The Solomon Islands Beef Industry

Country report for ACIAR Project LS/2018/102

Research opportunities for small-holder beef cattle systems in Pacific island countries

Simon Quigley and Scott Waldron, School of Agriculture and Food Sciences, The University of Queensland, Australia

January 2019[1]

[1] To be cited as Quigley, S. and Waldron, S. (2019). The Solomon Islands Beef Industry. A country report for ACIAR Project LS/2018/102 "Research opportunities for smallholder beef cattle systems in Pacific island countries".

Contents

1 Introduction 1
1.1 Background to report 1
1.2 Summary 1
2 Underlying structures 2
2.1 Economic 2
2.2 Demographics 2
2.3 Land use 3
2.4 Cattle statistics 6
3 Policy, development and research initiatives 7
3.1 Government Policy 7
3.1.1 Agriculture in National Development 7
3.1.2 The Agriculture and Livestock Policy 2015 to 2019 7
3.1.3 Medium-Term Economic Development Plan 8
3.1.4 Other relevant Acts and Legislation 9
3.2 Agencies 9
4 Industry structures 10
4.1 Previous cattle development programs and recommendations in the Solomon Islands 10
4.2 Industry profile 12
4.3 Inputs 12
4.3.1 Extension and training 12
4.3.2 Cattle Health 13
4.3.3 Finance 13
4.3.4 Breeding 13
4.3.5 Pastures 13
4.4 Production 14
4.4.1 Temporal trends 14
4.4.2 Cattle herd and indicators 14
4.4.3 Farm sizes and facilities 14
4.5 Cattle marketing 14
4.5.1 Sales channels for slaughtered cattle 14
4.5.2 Prices 14
4.6 Slaughter 14

4.6.1 Bush kill 14
4.6.2 Butchers / wholesalers 14
4.6.3 Country cattle sector priorities for research and development 15
5 References 16
6 Stakeholder interviews 18

Figures

Figure 1: Provincial population density map of the Solomon Islands 3
Figure 2: Map of the Solomon Islands 4
Figure 3: Long-term average monthly rainfall data for Honiara (a. Guadalcanal island) and Kira-Kira (b. Makira island) in the Solomon Islands 5

Acronyms

ACIAR - Australian Centre for International Agricultural Research

ADB - Asian Development Bank

AIDAB – Australian International Development Assistance Bureau

AU$ - Australian Dollar

CDA - Cattle Development Authority [later named the Livestock Development Authority (LDA)]

DFAT – Department of Foreign Affairs and Trade

DLVS - Department of Livestock and Veterinary Services

GPPOL - The Guadalcanal Plains Palm Oil Company

KGA - Kastom Gaden Association

LDA - Livestock Development Authority (formally CDA)

MAL - Ministry of Agriculture and Livestock

NDS - National Development Strategy

NGO – non-government organisation

PIC – Pacific Island Countries

RTC - Rural Training Centres

SINSO - Solomon Islands National Statistics Office

SINU - Solomon Islands National University

SI$ - Solomon Islands Dollar (SI$1 = AU$0.165 on 01-Jul-2018)

SNRAS - School of Natural Resources and Applied Sciences

SPC - The Pacific Community (formerly The Secretariat of the Pacific Community)

US$ - United States Dollar

1 Introduction

1.1 Background to report

The beef cattle sector plays a significant role in livelihoods in many Pacific island countries (PICs). Contributions of the industry vary by locality but includes contributions to localised consumption and ceremonies, rural incomes, downstream industry, and trade. Benign tropical systems in the region are well suited to cattle production, and under-utilised resources are available to boost productivity in some countries. There is robust demand for beef in a diverse range of markets.

Cattle production is however stagnant in nearly all countries and small-holder segments of the industries are under-performing. All national governments are interested in building or revitalising beef industries to various degrees. The sector is under-invested and under-researched, and policy is not necessarily informed by detailed, household-level or up-to-date research.

Against this background, ACIAR commissioned a Small Research Activity to investigate research opportunities for small-holder beef cattle systems across some of the Pacific island countries, namely Fiji, Vanuatu, Samoa, Tonga and the Solomon Islands.

This report provides a brief descriptive analysis of the Solomon Islands beef industry. The research was conducted in 2018 using the following methods:

- A review of existing published or unpublished literature on the Solomon Islands beef industry;
- Statistics collected from international databases, from government sources and from industry; and
- A scoping trip, including interviews and field visits with government agencies, extension and education providers and the commercial sector (small holder and large holder cattle producers, abattoirs, butchers, input suppliers). See Section 6.

This country report on the Solomon Islands will be combined with country reports from Fiji, Vanuatu, Samoa and Tonga to identify priority areas of research for development of the beef cattle sector that fall within the remit of ACIAR.

1.2 Summary

- Reports and comments from knowledgeable interviewees suggest a lower than reported national cattle herd size. The decline in the herd population from a peak in the mid-1980s was a result of a Tuberculosis and Brucellosis eradication scheme in the 1970s and 1980s and ethnic tensions in the late 1990s and early-2000s;
- No formal market or processing sector exists for local cattle or beef. The sale of any local cattle is largely for ceremonial use or local consumption with high prices reported. All beef available in commercial outlets is imported;
- The government of The Solomon Islands intends to develop the beef sector, mainly through the importation of breeding females from other Pacific island countries (including shipments from Vanuatu in 2011 and 2013 and a proposed shipment from Fiji). The existing plan is to establish a medium to large-holder sector with private sector support, which acts as a multiplier for small-holders;
- Infrastructure to support development of the cattle sector is currently lacking with poor roads, no abattoir and no cattle transport vehicles (intra- and inter-island);
- Capacity of local support agency staff, particularly younger staff, and farmers to improve the cattle sector is limited;

- The biophysical and climatic conditions for cattle rearing are comparable with those of the northern provinces of Vanuatu. Cattle were previously raised under coconut plantations on the coastal fringes, open grazing on the Guadalcanal plain, and tethered on unimproved 'bush';
- Since the mid-1980s there has been limited financial support for the development of the beef cattle sector by international donors and non-government agencies;
- Given the current state of the industry and environmental and biological similarities with Vanuatu the implementation of a research program to support the development of a beef cattle industry appears limited. Research findings, extension materials, and training packages from Vanuatu and other Pacific island countries would be directly transferable to the Solomon Islands and would assist in industry development; and
- The priority for industry support is a long-term strategic development plan coupled with capacity development of support agency staff to implement the industry development plan.

2 Underlying structures

2.1 Economic

The Solomon Islands has a projected GDP of US$1.4 billion in 2018 (current prices) or US$2195 per capita (DFAT, 2018). Year-on-year growth of GDP ranged between 2.3 and 3.5% between 2013 and 2018 (DFAT, 2018). The major exports are timber, seafood, oils (from the coconut and palm oil sectors), cocoa, oilseeds, and animal feeds (presumably by-products from the copra and palm oil extraction processes) (Simoes et al, 2011). The major imports are refined petroleum, cars and industrial machinery, and cereals (rice and wheat).

Estimates provided locally were that the Solomon Islands is currently importing 800 to 1,000 tonnes of beef and 3,000 tonnes of chicken meat annually. UNComtrade reports imports of 268 tonnes of frozen beef in 2016 valued at US$1.2 million (i.e. US$4.50/kg) mainly from Australia and New Zealand (UNComtrade, 2018). It also reports imports of 117 tonnes of fresh/chilled beef (US$7.80/kg) almost all from Vanuatu. These figures exclude imports of beef and beef offal in tinned and processed form.

2.2 Demographics

The most recent census conducted by the Solomon Islands National Statistics Office (SINSO) was 2009 (SINSO, 2009) with a *Household Income and Expenditure Survey* conducted in 2012 (SINSO, 2015). The next population census and HIES surveys are scheduled for 2019 and 2020 respectively, with an agricultural survey scheduled for 2020 (although FAO were supporting a small survey at the time of writing).

The population of the Solomon Islands was estimated to be 651,700 by mid-2016 with an annual growth rate of 2.3% (SPC, 2016). Approximately 75 to 80% of the population is rural with a drift to urban centres, particularly Honiara (65,000 residents; SINSO 2009), reported. The highest population is in Malaita province, with Guadalcanal province having the second highest population (SINSO, 2009; Figure 1).

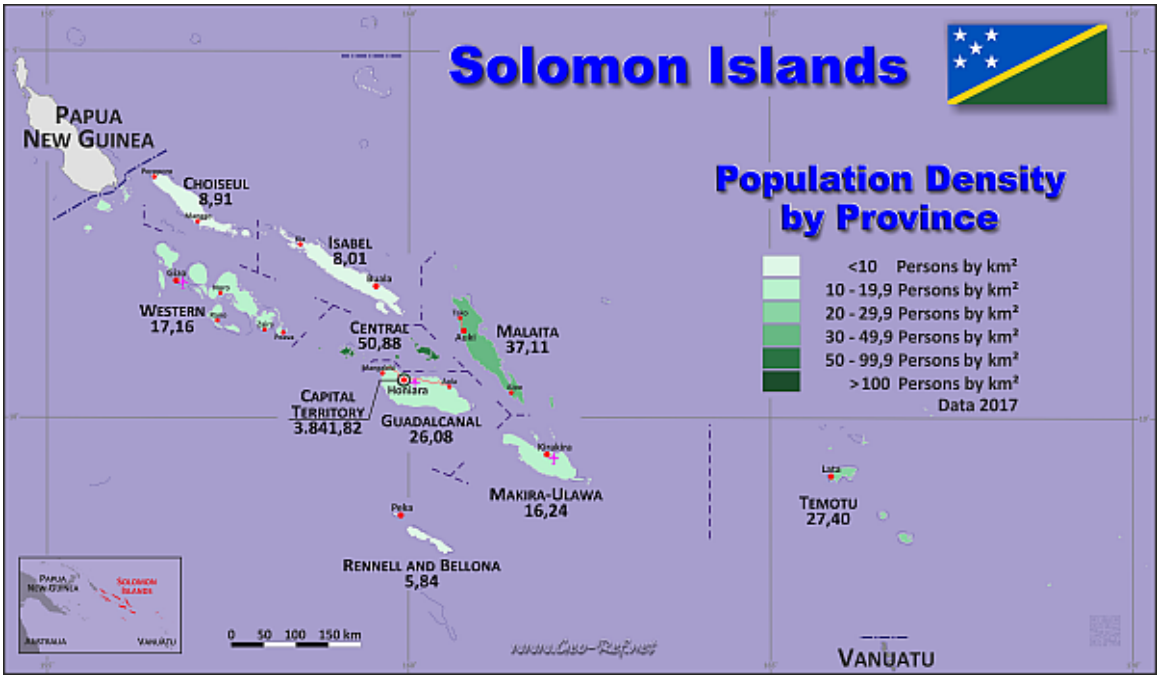


Figure 1: Provincial population density map of the Solomon Islands

Source: Geo-Ref (2018)

Most rural households are engaged in semi-subsistence agriculture. The major activities undertaken in these households are cropping for consumption and income, fishing in customary seas with small livestock (pigs and chicken) rearing practiced by almost all rural households. Sweet potato, slippery kabis, cassava, and bananas are considered the most important crops for both income and consumption by small-holder households. Copra plantations of between 1 to 10 Ha are important sources of nutrition and cash for rural small-holder households on the coastal fringes. Palm oil production is also a major employer of the rural population, particularly in the northern Guadalcanal plain.

2.3 Land use

The Solomon Islands has 28,230 square kilometres of land area spread across six major islands (Guadalcanal, Malaita, Choisseul, Santa Isabel, San Cristobel, and New Georgia) and over 900 smaller islands (Figure 2).

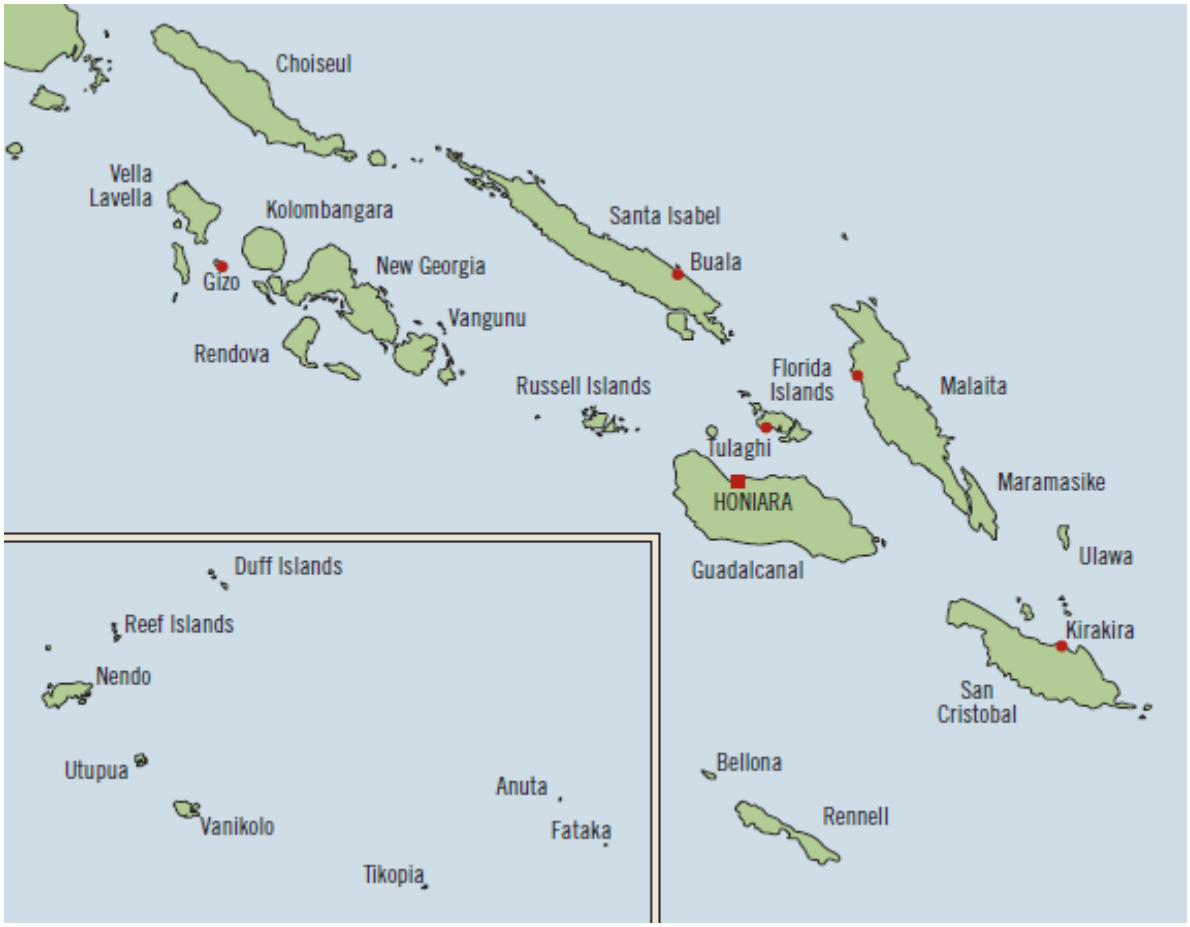
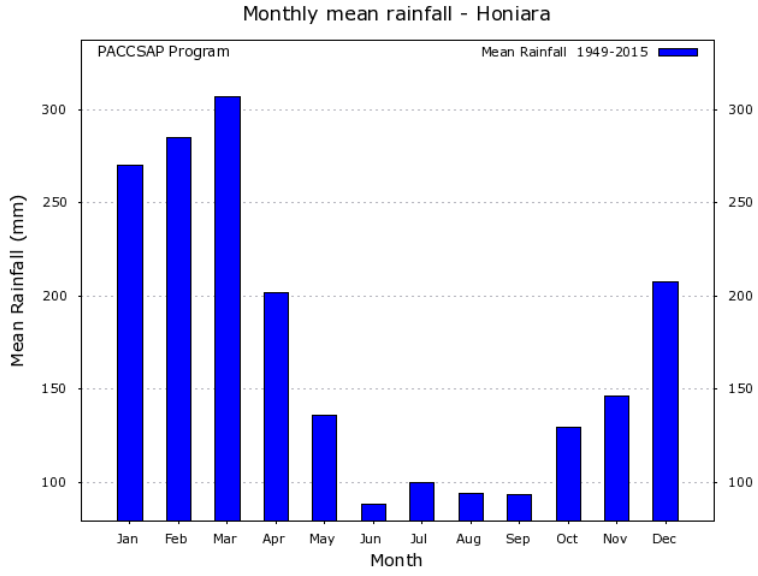


Figure 2: Map of the Solomon Islands

Source: Bourke et al (2006).

Annual rainfall across the Solomon Islands is between 2,500 and 5,000 mm with no distinct dry season (Figure 3), with the exception of the Guadalcanal plain, which is located in a rain shadow with a pronounced wet season between November and April each year. The land types of the Solomon Islands range from coastal plains to volcanic mountains and coral atolls and are broadly described as tropical or disturbed tropical forests. Soils are largely infertile due to extreme weathering and a shift to continuous cropping of arable lands (Evans, 2006).

a.



b.

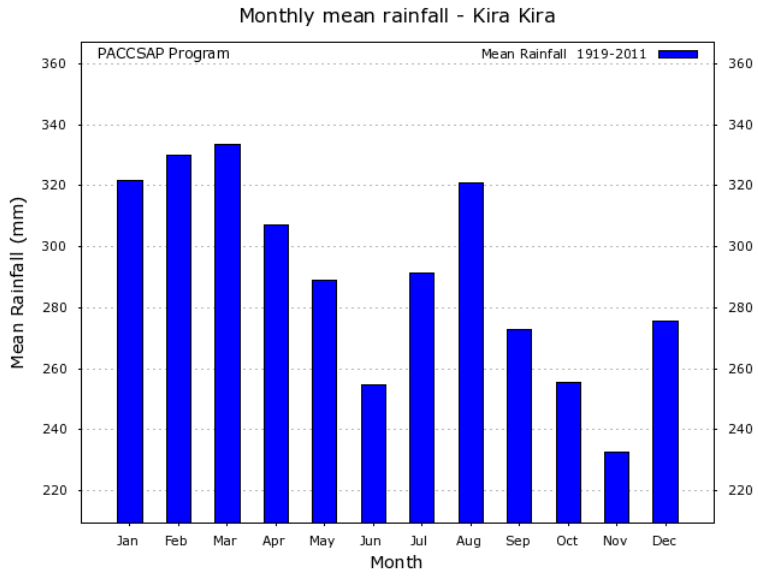


Figure 3: Long-term average monthly rainfall data for Honiara (a. Guadalcanal island) and Kira-Kira (b. Makira island) in the Solomon Islands

Source: PACCSAP (2018)

Between 85% and 90% of the land area (2.4 million Ha) is classed as forest (Duncan, 1995) with timber the major export commodity until the global crash in timber prices in the late 1990s. While timber remains economically the most significant export commodity, over-harvest is now a growing concern within the country. The Guadalcanal grass plain in the north of Guadalcanal island is the largest savannah area in the Pacific (460 km^2; Watson *et al.* 1981a) and consists of approximately 33,000 Ha of agricultural land based on alluvial soils (Waroka, 1997). The grasslands originated from forest clearings and have been maintained by regular burning. Most small-holder land (and sea) is held under customary arrangements and this appears to work well for the rural communities, at least these arrangements alone are unlikely to be a major impediment to cattle sector development.

Coconut plantations were traditionally located on the coastal fringes. Whilst these have declined in recent years, largely due to a decline in the large plantation sector as a result of land redistribution scheme's, the coconut Rhinoceros beetle, and declining global prices, copra remains the single largest cash crop in the Solomon Islands by land area (ITC, 2010) and is an important contributor to the livelihoods (nutritionally and financially) of rural households. Any expansion of the industry in the future will be reliant on small-holder farmers. The existing industry and any proposed expansion are now under significant threat from the Coconut Rhinoceros beetle which will also attack oil palm and sagu palm. Nevertheless, cattle managed under coconuts is likely to offer the greatest opportunity to re-establish a beef cattle sector.

The oil palm industry has re-established after the ethnic tensions and has expanded on the northern Guadalcanal plain. The Guadalcanal Plains Palm Oil Company (GPPOL) owns approximately 6700 Ha of mature and new plantings on registered land with an additional 700 Ha maintained by approximately 233 small-holder households on customary land under an 'Outgrower Association' scheme (World Bank Group, 2017) with plans to increase this area by an additional 7,000 Ha of customary land. The GPPOL is one of the largest employers in the Solomon Islands. There is strong private and public support to expand oil palm production to improve cash flow for rural households through Outgrower schemes and direct employment.

The main livestock species raised in Solomon Islands are pigs and poultry, with pigs economically and socially more important. Whilst pigs are found throughout the country, higher numbers are found closer to the larger urban centres (Honiara, Auki and Gizo) where the more lucrative markets exist (prices of SI$300 offered for unborn piglets acquired at weaning and up to SI$5,000 for large white boars were reported). Poultry are an important source of income and protein in rural communities. Both pig and poultry production are easily accessible entry points into livestock farming for most small-holder households in the Solomon Islands. There are very few goats in the Solomon Islands and sheep are non-existent. Goats were previously reared in large numbers with high demand. Several experts indicated that goats would be easier for small-holders to manage, transport, and slaughter than cattle. There is also high demand from crews on freight ships that often dock in Honiara, making the development of goats in the livestock sector a higher priority than currently exists. Issues raised by interviewees in relation to goat rearing was that in the past flocks were decimated by wild dogs and internal parasites. Honey bees are also an important livestock system managed by some small-holders in the Solomon Islands.

2.4 Cattle statistics

There are limited recent data regarding cattle numbers in the Solomon Islands. FAO (FAOStat, 2018) estimate a population of 15,000 head down from a peak of 25,000 head in 1978, whilst the 2009 national census (SINSO, 2009) reports a national cattle population of approximately 30,000, with around one-third of these located in Malaita. Ramsay (1999) refers to unpublished data of the Pacific Community (SPC) which puts the national herd at just 4,000 head. A major correction in numbers occurred in 1987 when the herd declined to 13,000 due to the successful implementation of a Brucellosis and Tuberculosis eradication scheme. It is accepted that the FAO data is an overestimate and local experts estimate the current national herd size to be between 3,000 and 8,000 head. In the absence of any recent census, the size of the national herd is unknown but a decline in herd size in the sector over the last 30 years is apparent and is supported from various sources.

The 2009 census (SINSO, 2009) reported 440 households rearing cattle (out of 91,251 private households). Over half of these were in Malaita province (240) with Western (57) and Guadalcanal (50) the only other provinces with greater than 30 households rearing cattle. Interestingly, the census

suggested that while Malaita province had the greatest number of cattle, the next most populous provinces were Honiara and Central Provinces, suggesting a smaller number of larger herds in these provinces. The 2009 census has a total count of 'cows' (assumed to be all cattle) and does not report on the profile of the herd.

3 Policy, development and research initiatives

3.1 Government Policy

3.1.1 Agriculture in National Development

The *National Development Strategy - 2016 to 2035 (NDS)* (MDPAC, 2016) describes detailed medium-term strategies and priorities for the Solomon Islands. The first national development priority is to "*reinvigorate and increase the rate of inclusive economic growth*", which includes the development of agriculture, fisheries, tourism, and resources sectors. The NDS refers specifically to an under-developed livestock sector where domestic production does not meet local demand, with high levels of meat imports from Vanuatu, Australia, and New Zealand. This is in contrast to food crop production which has largely met increased domestic demand resulting in self-sufficiency in basic staple crops through improved semi-subsistence farming practices. The NDS states:

> *"the domestic livestock industry is mostly back-yard production, but meat production could be increased through better animal husbandry and feeding practices and improved breeds. Commercial cattle farming offers possibilities (MDPAC, 2016, pp.16)"*

3.1.2 The Agriculture and Livestock Policy 2015 to 2019

The Ministry of Agriculture and Livestock (MAL) is mandated:

> *"to provide extension, education, regulatory services, research and associated activities to improve the agricultural sector's contribution towards increased food production, food security and standards, and economic recovery and development (MAL, unpublished, pp. 13)".*

To achieve National Development Objectives the MAL was tasked with undertaking and delivering the following priority activities between 2015 and 2019:

- Development of oil palm production to target 40,000 Ha development over next ten years with priority to Guadalcanal Province (GPPOL), Waisisi, and Auluta projects in Malaita Province, Western Province (Vangunu) and later to other provinces like Choiseul, Isabel, and Makira;
- Establishment of 400 Ha commercial rice production projects;
- Continue the rehabilitation and value-added product developments of coconut and cocoa;
- Improve production and sustainability of small livestock projects;
- Revival of the cattle industry;
- Pursue development of exotic and indigenous fruits; and
- Improve production and processing of staple food crops and spices for domestic and overseas markets.

A draft Livestock Policy Guideline (2015-2020) exists and states a vision for the livestock subsector

> *"of working together for a robust, productive, and sustainable livestock sector, food security, improving livelihoods and economic stability to meet the needs of all people of Solomon Islands (DLVS, unpublished, pp. 3)".*

The listed functions of the DLVS include:

- Livestock technical service and information: Provide technical support and services to all clients and farmer at all levels of farming – subsistence to commercial scale, in animal health, production, processing and marketing;
- Animal health and welfare: Provide animal health and welfare services, including disease surveillance for national animal health and disease status and early detection of zoonosis, and promote production practices and standards for animal welfare;
- Livestock industry development: Promote an enabling environment and facilitate for industry strengthening and private sector investments in commercial livestock developments, small-holder production, slaughter, processing, and marketing facilities and access developments;
- Livestock research and development: Research into systems and technologies which increase production, improve productive performance and providing such information to MAL extension services and stakeholders; and
- Policy and regulations: Provide clear cut policies for operations and subsector support, strategies for livestock development and uphold and update existing regulations of livestock and veterinary services.

The Livestock Policy Guideline (DLVS, unpublished) describes areas of specific relevance to the cattle sub-sector which include:

- Cattle industry development: Support the revitalization of large scale commercial beef cattle production and marketing in a province specific approach and development of small-holder farms around the economic radius of commercial farms;
- Livestock slaughter and process: Support development of slaughter and processing facilities for ensuring quality assurance and food safety of local meat and meat products; and
- Market development and improvements: Support existing market outlets in Honiara and provincial centres improve capacities to trade meat and meat products and strengthen alliances and linkages between farmers and buyers or market outlets.

The Agriculture and Livestock Policy (MAL, unpublished) refers to outputs from investment in research which specifically result in:

- Increased capacity in policy analysis and strategy formulation enhanced, in particular agricultural policy analysis;
- Farm management improved through cluster farm cooperatives and associations;
- Prevention and control system for emerging plant and animal disease strengthened; and
- Agricultural research and development capacity strengthened.

3.1.3 Medium-Term Economic Development Plan

The *Solomon Islands Medium-term Economic Development Plan (2016-2020)* (MDPAC, 2015) proposes a set of activities to be undertaken and expected outcomes within the cattle sector. The target is to have between 500 and 1,000 households generating income through cattle farming by 2020. The plan proposes to achieve this target through an increase in the number of imported breeder cattle (1,500

to 4,000 by 2020), an increase in the area of improved pastures (4,000 to 5,000 Ha by 2020), improvements to slaughter, processing and marketing facilities in Gizo, Auki, and Honiara, increase local beef production to 50 T/year (by 2019) and increase the national herd population by 40% (by 2020 through imports and natural increase).

3.1.4 Other relevant Acts and Legislation

The Pure Food Act (1996) enforces regulations pertaining to the processing, packaging and inspection and the import and export of foods and is administered by the Ministry of Health and Medical Services.

The Diseases of Animal Act (Cap. 37) amendments 1972; the *Agriculture and Livestock Order* (Cap. 80) 1978; the *Agriculture Quarantine Act* 1982; the *Quarantine Order* (Cap 34) 1986 and the *Handling of Container Rules* 1994. All these prohibit, regulate, and control the importation and movement of plant/animal and products.

Livestock Development Authority (Cap.41) 1977: covers all aspects of livestock production and commercial development of its products. It also promotes development of the livestock industry in the Solomon Islands.

3.2 Agencies

Key government agencies and NGOs and their roles relevant to the beef industry include:

Ministry of Agriculture and Livestock (MAL). The MAL Divisions include:

- Corporate services;
- Policy, planning and communications;
- Crops;
- Livestock;
- Fisheries; and
- Quarantine.

The key agency in the beef sector is the Department of Livestock and Veterinary Services (DLVS). The DLVS currently has five main sections each of which is led by a Deputy Director:

- Livestock policy and planning, which includes implementation of existing and new regulations and acts;
- Livestock technical services;
- Livestock industry development;
- Livestock research; and
- Animal health and welfare.

Sixteen Provincial Livestock Officers from DLVS are distributed across the nine national provinces, including Honiara, but reporting lines are through the Provincial Agriculture Extension Services which implement programs on behalf of the DLVS.

Rural Training Centres (RTCs) sit under the umbrella of the Solomon Islands Association of Rural Training Centres. There are 34 training centres across eight provinces, many of which are attached to churches and schools. The RTCs provide informal training to young males and females from rural households to help them increase productivity, generate income and maintain self-sufficiency from agricultural and livestock production.

The Kastom Gaden Association (KGA) is a NGO with a focus on grass-roots participatory approaches to building capacity of small-holder farmers in a network of communities across the Solomon Islands. Whilst the focus of KGA is on crops for consumption and sale, they do have some programs on small

livestock. For example, they build capacity in key farmers (plant doctors) in communities to assist other farmers with plant health diagnosis.

The Solomon Islands National University (SINU) was formed in 2012 from the Solomon Islands College of Higher Education. The SINU consists of five schools, including a School of Natural Resources and Applied Sciences (SNRAS) which offers Certificate in Tropical Agriculture, Certificate in Plantation Forestry, Certificate in Environmental Studies, Diploma in Tropical Agriculture and a Bachelor in Tropical Agriculture. Over 200 students are enrolled in SNRAS each year. SNRAS also offers short courses in sawmill operation and timber grading, women in agriculture, environmental impact assessment and basic GPS/GIS.

4 Industry structures

4.1 Previous cattle development programs and recommendations in the Solomon Islands

The Cattle Under Trees program ran from 1976 to 1987 under funding from Australian International Development Assistance Bureau (AIDAB; AUD$2 million) and with contributing support from the British, New Zealand, and Solomon Islands governments at the time (Shelton *et al.* 1987). The objective of the program was to develop cattle grazing systems under *Eucalyptus deglupta* and other tree species in the Western province. The project had the broad objective to promote economic development in the Western province and a series of more specific technical objectives. A review of the project undertaken by Shelton *et al.* concluded that after 11 years 'the project was not financially viable, was not achieving its objectives and was almost unworkable (1987, pp. v). At the time, the reasons described for the failed long-term sustainability of the project included:

- Pastures under *Eucalyptus deglupta* failed to persist due to shade;
- Pastures in open grazing lands failed to persist due to high phosphate-fixing of the soils in Western province;
- High labour inputs required to establish and maintain pastures;
- Low cattle productivity;
- Low timber yield and decreased quality due to damage by cattle and fungal infection;
- Insufficient preliminary research conducted on the systems; and
- Differing opinions on the vision and priorities of the project.

The review highlighted the significant contribution of both expatriate and Solomon Islands staff and the significant capacity developed in Solomon Islands staff in terms of cattle and pasture management.

The *Beef Cattle Development Program* which was implemented by the program Cattle Development Authority [CDA; later named the Livestock Development Authority (LDA)] was funded under an Asian Development Bank (ADB) loan (AUD$3.5 million) between 1977 and 1984 (Carroll et al, 1984). The program was the first ADB loan with the Solomon Islands and was designed to support the objective of national self-sufficiency in beef described in the *National Development Plan* (1975 – 1979). The project was to meet this objective through the development of infrastructure, breeding stock and capacity to develop a small-holder cattle sub-sector. The main components of the project included:

- Importation of 2000 Brahman cross heifers for small-holders and government farms;
- Farm level activities largely focussed on pasture development on both small-holder and large-holder farms;
- Establishment of cattle holding grounds;

- Establishment of a central processing facility (abattoir, rendering plant, cannery);
- Development of marketing channels;
- Strengthened extension services;
- Strengthened training facilities;
- Provide support facilities for inter-island transport;
- Provide credit facilities for small-holder farmers; and
- Improved meat inspection services.

Between 1970 and 1986 it is estimated that approximately 40,000 head of cattle were imported into the Solomon Islands under the above programs or with direct support of the national government (Waroka, 1997). Of these imported cattle approximately 50% were believed to be provided to small-holder farmers. During this period the national government heavily subsidised cattle farming development (pasture improvement, fencing, stockyards) whilst farmers were also able to access credit from the Solomon Islands Development Bank for cattle farming projects. The LDA also initiated a cattle lending scheme for small-holder farmers who received a weaner, grew it out and sold it back to the LDA.

Many of the lessons learnt from these programs in the Solomon Islands were incorporated into other successful programs implemented in other Pacific island countries (for example, the AIDAB *Vanuatu Pasture Improvement Program*, 1989-1993). The technologies were largely transferable between countries given the similarity in environment and production systems.

In the period immediately after the AIDAB and ADB programs, a decline in the beef sector was apparent. Waroka (1997) suggests a decline in herd numbers of approximately 7 to 8% between the late 1970s to the early 1990s. Infrastructure established in these programs was not maintained. Land held by the larger landholders was transferred to the traditional owners, resulting in an exit of larger commercial cattle producers. The government extension service became under-resourced and less able to engage with the large number of small-holder farmers. Slaughter of cattle suspected to carry diseases became overly cautious with suggestions many productive cattle were unnecessarily slaughtered. Small-holder farmers also shifted their attention to the production of cash crops.

The ethnic tensions of the late 1990s to early 2000s significantly impacted on an already fragile cattle sector. Government stations and records, data and extension materials were destroyed. Larger herds, typically maintained by the government, schools, or churches, were slaughtered and consumed. Industry infrastructure (e.g. the abattoir) was destroyed.

In the post-conflict period DFAT commissioned a comprehensive study of small-holder agriculture in the Solomon Islands. The Solomon Islands Small-holder Agriculture Study, Volumes 1 to 5 (see Bourke et al; Jansen et al; McGregor; Allen et al & Evans et al, 2006) outlines recommended agriculture sector development activities. The study identified increasing beef production as a low priority for improving rural livelihoods at the time the study was undertaken. Within the cattle sector it identified the following opportunities for development (Bourke et al, 2006. pp 68):

- Establish networks of provincial cattle farmers;
- Provide appropriate training and extension materials, drawing on those developed in Vanuatu;
- Facilitate communication between suppliers and buyers for improved marketing;
- Provide training in business management for beef cattle farming;
- Develop positive interactions between large and small-holder cattle farmers;
- Develop an effective quarantine service;
- Re-establish the medium to large beef sector; and

- Undertake a review to identify the most appropriate structures, areas and methods to do this.

The national government places a high priority on reviving the cattle sector as evidenced in the various policy and strategy documents. To facilitate this DLVS had undertaken a strategy of importation of breeder cattle with mixed success. Two consignments of approximately 400 breeders were received from Vanuatu in 2011 and 2013 and were distributed to Guadalcanal and Maliata respectively under different schemes. A third planned consignment never eventuated, and this may have been due to a change in policy on the export of live cattle from the Government of Vanuatu. The herd on Guadalcanal was initially placed on government land, which was redistributed back to the traditional owners who took responsibility for the cattle. Herd numbers initially increased, and weaners were dispersed to small-holders. However, the traditional owners then started to make independent management and marketing decisions regarding the cattle. The number of cattle remaining from this program is believed to be around 50% of the original shipment. In Malaita, the shipment suffered a significant mortality rate and the herd declined to approximately 200 head. The main issue arising from this shipment was a large number of claims made by neighbours to DLVS in relation to these cattle damaging gardens and crops. The DLVS is currently in negotiations in relation to a shipment of 250 heifers from Fiji. There is uncertainty regarding this shipment due to concerns over the disease status of the consignment. The proposed scheme was to import these heifers and provide them to a private sector stakeholder who is developing 750 Ha of improved pastures in Western province. The expectation would be that the large-holder would distribute cattle to small-holder farmers. The DLVS is also exploring artificial reproduction technologies as an alternative method to introduce improved genetics from Australia with little or no disease risk.

4.2 Industry profile

There is currently no specific information to assist with a description of the industry profile. Historically the industry consisted of a large holder estate sector (such as Levers), medium to large holders (churches and government farms) and small-holders who practiced a mixture of grazing under coconuts, cattle tethered in bush or on roadsides. The medium and large holder sectors are almost non-existent. Some medium sized holdings have remained intact, mainly in the Western province.

The DLVS proposes to develop a Cattle Industry Development Plan in 2019. This will draw on results of the current FAO supported agriculture survey.

4.3 Inputs

Fuel prices are high (SI$9.50/L) and livestock transport is a challenge given the large number of islands, lack of suitable road transport, the disrepair of roads, and lack of any holding yards for inter-island transport. Inputs for fencing, fertilizer, and water supply are all available in Honiara but less so in the provinces. Water is rarely a limiting factor for livestock production in the Solomon Islands due to high rainfall evenly distributed across the year and an abundant supply of ground water and springs.

4.3.1 Extension and training

The DLVS extension officers are based in the provinces. They are under-resourced and over-committed across a range of non-livestock related activities. New, young, extension workers have limited experience with cattle and both young farmers and young extension officers were reportedly ‘scared’ to work with cattle as they had no prior experience. There is a requirement to rebuild the skills of support agency staff in basic cattle husbandry if industry development is to occur.

4.3.2 Cattle Health

After previous eradication schemes in the 1970s and 1980s (Fredrick and Reece, 1980) the Solomon Islands is believed to be largely free of the major production diseases and diseases that are transmissible to humans. However, surveillance appears to be limited since eradication with limited recent data available. Approximately 60 individuals have participated in SPC Para-vet training activities.

4.3.3 Finance

There is limited access to credit for farmers in the Solomon Islands at present, although schemes did exist in the past under the LDA.

4.3.4 Breeding

There is no structured breeding program in the Solomon Islands. It is assumed breeding occurs naturally amongst the current cattle herd. There was a significant infusion of *Bos indicus* bloodlines from Australia, Papua New Guinea and more recently Vanuatu but the original blood lines imported by the missionaries in the late 1880s were *Bos tuarus* based, for meat and milk consumption.

4.3.5 Pastures

Pasture development in the open grasslands focussed on the replacement of *Themada australis* – *Pennisetum polystachyon* natural pastures with introduced *Brachiaria mutica* (Para) grass (Watson and Whiteman, 1981). Watson and Whiteman (1981) compared the liveweight gain of cattle grazing Para grass with that of cattle grazing Signal grass (*Brachiaria decumbens*) or Hamil grass (*Panicum maximum*) in combination with a mixture of herbaceous legumes (styolsanthes, centrosema, macroptilium). Mean daily liveweight gain and annual liveweight production were greatest in cattle grazing the Para grass pastures, which also maintained the highest legume content over the four-year grazing study. The highest annual liveweight production of 607 kg/Ha was reported for cattle grazing Para grass at a stocking rate of 3.6 animals (~200 kg Brahman heifers or steers at induction each year)/Ha. Centrosema persisted best across stocking rates for all grass species.

The *Cattle Under Trees* project evaluated the persistence and capacity to support liveweight gain of cattle grazing Para grass, Signal grass, Koronivia grass (*Brachiaria humidicola*) and Batiki grass (*Ischaemum aristatum*) sown with centrosema at three different stocking rates under Eucalyptus tree's (MacFarlane and Whiteman, 1983). All grasses disappeared from the site as tree age increased and light intensity decreased. The legume persisted longer than the grasses, but the entire area was dominated by T-grass (*Paspalum conjugatum*). A reduction in tree density allowed for high light transmission and more productive T-grass and greater legume persistence. Later evaluations found Buffalo grass (*Stenotrophrum secundatum*) to have greater persistence and weed control potential but liveweight gain was still low at 0.2 kg/head day (although this was at the very high stocking rate of 3 animals/Ha).

There has been no pasture improvement program of recent times and pastures are degraded with high weed burdens. The development of land in Western province to support the importation of breeders is a significant undertaken (>500 Ha) and the first substantial pasture development program since the 1980s. The decline in copra production and new plantings, and similarly in the palm oil sector, poses an interesting question for support agency staff on the best regions and farms to be considered priorities for the development of the beef sector.

The DVLS is interested in the introduction of the newer leucaena varieties as part of any future pasture development programs in the Solomon Islands.

4.4 Production

No current data is available on rates of production from cattle in the Solomon Islands. Given the biophysical environment and climatic similarities with Vanuatu it is largely expected that similar levels of potential productivity are likely to exist under similar grazing conditions.

4.4.1 Temporal trends

Waroka (1997) reports an annual decline of 7 to 8% in the national cattle population between 1978 and 1996 (based on available data from the National Statistics Office). This trend is likely to have continued as a result of the ethnic tensions and the reported high off-take for ceremonial purposes.

4.4.2 Cattle herd and indicators

There is no reliable current information on the cattle herd or indicators of productivity at present in the Solomon Islands. The only information that exists is from the 1970s and 1980s and there have been significant changes in the industry structure and profile since that time, which would suggest the information is unlikely to be relevant to the current industry.

4.4.3 Farm sizes and facilities

There is no reliable current information on the size of cattle farms at present in the Solomon Islands. Previously established infrastructure is largely non-existent, with no central abattoir and transport infrastructure requires significant upgrades (roads, inter-island transport).

4.5 Cattle marketing

4.5.1 Sales channels for slaughtered cattle

There is no information regarding the slaughter of local cattle in the Solomon Islands. All cattle and beef are believed to enter the ceremonial market or possibly for other local consumption purposes. All beef sold through the formal retail outlets is imported from Australia, New Zealand, or Vanuatu (in limited and decreasing amounts).

4.5.2 Prices

Cattle prices for local and ceremonial consumption are set on a per head basis and negotiated between buyer and supplier. These are variable but appear extremely high at current global prices probably reflecting the high demand and low supply of product. Interview data suggested prices of SI$5,000 to $10,000/head for a young animal for a ceremony.

4.6 Slaughter

4.6.1 Bush kill

In the absence of a central processing facilities (such as abattoirs) it is assumed that all domestic cattle are slaughtered on-farm with meat delivered to or collected by the buyer. This would be done with basic facilities and limited hygienic conditions. However, most product would be consumed locally and would not require a long-shelf life.

4.6.2 Butchers / wholesalers

There are a number of butchers in Honiara (Nambawan Meats, MeatLovers, and King of Meatz) all with multiple outlets. Meat is also sold in a number of small supermarkets. The majority of the beef, chicken, and pork is imported frozen from Australia and New Zealand. Beef supply from Vanuatu is desired but limited in supply. Small quantities of lamb, mutton, and goat are also imported.

Nambawan Meats typically imports between 250 to 300 tonnes of beef per year and sells yearling beef primals for SI$250 to SI$300/kg.

The formal meat suppliers believe imported product will continue to be significantly cheaper than local product delivered in store. As such, the competitive advantage of the local meat industries is the local and ceremonial markets, where the prices are higher, transaction costs lower, and there is less enforcement of regulatory requirements. The system appears efficient for those involved.

4.6.3 Country cattle sector priorities for research and development

Given the current state of uncertainty around the cattle herd in the Solomon Islands it is difficult to justify any significant investment in research to support the cattle sector. Many of the lessons learnt in previous projects in-country and in other countries, such as Vanuatu, would be relevant and directly transferable provided local support agency staff had the capacity to implement industry development plans and were trained in the use of improved practices and technologies. The priority provinces identified locally for cattle development are Malaita, Western, and Guadalcanal due largely to existence of some remnants of the former industry, proximity to urban centres and markets, and standard of infrastructure (relative to other provinces).

Based on the data collected during the scoping study and secondary data sources the recommended priority areas for research and development of the cattle sector in the Solomon Islands include:

- A detailed Situation Analysis of the current state of the cattle sector (domestic demand for product; herd size, profile, and location of existing herd; assessment of the existing pasture resources, transport infrastructure, farmers knowledge and skills, on-farm infrastructure);
- Development of a Cattle Development Plan (scheduled for 2019) based on reliable data (collected under point 1 above); and
- Capacity development of support agency staff, particularly linking with previous and existing research, extension and training materials and activities in Vanuatu.

5 References

Allen, MG, Bourke, RM, Evans, BR, Iramu, E, Maemouri, RK, Mullen, BF, Pollard, AA, Wairiu, M, Watoto, C & Zotalis, S 2006, Solomon Islands Small-holder Agriculture Study, Volume 4, Provincial reports, Australian Department of Foreign Affairs and Trade, Canberra, ACT, Commonwealth of Australia, www.dfat.gov.au/about-us/publications/Documents/solomon_study_vol4.pdf

Bourke, RM, McGregor, A, Allen, MG, Evans, BR, Mullen, BF, Pollard, AA Wairui, M & Zotalis, S 2006, Solomon Islands Small-holder Agriculture Study, Volume 1. Main findings and recommendations, Australian Department of Foreign Affairs and Trade, Canberra, ACT. Commonwealth of Australia, www.dfat.gov.au/about-us/publications/Documents/solomon_study_vol1.pdf

Carroll, P, Hood, R, Bontia, C & Falvey, L 1984, Project completion report of the beef cattle development project in the Solomon Islands, Asian Development Bank, www.adb.org/sites/default/files/project-document/72968/26401-sol-pcr.pdf

DFAT 2018, Solomon Islands Factsheet. Statistics Department, Australian Department of Foreign Affairs and Trade, Canberra, ACT. Commonwealth of Australia.

DLVS, Unpublished. Livestock Policy Guideline 2015 – 2020. Department of Livestock and Veterinary Services, Ministry of Agriculture and Livestock (MAL), Solomon Islands Government.

Duncan, RC 1995, Melanesian Forestry Sector Study, Australian International Development Assistance Bureau, Canberra, ACT, Commonwealth of Australia. pp 30.

Evans, BR 2006, Solomon Islands Small-holder Agriculture Study, Volume 5. Literature Review: A Brief National Assessment of the Agriculture Sector, Australian Department of Foreign Affairs and Trade, Canberra, ACT, Commonwealth of Australia, www.dfat.gov.au/about-us/publications/Documents/solomon_study_vol5.pdf

FAOStat 2108, Food and agriculture data, viewed September 2018 http://www.fao.org/faostat/en/ Food and Agriculture Organisation of the United Nations.

Fredrick, DF & Reece, RL 1980, “Diseases of cattle in the Solomon Islands” Australian Veterinary Journal, vol, 56, pp. 522-525.

Geo-Ref 2018, Solomon Islands: Country map – Population density, Geo-Ref.net, www.geo-ref.net/en/slb.htm

ITC 2010, Coconut Sector Strategy: Solomon Islands, International Trade Centre (ITC), World Trade Organization and the United Nations, Switzerland, pp. 68.

Jansen, T, Mullen, BF, Pollard, AA, Maemouri, RK, Watoto, C & Iramu, E 2006, Solomon Islands Small-holder Agriculture Study, Volume 2. Subsistence production, livestock, and social analysis. Australian Department of Foreign Affairs and Trade, Canberra, ACT, Commonwealth of Australia, www.dfat.gov.au/about-us/publications/Documents/solomon_study_vol2.pdf

MacFarlane, DC & Whiteman, PC 1983, Grazing under Eucalyptus deglupta reafforestation on Kolombangara Island, Solomon Islands, Department of Agriculture, The University of Queensland and Australian International Development Assistance Bureau, Canberra, Final Report (1977-1986).

MAL 2009, National Agriculture and Livestock Sector Policy – 2009 to 2014, Ministry of Agriculture and Livestock (MAL), Solomon Islands Government.

MAL, Unpublished, Solomon Islands Agriculture and Livestock Sector Policy, 2015 – 2019, Ministry of Agriculture and Livestock (MAL), Solomon Islands Government.

McGregor, A 2006, Solomon Islands Small-holder Agriculture Study, Volume 3. Markets and marketing issues. Australian Department of Foreign Affairs and Trade, Canberra, ACT, Commonwealth of Australia, www.dfat.gov.au/about-us/publications/Documents/solomon_study_vol3.pdf

MDPAC 2015, Solomon Islands Economic Development Documents – Medium Term Development Plan, 2016-2020, Ministry of Development Planning and Aid Coordination (MDPAC), Solomon Islands Government, International Monetary Fund, Washington D.C. www.imf.org/en/Publications/CR/Issues/2016/12/31/Solomon-Islands-Economic-Development-Documents-Medium-Term-Development-Plan-2016-20-43824

MDPAC 2016, National Development Strategy, 2016 – 2035: Improving the social and economic livelihoods of all Solomon Islanders, Ministry of Development Planning and Aid Coordination (MDPAC), Solomon Islands Government, www.adb.org/sites/default/files/linked-documents/cobp-sol-2017-2019-ld-01.pdf

PACCSAP 2018, Pacific Climate Change Data Portal, Pacific-Australia Climate Change Science Adaptation Planning program (PACCSAP), http://www.bom.gov.au/climate/pccsp/

PACCSAP 2018b, Pacific-Australia Climate Change Science Adaptation Planning Program (PACCSAP), Australian Government, Canberra, http://www.bom.gov.au/climate/pacific/

SPC 2016 Pacific Islands Population, 2016, PRISM, Statistics for Development Division, Secretariat of the Pacific Community, Noumea, New Caledonia.

Ramsay, G 1999. Integration of livestock in traditional farming systems in the Pacific Islands, In: Improvement and Development of Traditional Farming Systems for the South Pacific, Proceedings of an IRETA Workshop 18-22 October, Institute for Research Extension and Training in Agriculture (IRETA), The University of the South Pacific (USP), Alafua, Campus, Apia, Samoa, pp. 37-48.

Shelton, HM, Schottler, JH & Chaplin, G 1987, Cattle under tree in the Solomon Islands, Department of Agriculture and The University of Queensland, Australia.

Simoes, AJG & Hidalgo, CA 2011, The economic complexity observatory: An analytical tool for understanding the dynamics of economic development, Workshops at the Twenty-Fifth Conference on Artificial Intelligence, Association for the Advancement of Artificial Intelligence, www.atlas.media.mit.edu/en/

SINSO 2009, 2009 Population and Housing Census, Volume 2, Solomon Islands National Statistical Office (SINSO), Solomon Islands Government.

SINSO 2015, 2012/2013 Household Income and Expenditure Survey, Solomon Islands National Statistical Office (SINSO), Solomon Islands Government.

UNComtrade 2018, United Nations Commodity Trade Statistics Database, United Nations Statistics Division, viewed December 2018, United Nations, New York. www.comtrade.un.org/db/dqquickquery.aspx

Waroka, W 1997 “Strategies to increase beef cattle production and retain farmer participation in beef cattle farming in the Solomon Islands”, Master of Applied Science Thesis, Massey University, New Zealand, www.mro.massey.ac.nz/bitstream/handle/10179/5006/02_whole.pdf?sequence=2&isAllowed=y

Watson, SE & Whiteman, PC 1981a, “Grazing studies on the Guadalcanal Plains, Solomon Islands. 1: Climate, soils, and soil fertility assessment”, Journal of Agricultural Science, Cambridge, vol. 97, iss. 2, pp. 341-351.

Watson, SE & Whiteman, PC 1981b, “Grazing studies on the Guadalcanal Plains, Solomon Islands. 2: Effects of pasture mixtures and stocking rate on animal production and pasture components”, Journal of Agricultural Science, Cambridge, no. 97, iss. 2, pp. 353-364.

World Bank Group 2017, Solomon Islands systematic country diagnostic: Priorities for supporting poverty reduction and promoting shared prosperity (English), World Bank Group Washington, D.C., www.documents.worldbank.org/curated/en/112901498499975277/pdf/Solomon-Islands-Systematic-Country-Diagnostic-2017-06222017.pdf

6 Stakeholder interviews

July 3-6, 2018

- Island Enterprises Limited, Honiara
- University of Adelaide (former member of CDA 1980-1983)
- Kustom Gaden Association
- Ministry of Agriculture and Livestock, Honiara
- Department of Livestock and Veterinary Services (Livestock Technical Services), Honiara
- FAO Honiara
- Office of Transparency for Solomon Islands, Honiara
- Sullivans and Nambawan Meats, Honiara