THE HISTORICAL EVOLUTION OF RICE AS A 'LOCAL' FOOD IN AUSTRALIA

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Abstract

This case study investigates the historical evolution of rice as a 'local' food in Australia by focusing on two areas of inquiry: firstly, the nature and meaning of rice as a local food, and secondly, the characteristics of the production and consumption that have often been ignored in other scholarly literature. The history of rice as a commodity shows clear connections between ideas of independence and the values of democratic production methods in establishing the concept of local. This history is presented using a history of commodities approach to examine its changing meaning over time. By linking the production and consumption of rice, this article casts a new light on the standard historical narrative and deepens our understanding of what local foods represented to Australians at different points in time.

Keywords

Rice, Australian rice, local food, local food Australia, history of rice Australia

Introduction

This case study investigates the historical evolution of rice as a 'local' food in Australia by focusing on two areas of inquiry: firstly, the nature and meaning of local foods themselves, and secondly, the

characteristics of the production and consumption of rice as a local food product. The links between food and locale, Country of Origin Labelling (CoOL), food policy, industrialisation, and marketing have been previously introduced as factors that created and reinforced local food concepts in my doctoral thesis (Chant 2016). This case study brings together the contexts of consumption and production that often have been ignored in other scholarly literature; therefore, by linking the production and consumption of rice, this article seeks to cast a new light on the standard historical narrative and deepen our understanding of what local foods represented to Australians at different points in time. Rice has been chosen for this study as it was popularly thought of or promoted as local during the period under investigation.

The history of rice as a commodity shows clear connections between ideas of independence and the values of democratic production methods in establishing the concept of local. This history is presented using a history of commodities approach to examine its changing meaning over time. Throughout this narrative, primary and secondary sources have been used extensively and considered from a different perspective than has been previously attempted. A review of the available literature on rice is given, drawing mainly from social historical studies of food and agriculture, and government reports. The evolution of rice is presented in chronological order. This approach aims to understand what rice represented to Australians at different points in time.

The available literature on Australia's rice industry is scant and consists mainly of industry data which reveals very little about its consumption history. A number of reports identify its early cultivation commencing around 1924, and more recent reports largely only address environmental concerns and technological advances (Lewis 2012; Sunrice 2015; Macadam 2002). Therefore material for this article has been drawn mainly from the *Australian Dictionary of Biography*, agricultural and farming histories, newspaper articles, and available industry reports, such as Peter Lewis's historical account of the co-operative rice industry commissioned by Ricegrowers' Co-operative Limited (RCL). Notwithstanding recent perceptions of environmental issues, the story of rice in Australia is one of a democratically run Australian primary industry, reflecting adaptation to

seasonal cycles and changes in land use, water use and economic, cultural and political environments. This case study shows how 'local' can become a synonym for ideologies such as democracy, both in closer settlement schemes and the idea that it was possible to democratically organise and fund the industry.

History of Rice in Australia

Before Europeans discovered and settled in Australia in 1788, voyagers from the Indonesian archipelago, Papua New Guinea and China regularly visited northern parts of the continent (Wahlqvist 2002). Edible varieties of rice,[1] which grow spontaneously in tropical regions, were introduced by these Asian travellers, probably fishermen or traders, before European occupation (Oka 1998; OGTR 2005). Anne Gollan and Peter Lewis refer to Aborigines using these introduced plants (Gollan 1978; Lewis 2012). Gollan writes that wild rice was collected, tied up, and soaked underwater before being dried and winnowed, then ground into a source of flour and used for bread. Rice was also a regular ingredient in the weekly rations brought to Australia from England in 1788, and according to Geoffrey Blainey, cultivated Indian rice entered the Australian diet in June 1792 after Governor Phillip dispatched the store ship *Atlantic* to Calcutta in October 1791 (Blainey 1983; Vicziany 2003; Westrip and Holroyde 2010; Nash 2009). As food imports became more frequent by the mid-nineteenth century, rice was advertised as a luxury item and frequently referred to by its place of origin: "Important to those who can appreciate choice articles...Carolina rice," and "Java machine cleaned table rice...Madagascar rice...", suggesting that consumers were interested in information about provenance (Bannerman 2001). This preference was possibly due to residents being encouraged to value imported foods over local foods because their consumption was associated with 'appreciation' and refinement. It could also be because commercial operators exaggerated the exotic status of imported products to make up for the lack of fresh local foods and the isolation and harsh climate that Australians were experiencing at the time. Another possible reason is that more staple foods were being provided locally, and the merchants were giving more advertising attention to higher value-added items (Bannerman 2001). Whatever the reason, rice was

a sought after ingredient. This is reflected in the sweet dishes prevalent in the late nineteenth century, which were dominated by heavy farinaceous confections such as pastry, boiled suet puddings and baked puddings of rice, sago or tapioca. Of the most common dishes included in cookbooks from the mid-nineteenth century until the early twentieth century, rice pudding was the second most popular dessert, second only to the potato as a starch, and rice custard on dinner menus was the most popular dessert (Bannerman 2001).

Asian migration since European settlement and before and after the Colonial period contributed to the development of much of Australia's food chain. At every critical point, Chinese Australians have been the dominant Asian influence in the introduction of food crops, including rice, various green vegetables, tropical, citrus and stone fruits, the Chinese gooseberry (later called kiwi fruit), herbs and spices, market gardens and the subsequent fresh food markets (Wahlqvist 1981; Hsu-Hage et al 1995; Simoons 1991). Chinese prospectors carried rice seed with them to the southern Australian goldfields in the 1850s and cultivated the grain in marshy areas and ponds using effluent from mining, helping to feed the workers while they fossicked for gold (Ricegrowers' Association of Australia Inc 2015). These early attempts at rice cultivation appear to have been commercially unsuccessful, probably due to a poor understanding of climate and weather patterns in Australia in the nineteenth century (Yong 1969). The first documented record of successful rice cultivation was a small rice industry that supplied Chinese locals during the 1860s in the Northern Queensland Gold Rush (Lewis 2012; Bolton and Cronin 2015; Logan 2015). High import duties on rice (a form of tax on gold prospectors of Chinese descent) were in place, which forced many Chinese farmers to grow their own; however, husking and milling the rice by hand dolly meant that commercial quantities were challenging to produce.

Rice cultivation was a small-scale endeavour until surveyor Thomas Behan arrived in Cairns in the early 1880s. Almost one-third of the town's population of 5,000 was Chinese. In 1885, Behan obtained a thirteen-acre (5.2ha) lease with water frontage on the Barron River to build the largest steam powered rice mill in Queensland, using the latest US milling technology (Stratford Heritage

Trail 2011; Cairns Post 1887). By the spring of 1888, 400 people of Chinese descent were growing rice in the area (Malcom 1962). The Chinese also grew rice in the Northern Territory in the early 1900s. Although attempts were made for many years, the crops consistently failed due to iron and manganese toxicities in the soils and destruction by weeds and pests (Kraehenbuehl 2015; Bolton 2015; Lewis 2012; OGTR, 2005). Even though rice cultivation was generally seen as a 'coolie'[2] crop, it is evident that mechanised rice-growing methods were known in Queensland when attempts were made to develop an industry there in the late nineteenth century (NSW State Records 2015; Lewis 2012). The industry developed slowly, peaking at 30,000 tonnes of rice per annum, before finally collapsing in 1893 when farmers grew sugar cane instead. Rice growing was also trialled at Esperance, Western Australia after World War II, but this failed due to quality and pests problems (Bolton 2015). The New South Wales Department of Agriculture began trials with 'upland' varieties in the north of that state in 1891, however, results were not encouraging (Ricegrowers' Association of Australia Inc 2015). Queensland remained the most successful area in Australia for rice production until the early twentieth century.

In the 1860s, in south-western New South Wales, wool farmer Sir Samuel McCaughey demonstrated that irrigation was possible along the Murrumbidgee River. His efforts would greatly assist future commercial crop production which had previously failed due to lack of water in the region. The experimental area on Sir McCaughey's farm eventually became the Yanco Experiment Farm, and its success persuaded the New South Wales state government to support the idea of a large irrigation scheme in the same area in order to encourage closer settlement and the creation of a small farmer class. By 1906, part of the Murrumbidgee River was dammed, and the Burrinjuck Dam was constructed (which was completed in 1927), allowing the irrigation area to be developed and supported by government legislation (Hohnen 2015). These *Acts* allowed the Yanco and Mirrool areas to be established. The first farmers in the irrigated area produced fruit, vegetables and dairy products, but a combination of unsuitable soils, small farm sizes and inadequate farming skills led to significant financial difficulties (Ricegrowers' Association of Australia Inc. 2015). It was not until Japanese ex-parliamentarian Isaburo (Jō) Takasuka began cultivating Japanese varieties (*Japonica*) of

rice in 1906, near Swan Hill on the Murray River in Victoria, that successful cultivation was possible (Sissons 2015). By World War I Takasuka demonstrated the feasibility of rice growing and completed what is thought to be the first commercial sale of paddy seed rice in Australia,[3] donating the proceeds from his first 45kg (sold to the Lord Mayor of Melbourne) to the Belgian Relief Fund, part of Australia's support for European countries fighting against Germany (Lewis 2012; Ricegrowers' Association of Australia Inc. 2015). From World War I onwards, the New South Wales Department of Agriculture experimented with Takasuka seed and other varieties on the Murrumbidgee Irrigation Area and elsewhere. In the 1920s, rice was seen as a possible irrigation crop on soils within the Murray-Darling Basin that were too heavy for fruit cultivation and too infertile for wheat (Wadham and Wood 1957). In 1921 and 1922, Takasuka had favourable harvests on his property; however, tests of his best variety conducted over four seasons at the Yanco Experiment Farm were not favourable, and he eventually abandoned cultivation in 1927.

Meanwhile, Water Conservation and Irrigation Commission employee Jack Brady travelled to California in 1920 to study rice growing and, while there, observed that rice was produced in similar soil types and climatic conditions to that of the Murrumbidgee Irrigation Area. Brady brought seed back to Australia that was successfully farmed at the Yanco Experiment Farm, combining Takasuka's seeds and techniques. Various agricultural groups took up rice cultivation over the following decades, with irrigation water being very inexpensive (Wadham and Wood 1957). In 1921 the Federal Government prohibited the importation of sugar and rice to protect the Australian industries, and by 1927 a duty was applied on imported rice along with an agreement to prevent rice production outside the Murrumbidgee Irrigation Area (Bain 2015; Sunrice nd). From 1922 to 1924, Department of Agriculture experimentalist Austin Shepherd demonstrated the viability of rice on the Murrumbidgee Irrigation Area using the *Japonica* varieties obtained in California, and in 1924–25, farmers pioneered cultivation in the Leeton and Yenda districts. Californian rice varieties were found suitable for the climate in the Riverina and the first mill opened at Leeton in 1951. Production rapidly overtook local consumption, and rice exports to Japan became a major source of foreign exchange (Wadham and Wood 1957).[4]

The New South Wales rice industry helped save the Murrumbidgee Irrigation Area, then one of the largest and most expensive irrigation systems in the world, from economic failure. From its inception, the industry was a joint effort between the Department of Agriculture and the Water Conservation and Irrigation Commission, and a Federal Government 'gentlemen's agreement' confined rice growing to the state of New South Wales while the industry was being established. The Government believed the rice industry would become a "vast national asset," but was only effective so long as New South Wales fulfilled national rice needs (McMillan 1945: 163). Proprietary millers, grocery merchants and rice importers assisted by providing infrastructure and ready markets for paddy rice and finished products through an organised network of retail outlets. The industry continued to develop without further protection, apart from a very low tariff, due mainly to the urging of growers who desired independence (Lewis 2012). This desire was demonstrated in a statement by A. F. Bell at the Water Conservation and Irrigation Commission Conference of Rice Growers in 1925:

> *When you start an industry in Australia it seems to me that you start with the idea of what can the government do for you in one way or another. I think sometimes that if we can make an industry standing on its own footing, irrespective of government assistance, we are doing something somewhat rare* (WCIC 1925, cited in Lewis 2012: 64).

By the early part of the twentieth century, Australia's agricultural production had rapidly increased due to new and improved technology, including more productive grain varieties and advances in livestock breeding. Output expanded well beyond the needs of the Australian population. To support growth, a succession of governments provided various assistance schemes to the primary production sector in the ensuing years. The first of these, *The Bounties Acts and Amendments*, aimed to support and encourage burgeoning industries and was designed to encourage the manufacturing of certain items. In 1907 bonuses were paid on the production of a number of agricultural products, including rice (Pollard 2000).[5] The *Acts* enabled a government-funded bounty to be paid to each manufacturer based on the quantity of manufactured produce. The justifications for such payments

related to food security and the goal of establishing a population on the land in rural areas. Furthermore, rice was now growing successfully in the Murrumbidgee Irrigation Area, and as the US had established a number of lucrative new outlets in Asia, in 1924–25 the Government, keen to support growers, applied a custom duty on the import of rice (Pollard 2000).

In the Great Depression of the 1930s, farmers turned to growing rice when it earned a reputation as a "salvation crop." It also had strategic value in feeding combat personnel in Pacific War zones during World War II, and production also rose in response to the Commonwealth's drive to increase food production following the war (National Water Commission 2011). After the war, rice brought in exceptionally high prices, but these were not reflected in grower returns. Rice growers subsequently formed a co-operative, Ricegrowers' Co-operative Mills Limited, trading as SunRice, which eventually amalgamated to become Ricegrowers' Co-operative Limited in the 1980s. In 1955, the co-operative launched its own branded retail packaging of 'Sunwhite' rice. It was also the first time that nutritional value, product quality (hence the purity implied by 'white' in Sunwhite) and consistency were emphasised in marketing (Sunrice 2015). By the early 1990s, 2,400 Riverina rice farmers were producing over a million tonnes of rice paddy and their crop was received, transported, stored, milled, processed, packaged and marketed by Ricegrowers' Co-operative Limited, wholly-owned and controlled by growers. Around 90% of all rice products were exported under Ricegrowers' Co-operative Limited 'SunRice' brand name. Without any production or export subsidies, the New South Wales rice industry was regarded as the sole surviving free-trade rice industry in the world. In 2005, Ricegrowers' Co-operative Limited was listed on the stock exchange as Ricegrowers Limited (SunRice). The rice industry grew strongly and equitably with an ability to finance itself. Politicians regularly cited it as an example of what was possible in Australian agriculture through democratic industry self-management. Worth four hundred million Australian dollars per annum, rice remains Australia's third-largest cereal grain export and its ninth-largest agricultural export (Ricegrowers' Association of Australia Inc. 2015). In 2017 the industry celebrated its 93rd anniversary.

Environmental issues

After World War II, rice production increased as a result of the Snowy Mountains Hydro-Electric Scheme. Above-average rainfall from the 1950s to the mid-1990s encouraged the expansion of the Riverina rice industry, but its high water usage in a practically waterless region attracted environmental attention concerned with declining flows in the lower Murray River, the Snowy River and the effects on fragile aquatic ecosystems (Australian Bureau of Meteorology 2000; Wadham and Wood 1957). Rice growing is dependent upon delicate irrigation systems, the design and use of which, in the past, were periodically subject to political expediency often at odds with environmentally sustainable choices (Lewis 2012). Since 1988, suitable rice growing practices have been determined on environmental grounds. In 2008, due to drought, only 38 farmers were involved in the production of 19,000 tonnes of rice in the Riverina (Ricegrowers' Association of Australia Inc. 2011). The Australian rice industry argues that it is the most technically efficient rice growing industry in the world, increasing from an average of eight tonnes per hectare in the early 1990s to more than 10 tonnes per hectare in recent seasons, becoming a world leader in water usage (Ricegrowers' Association of Australia Inc. 2015). It was also the first industry to initiate a project to return water to the environment and the first agricultural sector in Australia to develop a biodiversity strategy and plan to minimise the impact of irrigation (Ricegrowers' Association of Australia Inc. 2015; Australian Government 2015). In 2003, the industry launched a new breed of rice named 'Quest', its shorter growing cycle designed to reduce water use by a further 10% from the already reduced water usage of 60% over the past ten years (Sunrice nd). 'Sherpa' is another new variety recently released to growers that has improved cold tolerance (down to 11.5 degrees Celsius), meaning it requires less water to grow and has a positive yield potential (Ricegrowers' Association of Australia Inc. 2015). Growers are additionally experimenting with biodynamic rice farming with the variety 'Rainfed Rice', an example of 'dryland' rice which requires only natural rainfall to grow, saving critical water resources (most rice is grown in flooded rice paddies) (Rainfed Rice 2015). The rice industry believes a significant cultural change is required in the future to move away from the exploitation of natural resources to their stewardship. A number of scientific and agricultural studies

support this view, including studies on greenhouse gas emissions, water productivity, rising water tables and those addressing the notion that food security could be increased by relocating the rice industry to more climate suitable locations in northern Australia (Macadma et al 2002; Maraseni et al 2009; Khan et al 2009; Beecher et al 2006; Humphreys et al 2006; Mushtaq et al 2012). Although no consumer studies could be found that indicate a negative view of Australian rice relating to environmental concerns at the time of print, several studies refer to the assumption that the "wider community" believes this is so (Glyde et al 2014; Macadam et al 2002).

Conclusion

By investigating the consumption and production of rice in its Australian context over the last 200 years, the research has shown how 'local' has become a synonym for the ideologies associated with independence and democracy, both in terms of closer settlement and the idea that it was possible to organise and fund the industry democratically. Successive governments believed the industry would become a "vast national asset", and it developed without further protection at the urging of the growers who strongly supported this independence. To support growth, various assistance schemes were provided, including the payment of bonuses for its production. In the 1930s depression, rice-growing was associated with food security and its strategic value in feeding the armed forces during World War II. Without any production or export subsidies, the New South Wales rice industry was regarded as the sole surviving free-trade rice industry in the world, and the company SunRice was regularly cited by politicians as an example of what was possible in Australian agriculture through democratic industry self-management.

This article has investigated the history of rice as a local food product, paying particular attention to the characteristics and meanings associated with its consumption and production. The essential elements of rice as a local food have been examined, along with the political and cultural impacts moderating it, to gain a richer understanding of what it represented to Australians at different points in time and the different ways in which it has been constructed as local. The conclusions drawn from

this case study have identified distinct and interrelated drivers. Government intervention was often a factor in the development of the industry, allowing for its survival, which in a free market situation may not have developed to such an extent. Rice showed how 'local' can become a synonym for cultural values such as independence and democracy, both in terms of closer settlement and the idea that it was possible to organise and fund an industry democratically and sometimes even without government assistance in terms of protection. This case study shows that the development of a local food culture in Australia was driven by forces associated with ideas of progress, in particular the transition from survival to 'civilisation', generating Australian produced foods as an expression of national identity.

Endnotes

[1] The two distinct forms of cultivated rice (*Oryza Sativa*) are 'upland' and 'lowland'. *O.sativa* grows at latitudes from 36° south in Australia, to 49° north in Czechoslovakia, occurring on every continent except Antarctica, grown extensively in tropical and temperate regions and as a dryland (upland) crop. Lowland (or 'swamp') rice is grown under almost continuous flooding on submerged soil.

[2] Chinese immigrants, known as 'coolies', were seen as part of a solution for a labour shortage that followed the ending of the convict system in New South Wales from 1828 onwards.

[3] The term 'paddy', from the Malay-Indonesian word *padi*, refers to the field in which rice is grown and to the unhusked seed.

[4] See Wadham and Wood, 1957: 266: Wadham states that at the time of publishing (1957) tariffs were: "for uncleaned rice, 1d.; and for other types, 1 ½ d. per lb."

[5] Other products supported were cotton, fibres, coffee, tobacco and dried fruits. Bonuses were extended across other agricultural industries, and in 1924 they included the production and export of canned apricots, peaches, pears and pineapples. See Pollard, 2000.

Bibliography

Australian Bureau of Meteorology 2000. *Climatic Atlas of Australia: Rainfall*. Melbourne, Victoria.

Australian Government nd. 'Ricecheck program', in *Australian Natural Resources Atlas*. (https://researchdata.ands.org.au/australian-natural-resources-atlas-anra/428784. Accessed 18 December 2017).

Bain, M. A., 'Male, Arthur (1870–1946)' nd, in *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/male-arthur-7469/text13013. Accessed 18 December 2017).

Bannerman, C. 2001. Print Media and the Development of an Australian Culture of Food and Eating c. 1850 to c. 1920: The Evidence from Newspapers, Periodical Journals and Cookery Literature. Ph.D. Thesis, University of Canberra.

Beecher H.G., Dunn B.W., Thompson J.A., et al. 2006. 'Effect of raised beds, irrigation and nitrogen management on growth, water use and yield of rice in south-eastern Australia', *Australian Journal of Experimental Agriculture*, 46: 1363–1372.

Blainey, G. 1983 The Tyranny of Distance: How Distance Shaped Australia's History. Melbourne: Sun Books.

Bolton, G. C. 'Wise, Frank Joseph Scott (1897–1986)' nd, in *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/wise-frank-joseph-scott-15616/text26819. Accessed 18 December 2017).

Bolton, G. C. and Cronin, K. 'Leon, Andrew (1841–1920)', nd, in *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/leon-andrew-4012/text6359. Accessed 18 December 2017).

Chant, S. 2016. 'A History of Local Food in Australia 1788–2015'. (https://digital.library.adelaide.edu.au/dspace/bitstream/2440/99519/2/02whole.pdf. Accessed 18 December 2017).

Glyde, S., Gray, I., Ovenden B., Dunn D. 2014. 'Extension in the rice industry. A review of the development, delivery and prioritisation of extension in the Australian rice industry', RIRDC Publication No. 13/072 RIRDC Project No: PRJ-007299.

Gollan, A. 1978. *The Tradition of Australian Cooking*. Canberra: Australian National University Press.

Hohnen, P. 'McCaughey, Sir Samuel (1835–1919)' nd, in *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/mccaughey-sir-samuel-682/text6485. Accessed 18 December 2017).

Hsu-Hage B., Ibiebele T., and Wahlqvist, M.L. 1995. 'Food intakes of adult Melbourne Chinese', *Australian Journal of Public Health*, 19: 623–628.

Humphreys, E., Lewin, L.G., Khan S., et al. 2006. 'Integration of approaches to increasing water use efficiency in rice-based systems in southeast Australia', *Field Crops Research*, 97: 19–33.

Khan S., Khan M.A., Hanjra M.A., et al. 2009. 'Pathways to reduce the environmental footprints of water and energy inputs in food production', *Food Policy*, 34: 141–149.

Kraehenbuehl, D. N. 'Holtze, Maurice William (1840–1923)' nd, in *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/holtze-maurice-william-6720/text11605. Accessed 18 December 2017).

Lewis, G. 2012. The Growers Paddy. Land, Water and Co-operation in the Australian Rice Industry to the 1990s. Australia: Sydney University.

Logan, G. N. 'Boyd, William Alexander (1842–1928)' nd, in *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/boyd-william-alexander-5325/text8997. Accessed 18 December 2017).

Macadam, R. D. 2002. Building Capacity for Change in the Rice Industry: A Report of a Review of the Extension Services of the Rice Industry. Report for the Rural Industries Research and Development Corporation. Barton, ACT: RIRDC.

Macadam, R., Drinan, J. and Inall, N. 2002. 'A report of a review of the extension services of the rice industry', Report for the Rural Industries Research and Development Corporation. RIRDC Publication No 02/009. RIRDC Project No RUE-1A.

Malcolm, J. 1962. 'Kamerunga in the early 1900s', *Cairns Historical Society Bulletin*, No. 45, November, 1962; *Brisbane Courier*, Thursday 21 July 1887: 2. (http://stratfordhistory.org.au/Trail_Sites/14.php. Accessed 18 December 2017).

Maraseni, T.N., Mushtaq, S. and Maroulis, J. 2009. 'Greenhouse gas emissions from rice farming inputs: A cross-country assessment', *Journal of Agricultural Science*, 147: 117–126.

McMillan, R. B. c1945. The Rice Industry in New South Wales: Review of Marketing and Agricultural Economics. Wade Shire Library.

Mushtaq, S., Cockfield, G., White, N., and Jakeman, G. 2012. 'Plausible futures for regional development and structural adjustment under climate change: A case of the rice industry in Australia', Water and Climate: Policy Implementation Challenges; Proceedings of the 2nd Practical Responses to Climate Change Conference: 224-231.

Nash, M. 2009. *Sydney Cove. The History and Archaeology of an Eighteenth-Century Shipwreck*. Hobart: Navarine Publishing: 29–30. (http://www.parks.tas.gov.au/file.aspx?id=7027. Accessed 18 December 2017).

National Water Commission. 2011. 'Water trading in the rice industry'. Canberra: Australian Government.

NSW State Records, nd. *Chinese Migration and Settlement in New South Wales*. (http://www.records.nsw.gov.au/state-archives/guides-and-finding-aids/archives-in-brief/archives-in-brief-33. Accessed 18 December 2017).

Office of the Gene Technology Regulator (OGTR), 2005. *The Biology and Ecology of Rice (Oryza sativa L.) in Australia* : 1–3, (http://www.ogtr.gov.au. Accessed 18 December 2017).

Oka, H. I. 1988. *Origin of Cultivated Rice*. Tokyo: Japan Scientific Societies Press.

Pollard, J. 2000. *A Hundred Years of Agriculture*. 1301.0 Year Book Australia 2000. Australian Bureau of Statistics. (http://www.abs.gov.au/ausstats/abs@.nsf/94713ad445ff1425ca25682000192af2/3852d05cd2263db5ca2569de0026c588!OpenDocument. Accessed 18 December 2017).

Rainfed Rice, nd. (http://www.rainfedrice.com.au/. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc. (RGA), nd. 'All about rice', *Our Australian Rice Industry*, Growing Rice to Feed the World. (http://www.rga.org.au/f.ashx/278535All-About-Rice-Factsheet_Web.pdf. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc., nd. 'History of rice in Australia', Information sheet. (http://www.aboutrice.com/handout01.htm. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc., nd. 'Research and development'. (http://www.rga.org.au/about-rice/research-development.aspx. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc., nd. 'Rice and the environment'. (http://www.rga.org.au/rice-environment.aspx. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc., nd. 'Trading Australian rice'. (http://www.aboutrice.com/handout12.htm. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc., nd. 'Water and rice'. (http://www.aboutrice.com/water.htm. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc., nd. 'The rice growing pioneer of Australia, Mr Isaburo (Jo) Takasuka', Information sheet. (http://www.aboutrice.com/handout05.htm. Accessed 18 December 2017).

Ricegrowers' Association of Australia Inc., 2012. Submission to the review of rice vesting proclamation (NSW Rice Marketing Act 1983), August 2012: 2. (http://www.rga.org.au/f.ashx/030812-RGA-Rice-Vesting-Review-Submission-Final.pdf. Accessed 18 December 2017).

Simoons F. J. 1991. *Food in China. A Cultural and Historical Inquiry*. Boca Raton, FL: CRC Press.

Sissons, D. C. S. 'Takasuka, Jō (1865–1940)', nd. *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/takasuka-jo-8741/text15307. Accessed 18 December 2017).

Stratford Heritage Trail. 2011. 'Behan's rice mill', *Cairns Post*, 17 September 1887: 4. (http://stratfordhistory.org.au/Trail_Sites/14.php. Accessed 18 December 2017).

Sunrice, nd. 'History of Australian rice'. (https://www.sunrice.com.au/consumer/about/faqs/rice-growing-and-origin/. Accessed 18 December 2017).

Sunrice, nd. 'Detailed historic timeline of the Australian rice industry.' (https://www.sunrice.com.au/media/6662/detailed_history_of_the_australian_rice_industry.pdf. Accessed 18 December 2017).

SunRice, nd. 'The SunRice story'. (http://www.sunrice.com.au/about-us/the-sunrice-story. Accessed 18 December 2017).

Vicziany, M. 2003. 'Indian–Australian relations', in *The Oxford Companion to Australian History*, 1 rev. ed., Davison, G.; Hirst, J. and Macintrye, S. (eds.). Oxford University Press. (http://www.oxfordreference.com.proxy.library.adelaide.edu.au/view/10.1093/acref/9780195515039.001.0001/acref-9780195515039-e-775?rskey=qCkKAN&result=4&q=rice. Accessed 18 December 2017).

Wadham, Sir S. and Wood, G. L. 1957. *Land Utilisation in Australia*. Melbourne University Press.

Wahlqvist, M. L. 2002. 'Asian migration to Australia: Food and health consequences', *Asia Pacific Journal of Clinical Nutrition* 11 (Suppl.): S562.

Walquist, M. L. 1988. 'History of nutrition in Australia', in *Food and Nutrition in Australia*. Melbourne: Thomas Nelson Australia.

Westrip, J. and Holroyde, P. 2010. *Colonial Cousins, a Surprising History of Connections between India and Australia*. Adelaide: Wakefield Press. (http://www.southaustralianhistory.com.au/cousins.htm. Accessed 18 December 2017).

Yong, C. F. 1969. 'Ah Mouy, Louis (1826–1918)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. (http://adb.anu.edu.au/biography/ah-mouy-louis-2872/text4099. Accessed 18 December 2017).