Campbell et al. 2007), we attempt to identify key factors that have frustrated attempts to develop sustainable market gardens and that influence consumption of produce in one region (Cape York Peninsula). And we consider in more detail the experience in Lockhart River, a discrete community on the eastern coast. This paper focuses on the use of horticulture as a means to improve nutrition and health. Although we are interested in whether horticulture can be scaled up to ensure reliable and extended local supply that could potentially lead to commercial production, such economic enterprise is not our focus.

Policy context

The Senate Select Committee on Regional and Remote Indigenous Communities (2010: 1), in Recommendation 2 of its fourth report, stated:

> The committee recommends that the COAG work on the National Strategy for Food Security in Remote Indigenous Communities include an analysis of alternative agriculture to improve the affordability, quality and availability of fresh fruit and vegetables in regional and remote Indigenous communities.

In its response, the government (Australian Government 2010) said:

> The Australian Government recognises the important role of local traditional food, local agriculture and horticultural projects, and community gardens in supporting

1 Although nutrition is also a major health concern for Torres Strait Islanders, and while gardens have been set up in the Torres Strait as health promotion initiatives (Leonard et al. 1995: 589–95) and use of traditional resources explored (Bird et al. 1995: 2–17), the populations and issues are very different. Further, while many Aboriginal people are involved in agriculture in rural Australia and have successful domestic vegetable gardens, our focus is on remote Aboriginal communities, most of which (and nearly all of which in Cape York) have certain commonalities in their histories and current circumstances and bear a disproportionate burden of the health and social disadvantage of Aboriginal Australians, including nutritional disadvantage.

> food security in remote Indigenous communities and agrees that these are an important element in improving the supply of healthy food to remote Indigenous communities.

Responses to the national strategy have included calls for food literacy and agri-literacy to enable local production in support of food security for remote communities (Ninti One 2011). Food security (access, availability, utilisation and stability) is an important issue for indigenous populations undergoing 'nutrition transition', including the Inuit populations of northern Canada (Sharma 2010) for whom, as with Indigenous Australians (Green, D et al. 2009; Hunter 2009), climate change presents another major challenge. In these populations changing dietary preferences across generations now operate, with fewer traditional foods consumed by children and declining knowledge of traditional food systems (Stroink and Nelson 2009). Consequently, as Power (2008: 95) notes, food security — which the Canadian government defines as being 'when all people, at all times, have physical and economic access to sufficient, safe, and nutritional food to meet their dietary needs and food preferences for an active and healthy life' — needs to include a cultural dimension incorporating traditional inputs.

A parallel argument has been made in relation to conceptualising 'economic security'. Jon Altman (2005; Altman et al. 2005) has argued for a broader conceptualisation of inputs (including activities within the customary sector) into analyses of the 'hybrid economy' in remote Indigenous Australia. However, in quantifying the benefits of this model (which include hunting, fishing, arts and crafts, natural resource management and carbon abatement initiatives), no mention is made of agriculture or horticulture (Altman 2004) — local agricultural/garden production is sufficiently important to be identified as a policy priority in terms of Aboriginal food security but is not significant enough within Aboriginal communities to be regarded as an economic input. Indeed, despite agriculture increasing in importance across many areas of northern Australia and gardening being omnipresent across much of Melanesia (and, to a lesser extent, Torres Strait communities), the National Food Plan green paper 2012 (Australian Government 2012: 158) notes:

> The 2006 Census showed 67.6 per cent of Indigenous Australians lived in regional and remote Australia, yet Indigenous participation in agriculture has been falling. In 1971, 24 per cent of Aboriginal and Torres Strait Islander people were employed in agriculture, fisheries and forestry but by 2006 this had fallen to only 3 per cent.

Whether this reflects cultural attitudes, historical factors, training and skills, or the social context of widespread welfare dependence (with limited avenues for private enterprise) is unclear. Further, before exploring those possibilities it should be noted that, as in the case with encouraging physical exercise as a priority for Indigenous health promotion, perceptions and expectations within the wider society presume 'choices' regarding relevant behaviours that are implied to be 'morally right' (Nelson et al. 2010). This supervenes on a history in which, as Kidd (1997: 137) has noted in relation to Queensland, attempts to legislatively enforce certain lifestyle practices might be considered 'medical and moral policing'. The failures of mainstream institutions and organisations to embed these

self-evidently beneficial practices may be interpreted as resistance or as 'modes of Aboriginal non-compliance with the Australian state's efforts to impose order', as has been raised by Sackett (1988: 73) in relation to drinking and drunkenness in Central Australia.

Background: Cape York

From the base of the Gulf of Carpentaria in the west to the Torres Strait in the north, Cape York has a total area of 127,819 square kilometres, which accounts for 7.4 per cent of the total area of the state of Queensland (OESR 2012). The population of the Cape York region is 16,280. Excluding people living in the mining town of Weipa, 67 per cent of the population is Indigenous. The majority is Aboriginal (69 per cent) and the remainder Torres Strait Islander (18 per cent), with a proportion of the population identifying as both Aboriginal and Torres Strait Islander (13 per cent) (OESR 2012).

Permanent European settlement dates from the late 1800s. The primary economic drivers for settlement of the remote areas of Cape York were timber, mining, pastoralism and fishing/pearling. Through policies of isolation and concentration, the Aboriginal people of north Queensland were relocated to a series of discrete settlements in which, through the *Aboriginal Protection and Restriction of the Sale of Opium Act 1897* (Qld) and its successors, draconian social controls were maintained. Initially managed by missions,[2] by the late 1960s these settlements were all state run and were accorded quasi-autonomous status as Deed of Grant in Trust (DOGIT) communities in 1987. The introduction of the Queensland *Community Services (Aborigines) Act 1984* provided a legislative base for a range of changes, including the capacity for self-government and the trusteeship of former reserve lands through the DOGIT allocation. By 1989 the Act had been introduced to all of the communities except Aurukun and Mornington Island. In 2004 all remaining DOGIT communities came under the *Local Government (Community Government Areas) Act 2004* (Qld), and four communities (Hope Vale, Aurukun, Coen and Mossman Gorge) became the focus of the Cape York Welfare Reform agenda in 2007 (Cape York Partnerships 2012).

Foraging and 'farming'

The 'informed opportunism' (Hunter 1999) of traditional Aboriginal hunter-gatherer societies provided nutritional variety and sufficiency through nuanced knowledge and exploitation of locational and seasonal diversity that shaped local cultural practices (Chase 1980; Thomson 1939). The resulting diets had high levels of carbohydrates (but low levels of sugar), very low levels of fat, and high levels of iron and other micronutrients (Maggiore 1993; Smith, R and Smith, P 2003). Changing natural resource utilisation and diets began with frontier contact and conflict, and were entrenched with permanent European settlement. An important feature of traditional food-related practices (including consumption) was that they were informed by gender and complex social and kin-based relationships, with gathering (for

2 Cape Bedford (Lutheran), 1886; Bloomfield (Lutheran), 1887–1901 then 1957; Yarrabah (Anglican), 1892; Weipa (Presbyterian), 1898; Aurukun (Presbyterian), 1904; Mornington Island (Presbyterian), 1914; Mitchell River (Anglican), 1904; Lockhart River (Anglican), 1924; Edward River (Anglican), 1938; Mona Mona (Seventh Day Adventist), 1913; Doomadgee (Plymouth Brethren), 1931.

females) and hunting (for males) involving intra-gendered sociality (Martin 1993). As Taylor (1984: 57) noted regarding populations of western Cape York:

> There was a sexual division in the organisation of tasks. It was the men who hunted (and cooked) mobile and elusive quarry such as marsupials, large landfowl, lizards and fish, sharks and rays. Women on the other hand exploited and processed the relatively static concentrations of food resources composed in the main of rootstocks, fruits, crustaceans, molluscs and turtles.

Considerable prestige was associated with hunting. The arduous work of women in foraging and gathering provided the staples for survival and conferred on them economic power (and vulnerability) in societies in which the sacred domain of power through ritual was largely controlled by men (Bell 1983; Mol 1982). The arrival of Europeans altered the existing power relations, with deaths, dislocation, and overt and covert acculturative pressures undermining the centrality of ritual and the sacred domain for large sections of the Aboriginal population. However, even before Aboriginal Australians were drawn or coerced into sedentary lifestyles in association with European activities, contact was changing practices associated with food.

The arrival of processed foods, particularly flour, in the stock camps and nascent settlements of the frontier had a dramatic impact not only on diet but also on social and gender relationships (Brock 2008). Unconstrained by the 'tabu' system (Taylor 1977), flour freed women from the demands of collecting traditional sources of carbohydrate and the vicissitudes of seasonal availability (Martin 1993). It also eliminated the laborious demands of leaching out toxins, a task that was required for certain traditional sources such as cycad nuts (leaching also subsequently reduced enthusiasm for the use of particular crops introduced during mission times, such as cassava (MacKenzie 1981)).

As the cattle industry flourished, Aboriginal workers and their extended families were brought into a station-based lifestyle in which (Smith, P and Smith, R 1999: 131):

> …the reliability of an adequate diet depended on the patronage of the station owner, an access to regular supplies of supplementary bush foods and on the position of each individual in a new and imposed hierarchical structure based on the division of labor. The staples of the station diet were barely adequate quantities of grain (processed flour), adequate meat, and liberal sugar, the latter replacing the fruit/sugar component of the traditional diet. Although the station diet resembled what must initially have been the ideal diet as seen by hunter gatherers, nutritionally it was much less adequate.

Providing stable sources of such foods as rations proved to be an effective mechanism for social control (Rowse 1998). It operated across pastoral, mission and government settlements and reserves and was dependent on particular processes of social exchange that undermined Aboriginal social practices and structures (Brock 2008). As Trigger (1992: 226) notes in relation to the gulf area of north Queensland, 'The introduction of "rations" by the colonisers established a material basis for the beginning of a prolonged process

of pauperisation among Aboriginal residents of camps fringing towns, cattle stations and police depots.'

With the arrival of missions in Cape York — and after some disappointing starts, such as at Trubanaman in the first decade of the century (Freier 1999) — gardens were set up with a view to supplementing diets in settings in which traditional sources were compromised by population density and choice, and where external funding was perennially short. The best described of these gardens were at Kowanyama (Mitchell River), which replaced Trubanaman after the First World War, and Pormpuraaw (Edward River) (Taylor 1977, 1984). Driven by the pragmatics of food security and ideals of village-based agrarian self-sufficiency (Taylor 1979), initial success reflected the drive and skill of particular mission staff, such as ex-farmer JW Chapman at Edward River (Taylor 1984: 336), who:

> …with the help of his newly settled villagers, planted gardens with potatoes, yams, taro, cassava and sugar cane to supplement the slender mission supply of flour, rice, tea, sugar and salt beef. He planted orchards of pawpaws, bananas, mangoes and custard apples and established a grove of coconut palms from all of which he hoped to produce commercial crops.

The introduction of competing activities (such as other work in the mission economy or on nearby stations), rations and stores, and the beginning of cash payments combined to undermine local investment in the gardens, which, at Edward River, came to a sudden end with Cyclone Dora in 1964.

By the late 1970s, criticisms of ration-based institutionalisation had taken on an increasingly moralistic tone. As a doctor in Western Australia's Kimberley noted at that time about the Catholic mission of Kalumburu (Randolph Spargo, pers. comm., 2012):

> Just about everyone used to be fed in a communal dining hall and they would get their meals through a hatch. One day a politician visited — he was later Premier. Before he left he said he was outraged that people were still fed through a hole-in-the-wall in the twentieth century. A week later it was on the front page of the *West Australian* newspaper and a year later that was gone and people lined up at another hole-in-the-wall to get their welfare payments.

Stores and staples

The 1960s were a period of instability for all missions in Cape York, and in 1967 administrative control was assumed by the Department of Aboriginal and Islander Affairs. One consequence of this was the dominance of a cash economy, with a shift from rations to welfare payments. This was the end of the mission-garden era and with it came increasing dependence on a narrower dietary range and a worsening nutritional status. Taylor undertook dietary surveys in Edward River in 1970 and 1972 at a time when the gardens had been abandoned and noted that three-quarters of food expenditure (in which women had moved from gatherers to purchasers) was on meat, sugar, flour and tea (Taylor 1984: 397–8). In a separate survey in 1973 he noted that in this area, where access to sea resources was good (Taylor 1984: 401): 'Hunted food figures in only 10 per cent of the meals. None of the pre-settlement

plantfood staples were gathered by the women. Flour and other prepared cereals had completely replaced them.'

Store-bought processed foods were energy dense and contained high levels of salt, which, like sugar, was not a feature of traditional diets. Across northern Australia the residents of mission settlements shared the experiences of pastoral workers and their families as they made the transition from station life to community life. In a comparison of food culture on cattle stations prior to the 1960s with food culture in 1988, Kouris-Blazos and Wahlqvist (2000: 224) noted that in the Kimberley:

> Food habits prior to the 1960s appeared to be more nutrient dense, due to greater food variety and higher intakes of lean fresh and salted buffalo meat…offal, vegetables and bush foods…High intakes of tea and sugar appear to have remained unchanged. Food intake was more or less constant from day to day in contrast to the 'feast' and 'famine' days observed in the community studied in 1988.

This is consistent with the experience of a doctor working in the Kimberley at that time, who noted that in the movement of people from stock camp and station life to towns, diets shifted to a narrow range of processed staples that contained high levels of salt and sugar (Hunter 2010). Further, whereas ration systems (usually) guaranteed food resources — however nutritionally compromised and paternalistic — across pastoral, mission and government settings, stores provided powerful alternatives, including tobacco, for welfare-derived sustenance incomes. This increased dramatically through the 1970s as mobility increased (through legislative change and improved road access) and vehicles and alcohol began to compete for available funds. As Kidd (1997) notes, in Queensland alcohol was a means of returning money to government coffers. In Cape York the situation was compounded in the 1980s by the setting up of alcohol canteens in almost all communities and the ultimate dependence on canteen revenues for funding 'local government' activities. As Martin (1993: 110) notes in relation to Aurukun:

> Following the opening of the Council run beer canteen in late December 1985, there was a strong trend in expenditure away from foodstuffs from the store to convenience foods from takeaway, and away from food and other items in general to alcohol. In comparison with those people in the broader Australian community living in households dependent on unemployment and sickness benefits, who had a similar per capita income, Wik on average spent more on food — twice as much…However, at least five times and possibly up to nine times as much of their income was used to obtain alcohol as was the case for those in the broader community.

Alcohol not only competed with funds for food but also, as a result of the chaotic behavioural consequences in crowded living spaces, made domestic food preparation more difficult. Most alcohol-fuelled violence in the 1980s in Aurukun occurred within the domestic arena. Martin (1992: 174) notes that in the year for which he had data most adult males and essentially all of those between 20 and 30 years of age had been arrested at least once.

Consequently, alcohol reinforced greater reliance on convenience foods, which, in Aurukun in 1986, accounted for 40 per cent of store takings, with children noted to be increasingly scavenging for food from house to house (Martin 1993: 147).

There are other reasons for 'fast' food becoming entrenched as a major component of the dietary landscape of remote communities in Cape York (and elsewhere), important among which is the impact of demand sharing[3] (Macdonald 2000; Peterson 1993). As Sutton (2005: 6) has commented in relation to certain practices reflecting traditional and 'family' values (including demand sharing), 'after colonisation, they were no longer operating in the same environmental and cultural context, and they became applied to new substances, new diseases, and new relationships.' Fast food solved various problems. In the new social and economic context of concentrating people and need, storage and preparation of food is difficult in places where housing is poor and accommodation crowded (Bailie and Wayte 2006). Furthermore, given the impact of demand sharing in crowded living settings, the store manager at Aurukun was reported as stating in the early 1980s that residents did not stockpile food at home for fear that it would be taken by relatives (Stephens 1985). Fast food, as a unit commodity, could be obtained and consumed in ways that avoided the depredations of others (Saerthre 2005: 166):

> The food can be consumed immediately, also eliminating the need for a secure storage facility that will not be pilfered by guests. Because the proportions are small and intended only for a single individual, the meal can easily be concealed and later eaten in private, reducing the chances that other family members will request a share…The priority of shoppers who purchase food from the takeaway is not about health but rather about obtaining a quick, cheap, easy meal that tastes good and does not have to be shared.

Processed and fast foods also made economic sense. In the Cape York communities of the 1980s almost all stores were run by a government department, and residents' capacity to exercise choice in obtaining healthy food was significantly compromised not only by availability but also by a dramatically elevated differential (by comparison to city prices) in the cost of fresh produce compared to processed foods and products such as cigarettes (Leonard et al. 1997). While the store-turnover methodology of food intake quantification in these settings is not as straightforward as it may appear (Brimblecombe et al. 2006), evidence shows that in terms of store-bought foods there was an economic disincentive to the purchase of fruit and vegetables. The Healthy Food Access Basket surveys[4] across Queensland between 2000 and 2006 revealed continuing disadvantage in cost and variable changes (including worsening in relation to fresh fruit) in terms of availability with increasing remoteness (Harrison et al. 2010). As Brimblecombe and O'Dea (2009: 549)

3 Demand sharing is an obligation to share resources, including food, with others within kinship relationships. It is common within remote Aboriginal and Torres Strait Islander communities. The obligation may, or may not, be reasonable; regardless, established cultural protocols reinforce the obligatory nature of this activity.

4 The Healthy Food Access Basket survey is information collected regularly about the availability and price of 44 predetermined common household food items, including fruit and vegetables, throughout Queensland (Harrison 2010).

note, 'the energy-cost differential between energy-dense, nutrient-poor foods and energy-dilute, nutrient-rich foods influences the capacity of Aboriginal people living in remote communities to attain a healthy diet.'

By the last decade of the twentieth century, the diets of the Aboriginal residents of remote Cape York communities were clearly inadequate, with significant health consequences. Food was largely bought or 'borrowed', rather than caught or collected, and there were cultural, social and economic disincentives to the purchase and preparation of fresh produce — and to the use of locally grown fruit and vegetables, including limited facilities for storage and preparation and the greater vulnerability of such foods to the demands of others. Furthermore, by the 1990s most of the mission workers who had been the drivers of community gardens had left. Responsibility shifted to projects driven by government representatives, and, whether a consequence or not, in almost all of these communities the local gardens fell into disrepair and most were abandoned.

The Lockhart River setting

Lockhart River is a small community of approximately 640 people (89 per cent of whom are Aboriginal and/or Torres Strait Islander peoples) situated on the north-east coast of Cape York Peninsula (OESR 2012). It is located on the traditional lands of the southern Kuuku Ya'u (Kanthanumpu) and is bounded by rainforest, low mountain ranges and the sea. The economy of Lockhart River is dependent on direct (welfare) and indirect (subsidised infrastructure and services) government payments. The largely non-Indigenous professional workforce, augmented by local Indigenous workers, supports government services and activities through Community Development and Employment Projects (CDEP).

CDEP was introduced in the Northern Territory as a remote trial by the Commonwealth Department of Aboriginal Affairs in 1977 and expanded substantially in the mid-1980s to regional and urban settings. CDEP has had supporters and detractors, including some who present the initiative as another form of 'welfare colonialism' (Bernardi 1997), but it has been the major vehicle for Indigenous funding across Aboriginal Australia (Stone 2008). Management of the program in Lockhart River (along with a number of other Aboriginal communities) was privatised in 2006 to Jobfind Centres Australia, a subsidiary of the Angus Knight Group, which since 2009 has operated under contract to the Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA).

Mission days

Contact with Europeans was intermittent through the nineteenth century. One such meeting was with a Frenchman, Narcisse Pelletier, who in 1858 at age 14 was left on the shore by survivors of the wreck of the *Saint-Paul*. 'Adopted' by the Night Island people, he spent the next 17 years living with them, and his accounts recorded in 1875 are the first detailed descriptions of the Aboriginal residents of this region (Anderson 2009). Ongoing contact with Europeans was with pearlers, timber cutters and fishermen from the 1870s

and with prospectors and miners further inland from 1907. The varied coastal environment encountered by these intruders had shaped Aboriginal hearth-based cultures as groups traversed the landscape to take advantage of seasonal resources. This process — including 'domiculture' (Hynes and Chase 1982) — also resulted in human-mediated ecological change as a result of generations of Aboriginal foragers bringing edible produce from naturally occurring plant communities into camps where accidental/incidental disposal of seeds resulted in 'groves' of highly desirable edible species (Athol Chase, pers. comm., July 2012).

In 1922 the area near the future site of the original mission (the 'Old Site') was surveyed with a view to settling returned servicemen following the First World War. Although that did not proceed, mission activities began soon after. The records of the Australian Board of Missions reveal that soon after the arrival of missionaries in 1924 at Waterhole near Orchid Point, garden areas had been cleared. The following year the mission was moved to a more fertile site where, by 1928, around eight acres were cultivated, increasing to 40 acres in 1933 with maize, potatoes, cassava, pumpkin, melon, pawpaw, custard apple, coconuts and other produce. From 1927, the first superintendent, Harry Rowan, who remained until just before the beginning of the Second World War, supported the agricultural activities of lay missionary Charles Cook in the development of gardens and his experimentation with coffee and cotton. The Torres Strait Islander involvement with the church in its earliest days was likely a significant factor in this support and encouragement (Thompson 1988, 1995). The Anglican Board of Missions Report (Cook 1933: 103) records that:

> Contrary to the general opinion held concerning the aborigines as an agriculturalist, the encouragement and experience gained during a period of six and a half years proves that, given reasonable opportunity and sympathy for their efforts to make gardens, the aborigine is capable and successful in partly supporting himself and his family from the results of his labours on the land.
>
> But in other spheres concerning his progress, it is a matter left largely to the Church and her missions, and we find that our effort to teach them to support themselves on the land is often keenly and adversely criticised. Such criticism creates difficulties which need not exist. On the whole I find that the prospect of the aborigine as agriculturalist is very favourable and should receive every encouragement and assistance.

Through the early 1930s additional groups brought in to the mission increased the population significantly, and the demands for support caused the mission staff to reflect on whether their core role was providing welfare and, consequently encouraging dependence, or supporting agrarian self-reliance, both of which need to be viewed in the context of traditional expectations (Thompson 1996: 151):

> …the subsistence life-style of hunter-gatherers has its own deeply-rooted ethic which conflicts with capitalist aims. The hunter-gatherer's objective is to obtain food requirements for immediate use from naturally available resources for minimum effort. There is a strong obligation to share the supply with kin in

> prescribed ways, particularly in hard times: not a benevolent sharing with anyone as is often assumed. Hoarding is antisocial.
>
> The Mission alternative required consistent effort, often without immediate gain, and the accumulation of capital and goods for the future. The Aboriginal ethic expected minimum effort with direct results, and when there appeared a benevolent source of supply in the Mission, there was natural pressure for it to be shared for immediate needs. Instead, the Aborigines were brought to depend partly on non-natural food sources and on a cash economy. They no longer had full control of the means of production, and became dependent on the capitalist mode and the Mission patronage.

With dry conditions in the 1930s and with the departure of Cook and, later, Rowan, the gardens lapsed. The next period of economic activity was not until after the Second World War, during which, due to lack of funding, the mission residents were required to return to hunting and foraging to ensure nutritional sufficiency until mission activities recommenced in 1947. Subsequently, under the guidance of supervisor John Warby and the auspices of the Lockhart River Aboriginal Christian Co-operative (which was seen as a model for missions elsewhere in Cape York), there was a shift in the focus of economic initiatives to cattle and trochus shell harvesting, although there was an effort to reintroduce cotton, with plans for some 600 acres. By the 1950s, though, these endeavours were compromised by lack of funding support that more broadly challenged the viability of missions throughout Cape York (Warby 1999). There were also attempts to re-establish gardens for local consumption at nearby Cutta Creek through the late 1950s and also to grow cotton commercially. However, these activities lapsed in the early 1960s. With the demise of local production and financial stringencies, malnutrition became common, despite a government weekly food ration (Warby 1996). After a period of growth and vitality, the cooperative ultimately failed around 1960, and the mission itself languished under increasing financial burdens until responsibility was transferred to the Department of Aboriginal and Islander Affairs in 1967.

Department days

Two years later, in 1969, the community was relocated to its current site. This entailed a shift from increasing dependence on rations through the latter years of the mission's history (in which dietary insufficiency was increasing) to a cash economy and store dependence. Warby (1996: 173) notes government weekly food rations per adult in the 1950s as being '7lbs. of white flour, 1lb. of sugar, with baking soda and cream of tartar, and lesser amounts for children'. Some 30 years later Chase recorded fortnightly consumption for a household of four adults and three children as 60 pounds of flour, 20 pounds of sugar, four pounds of tea, 20 pounds of butchers meat, 63 packets of cigarettes, one pound of tobacco and eight 12-ounce cans of meat (Chase 1980). These rations were supplemented with marine protein but, as Chase (1980: 32) notes:

> European-type green vegetables and dairy products are not favoured and seldom eaten. Brown flour and brown rice are seen as inferior to the white varieties, and apart from the staples of flour, rice, sugar and tea, popular store purchases

> are tinned meat and sugar-based products such as soft drinks, syrup and sweet biscuits.

Access to alcohol had been limited in mission days, and in the first years of government control at the new site it was (theoretically) restricted to European workers. However, with the opening of the alcohol canteen in Lockhart River in 1974 everything changed. Drinking and the canteen became a powerful 'means of Aboriginal solidarity' and the eighteenth birthday, which signalled initiation into the canteen culture, was a rite of passage (Thompson 1988). The 1970s to the 1990s was a period of rapid change. Key developments included the appointment of an Aboriginal Advisory Council in 1976 (although the Department of Aboriginal and Torres Strait Islander Advancement manager still had formal control under the *Aborigines Act 1971* (Qld)) and the formation of the Lockhart River Aboriginal Council under the *Community Services (Aborigines) Act 1984*. This for the first time placed the control of Lockhart River with Lockhart River people. A DOGIT in favour of the Lockhart River Aboriginal Council was issued in October 1987, and in 2001 those lands were transferred, under the *Aboriginal Land Act 1991* (Qld), to the Mangkuma Land Trust, representing the traditional owners. The present-day Lockhart River Aboriginal Shire Council was formed under the *Local Government (Community Government Areas) Act 2004* (Qld). A massive increase in funding from Commonwealth sources occurred from the mid-1970s; Clifford (2003: 163) noting that such 'payments were not, however, based on any notion of reciprocal exchange, but upon the rights of specific categories of individuals (pensioners, single mothers) to welfare incomes.'

By the late 1980s, welfare and alcohol had come to dominate the economy of Lockhart River. The Lockhart River Aboriginal Council depended on social security to support the CDEP program and on profits from the sale of alcohol to support community programs and projects (Clifford 2003). In the 1990s, average income from all sources was around $245 per adult per week, with nearly half of community wages going to purchasing alcohol from the canteen ($1.2 million in the 1996–97 financial year) and more spent on 'sly grog' (illegal sales of alcohol): 'Combining the sales of legal alcohol with the estimated purchase of sly grog represents as much as two-thirds of the total community wages for 1996–1997' (Clifford 2003: 173). The costs for the community were even greater: escalating injuries were associated with alcohol-fuelled violence, half of which was intra-familial (Gladman et al. 1998).

The diversion of welfare sustenance incomes to alcohol compounded the welfare pay week / slack week 'feast and famine' cycle, as noted in research undertaken in the mid-1990s (Hunter et al. 1998: 137):

> Alcohol thus functions in the paradoxical role as the primary source of Council revenue within Cape Community but, at the same time, as the primary impediment to sustained growth — on a community level through its toll in injuries and reduced work performance, and on an individual and family level through the diversion of disposable and, frequently, sustenance income…

> Nutritional sufficiency in this setting of high costs, poor quality and competing demands (diversion of sustenance income to purchase alcohol) is periodic in families in which drinking is heavy, with money available for food from payday until finances are exhausted through purchases of alcohol. As noted earlier, some families supplement their diet by fishing, but this option is clearly not available to all. Particularly vulnerable are those on pensions whose income may be viewed as a communal resource for the purchase of alcohol.

Council days

The second shift of responsibility for local governance to the Lockhart River Aboriginal Shire Council coincided with the closing of the canteen in October 2003 following a period of escalating violence and imposition of alcohol management plans across the remote communities of Cape York. Although this resulted in a reduction in trauma, it did not eliminate drinking, which continued through sly grog, and cannabis became a major cause for diversion of sustenance incomes. A 2011 survey of three Cape York communities (including Lockhart River) revealed the extent of cannabis use: in a typical community with 70 men and 65 women aged 15 to 49 years of age, 66.2 per cent of males were current cannabis smokers and 12.2 per cent were former smokers; the figures for women were 30.5 per cent and 30.5 per cent (Bohanna and Clough 2012). The average expenditure per user was $80 per week and $4160 per year (Alan Clough, pers. comm., July 2012).

Although there were obvious social benefits from the canteen closure, the consequences for the Lockhart River Aboriginal Shire Council included the elimination of a revenue source that had funded discretionary projects within the community. Further, in 2006 the management of the other major source of income, CDEP, was privatised. Together, these changes had significant implications for the most recent chapter of horticultural activity in Lockhart River (discussed below).

Bureaucrats and bananas

For nearly 20 years, until the mid-1980s, there was little community-supported horticulture at Lockhart River. However, certain individuals maintained small gardens. Daniel Hobson, a keen Indigenous gardener, managed several hectares on the banks of the Claudie River in the early 1980s. In 1989, two years after the DOGIT was designated, a garden was established on the present site by a visiting gardener, Bill Rofe, and a small group of Indigenous residents. Eight hectares were cleared and a dam constructed. The garden never reached production, though, due to an unrelated dispute which resulted in Rofe moving to Coen to develop a successful remote Indigenous garden. Again, this was not sustained in the long term. In the context of financial difficulties for the council and the departure of Rofe, the garden was abandoned.

In 1996 one of the authors (John Pritchard, a qualified horticulturist resident at that time near Lockhart River) was approached by the chief executive officer and chairperson of the

council with plans to recommence the garden (referred to as 'the farm' in the remainder of this section). The farm was planned as an extension of the Lockhart River Revegetation Project, which involved tree planting in and around the community in conjunction with National Parks. Visits were arranged to other Cape York sites with existing gardens (Coen and Bamaga) and in 1997, with council support, the farm was re-established. Early crops were taro, cassava, bananas, tomatoes and pawpaw. In addition to funding a position for the horticulturist as farm manager, CDEP resources provided for three other staff members, who were able to work extra hours beyond those designated through CDEP (funding came from discretionary council revenue, which, at that time, was partly from alcohol sales).

The objectives of the farm in the late 1990s were twofold: first, to produce fresh fruit and vegetables for local consumption and, second, to engage community members in purposeful activities to support local capacity and pride. This was a time of optimism and local interest, with discussions about appropriate crops, horticultural skills and distribution processes. Although some of the early crops were appropriated, this was considered an unavoidable and acceptable loss consistent with the ultimate goal of increasing consumption of fresh produce. In 1997, with this enthusiasm extending to Lockhart River primary school staff, school children were involved in farm activities around harvest time, and fruit and vegetables were freely distributed to participating children.

At this stage the farm occupied approximately eight hectares and the employment of three women was funded through topped-up CDEP payments. This arrangement continued until 2000. Produce was distributed at no cost to farm workers, through family networks and to the local Health and Community Care program. Around 2000, with a new council confronting a range of increasing local problems (petrol sniffing among youth, alcohol-fuelled violence and increasing cannabis use), council support for the farm lessened. The council withdrew the funds that had supplemented the CDEP base allowance, thus removing a key incentive for workers. Ultimately, amid worsening community social problems and unsatisfactory financial audit findings, administrators were appointed to the council in 2002.

The period 2002–2005 was the most difficult for farm management, with increasing community disruption and repeated episodes of vandalism at the farm. Across Cape York there was heated debate about alcohol management plans, which ultimately led to the closure of the Lockhart River canteen in October 2003 and, consequently, the loss of a critical source of revenue for the council. Social unrest and violence continued on and off until 2006 when, with improvement in policing capacity and other factors, the level of social disturbance declined.

Through this period of reduced council support for the farm, workers were not able to work extra time, vandalism continued and the farm operated in survival mode. However, as John Pritchard noted, 'we just kept planting.' In August 2006, two representatives from the newly privatised CDEP management (Jobfind Centres Australia) visited the community to hold separate meetings with men and women. In relation to the farm (the most functional component of the overall CDEP activities) there was limited understanding of the social complexity (or goals) of farm activities, and structural solutions were presented to remedy

social ills (for instance, in relation to farm theft the comment was made that 'a fence will stop theft' (Jobfind management, pers. comm., August 2006). Within two months the horticulturist (JP) was made redundant by the council, and productive farm activities rapidly decreased to an insignificant level for several years.

The period 2006–2010 was a 'fallow time' for the farm, but there were also major admini-strative and bureaucratic changes. In the decade from 1996 the objectives of the farm had been to cultivate and distribute fresh produce through incentivised work to support participant skill development and pride, activities undertaken with the support of the council and with direction from a professional horticulturist who developed strong personal relationships with the work team. From 2006 the focus was on allocating CDEP activity (without suitable mentoring or management; thus while there was infrastructure development — a fence and shed — production was minimal). Although there were several visits by Jobfind trainers to the community farm, there was a general failure to develop sustainable cropping practices and workforce competencies. By this time most of the original workers had been replaced and, with ongoing staff turnover, learned skills and corporate memory from the earlier stages of the farm were lost.

In 2009 Lockhart River opened a new store (still under government control). The manager was committed to improving the availability of fresh produce and the following year the horticulturist (JP) was approached by the then Lockhart River Jobfind manager to return to the farm as a 'mentor'. The intention of the farm staff was to replicate the cropping approach of the late 1990s, albeit with CDEP funding alone. Despite turnover of local Jobfind management staff, the farm returned to productivity. The monthly Farm Report from March 2011 (Pritchard 2011a: 1) recorded:

> A community farm food demand survey is yet to be completed to a standard where it would provide an accurate assessment to guide a farm development plan. A comprehensive survey might also help to focus and update community interest and ownership of the farm. Recent communication with Queensland Health and the [Royal Flying Doctor Service] has revealed that farm food demand surveys are unheard of, so there is no pro forma or valid format. There have been many surveys in remote community settings to determine what people do buy, but none to determine what people want to buy. A Lockhart River community horticulture development plan would also help to guide future nursery activities. The [Lockhart River Aboriginal Shire Council] engineer has expressed interest in this development plan…
>
> Opportunity presents for an increase in the scale of operations at the farm. The construction of shadehouses would lengthen the growing season and improve the quality and quantity of tomatoes, Chinese cabbage, cucumbers, herbs, lettuce, bell capsicum etc.

In this phase the investment in activity (which had been purposeful and productive activity prior to 2006 and bureaucratically documentable activity from then until 2010) began to

foreground economically 'profitable' activity, with three modest potential markets identified by the mentor (Pritchard 2011b: 1):

> The Portland Roads Café has expressed a desire to purchase cut herbs from the Lockhart farm during their trading season April – December. The café presently freights their vegetable food requirements from Cairns. Lockhart farm will be well situated to supply café herb demand from Sept. – Dec. this year, then again from the start of their season next year. The Lockhart River State School has agreed to purchase $100 of mixed fruit and vegetables per week. The vegetables could be valued using Lockhart River community store prices. The Lockhart River community store is willing to sell any farm product in demand, provided supply can be guaranteed over an agreed period, and quality assurance standards are met. Farm product over the next 4 months will include tomatoes, capsicum, chilli, Chinese cabbage, lettuce, herbs, spring onion, radish, pumpkin, sweet corn, cucumber, zucchini, passionfruit, limes and mango.

However, economic viability is about much more than growing produce, and in other communities stores have refused to accept local farm produce; for instance, at Kowanyama (Viv Sinnamon, pers. comm., May 2012). This reflects many factors, including the requirement of stores dependent on pre-budgeted purchasing and freighting for assured supply (Dympna Leonard, pers. comm., May 2012). Furthermore, in Lockhart River there was an expectation that such produce would be sold at imported prices, thus compromising the economic benefit for the store and affordability for the consumer. Not surprisingly, tensions emerged over the vision for the farm. This was exemplified in September 2011 when the prospective purchase of a new tractor and equipment (valued at $50,000) was made contingent on income from the sale of produce. Linking essential farm equipment to income seriously compromised the farm's objectives of community development, social capital investment and optimising health gains from improved nutrition. This situation was compounded by the unannounced removal of some of the essential machinery, leaving a disenfranchised farm. With increasing and unresolved tensions between management and workers, the horticulturist/mentor left for the second time. These tensions were, however, broader than the farm; the Jobfind manager had to 'manage up and down' — that is, not only to manage locally through the CDEP 'work for the dole' program and the very limited other employment opportunities but to manage the corporate demands from above, which were often uninformed about local circumstances and issues (Dianne Mitchell, Jobfind Manager, pers. comm., May 2012). Yet again the farm went into decline and, while 'work' continued, productive activity fell away.

Discussion

Improved nutrition has been clearly identified as an Indigenous health priority, particularly in remote Australia. The appealing logic of local production has seen horticulture foregrounded as integral to ensuring accessible fresh produce appropriate to local demands and preferences (recent initiatives include the Edible Gardens project of the EON Foundation (n.d.) in the Kimberley and the Remote Indigenous Gardens Network (n.d.) in the Northern

Territory). Such activities offer the additional benefits of purposeful activity and, potentially, income. However, while the history of gardens, at least in Cape York, dates back a century in mission settings, by and large gardens have not been sustained or contributed meaningfully to local nutritional sufficiency. Why?

The issues raised in this discussion paper are summarised in two ways: first, as synopses of the three broad (and admittedly somewhat artificial) 'eras' that preceded contemporary times (pre-settlement, institutionalisation (in Cape York on missions and later, government settlements) and a period that has been called 'deregulation' (Hunter 1999), in which there was a rapid and largely unplanned repeal of discriminatory legislation and controls, with widespread entry into the welfare-based cash economy); second, through a model of contemporary issues influencing nutritional practices that relate to the cultivation and use of local produce.

Historical precursors

The point already raised in relation to pre-settlement practices relevant to this discussion is simply that Aboriginal Australian societies were not agrarian in the sense that the term is used here. Gathering sources of nutrition was a gendered activity with its own gendered sociality and was, by and large, hard work. It required a sensitive understanding of availability by location (in some places human activity concentrated edible resources) and season, knowledge of which was transferred by experience and movements, and informed by spiritual understandings and practices. The nature of societies and their relationships with their environments was such that food was sought and consumed as needed, with intra-group shortfalls addressed through obligatory sharing and social/cultural constraints on consumption. The consequence of this lifestyle was reliance on a wide range of food sources conferring nutritional diversity and an energy balance resulting from the effort necessary to ensure nutritional sufficiency.

In Cape York the era of institutionalisation was one of mission control — a missionary, village ideal informing built and social structures in which horticulture was both part of the ideal and a necessity of survival. There was disruption of gendered roles and, more broadly, dramatic changes in gender relations, gender-based power and even the structure of the 'family'. Horticulture was proved possible but sustainable only with the motivation and investment of mission staff, usually with a background in farming. Ultimately there was little transfer of horticultural practice (other than 'self-sustaining' fruit trees) to the private domain and, in some places, there was obvious resistance to participating in garden projects. This reluctance was at times ascribed to cultural unfamiliarity with the concept of delayed rewards for effort expended in horticulture. The use of bush foods fell dramatically and, regardless of garden produce, there was increasing reliance on ration-based staples. Nutritional deficiencies became obvious.

Deregulation brought dramatic social changes across Aboriginal Australia. In relation to nutrition, changes included a transition from ration systems to a welfare cash economy and the arrival of powerful competing inducements, including alcohol. Along with alcohol came social and family disturbance and increasing pressures on sustenance incomes mediated

by drinkers' kinship-based demand sharing. Rising rates of domestic violence impacted the environment and activities of food preparation and, along with the domestic pressures of demand sharing, encouraged increasing reliance on 'fast foods', which became major sources of revenue for community retailers. These preferences were also supported by the relative economic disincentives for fresh produce in remote settings by comparison with processed foods, tobacco and soft drinks.

In terms of local production, remote Indigenous community gardens were again shown to be possible but not sustainable in the absence of external drivers and horticultural expertise. However, with the bureaucratisation (and privatisation) of Indigenous affairs and dramatic expansion of the number and range of non-Indigenous functionaries in remote communities, such investments were increasingly project-based and short-term, undermining the development of local commitment and skills. Alcohol-fuelled social disturbances increased in communities and spilled over to garden projects through their direct effects on the workforce, increased vandalism and, in Lockhart River, compromised council support in the face of these social challenges. Regardless, given commitment, expertise and funding to support the garden workforce, at least in Lockhart River, the garden generated produce over a number of years, with that food reaching local consumers through workers' informal distribution networks. In the aftermath of alcohol prohibition, while resource diversion to substance use continued through cannabis and sly grog, there was a general improvement in social circumstances supporting reinvestment in garden activity. Concurrent with these changes, shifts in workforce administration and management (including privatisation) resulted in fundamental shifts and conflicts in objectives — from nutrition and participation to activity and income. However, because of issues of scale, outlets, lack of incentives for workforce motivation, and reliability of supply, realistic options for income-generating production are now poor. Despite dramatic increases in health and nutritionist services, nutrition in remote communities remains a major concern and health priority, and subnutrition through pregnancy and infancy is a continuing determinant of later-life chronic disease.

Contemporary issues

One way to summarise key differences across these later phases of garden activity, at least in Lockhart River, is to consider the differences in relation to what motivates the investment of effort. Table 1 presents three motivational drivers: example (which may be as training but also as vicarious developmental and social exposure), incentive (behavioural reinforcers that may be material or psychological) and dissonance (motivation based on the avoidance of negative outcomes). While recognising that the 'accidental gardens' and opportunistic gathering of pre-contact coastal residents were not horticulture, these are nevertheless included to clarify the point made. The motivating factors for pre-contact populations and mission residents are broadly similar: the example of knowledgeable and experienced adults, the incentives of sustenance and purposeful activity, and the avoidance of dissonance (hunger and coercion) are common to both. Subsequently, within a welfare-driven, store-based cash economy in which even the most impecunious can fall back on demand sharing,

dissonance was, and is, functionally and significantly neutralised. However, in Lockhart River during the period of community CDEP control and productive farm activity, example (of a competent horticulturist for workers at the farm who themselves represented capacity and purpose to their wider families, the school and community more broadly) and incentive (ability to work extra hours and to access produce for workers' families) both applied. These were not consistently present in the aftermath of the privatised CDEP control, during which production collapsed (though CDEP 'activity' continued).

Table 1: Motivational factors influencing participation in horticulture in Lockhart River

	Precontact (domestic and gathering)	Mission control	CDEP control	Privatised CDEP control
Example	+	+	+	+/-
Incentive	+	+	+	-
Dissonance	+	+	-	-

\+ present
\- absent
+/- may be present/absent

Table 1 suggests that, where dissonance is no longer a driver, both example and incentive are necessary to sustain horticultural effort. However, critical as they may be, they are not sufficient and are set in a constellation of contemporary factors determining the extent to which local horticulture can effectively contribute to improved health outcomes. In remote communities, of the four sources of food — retail stores, fast food outlets, horticulture and bush resources — it is the first two that are and will remain dominant. Regardless, the benefits of increasing the use of garden and bush resources may be greater than the food provided; there is also higher bioavailability of micronutrients in locally grown produce, which does not require protracted transport and storage (Li et al. 2012), and activity/land interactions associated with both gardening and Indigenous cultural and natural resource management (Garnett et al. 2009). In addition to benefits in terms of esteem from the mastery of traditional land and food practices, it has been known for more than 20 years that even a brief return to a diet based on gathered/caught rather than bought foods is associated with a significant improvement in the clinical and laboratory status of Aboriginal people with non–insulin dependent diabetes (O'Dea et al. 1980).

In terms of horticulture, Figure 1 represents a hypothetical synthesis of these influences on the progression from garden initiatives to the ultimate objective of increasing the consumption of locally grown fresh produce. Clearly, as part of institutional initiatives in the past or contemporary community-based projects, gardens are feasible. From the experience of both missions and recent projects (Green, R 2009), horticultural expertise and personal commitment are critical to translating gardening effort into food for consumption and, to date, have been reliant on external drivers. However, as the experience of Lockhart River (and probably many other places) shows, this is not sufficient. Horticulture requires

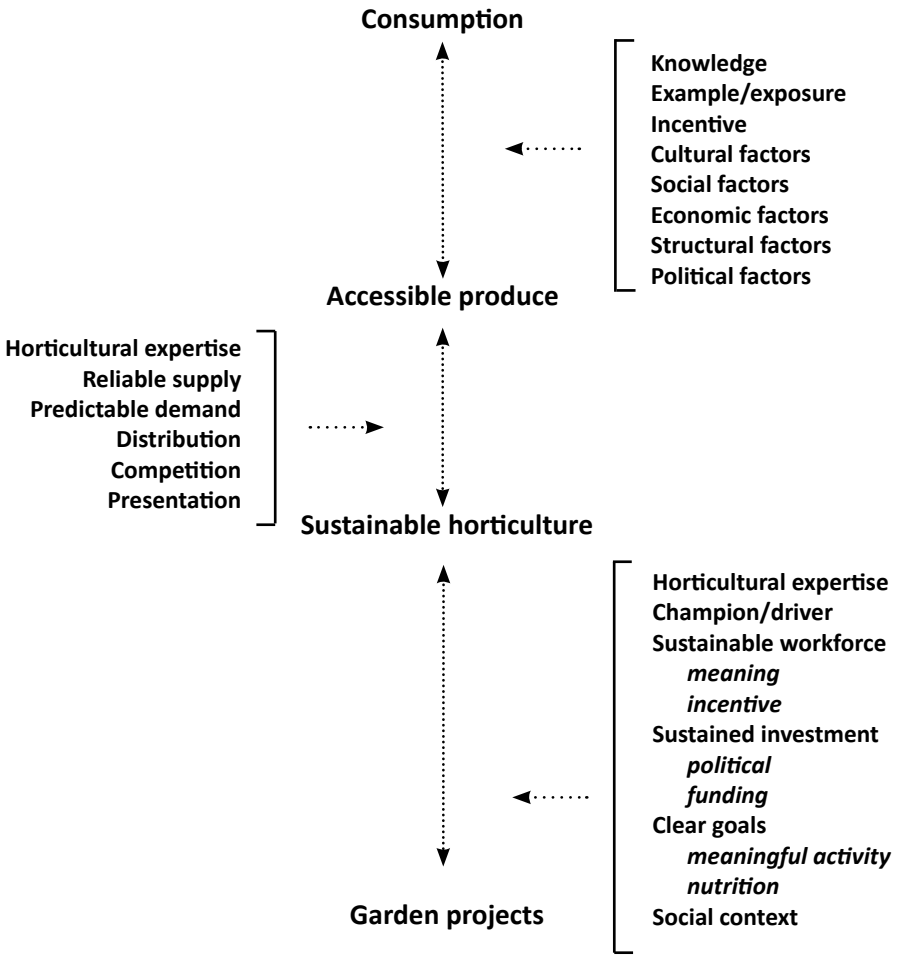
a workforce, but maintaining a reliable and skill-building Aboriginal workforce in a welfare-dependent economy is challenging and, at the very least, requires personal investment. This may be through a shared understanding that the activities undertaken are meaningful and through incentive — either the rewards of labour or greater earning capacity than other less arduous CDEP work. Meaningfulness is also informed by developmental experience: what children are exposed to at home and at school. With little extension of gardening to the Aboriginal private domain,[5] as occurred in Lockhart River, schools provide an opportunity to link nutrition and gardening education with experience, showing that while such initiatives are not difficult to set up they have not survived beyond project-based personal investments (Viola 2006).

These factors in turn depend on funding and, consequently, political commitment. Maintaining horticultural expertise and an incentivised workforce, and supplying the right tools for the job, requires investment beyond what might be available through welfare-equivalent workforce funding. Although in Lockhart River in the 1990s and 2000s this was made available through local council/management support, in the current economic and political climate such discretionary funding cannot be assumed. Further, in the social context of welfare-dependent communities, the prospect of institutional financial returns has little potency in terms of motivating a workforce and does not engage interest. This is exacerbated during times of increased social turmoil, as was shown in Lockhart River when both political support and workforce participation were compromised. At such times of instability the situation can be compounded by increasing recourse to external 'solutions', which create higher levels of conflict and confusion, with less and less relevance to local circumstances and issues (Clifford 2003: 345):

> The overwhelming problem for effective planning in the Lockhart River region is that most planning undertaken by government agencies is guided by inappropriate legislative mechanisms and bureaucratic structures that are commonly inconsistent with the cross-cultural context, and hence, are inconsistent with appropriate [community-based planning] principles and methodologies. Generally, government planning and implementation is pursued in a short-term visit, consultant-type fashion, whereby agency officers and consultants move across a number of communities, operating to strict bureaucratic processes, short-term funding guidelines and timelines.

5 This might better be considered as the 'domestic' domain given that there is essentially no freehold title in remote Aboriginal communities, which may itself be a relative disincentive to long-term investments of effort. There is some evidence from surveys in north Queensland communities (including Lockhart River) that residents of community rental properties anticipated that ownership of homes would be associated with improvements, including gardens (Moran et al. 2001), and that in a survey of employed Indigenous residents of remote Queensland and Northern Territory town settings, moving from renting to home ownership was associated with garden improvements (Szava and Moran 2008). While 'gardens' in these surveys did not refer to horticulture, it raises the question of whether lack of ownership is a disincentive to the kinds of investments in time and energy that horticulture requires.

Figure 1: A synthesis of contemporary factors relevant to horticulture and contributing to addressing nutritional inadequacy in remote Aboriginal communities



In Lockhart River, the shift in goals around 2000 was from an initiative driven by the dual goals of improving nutrition and developing a local workforce through productive and meaningful activity (which, in turn, supported self-esteem and community esteem) to accountable activity (that is, activity that meets bureaucratic ends regardless of productivity) and profitability (at least in terms of demonstrating economic returns which are not necessarily translated into worker incentives). However, as has been noted in relation to Aboriginal engagement in pastoralism in Cape York, the intersection of Indigenous priorities, state controls and market forces is a contested space (Smith, B 2003: 98):

> This body of local knowledge and its relationship to the state have emerged from the particular relationship of the Aboriginal domain to the regional history of capital… [T]his relationship, which privileges the 'reproduction of social relationships at the cost of obvious immediate personal benefit and profit maximisation', is 'anti-market'. This is true of the activities undertaken within the 'Aboriginal domain', but this domain has been reproduced through the hybrid interplay of market, state and Aboriginal life-worlds.

Enabling productive and sustainable garden effort in remote settings is, even when successful, not sufficient to ensure accessible produce. Horticultural expertise is required for a reliable supply of nutritionally sound and sought after produce. Further, while there is sufficient appreciation of the fresh produce that will supplement other sources to address nutritional need, as noted by the Lockhart River horticulturist in his reports, there have been no significant farm food demand surveys to ensure that this matches what people want — and will eat.

Even accounting for demand, ensuring functional access requires a distribution strategy that will ultimately be informed by the goals defined earlier. If the goal is nutritional, it may be that approaches to distribution other than supplying stores are demanded in this context — as was the case in the early Lockhart River farm project and in mission days. There may, of course, be multiple distribution methods, as noted by Rachel Green (2009) in reviewing seven quite different garden projects in the Kimberley region of Western Australia where access was enabled by delivery directly to homes, through the garden itself, as a 'trade' commodity, on request and through stores. In all (including the two communities with store distribution), produce was free or provided at minimal cost. For struggling local stores such as in Lockhart River (government stores in Cape York Peninsula have historically run at a loss) this introduces significant uncertainties, if not competition with store goals. One option driven by economic incentive, as proposed for Lockhart River, is to develop other markets (for instance, tourism), but this is an unlikely solution given issues of scale. And, again, it is not driven by consideration of local nutritional needs. Further, for produce distributed through stores and to the non-local population, maintaining supply presents challenges for local production (for instance, issues associated with seasonal impacts on crops), which stores can manage through shifting sources of supply.

Finally, making healthy fresh produce available does not necessarily ensure consumption. Obviously, knowledge is critical and has been central to successful health promotion and changing practices in economically privileged societies. However, the health promotion paradox in this area (and in others, including smoking) is that there is clearly a class bias for such gains, and those who are most needy, with less discretion in terms of lifestyle 'choices', benefit the least. Aboriginal Australians are the most disadvantaged group in Australia, so it is not surprising that dietary change through knowledge-based approaches has had limited effect — knowledge is not enough. This is reflected in evidence that although Aboriginal informants are able to recite foods appropriate for healthy infant nutrition this is not necessarily reflected in what their babies receive (Kruske et al. 2012). This Northern Territory research, which focuses on early life parenting practices, also draws attention to the influence of cultural factors in infant socialisation, which, as Annette Hamilton (1981) noted

in her pioneering work, may be construed by parents in the wider society as privileging very early life 'autonomy', capacity and, consequently, choice in ways that parents in the wider society would not understand. In relation to child nutrition, this may involve a conflation such that what a child might '"want", "like" or "need"…are all regarded as part of the same concept…Family members appeared to find it impossible to deny children anything they wanted, including sweets and carbonated drinks, even when the parents knew the foods were unhealthy' (Kruske et al. 2012: 784). The implications are not only for foods actually consumed in infancy but also for the models of early parental feeding practices that may well be in conflict with those provided through services. Furthermore, as also noted by these researchers (Kruske et al. 2012: 784), the suasive force of health-based messages may be compromised in such settings because 'communities appear to have accepted and normalized poor health'.

Child rearing involves deeply embedded cultural beliefs. However, certain practices that are discussed in terms of 'traditional' activities are problematic in the radically different social context of increasingly globalised societies (Hunter 2006, 2007). As noted earlier, demand sharing is an important example that, along with other cost-based factors such as 'utility stress' (Willis et al. 2006), functionally constricts available sustenance budgets and increases recourse to fast foods. Other social tensions include conflicts over land rights and the use of particular tracts of land for communal purposes, including horticulture.

Fresh produce from local gardens that is made available on a 'cost-recovery' basis (at store prices) entails significant economic disincentives. Whether store-bought or garden-grown, cost can be offset by 'incentives' that may, in reality, be disincentives. Such is the logic of income management initiatives across northern Australia that have had a key goal of improving child nutrition in remote Aboriginal communities. However, as revealed in recent pre– and post–income management research from the Northern Territory (Brimblecombe et al. 2010: 549), income management 'appears to have had no beneficial effect on tobacco and cigarette sales, soft drink or fruit and vegetable sales'.

Positive incentives may be more effective in encouraging consumption of fresh produce. In the remote Cape York community of Aurukun, for instance, a project between the Royal Flying Doctor Service and the Aurukun store to improve infant nutrition utilised checkout software that identified all customers who purchased five or more different fresh produce items; these customers were automatically enrolled in a bimonthly 'raffle', the prize for which was a significant hamper of fresh foods (Craig Oxlade, presentation to the Aurukun clinic 2010, pers. comm., 2012). Another initiative was the supply at very low cost of bar fridges that could be placed in a locked room to protect infant/child foods from demand sharing. In an article that reviewed the impacts of the Family Responsibilities Commission in Aurukun, Catherine Ford (2012: 28) reported that local women were coming before the commission requesting to be placed on Basics Card income management 'as a defence against the "demand share" requests'. Although such incentives (or subsidising store-bought fresh produce relative to processed products or fast food) may increase the purchase of fruit and vegetables from stores, they will not increase the consumption of locally grown produce unless there is a meaningful price differential.

So, given the current social and political circumstances of remote Aboriginal communities, if the objective is economically viable enterprise there is very limited likelihood of success without — and perhaps even with — significant and sustained investment and fundamental political change of the prevailing work-for-welfare arrangements. If the purpose is simply 'activity' that fulfils the bureaucratic requirements of accountable, if not productive, work (as is too frequently the case) then the existing arrangement 'works', but at the expense of benefit in terms of either meaningful work or nutrition. If meaningful work or improved access to nutritious food is the goal, however, then this will demand investment in expertise and infrastructure, and innovative distribution strategies. As such investments are unlikely to result in economic returns they will consequently require political support at the levels of local governance and state and Commonwealth departments. They are thus interwoven with the broader debates regarding the very viability of certain remote Aboriginal communities (Altman 2005; Stafford Smith et al. 2008).

There are very substantial political obstacles. Although overcoming these challenges will clearly not be sufficient to ensure that horticulture is sustainable and the results of inputs in terms of effort and investment are consumed locally, addressing them is a necessary precondition. This demands being clear about goals and, if they are to improve health and social outcomes, prioritising and committing support to them. Minimally this support needs to span a generational timeframe that will embed gardening and distribution activities, and produce preferences and preparation capabilities, through local social and cultural change.

Conclusions

When visiting homelands, residents of Lockhart River may return to campsites that were frequented by past generations of coastal dwellers. Around the mouth of the Pascoe River and opposite Night Island, groves of Manilkara kauki (wongai plum/muungkal) mark two of these sites, and in season the fruit is taken. Even in the bush, however, store-bought foods are the staple and bush resources generally provide only opportunistic snacks, though the knowledge of them nourishes in other ways. Although little used now, such 'accidental/incidental gardens' prove that the activities of Aboriginal peoples resulted in concentrations of edible species and that the landscape was transformed in ways that addressed particular needs — seasonal supplies of foods that required no maintenance. We are grateful to Athol Chase for pointing out that such spaces — many now entirely unvisited — might also be considered as 'gardens of discontent'. 'Untended' and their booty unsavoured, their significance and nutritional potential is massively reduced as new circumstances and lifestyles have prevailed, bringing with them new problems. Ironically, prominent among these is nutritional inadequacy, which is a major contributor to both the nation-shaming statistics of Indigenous infant and child health and the increasing toll of later-life chronic disease. The long-abandoned 'gardens' may be considered signifiers of this discontent.

In this paper we have considered introduced horticultural practices as a means to health improvement in remote Aboriginal communities. It might be argued that the absence of significant improvements reflects a failure to incorporate culturally appropriate health promotion principles (Demaio et al. 2012) into nutrition and garden projects. Although

such principles are surely critical to the success of local projects, as we have sought to demonstrate, the obstacles to horticulture as a sustained and substantial (albeit small) component of a wider Aboriginal nutritional strategy involve multiple factors over a number of levels. Indeed, while creating productive gardens in these settings may seem challenging enough, it pales by comparison to ensuring the sustained political and cultural changes required to embed support for gardens, gardening and horticulture in the social, economic and developmental spaces of remote Aboriginal Australia.

However, while there is no certain formula for success, this research suggests necessary, albeit insufficient, components. First, there must be clarity about the goal. If the goal is to improve nutrition, it must be maintained in the face of shifting political agendas (for instance, to prioritise enterprise over nutrition) and changing bureaucratic functionaries (as with the loss of community owned and driven CDEP programs). Second, as non-coerced behavioural change is slow, sustained horticultural output requires long-term funding. Accordingly, evaluation of such investments should focus on the identified objectives, accommodate the realistic timeframes for change, and be sensitive to collateral but important social outcomes (such as community and personal pride in place and performance). Approaches such as 'social return on investment' may offer opportunities in Aboriginal communities (Gibson et al. 2011). Third, whether through stores or alternative distribution strategies, building demand requires tangible economic advantages for consumers in choosing local fresh produce — promoting knowledge of the health benefits is not sufficient. Fourth, expertise is critical, not just in horticultural techniques but in the broader knowledge and experience that is necessary for long-term planning. Such expertise must extend to developing and maintaining relationships with the community, workforce, regulatory authorities and the market, and the skills to nurture local horticultural capacity. Finally, there must be a transfer not only of expertise but also, ultimately, of control to local Aboriginal individuals and/or groups[6] with the capacities and political support to ensure commitment in the long term.

As we have demonstrated, there are other factors to consider. This complexity led us to the title 'Gardens of discontent'. However, by discontent we do not want to suggest despair. Rather, if the goals are considered important enough — as we believe and as those proposing remote horticulture as part of a national strategic approach to Indigenous nutrition and health improvement suggest — there needs to be a more nuanced appreciation of the historical and social complexity that has informed the lack of success to date. On page 1 of the *Weekend Australian* of 26–27 May 2012, two articles were juxtaposed — 'Grants blighted by waste, lack of checks' (Natasha Robinson and Susannah Moran) and 'Aborigines lash out at advice to grow veggies' (Amos Aikman and Imre Salusinszky). Although the backgrounds to these articles are more convoluted than the titles suggest, they are a salutary reminder that the issue is more about politics than planting.

6 The process of 'ownership' should commence with conceptualisation at the project phase. The complexities of beginning this process are exemplified in the report on the community consultation for the 'box of veg' project at Galiwin'ku undertaken in 2008 (Yolŋu Aboriginal Consultants Initiative n.d.) and in the subsequent paper by Michael Christie (n.d.).

References

Aboriginal and Torres Strait Islander Social Justice Commissioner 2007, *Achieving Aboriginal and Torres Strait Islander health equality within a generation: a human rights based approach*, Human Rights and Equal Opportunity Commission, Sydney.

Altman, Jon C 2004, 'Economic development and Indigenous Australia: contestations over property, institutions and ideology', *Australian Journal of Agricultural and Resource Economics* 48: 513–34.

—— 2005, 'Development options on Aboriginal land: sustainable Indigenous hybrid economies in the twenty-first century', in L Taylor, GK Ward, G Henderson, R Davis and LA Wallis (eds), *The power of knowledge: the resonance of tradition*, Aboriginal Studies Press, Canberra, pp. 34–48.

——, N Biddle and BH Hunter 2005, 'A historical perspective on Indigenous socio-economic outcomes in Australia 1971–2001', *Australian Economic History Review* 45: 273–95.

Anderson, Stephanie 2009, *Pelletier: the forgotten castaway of Cape York*, Melbourne Books, Melbourne.

Australian Government 2011, Government response to the *Fourth report 2010* of the Senate Select Committee on Regional and Remote Communities, http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Former_Committees/indig/index, accessed 18 November 2013.

Australian Government 2012, National Food Plan green paper, Department of Agriculture, Fisheries and Forestry, Canberra.

Bailie, Ross S and Kayli J Wayte 2006, 'Housing and health in Indigenous communities: key issues for housing and health improvements in remote Aboriginal and Torres Strait Islander communities', *Australian Journal of Rural Health* 14: 178–83.

Barker, David J 1992, 'Fetal growth and adult disease', *British Journal of Obstetrics & Gynaecology* 99: 275–6.

—— 1995, 'The fetal and infant origins of disease', *European Journal of Clinical Investigations* 25: 457–63.

Bell, Diane 1983, *Daughters of the Dreaming*, McPhee Gribble/George Allen & Unwin, Melbourne.

Bernardi, Gus 1997, 'The CDEP scheme: a case of welfare colonialism', *Australian Aboriginal Studies* 2: 36–46.

Bird, Rebecca Bliege, Douglas W Bird and John M Beaton 1995, 'Children and traditional subsistence on Mer (Murray Island), Torres Strait', *Australian Aboriginal Studies* 1: 2–17.

Bohanna, India and Alan Clough 2012, 'Cannabis use in Cape York Indigenous

communities: high prevalence, mental health impacts and the desire to quit', *Drug and Alcohol Review* 31: 580–4.

Brimblecombe, Julie K and Kerin O'Dea 2009, 'The role of energy cost in food choices for an Aboriginal population in northern Australia', *Medical Journal of Australia* 190: 549–51.

——, Dorothy Mackerras, Penny Clifford and Kerin O'Dea 2006, 'Does the store-turnover method still provide a useful guide to food intakes in Aboriginal communities?', *Australian and New Zealand Journal of Public Health* 30: 444–8.

——, Joseph McDonnell, Adam Barnes, Joanne Garnggulkpuy Dhurrkay, David P Thomas and Ross S Bailie 2010, 'Impact of income management on store sales in the Northern Territory', *Medical Journal of Australia* 192: 549–54.

Brock, Peggy 2008, 'Two-way food: bush tucker and whitefella's food', *Journal of Australian Studies* 32: 19–32.

Campbell, David, Jocelyn Davies and John Wakerman 2007, *Realising economies in the joint supply of health and environmental services in Aboriginal Central Australia*, Working Paper 11, Desert Knowledge CRC, Alice Springs, NT.

Cape York Partnerships 2012, 'Cape York welfare reform history', www.capeyorkpartnerships.com/about/history/cape-york-welfare-reform-history, accessed 19 April 2012.

Chase, Athol Kennedy 1980, 'Which way now? Tradition, continuity and change in a north Queensland Aboriginal community', PhD thesis, University of Queensland, Brisbane.

Christie, Michael n.d., 'The box of vegies: method and metaphysics in Yolŋu research', www.cdu.edu.au/centres/yaci/pdf/CHRISTIE_Box-of-Veg_YACI%20.pdf, accessed 3 October 2012.

Clifford, Christopher J 2003, 'Interactions between government agencies and the Lockhart River Aboriginal community', PhD thesis, Griffith University, Brisbane.

COAG (Council of Australian Governments) 2009, National Strategy for Food Security in Remote Indigenous Communities, Australian Government, Canberra.

—— 2010 National Strategy for Food Security in Remote Indigenous Communities: National Healthy Eating Action Plan, Australian Government, Canberra.

Cook, Charles R 1933, Anglican Board of Missions Report, October 1933, unpublished.

Daniel, Mark, Alex Brown, J Garnggulkpuy Dhurrkay, Margret D Cargo and Kerin O'Dea 2006, 'Mastery, perceived stress and health-related behaviour in northeast Arnhem Land: a cross-sectional study', *International Journal of Equity in Health* 5: 10.

Demaio, Alessandro, Marlene Drysdale and Maximilian de Courten 2012, 'Appropriate health promotion for Australian Aboriginal and Torres Strait Islander communities: crucial for closing the gap', *Global Health Promotion* 19: 58–62.

EON Foundation n.d., 'Eon edible gardens', http://eon.org.au/projects/eon-thriving-communities/eon-edible-gardens/, accessed 5 June 2013.

Ford, Catherine 2012, 'Great expectations: a bold social experiment on Cape York is in its fifth year', *The Monthly* November: 22–33.

Freier, PL 1999, 'Living with the *Munpitch*: the history of Mitchell River Mission, 1905–1967', PhD thesis, School of Humanities, James Cook University, Townsville, Qld.

Garnett, Stephen T, Bev Sithole, Peter J Whitehead, C Paul Burgess, Fay H Johnston and Tess Lea 2009, 'Healthy country, healthy people: policy implications of links between Indigenous human health and environmental conditions in tropical Australia', *Australian Journal of Public Administration* 68: 53–66.

Gibson, Julie, Anita Jones, Helen Travers and Ernest Hunter 2011, 'Performative evaluation and social return on investment: potential in innovative health promotion interventions', *Australasian Psychiatry* 19: 53–7.

Gladman, DJ, EMM Hunter, R McDermott, TD Meritt and FJ Tulip 1998, *Study of injury in five Cape York communities*, Australian National Injury Surveillance Unit, Adelaide.

Green, Donna, Ursula King and Joe Morrison 2009, 'Disproportionate burdens: the multidimensional impacts of climate change on the health of Indigenous Australians', *Medical Journal of Australia* 190: 4–5.

Green, Rachel 2009, 'From little things, big things grow: investigating remote Aboriginal community gardens', Honours thesis, University of Sydney.

Hamilton, Annette 1981, *Nature and nurture: Aboriginal child-rearing in north–central Arnhem Land*, Australian Institute of Aboriginal Studies, Canberra.

Harrison, Michelle, Amanda Lee, Michael Findlay, Ralph Nicholls, Dympna Leonard and Caroline Martin 2010, 'The increasing cost of healthy food', *Australian and New Zealand Journal of Public Health* 34: 179–86.

Hunter, Ernest 1999, 'Considering the changing environment of Indigenous child development', *Australasian Psychiatry* 7: 137–40.

—— 2006, 'Social engineers and bystanders: the limits of "responsibility" in Indigenous affairs', *Australasian Psychiatry* 14: 24–32.

—— 2007, '"Little children" and big sticks: paternalism and autonomy in Indigenous northern Australia', in J Altman and M Hinkson (eds), *Coercive reconciliation: stabilise, normalise, exit Aboriginal Australia*, Arena, Melbourne, pp. 121–31.

—— 2009, '"Radical hope" and rain: climate change and the mental health of Indigenous residents of northern Australia', *Australasian Psychiatry* 17: 445–52.

—— 2010, 'Hearts and minds: evolving understandings of chronic cardiovascular disease in Aboriginal and Torres Strait Islander populations', *Australian Aboriginal Studies* 1: 74–91.

——, Maggie Brady and Wayne Hall 1998, *Services relating to alcohol in Indigenous communities*, Office of Aboriginal and Torres Strait Islander Health Services, Canberra.

Hynes, RA and AK Chase 1982, 'Plants, sites and domiculture: Aboriginal influence upon plant communities in Cape York Peninsula', *Archaeology in Oceania* 17: 38–50.

Kidd, Rosalind M 1997, *The way we civilise: Aboriginal affairs — the untold story*, University of Queensland Press, Brisbane.

Kouris-Blazos, Antigone and Mark Wahlqvist 2000, 'Indigenous Australian food culture on cattle stations prior to the 1960s and food intake of older Aborigines in a community studied in 1988', *Asia Pacific Journal of Clinical Nutrition* 9: 224–31.

Kruske, Sue, Suzanne Belton, Molly Wardaguga and Concepta Narjic 2012, 'Growing up our way: the first year of life in remote Aboriginal Australia', *Qualitative Health Research* 22: 777–87.

Leonard, Dympna, Z Zlotkowski, M Harrison and M Bonehill 1997, *Report of the food supply monitoring project for North Queensland: Healthy Food Access Basket — HFAB*, Tropical Public Health Unit for North Queensland, Cairns, Qld.

——, Ruth Beilin and Mark Moran 1995, 'Which way kaikai blo umi? Food and nutrition in the Torres Strait', *Australian Journal of Public Health* 19: 589–95.

Li, Ming, Robyn McDermott, Karina D'Onise and Dympna Leonard 2012, 'Folate status and health behaviours in two Australian Indigenous populations in north Queensland', *Public Health Nutrition* 15(10): 1959–65, http://dx.doi.org/10.1017/S1368980011003661, accessed 18 June 2012.

Macdonald, G 2000, 'An economy out of kilter: demand sharing among the Wiradjuri', Department of Archaeology and Anthropology seminar, October Seminar, Australian National University, Canberra.

MacKenzie, Geraldine 1981, *Aurukun diary: forty years with the Aborigines*, Aldersgate Press, Melbourne.

Maggiore, Pat 1993, 'Analysis of Australian Aboriginal bush foods', *Australian Aboriginal Studies* 1: 55–8.

Martin, David F 1992, 'Aboriginal and non-Aboriginal homicide: "same but different"', in H Strang and S-A Gerull (eds), *Homicide: patterns, prevention and control*, Australian Institute of Criminology, Canberra, pp. 167–76.

—— 1993, *Autonomy and relatedness: an ethnography of Wik people of Aurukun, Western Cape York Peninsula*, Australian National University, Canberra.

Mol, Hans 1982, *The firm and the formless: religion and identity in Aboriginal Australia*, Wilfred Laurier University Press, Waterloo, ON.

Moran, M, P Memmott, R Stacy and J Holt 2001, *Home ownership for Indigenous people*

living on community title land in Queensland: preliminary community survey, Aboriginal Environments Research Centre, School of Geography, Planning & Architecture, University of Queensland, Brisbane.

Neel, James V 1962, 'Diabetes mellitus: a "thrifty" genotype rendered detrimental by "progress"?', *American Journal of Human Genetics* 14: 353–62.

—— 1999 'The "thrifty genotype" in 1998', *Nutrition Reviews* 57: S2–9.

Nelson, A, R Abbott and D Macdonald 2010, 'Indigenous Australians and physical activity: using a social-ecological model to review the literature', *Health Education Research* 25: 498–509.

Ninti One 2011, submission in response to the National Food Plan issues paper, Alice Springs, NT.

O'Dea, Kerin, Randolph M Spargo and Kim Akerman 1980, 'The effect of transition from traditional to urban life-style on the insulin secretory response in Australian Aborigines', *Diabetes Care* 3: 31–7.

OESR (Office of Economic and Statistical Research) 2012, 'Queensland regional profiles', OESR, Brisbane, www.oesr.qld.gov.au, accessed 7 June 2013.

Omran, Abdel R 1971, 'The epidemiologic transition: a theory of the epidemiology of population change', *Milbank Memorial Fund Quarterly* 49: 509–38.

Peterson, Nicolas 1993, 'Demand sharing: reciprocity and the pressure for generosity among foragers', *American Anthropologist* 94: 860–74.

Power, Elaine M 2008, 'Conceptualizing food security for aboriginal people in Canada', *Canadian Journal of Public Health* 99: 95–7.

Pritchard, John 2011a, Farm Report, March 2011, unpublished.

Pritchard, John 2011b, Mentor's Farm Report, August 2011, unpublished.

Remote Indigenous Gardens Network n.d., 'Welcome', www.remoteindigenousgardens.net, accessed 5 June 2013.

Rowse, Tim 1998, *White flour, white power: from rations to citizenship in Central Australia*, Cambridge University Press, Melbourne.

Sackett, Lee 1988, 'Resisting arrests: drinking, development and discipline in a desert context', *Social Analysis* 24: 66–84.

Saerthre, Eirik 2005, 'Nutrition, economics and food distribution in an Australian Aboriginal community', *Anthropological Forum* 15: 151–69.

Senate Select Committee on Regional and Remote Indigenous Communities 2010, *Fourth report 2010*, Senate Select Committee on Regional and Remote Indigenous Communities, Parliament of Australia, Canberra.

Sharma, S 2010 'Assessing diet and lifestyle in the Canadian Arctic Inuit and Inuvialuit to inform a nutrition and physical activity intervention programme', *Journal of Human Nutrition and Dietetics* 23 Supplement 1: 5–17.

Silveira, Patricia P, Andre K Portella, Marcelo Z Goldani and Marco A Barbieri 2007, 'Developmental origins of health and disease (DOHaD)', *Jornal de Pediatria* 83: 494–504.

Singh, Gurmeet R and Wendy E Hoy 2003, 'The association between birthweight and current blood pressure: a cross-sectional study in an Australian Aboriginal community', *Medical Journal of Australia* 179: 532–5.

Smith, Benjamin R 2003, 'Pastoralism, local knowledge and Australian Aboriginal development in Northern Queensland', *Asia Pacific Journal of Anthropology* 4: 88–104.

Smith, Pamela A and Richard M Smith 1999, 'Diets in transition: hunter-gatherer to station diet and station diet to self-select store diet', *Human Ecology* 27: 115–32.

Smith, Richard M and Pamela A Smith 2003, 'An assessment of the composition and nutrient content of an Australian Aboriginal hunter-gatherer diet', *Australian Aboriginal Studies* 2: 39–52.

Stafford Smith, Mark, Mark Moran and Kurt Seemann 2008, 'The "viability" and resilience of communities and settlements in desert Australia', *Rangeland Journal* 30: 123–55.

Stephens, HW 1985, 'An evaluation of health care delivery in Aurukun', MPH thesis, University of Sydney.

Stone, John 2008, 'Aboriginal employment and the CDEP', *Quadrant* LII(9): 72–7.

Stroink, Mirella L and Connie H Nelson 2009, 'Aboriginal health learning in the forest and cultivated gardens: building a nutritious and sustainable food system', *Journal of Agromedicine* 14(2): 263–9.

Sutton, Peter 2005, 'The politicisation of disease and the disease of politicisation: causal theories and the Indigenous health differential', 8th Rural Health Conference, Alice Springs, NT, March 11.

Szava, A and Mark Moran 2008, *Perceptions of home ownership among IBA home loan clients*, Indigenous Business Australia, Canberra.

Taylor, John C 1977, 'Diet, health and economy: some consequences of planned social change in an Aboriginal community', in RM Berndt (ed.), *Aborigines and change: Australia in the '70s*, Australian Institute of Aboriginal Studies, Canberra, pp. 147–58.

—— 1979, 'Housing programs at Edward River and Mitchell River Aboriginal reserves', in M Heppell (ed.), *A black reality: Aboriginal camps and housing in remote Australia*, Australian Institute of Aboriginal Studies, Canberra, pp. 207–28.

—— 1984, 'Of acts and axes: an ethnography of socio-cultural change in an Aboriginal community, Cape York Peninsula', PhD thesis, James Cook University, Townsville.

Thompson, David 1988, 'Bora, church and modernization at Lockhart River, Queensland', in T Swain and DB Rose (eds), *Aboriginal Australians and Christian missions*, Australian Association for the Study of Religion, Bedford Park, SA, pp. 263–76.

—— 1995, '"Bora belonga white man": missionaries and Aborigines at Lockhart River Mission', MA thesis, University of Queensland, Brisbane.

—— 1996, 'Struggling for relevance at Lockhart River', in BJ Dalton (ed.), *Lectures on North Queensland history no. 5*, Department of History and Politics, James Cook University of North Queensland, Townsville, Qld, pp. 142–68.

Thomson, Donald F 1939, 'The seasonal factor in human culture: illustrated from the life of a contemporary nomadic group', *Proceedings of the Prehistoric Society* July–December: 209–21.

Trigger, David S 1992, *Whitefella comin': Aboriginal responses to colonialism in northern Australia*, Cambridge University Press, Melbourne.

Viola, Antoinetta 2006, 'Evaluation of the outreach school garden project: building the capacity of two Indigenous remote school communities to integrate nutrition into the core school curriculum', *Health Promotion Journal of Australia* 17: 233–9.

Wang, Zhiqiang and Wendy E Hoy 2005, 'Is the Framington coronary heart disease absolute risk function applicable to Aboriginal people?', *Medical Journal of Australia* 182: 66–9.

Warby, John 1996, 'The Lockhart catalyst: building St James Church at the Old Site, 1953', in BJ Dalton (ed.), *Lectures on North Queensland history no. 5*, James Cook University of North Queensland, Department of History and Politics, Townsville, Qld, pp. 169–94.

—— 1999, *'You-me mates eh!' A personal story of reconciliation and change among the Aboriginal people and the missionary staff of Lockhart River Mission, Cape York Peninsula 1924–1970, and in particular 1950–60, a period still known as 'Warby time' by the people*, The Rams Skull Press, Kuranda, Qld.

Waterland, Robert A and Randy L Jirtle 2004, 'Early nutrition, epigenetic changes at transposons and imprinted genes, and enhanced susceptibility to adult chronic diseases', *Nutrition* 20: 63–8.

Willis, Eileen, Meryl Pearce, Carmel McCarthy, Tom Jenkins and Fiona Ryan 2006, 'Utility stress as a social determinant in health: exploring the links in a remote Aboriginal community', *Health Promotion Journal of Australia* 17: 255–9.

Yolŋu Aboriginal Consultants Initiative n.d., 'Projects: Box of veg', Charles Darwin University, www.cdu.edu.au/centres/yaci/projects_box-of-veg.html, accessed 5 June 2013.

Preventable chronic diseases are largely responsible for the high rates of death and illness among Indigenous Australians, and poor nutrition, particularly in early life, is a major contributor to those chronic diseases. One approach to the problem which has an appealing logic is to improve nutrition in remote settings through local cultivation of fruit and vegetables. Many projects have begun; however, despite a history of horticulture in remote mission and pastoral settlements across northern Aboriginal Australia, sustained and substantial improvement has been elusive. This paper focuses on Cape York in remote northern Australia, and the community of Lockhart River in particular, to outline the historical and contemporary factors that have undermined, and continue to undermine, horticulture's contribution to improving Aboriginal health.

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