

QUT Digital Repository:
<http://eprints.qut.edu.au/>



East, Andrew John and Dawes, Les A. (2009) *Homegardening as a panacea : a case study of South Tarawa*. Asia Pacific Viewpoint, 50(3). pp. 338-352.

© Copyright 2009 Wiley-Blackwell Publishing Asia

Journal compilation © 2009 Victoria University of Wellington

Homegardening as a Panacea: A Case Study of South Tarawa

Dr Andrew John East

Dr Les Dawes

ABSTRACT

The Republic of Kiribati is a small, highly infertile Pacific Island nation and is one of the most challenging locations to attempt to support dense urban populations. Kiribati like other nations in the Pacific faces an urban future where food insecurity, unemployment, waste management and malnutrition will become increasing issues. Homegardening is suggested as one way to address many of these problems. However, the most recent study on agriculture production in urban centres in Kiribati shows that, in general, intensive cultivation of homegardens is not a common practice. This disparity between theory and practice creates an opportunity to re-examine homegardening in Kiribati and, more broadly in the Pacific.

This paper examines the practice of homegardening in urban centres in Kiribati and explores reasons why change has or has not occurred through interviews with homegardeners and government/donor representatives. Results show that homegardening has increased significantly in the past five years, largely due to the promotion of homegardens and organic composting systems by donor organisations. While findings further endorse homegardening as an excellent theoretical solution to many of the problems that confront urban settlements in Kiribati and the Pacific it raises additional questions regarding the continuation of homegarden schemes beyond donor support programs.

KEY WORDS: Kiribati, homegardening, interviews, sustainable development, Micronesia, organic waste management

Introduction

The Republic of Kiribati (formally the Gilbert Islands) is an isolated, resource poor, atoll country with the unenviable reputation as one of the poorest nations in the Pacific. Since gaining independence from the United Kingdom in 1979, Kiribati has struggled to raise waste management, nutrition, employment and food security standards in both urban and rural areas. These issues have been exacerbated in the last 50 years by the rapid growth of Kiribati's capital and only urban centre, South Tarawa. However, according to literature on urban food production in the Pacific, the vast majority of these development issues can be addressed in the simple practice of homegardening (Thaman 1995; Thaman, Elevitch and Kennedy 2006). Despite the potential of such homegardening systems to provide a "panacea" for the majority of development issues in Kiribati, the most recent article on urban food production in South Tarawa by Thomas (2002: 167) found that 'few agricultural activities in terms of crop production (vegetables and root crops) were carried out'.

The purpose of this paper is to re-examine the practice of homegardening and agricultural production in South Tarawa and explore reasons why change has or has not occurred. Investigation into this topic occurred through a series of interviews with homegardeners, aid workers and government employees resident in South Tarawa during a one month field trip at the end of 2005. Despite being a relatively small nation, the results from this study are relevant to the broader discussion on the use of homegardening and urban cultivation to address development issues throughout the Pacific and the rest of the world.

Literature on homegardening and urban agriculture

Urban agriculture is a generic term used in reference to a variety of food production practices within city boundaries. Research into urban agriculture has gained increasing support following the global

population shift towards urban living, particularly in developing countries. The nature and importance of urban agriculture is discussed in RUAF (2007), Mougeot (2005; 2006) and Smit et al (1996). Although many different food production systems exist within the concept of urban agriculture (hydroponics, aquaponics, urban forestry), homegardening is one of the most common, simple, affordable examples of urban cultivation.

The word 'homegarden' and other associated terms (dooryard gardening, mixed gardening, food gardening, urban agroforestry) have been used to describe a variety of practices involving food production at a household level (Fernandes and Nair 1986: 280). In this study, it is used to refer to multipurpose, multileveled tree/non tree crop (annual and perennial) and livestock systems cultivated by family labour within the compounds of individual houses (Fernandes and Nair 1986: 281). This definition firmly establishes homegardening as an agroforestry system, where agroforestry is defined as 'any agricultural system (agro-ecosystem) in which planted or protected trees are seen as economically, socially or ecologically integral to the system' (Thaman and Clarke 1993: 10).

The importance of homegardening systems in developing countries is reflected in literature on homegardening in the Pacific Islands. Professor Randy Thaman of the University of the South Pacific is by far the most prolific author in the field of homegardening in the Pacific (Thaman 1977, 1988, 1990b, 1993b, 1995, 2004; Thaman, Elevitch and Kennedy 2006). Despite the large number of publications, the core thesis of Thaman's works remains unchanged. In brief, that the promotion, preservation and improvement of urban agroforestry, and in particular homegardening, is one of the most direct, cost-effective and culturally/ecologically appropriate means of achieving sustainable development and meeting the majority of the development goals of Pacific nations (Thaman 1988: 174, 1995: 223).

Thaman's works goes on to claim that the inclusion of time-tested, locally driven agroforestry technologies in urban areas can positively impact nutrition, food security, cultural preservation, household finance, waste management, community belonging and the environment. This list of identified benefits arising from homegardening is also supported in the more generalised literature on homegardening (Kumar and Nair 2004; Midmore, Niñez and Venkataraman 1991; Niñez 1986) and urban agriculture (Mougeot 2005, 2006; Resource Centres on Urban Agriculture and Food Security 2007; Smit, Ratta and Nasr 1996).

Geographical background to the study

The Republic of Kiribati is comprised of around 92,000 island inhabitants dispersed across 33 coral atolls straddling the equator 2,200 kilometres north of Fiji (refer Figure 1). In total, Kiribati's small land mass is dispersed across a vast 3.5 million square kilometres of ocean, making it effectively a 'nation of water' (Jones 1996: 160). The majority of Kiribati islands fit loosely into the model of the typical atoll, having ribbon-like, long skinny crescent landmasses with ocean on one side and a shallow, sheltered lagoon on the other. These atolls are rarely more than three meters above the level of high-tide, with few of the islands more than 500 meters wide in any place. A lack of surface fresh water resulting from high soil porosity, only adds to the harsh environmental atoll conditions. However, larger islands often have a fresh water lens that hydrostatically floats on the higher density saltwater lying beneath the island.

Soils in Kiribati are typically shallow, sandy and highly alkaline and are often referred to as some of the most infertile on earth (Paeniu 1999: 156; Thaman 1990a: 6). The harsh atoll environment means that soil based agriculture is heavily reliant on highly adapted and resilient species. Prior to European contact, Islanders were able to fashion a subsistence living through combining the rich marine resources with the cultivation of productive root and tree species amidst the coconut dominant agroforestry matrix. In traditional subsistence living, the most prominent tree species, in order of importance, were the coconut (*Cocos sp.*), pandanus (*Pandanus tectorius*), breadfruit (*Artocarpus sp.*) and Pacific fig (*Ficus tinctoria*) trees (Koch and Slatter 1986; Manner, Clarke and Thaman 1993; Thaman 1995). While these species provided a valuable dietary supplement, they were not intensively cultivated or maintained but rather part of a "bushland" holding. In contrast, the root crop babai

(*Cyrtosperma chamissonis*) was intensively grown through pit cultivation involving regular composting and harvesting (Small 1972: 67).

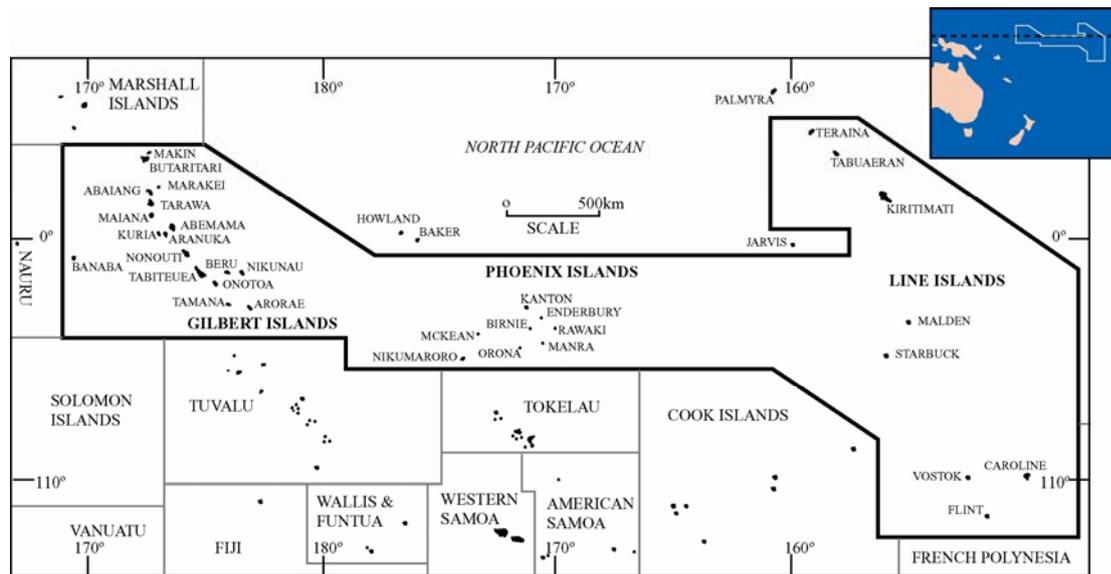


Figure 1: extent of the nation of Kiribati

Like other nations in the Pacific, urban living in Kiribati is a ‘comparatively recent phenomena’ (Thaman 1977: 146). The short history of urbanisation in Kiribati has focused on the development of the southern region of Tarawa atoll, known today as South Tarawa. Although initially a small colonial outpost of the Britain’s Gilbert and Ellice Colony, the real stimulus for urban growth in South Tarawa came during the post-war period leading up to independence in 1979. During this time, South Tarawa became the focus of unprecedented inter-island migration from outlying islands. Urbanisation in South Tarawa has continued to increase since independence, the 2005 census recording South Tarawa’s population to be 40,311 (Government of Kiribati 2006). Figure 2 shows this population increase in South Tarawa relative to the population of Kiribati.

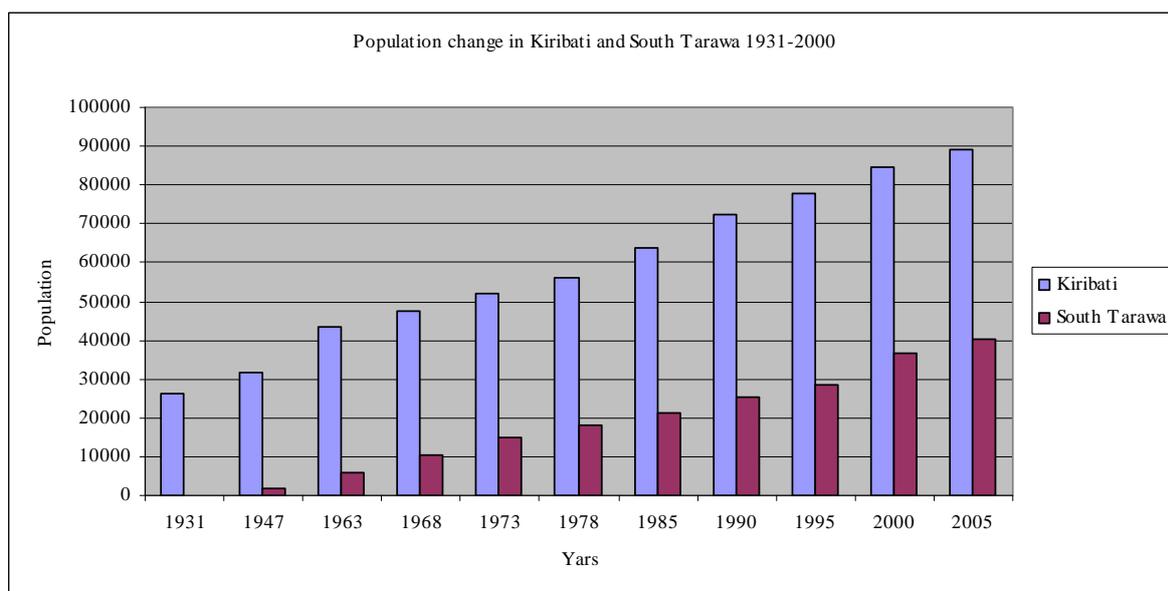


Figure 2: population change in Kiribati and South Tarawa 1931-2005

Source: Data from Government of Kiribati (2002; 2006), Van Trease (1993: 138) and Connell and Lea (2002: 32)

Today, Kiribati's economy is described as one of the smallest and least developed in the world (Tarhan 2006: 79). Despite attempts to diversify exports and remain competitive in a global economy, Kiribati has often struggled to balance expenditure against income. In response, an outward looking economy has emerged, focused towards Migration, Remittances, Aid and Bureaucracy, otherwise known as MIRAB (Bertram and Watters 1985). While the MIRAB model is often used to describe many small Pacific Island economies, such an approach is limited in its ability to make provision for locally driven business initiatives which, in turn, increase growth in the private sector. However, despite the limitations common to all economic models, MIRAB goes a long way to describing the current economy of Kiribati.

MIRAB allows the Republic of Kiribati to function and develop despite a variety of resource, labour, education and infrastructure challenges. In particular, international donor organisations continue to assist in improving the quality of life in Kiribati by conducting various aid projects. These monies make a considerable contribution to the economy in Kiribati with external aid increasing from A\$49.7 million to around A\$62.7 million from 2004 to 2005 (Asian Development Bank 2006: 250). A further component of the MIRAB system in Kiribati is the dominance of public sector employment. Although government is often looked to by *I-Kiribati* as the main source of employment, the capacity of the public sector to absorb the growing number of unemployed young people, many of whom have a lack of skills, is limited. Finally, the MIRAB economy in Kiribati is supported by the remittance of cash earning from migrant workers back to family members (Borovnik 2006). *I-Kiribati* seamen employed by international shipping companies is a clear example of such behaviour.

South Tarawa homegardening case study

South Tarawa is Kiribati's only urban centre. All other islands in Kiribati, including the northern end of Tarawa (North Tarawa), are considered to be 'Outer Islands' and are markedly different from South Tarawa due to reduced densities, isolation and strength of the subsistence sector in the Outer Islands. As the connection point to the global community and Kiribati, South Tarawa is increasingly becoming torn between allegiances to both the cash and subsistence economies. Such tensions are clearly evident in the current urban form of South Tarawa, where the densities, services and commerce of urban living coexist within a hybrid village settlement pattern shaped by the distinctive linear atoll landform. According to the 2005 census, over 40 per cent of Kiribati's population is located on South Tarawa's 16 square kilometers of land (Government of Kiribati 2006). The rapid population increase in South Tarawa over the last 50 years has seen the emergence of previously nonexistent urban issues such as pollution, falling nutritional standards, increasing food insecurity and unemployment. These issues will be discussed in detail in the results section of this paper.

Despite the accelerated urban growth of the past 50 years in South Tarawa, food producing trees have remained a prominent component of the urban landscape in many homegardens. However, while traditional food trees such as coconuts (*Cocos sp.*), breadfruit trees (*Artocarpus sp.*), pandanus (*Pandanus tectorius*) and the native fig (*Ficus carica*) do still exist in many of the densely populated areas, they are often seen as a remnant of traditional subsistence lifestyle and are undervalued and destroyed to make way for future development.

Research methods

Data for this study was collected during a four week field research trip to South Tarawa over November to December 2005. During this time, structured interviews were conducted with homegardeners of mixed gender who lived and worked in South Tarawa. Participants were recruited through pre-existing networks with homegarden organisations in South Tarawa. In particular, the assistance of an elderly *I-Kiribati* male translator was used to recruit homegarden participants. As well as being a member of the local homegardeners association, this translator had access to a well established network of local homegarden contacts. These contacts were used to assist in identifying potential homegardener participants. The translator also assisted in overcoming language difficulties and potential cultural misunderstandings during interviews. The translation of all interview material into the local language also helped in this regard.

The study purposefully targeted households who clearly demonstrate an increased willingness to invest in homegardening by growing a vegetable understorey in addition to the ever present canopy of coconut trees. Figures on urban food production by the Government of Kiribati (2006) record that, in 2005, 638 households were growing cabbages in areas surrounding their household. This figure is a good indication of the number of households in South Tarawa fitting the sampling criteria of this study at the time this study was undertaken. Of this number, 30 head gardeners (the person in charge of maintaining the garden) from separate households in South Tarawa were interviewed regarding the practice of homegardening at their place of residence.

The location of households involved in the interview can be seen in Figure 3. In general, the selection of homegardens was skewed towards the eastern end of South Tarawa where population densities were lower (and therefore more conducive to homegardening). Despite this, deliberate efforts were made to interview households from denser settlements such as Betio and Bairiki. The size of homegardens discussed in this study varies greatly due to the overpopulated nature of urban centres. In the denser settlement areas such as Betio, homegardens were found to exist on small, thin strips of land between the place of residence and the allotment boundary. In more peri-urban areas such as Banraeaba, larger plots were more common, where over 200 square meters of land was often under cultivation.

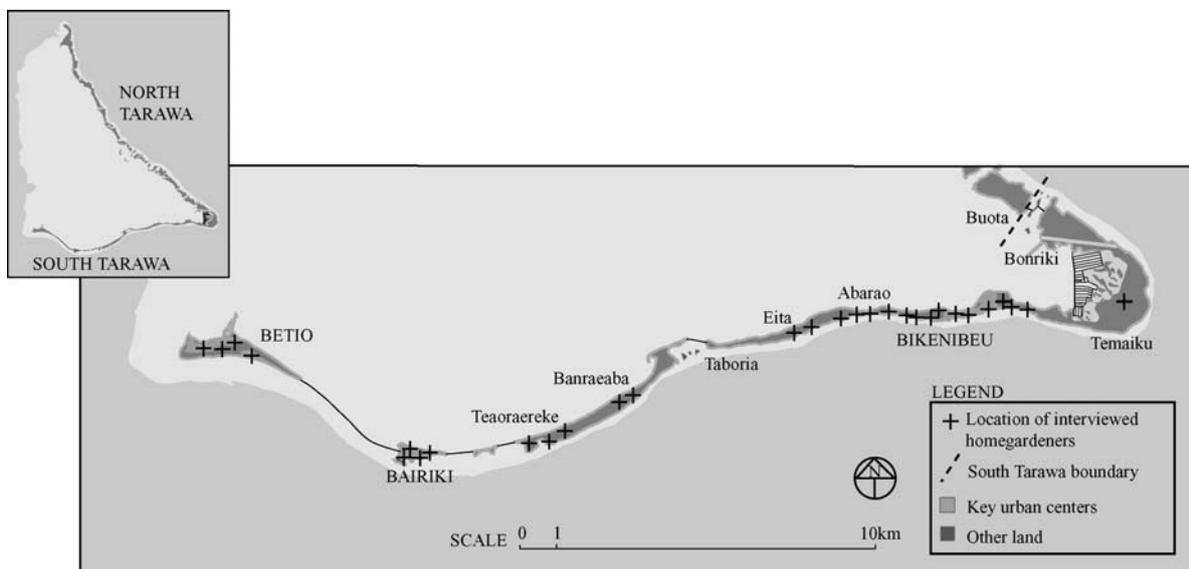


Figure 3: locations of participant urban farmer households in South Tarawa

Interview questions were based around the previously established benefits of homegardening in the Pacific (Thaman 1995). Homegardeners were asked to use an ordinal scale to evaluate how strongly they agreed or disagreed with statements about ten separate benefits of homegardening. Photographs and field notes were also used to verify responses given by participants during interviews. An additional 12 semi-structured interviews were carried out with project planners, implementers and teachers who had experience in agriculture, waste management and sustainable development in Kiribati. These interviews were separate from those carried out with homegardeners and served to give additional insight into the challenges of achieving sustainable development in Kiribati.

Care was taken during interviews to maintain the quality and accuracy of interview data. For example, prior to the commencement of the interview participants were asked to base their responses on what they thought, rather than on what they believed to be the correct answer. Furthermore, the translator was also made aware of the potential for misleading information and was asked to be watchful for dialogue where he believed that the participant's true opinion was not being communicated.

Results: the increasing popularity of homegardening in South Tarawa

Results from interviews show that, since Thomas's (2002) research, the practice of homegardening in South Tarawa has increased significantly. Of the 30 interviews that were conducted with head gardeners, 60 per cent of respondents stated that they had created their vegetable plot in 2005. Furthermore, all respondents stated that their vegetable plot had been created since 2000. Data on crop production in the 2000 to the 2005 census further supports this finding (refer Table 1). The homegardens visited during interviews ranged from complex combinations of traditional and introduced agroforestry species to simple vegetable mono cropping, usually in the form of Chinese cabbage (*Brassica chinensis*) under a canopy of coconuts (*Cocos nucifera*) (refer Figure 4 and 5). The variety of food species seen in these homegardens was very similar to the key species previously identified in Thaman (1993a), Thomas (2002) and Peduzzi (1999) (refer Table 2).

Table 1: number of South Tarawa households cultivating specific agroforestry species near their house

	Total	Breadfruit	Babai	Banana	Coconut	Pawpaw	Sweet potato	Local pig	Local chickens	Cabbages
2000 census	4529	1754	86	361	-	1826	164	3781	546	-
2005 census	5245	2865	247	2042	4204	3420	304	4268	512	638
Per cent change	16	63	187	466	-	87	85	12	-11	-

Note: "near" stands for the area surrounding the house; total households exclude "collective households" such as institutions, schools, etc.

The lack of data in some cells is due to differences in the data collected in the 2000 and 2005 census

Source: Government of Kiribati (2002: 105-6; 2006: 78-82)



Figure 4: example of a homegarden in South Tarawa

Table 2: key species identified in South Tarawa homegardens

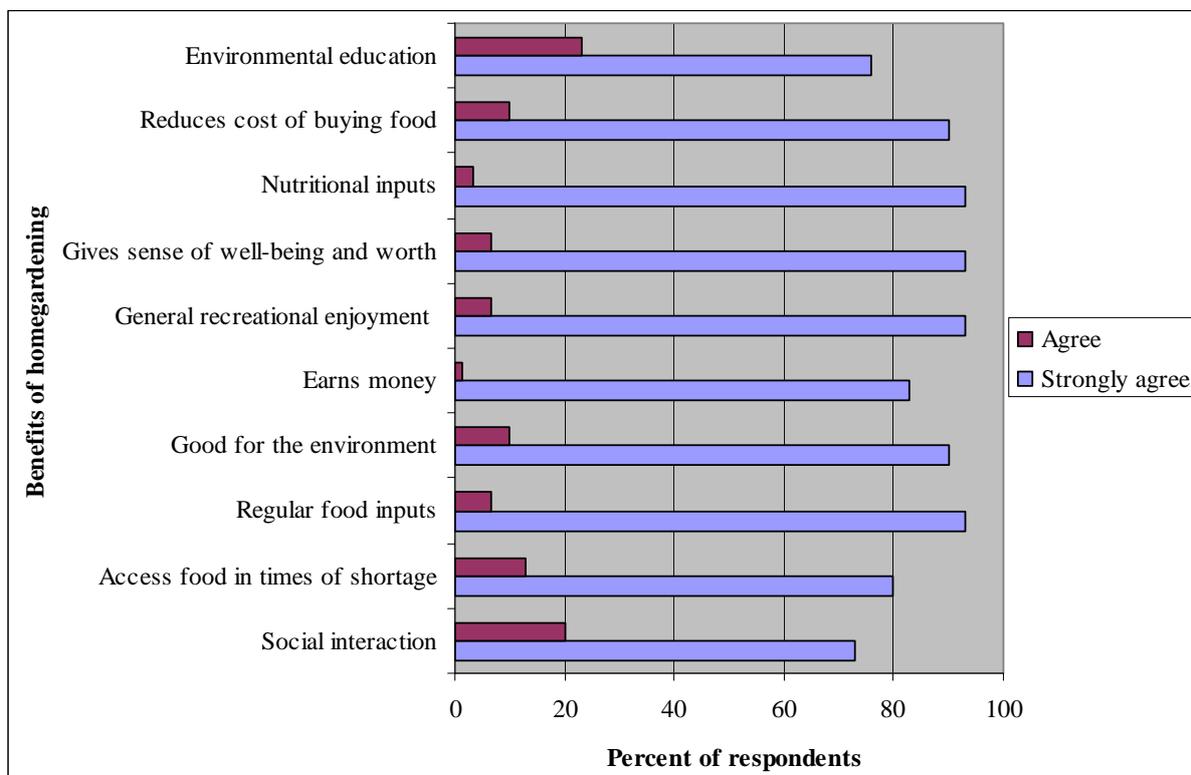
COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Trees		Vegetable and root crops	
Breadfruit tree	<i>Artocarpus altilis</i>	Chinese broccoli	<i>Brassica alboglabra</i>
Pawpaw	<i>Carica papaya</i>	Chinese cabbage	<i>Brassica chinensis</i>
Lime or west indian lime	<i>Citrus aurantiifolia</i>	English cabbage	<i>Brassica oleracea capitata</i>
Coconut palm	<i>Cocos nucifera</i>	Bell pepper	<i>Capsicum annum</i>
Common fig	<i>Ficus carica</i>	Chilli	<i>Capsicum frutescens</i>
Native fig	<i>Ficus tinctoria</i>	Watermelon	<i>Citrullus vulgaris</i>
Beach mulberry	<i>Morinda citrifolia</i>	Taro	<i>Colocasia esulenta</i>
Banana	<i>Musa sp.</i>	Rockmelon	<i>Cucumis melo cantalupensis</i>
Pandanus	<i>Pandanus tectorius</i>	Cucumber	<i>Cucumis sativus</i>
		Pumpkin	<i>Cucurbita pepo</i>
Shrubs		Babai	<i>Cyrtosperma chamissonis</i>
Chaya	<i>Cnidoscolus chayamansa</i>	Sweet potato	<i>Ipomea batatas</i>
Hibiscus	<i>Hibiscus manihot</i>	Tomato	<i>Lycopersicon esculentum</i>
Sugar cane	<i>Saccharum officinarum</i>	Eggplant	<i>Solanum melongena</i>
		Sweet corn/maize	<i>Zea mays</i>



Figure 5: example of a homegarden in South Tarawa

The benefits of homegardening in South Tarawa

Results from interviews with home gardeners showed an almost unanimous agreement on the value of homegardening (Figure 6). While this result is supported by existing literature (Thomas 2002), less is known about which of the many benefits of homegardens are the primary motivators behind urban cultivation in South Tarawa. When asked to identify the two most important benefits of homegardening, over 43 per cent of interviewed home gardeners identified accessing regular food inputs or producing supplementary income as the most important benefits (Figure 7). Lower down the scale, 30 per cent of interviewed home gardeners believed that environmental benefits associated with homegardening was one of their two most important reasons for gardening. Fewer respondents (13 per cent) identified the nutritional aspects of homegardening as one of their two most important benefits. These results identify the four main benefits of homegardening in interviewed households, in order of priority, as food security, financial incentives, environmental issues (such as waste management), and nutrition. The following sections discuss these four key benefits with reference to specific development issues in South Tarawa.



Food security benefits

Results from interviews with home gardeners demonstrate the capacity of homegardens to both provide regular food inputs and food security for times of shortage, thus diversifying the food base of urban settlements. On average, 61 per cent of food produced in homegardens in this study is directly consumed. The results are in keeping with literature on homegardening which stresses that subsistence 'food production is the primary function of most homegardens' (Fernandes and Nair 1986: 279).

Food security is a continual issue in both rural and urban settlements, due to the remote and isolated location of Kiribati. While food imports diversify the base of food security in Kiribati, they also add to the increased danger of placing consumers at the mercy of foreign producers (Thomas 2002: 172).

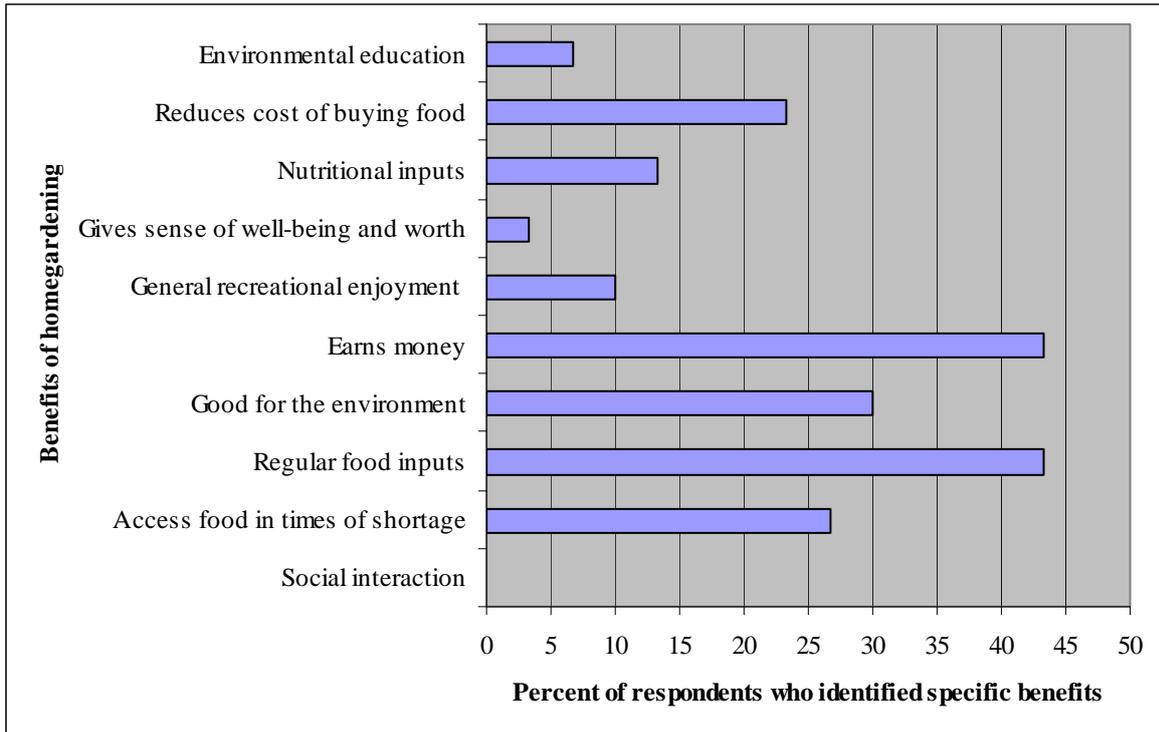


Figure 7: results showing the identification of the two most important benefits of homegardening

Today, the majority of urban residents rely on imports such as rice and flour to guarantee food security, instead of traditional foods such as coconuts and babai. In 2005, food were the most imported commodity in Kiribati, totalling over AU\$ 31 million (Kiribati National Statistics Office 2006). The dangerous nature of Kiribati’s over dependence on imported staples was made clear in the events of August 2004 when the late arrival of a cargo ship resulted in a national food crisis. From this one example it is evident that any significant disturbance to basic trade could have dramatic ramifications for South Tarawa and force urban residents to further consider food producing systems such as homegardens. While it is unrealistic to believe that homegardening alone would ever be able to sustain current population densities, urban cultivation can significantly improve a family’s food access in times of shortage.

Income and savings

Financial incentives were found to be a key influence on farmers’ decisions to invest in homegardening despite the time and effort required to produce crops in atoll soils. On average it was found that each head gardener spent around 16.5 hours working in the garden each week. In addition, 90 per cent of respondents said that they received additional help in the garden from other members of the family. Across respondents, this amount averaged out to an additional 11 hours and 45 minutes of labour each week. On average, 39 per cent of food from these gardens was sold. This amount translates into an average income of AU\$37 per week per household.

Kiribati’s economy faces many challenges in trying to compete in an increasingly global economy with severely limited resources. Primarily these economic constraints are associated with Kiribati’s isolation from world markets, limited base of physical resources, small land area, infertile soils and scarcity of skilled workers (Baaro 1993: 161). Assuming the established trend of rural to urban drift in Kiribati continues into future years, the already strained employment opportunities in South Tarawa will be exposed to even greater pressure. Clearly, one of the major challenges facing urban centres in Kiribati is the need to supply job opportunities for growing numbers of unemployed young people (Tarhan 2006: 86-7; Thomas 2002). While, urban cultivation provides a practical solution to the rising

youth unemployment issues in South Tarawa (Thomas 2002: 172), the average age of home gardeners in this study of between 36 and 40 suggests that additional incentives would need to be offered to encourage such involvement.

Homegardening is also an alternative source of employment outside the MIRAB economy and has significant potential to be further developed. The potential for urban gardening to contribute to household income both through the direct sale of produce and as an indirect result of offsetting household food costs is already well recognised (Overton and Storey 1999: 251; Thaman 1995: 170). Although homegardening is a labour intensive task it still provides significant opportunities for financial saving and earnings especially in poorer households.

Interestingly, Kunzel (1996: 143) comments that vegetables such as the Chinese cabbage have recently taken on a new level of cultural importance in place of more traditional foods such as Babai (*Cyrtosperma chamissonis*). Particularly in urban areas, difficulty in the cultivation of more traditional status foods such as babai has meant that plates of fresh vegetables at celebratory events is increasingly being accepted as a sign of wealth and social status. This connection between vegetables and social status can be attributed to the perception of these foods as 'modern' and 'nutritional' and therefore highly desirable (Kunzel 1996: 143). This perception creates a market for local grown produce such as Chinese cabbage and increases incentives for home gardeners to produce these crops.

Waste management and environmental benefits

Waste management is becoming an increasingly critical issue in overpopulated urban areas in Kiribati. The potential of homegardening to turn waste into a resource can be seen in the fact that all interviewed homegardens made and used compost in their gardens. Furthermore, half of the interviewed households used a simple backyard composting technique known as the 'banana circle' to compost organic waste and grow bananas (refer Figure 8). In the banana circle, a shallow pit is dug above the groundwater lens, lined with cardboard and then filled with organic matter. A ring of bananas is then planted around the pit. Households then place their organic waste in the middle of the pit, which in time breaks down and fertilises the bananas. Laundry water is also used to water the bananas and further fertilise soils (South Pacific Regional Environment Programme 2003). The popularity of the banana circle concept is reflected in the 466 per cent increase in the numbers of households in South Tarawa having access to bananas, according to the 2000 to 2005 census (Table 1).

One of the greatest challenges involved in addressing the growing domestic solid waste issues is overcoming past attitudes towards waste and waste reuse. Traditionally, waste is seen as 'something that is bothersome or no longer useful and that should be discarded' (Thaman et al. 2003: 3). As a result, landfills and illegal dumps are almost always sprawling, unplanned and unsound, creating both visual and health hazards while also been expensive to create and maintain (Thaman et al. 2003: 13). Much of what is discarded is directly recyclable, with an estimated three quarters of disposed waste being organic and around half of the remaining waste recyclable (Leney 2003: 3). Although the Kiribati Environmental Act (Government of Kiribati 1999) addresses waste management to a limited extent, it lacks clear directions and provisions for organic waste management. The decomposition of organic material both increases soil fertility and saves landfill costs.

Nutritional benefits

Studies into the nutritional value of food species in Kiribati show that traditional foods are considerably more nutritious than processed imported staple foods such as rice, bully-beef and canned fish (Christensen 1995; Englberger 2003; Tebano 1984; Thaman 1982). Furthermore, Thomas (2002: 166) states that 'dependence on nutritionally inferior food imports among growing segments of island populations is largely responsible for declining health standards'. Homegardening in South Tarawa provides simple, affordable and sustainable solutions to nutritional problems (Thaman 1995: 218). Of the 30 homegardens in this research, pandanus (*Pandanus tectorius*) (high in vitamin A), coconut

(*Cocos sp.*) (vitamin C) and sometimes the native fig (*Ficus tinctoria*) (vitamin B and C) were grown and consumed in the majority of households.

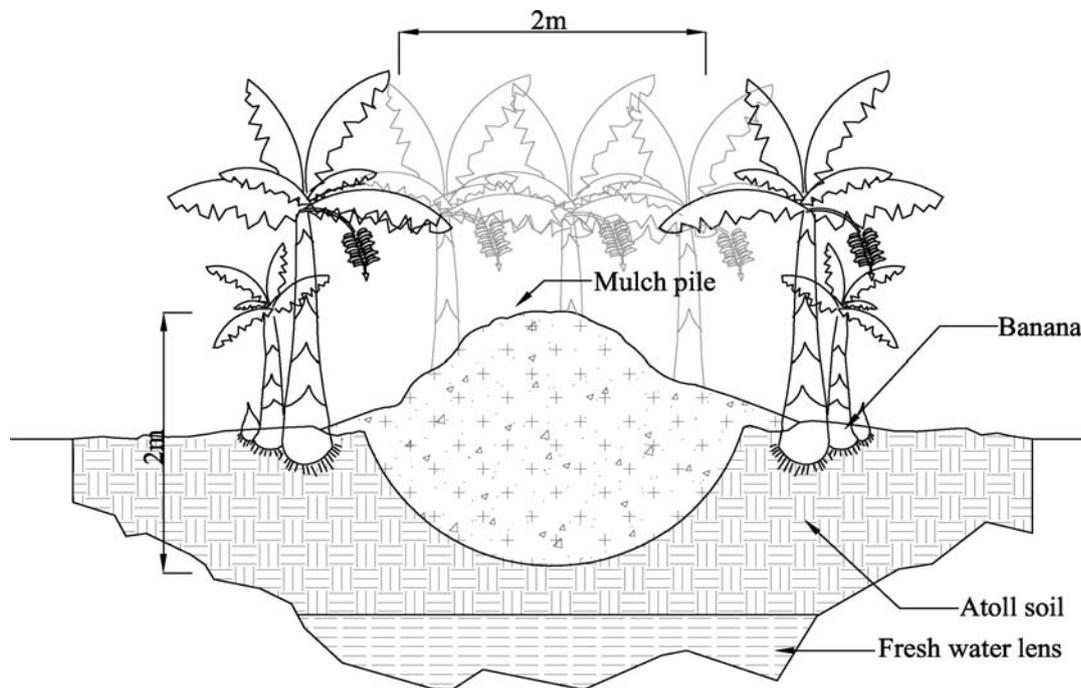


Figure 8: section showing the design of a banana circle

Malnutrition due to the lack of vitamins and minerals in urban diets is becoming an increasing problem in Kiribati (Englberger 2003). Many of Kiribati's nutritional problems are a result of ever-increasing separation from traditional subsistence lifestyles (Thaman 1982: 112). The majority of urban residents now live on 'imported diets high in sugar, salt, alcohol and animal fat and low in vitamins, minerals and fibre' (Neemia and Thaman 1993: 297). Even when local foods are available, there is a perception that imported foods are somehow superior. This general lack of nutritional understanding, combined with poor nutritional choices, has led to an increase in nutritional diseases such as night blindness (dietary vitamin A deficiency) and diabetes (Thomas 2002: 166).

Explaining the change

What is behind the increasing popularity of homegardening in South Tarawa? Over the last five years recurring attempts have been made by donor and quasi-government organisations in South Tarawa to harness the benefits of low cost homegardening systems. In particular, organisations have focused on the increased cultivation of a vegetable understorey and compost based waste management in homegardens. Agencies working in South Tarawa at the time of data collection included the Taiwan Technical Mission (TTM), Foundation of the Peoples of the South Pacific (FSP), Development of Sustainable Agriculture in the Pacific (DSAP), Kiribati Organic Farmers Association (KOFA) and the International Waters Project of Kiribati (IWPK). These organisations promote the value of homegardening by undertaking a range of activities, including holding homegarden competitions and supplying training, gardening equipment and seedlings to local gardeners.

The influence of aid programs on urban cultivation is demonstrated in the success of banana circles in South Tarawa. The idea of composting existing organic material to increase soil fertility and grow crops was first promoted by a FSP project called Kaoki Mange (return the waste). In this recycling program, the 'banana circle' was suggested as a composting system to combat the wasteful dumping of organic material in South Tarawa. Since the completion of this project, the IWPK has taken up the promotion of banana circles as part of their waste management project in Bikenibeu West. The

training and supplies given by organisations such as IWPK has encouraged an increasing number of urban residents to make labour and resource investments in homegardening systems.

As an investment choice, homegardening is informed by a variety of factors including the basic need for food, agricultural knowledge of urban residents, financial opportunity associated with growing food and the environmental opportunity (soil fertility, climate, precipitation etc.) in any given settlement. The relationship between homegardening and these four factors can be seen in Figure 9.

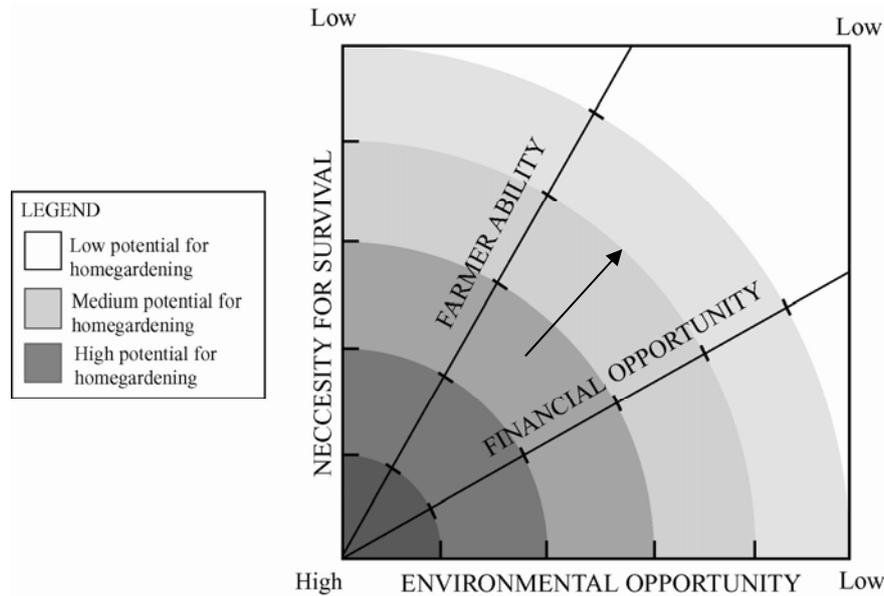


Figure 9: factors impacting farmer incentive to partake in homegardening

In the case of South Tarawa, the technical assistance and supplies of donor agencies since Thomas (2002: 167) has provided urban residents with increased agricultural ability, allowing urban residents to offset the limiting environmental opportunities. Additionally, increased economic and population pressure in urban centres has increased the necessity for urban residents to produce their own food. Finally, the increasing status associated with cultivating modern vegetables in Kiribati has increased the market for foods such as Chinese cabbage. Thus, while the harsh environmental conditions and scarcity of land in South Tarawa have remained constant (if not further deteriorated), other factors influencing the decision of urban residents to invest in homegardens have changed and thus increased its appeal.

Problems and challenges

The problems of homegardening in South Tarawa are considerable and should not be overlooked in this discussion. When asked to identify their two most significant problems, the most frequently reported problems by homegardeners (56 per cent) were pests such as crabs and a lack of supplies/tools. This result indicates that either a market for agricultural supplies in South Tarawa has yet to catch up with the recent increase in urban cultivation or households are too poor to purchase the necessary equipment. The general infertility of soils was the third most commonly reported problem, mentioned by over 33 per cent of respondents. Fourthly, over 26 per cent of respondents stated that access to fresh water was a issue. Access to fresh water problems presents a significant challenge particularly in times of drought which are known to be extremely severe particularly in Line and Phoenix Islands (Christensen 1995).

Other constraints on homegardening mentioned during interviews included the fact that intensive agriculture is a relatively new concept to *I-Kiribati* people and therefore poorly understood and not widely practiced. Furthermore, the lack of land available for urban cultivation was also mentioned, particularly in the more densely populated urban western end of South Tarawa. Similarly, the loss of

land use for other purposes and the time required for crops to mature was highlighted. Incidences of theft were only reported as an issue in two households. In one case, a wheelbarrow that had been won as a prize from a donor organisation for having the best homegarden in the community was stolen. In the second incident of theft, coconut fruit were stolen from trees in a garden in Betio. Although not believed to be a significant problem at the time of this study, crop theft is likely to be an increasing problem in urban areas as traditional trust systems are further fragmented by the continued influx of new families from Outer Islands.

These constraints clearly show that homegardening in South Tarawa is a difficult task. Yet as Thomas (2002: 172) remarks, 'these constraints are not insurmountable'. Clearly, the government and donor organisations can potentially play a significant role in overcoming such difficulties. Interestingly, only one respondent mentioned a lack of training as a constraint. This was surprising, given *I-Kiribati's* general lack of knowledge of intensive agriculture. However, this result makes more sense considering the support of a variety of different aid organisations over recent years. It is this support that is believed to be the primary driver of homegardening activity since Thomas (2002).

The greatest challenge: sustaining the homegarden movement

Sustaining the momentum gained over the last few years is perhaps the greatest challenge that homegardening faces in South Tarawa. Over the last 50 years, many different aid projects have been completed in Kiribati. Such projects are often not successful due to inappropriate project planning and implementation and often a lack of interest from the local people themselves. Liew (1990: 83) attributes past project failures in nations such as Kiribati to a variety of factors including the inappropriate use of technology, a general lack of understanding of the social-cultural issues involved in the target population, and the absence of public consultation and involvement with project beneficiaries. While homegardening is upheld as one of the most culturally and ecologically appropriate approaches to development in the Pacific (Thaman 1988: 167), care needs to be taken to ensure that donor projects foster greater independence rather than dependence.

The potential for over dependence was clearly demonstrated when respondents were asked where they obtained their garden supplies. Over 86 per cent of respondents stated that they obtained free plant stock and tools from aid programs. The remainder of head gardeners stated that they bought supplies from the local shop or government agriculture department. Only six to seven per cent of respondents stated that they propagated their own seeds.

These findings clearly communicate the challenge associated with transferring agricultural knowledge to the local level for the purpose of ensuring that current homegardening successes continues beyond the completion of donor projects. However, for this to happen, residents of South Tarawa themselves need to take responsibility for the future of homegardening and not adopt purely a handout mentality. The large amount of donor activity in the last five years associated with the recent increase in homegardening practice raises questions about the long term sustainability of homegarden practice in South Tarawa following the conclusion of these donor programs. However, ensuring the continuation of a project beyond the period of donor funding is a challenge shared by all aid interventions and resolved by few.

The locally based Kiribati Organic Farmers Association (KOFA) is an organisation where the long term sustainability of homegardening in South Tarawa has its greatest chance of success. As a quasi government organisations, KOFA already has the support of the Government of Kiribati and is fast building a membership base that provides technical assistance and low cost agricultural supplies to local farmers. Driven by the vision of local people, KOFA stands out from other homegardening aid programs because of its direct connection to the government, local people and supporting donor organisations. Organisations such as KOFA to be further strengthened and developed if homegardening in South Tarawa is to have a future beyond homegarden based aid programs.

At least in the short term it would appear that homegardening will require the continued support of over arching institutions and policy reforms to ensure that it does not join the long list of failed aid

interventions in Kiribati. From the government perspective, this could include reduction in council rates for households using banana circles, establishment of new waste management laws and financial incentives to encourage the growing number of unemployed young to cultivate the land. From a donor perspective, the gradual phasing out of free handouts and on going attempts to partner and train local organisations such as KOFA will also increase the sustainability of homegardening in South Tarawa.

Conclusion: homegardening as a panacea?

On a theoretical level, homegardening is a panacea for the majority of development problems in Kiribati. However, on a practical level, homegardening faces significant environmental, social and financial obstacles which threaten the continuation of its practice beyond the completion of key donor projects. The past success and future potential of homegardening in South Tarawa is perhaps best summarised in the banana circle. This low maintenance, low cost, culturally acceptable agricultural system is capable of producing nutritious food, sorting waste, increasing soil fertility, preventing ground water pollution, providing families with a saleable product and reducing landfill costs; all within an area of land less than four square metres.

While the banana circle provides an ideal example of the benefits of homegardens, consideration of the wider homegarden systems reveal numerous practical limitations on this theoretical panacea. In particular, homegardens in South Tarawa must overcome land scarcity, infertility, drought, lack of tools, pests, unfamiliarity with intensive agriculture and the threat of crop theft. However, these constraints can be overcome. This is demonstrated in the significant increase in urban cultivation since the publication of Thomas (2002: 172).

This increase is believed to be attributable to the large number of aid projects related to homegardening in recent years. These programs have and continue to use homegardening and associated organic composting techniques to address the key development challenges in Kiribati, ranging from waste management, food security, nutritional intake and employment. Despite the success of past years, the true test of homegardening in South Tarawa will commence with the conclusion of donor support. This is perhaps the greatest challenge that homegardening in South Tarawa faces, especially considering the attitude of dependence fostered by the MIRAB economy. For homegardening to endure beyond the recent injection of donor funding and activity, the local people will need sufficient ownership, experience and incentive to continue their homegarden practice. While such an approach may go against the usual concept of development and progress, this article demonstrates that it is a logical solution to many of the problems that confront urban settlements in Kiribati and the Pacific.

References

- Asian Development Bank (2006) Asia Development Outlook, 18th edition, Asian Development Bank, Retrieved 18 July 2006, from Website:
<http://www.adb.org/Documents/Books/ADO/2006/default.asp>.
- Baaro, B. (1993) Economic Overview, in H. Van Trease. (ed.), *Atoll Politics: The Republic of Kiribati*. Suva: Macmillan Brown Centre for Pacific Studies.
- Bertram, I. G. and R. F. Watters. (1985) The Mirab Economy in South Pacific Microstates, *Pacific Viewpoint*, 26 (3): 497-519.
- Borovnik, B. (2006) Working Overseas: Seafarers Remittances and Their Distribution in Kiribati, *Asia Pacific Viewpoint*, 47 (1): 151-61.
- Christensen, P. M. (1995) *Infant Nutrition and Child Health on Tarawa, Kiribati: A Nutrition Anthropological Approach*, Pacific Studies Monograph, No. 15, Sydney: University of New South Wales.
- Connell, J. and J. P. Lea. (2002) *Urbanisation in the Island Pacific: Towards Sustainable Development*, Routledge Pacific Rim Geographies, No. 3, London: Routledge.
- Englberger, L. (2003) *Nutritional Value of Kiribati Pandanus: Consultancy Report*, n.p.: Food and Agriculture SAPA Office, Secretariat of the Pacific Community and Task Force Sight and Life.
- Fernandes, E. C. M. and P. K. R. Nair. (1986) An Evaluation of the Structure and Function of Tropical Homegardens, *Agricultural Systems*, 21: 279-310.
- Government of Kiribati. (1999) *Environment Act 1999*, Tarawa, Kiribati: Government of Kiribati.
- . (2002) *Report on the 2000 Census of Population*, n.p.: Statistics Office Ministry of Finance.
- . (2006) *2005 Census of Population Volume 1: Basic Information and Tables*, Bairiki, Kiribati: Kiribati National Statistics Office Ministry of Finance.
- Jones, P. (1996) Changing Face of the Islands, *Australian Planner*, 33 (3): 160-3.
- Kiribati National Statistics Office (2006) Kiribati National Statistics Office, Government of Kiribati, Retrieved 13 June 2007, from Website:
<http://www.spc.int/prism/Country/KI/Stats/index.htm>.
- Koch, G. and G. Slatter. (1986) *The Material Culture of Kiribati*, Suva: Institute of Pacific Studies: University of the South Pacific.
- Kumar, B. M. and P. K. R. Nair. (2004) The Enigma of Tropical Homegardens, *Agroforestry Systems*, 61: 135-52.
- Kunzel, W. (1996) Atoll Agroforestry, in S. Rogers and P. Thorpe. (eds), *Agroforestry Research in the Pacific: Reports and Papers Presented at the Second Annual Meeting of Collaborators, Port Vila, Vanuatu*. Suva: Quality Print Limited.

- Leney, A. (2003) Recycling in Kiribati: Design Report - the Pathway to a Self-Financing Recycling Operation, Foundation for the Peoples of the South Pacific Kiribati (FSPK), Retrieved 3 May 2005, from Website: http://www.sidsnet.org/docshare/other/20050204160358_Design_Report_recycling_in_Kiribati.pdf.
- Liew, J. (1990) Sustainable Development and Environmental Management of Atolls, in W. Beller, P. d' Ayala and P. Hein. (eds), *Sustainable Development and Environmental Management of Small Islands*. Paris: United Nations Educational, Scientific and Cultural Organization.
- Manner, H. I., W. C. Clarke and R. R. Thaman. (1993) Agroforestry in Micronesia, in W. C. Clarke and R. R. Thaman. (eds), *Agroforestry in the Pacific Islands: Systems for Sustainability*. Tokyo: United Nations University Press.
- Midmore, D. J., V. K. Niñez and R. Venkataraman. (1991) *Household Gardening Projects in Asia: Past Experience and Future Directions*, Taipei, Taiwan: Asian Vegetable Research and Development Center.
- Mougeot, J. A. (2006) *Growing Better Cities: Urban Agriculture for Sustainable Development*, Ottawa: International Development Research Centre.
- . (ed.) (2005) *Acropolis: The Social, Political, and Environmental Dimensions of Urban Agriculture*: International Development Research Centre, Ottawa & Earthscan, London.
- Neemia, U. and R. R. Thaman. (1993) The Environment and Sustainable Development, in H. Van Trease. (ed.), *Atoll Politics: The Republic of Kiribati*. Suva: Macmillan Brown Centre for Pacific Studies: University of Canterbury, Christchurch, and Institute of Pacific Studies: University of the South Pacific.
- Niñez, V. K. (1986) The Household Garden as a Lifeboat, *Government publication*, 19 (4): 31-6.
- Overton, J. and D. Storey. (1999) Sustainable Urban Footprints, in J. Overton and R. A. Scheyvens. (eds), *Strategies for Sustainable Development: Experiences from the Pacific*. Sydney: UNSW Press.
- Paeniu, B. (1999) Pacific Island Least Developed Countries, in Poverty Reduction Section. (ed.), *Sustainable Agricultural Development Strategies for the Least Developed Countries of the Asian and the Pacific Region*. n.p.: United Nations Economic and Social Commission for Asia and the Pacific.
- Peduzzi, C. (1999) *Mixed Gardens: Gardening on a Coral Atoll - a Guide for Kiribati*, 2 edn, Suva: United Nations Children's Fund and Foundation of the Peoples of South Pacific.
- Resource Centres on Urban Agriculture and Food Security (2007) Ruaf Foundation: Resource Centres on Urban Agriculture and Food Security RUAF, Retrieved 7 June 2007, from Website: <http://www.ruaf.org/>.
- Small, C. A. (1972) *Atoll Agriculture in the Gilbert and Ellice Islands*, Hong Kong: Fotographics International Publishers.

- Smit, J., A. Ratta and J. Nasr. (1996) *Urban Agriculture: Food, Jobs and Sustainable Cities*, New York: United Nations.
- South Pacific Regional Environment Programme (2003) Kiribati International Waters Project South Pacific Regional Environment Programme, Retrieved 14 June 2007, from Website: <http://www.sidsnet.org/mir/pacific/sprep/iwp/IWPKiribatiPage.htm>.
- Tarhan, F. (2006) Kiribati, in C. Browne. (ed.), *Pacific Island Economies*. Washington: International Monetary Fund.
- Tebano, T. (1984) *Nutritional Value of Atoll Foods*, South Tarawa, Kiribati: Republic of Kiribati Atoll Research and Development Unit.
- Thaman, R. R. (1977) Urban Gardening in Papua New Guinea and Fiji: Present Status and Implications for Urban Land Use Planning, in J. H. Winslow. (ed.), *The Melanesian Environment*. Canberra: Australian National University Press.
- . (1982) Deterioration of Traditional Food Systems, Increasing Malnutrition and Food Dependency in the Pacific Islands, *Journal of Food and Nutrition*, 39 (3): 109-21.
- . (1988) By the People and for the People: Home Gardening and National Development in the Pacific Islands, in J. Hirst, J. Overton, B. Allen and Y. Byron. (eds), *Small Scale Agriculture*. Commonwealth Geographical Bureau, London, & Department of Human Geography, Australian National University, Canberra.
- . (1990a) Kiribati Agroforestry: Trees, People and the Atoll Environment, *Atoll Research Bulletin*, 333: 1-29.
- . (1990b) Mixed Home Gardening in the Pacific Islands: Present Status and Future Prospects, in K. Landauer and M. Brazil. (eds), *Tropical Home Gardens*. Tokyo: United Nations University Press.
- . (1993a) Atoll Agroforestry on Tarawa and Abemama, Kiribati, in W. C. Clarke and R. R. Thaman. (eds), *Agroforestry in the Pacific Islands: Systems for Sustainability*. Tokyo: United Nations University Press.
- . (1993b) Pacific Island Urban Agroforestry, in W. C. Clarke and R. R. Thaman. (eds), *Agroforestry in the Pacific Islands: Systems for Sustainability*. Tokyo: United Nations University Press.
- . (1995) Urban Food Gardening in the Pacific Islands: A Basis for Food Security in Rapidly Urbanising Small-Island States, *Habitat International*, 19 (2): 209-24.
- (2004) 'Urban Gardening on the Small Islands of the Pacific', *Urban Agriculture Magazine*, no. 13, December, pp. 12-4.
- Thaman, R. R. and W. C. Clarke. (1993) Introduction (to Agroforestry in the Pacific Islands), in W. C. Clarke and R. R. Thaman. (eds), *Agroforestry in the Pacific Islands: Systems for Sustainability*. Tokyo: United Nations University Press.
- Thaman, R. R., C. R. Elevitch and J. Kennedy. (2006) Urban and Homegarden Agroforestry in the Pacific Islands: Current Status and Future Prospects, in B. M. Kumar and P. K. R. Nair. (eds), *Tropical Homegardens: A Time-Tested Example of Sustainable Agroforestry*. Advances in Agroforestry, Netherlands: Springer.

- Thaman, R. R., J. Morrison, W. J. Morrell and B. Thaman (2003) Wasted Islands? Waste and the Need for Integrated Waste Management in the Pacific Islands: Current Status and Prospects for Reduction and Safe Disposal, from Website.
- Thomas, F. (2002) Self-Reliance in Kiribati: Contrasting Views of Agricultural and Fisheries Production, *The Geographical Journal*, 168 (2): 163-77.
- Van Trease, H. (1993) South Tarawa Case Study, in H. Van Trease. (ed.), *Atoll Politics: The Republic of Kiribati*. Macmillan Brown Centre for Pacific Studies: University of Canterbury, Christchurch, and Institute of Pacific Studies: University of the South Pacific, Suva.