



# SAMOA SOCIOECONOMIC FISHERIES SURVEY REPORT— 2012/2013



<sup>1</sup>Ulusapeti Tiitii, Principal Fisheries Officer, Fisheries Division, Ministry of Agriculture and Fisheries, Samoa

<sup>2</sup>Michael Sharp, Fisheries Development Officer (Economics), Coastal Fisheries Programme, Secretariat of the Pacific Community

<sup>3</sup>Joyce Ah-Leong, Assistant Chief Executive Officer, Fisheries Division, Ministry of Agriculture and Fisheries, Samoa

Fisheries Division,  
Ministry of Agriculture and  
Fisheries  
Apia, Samoa  
2014

## Acknowledgements

---

The Fisheries Division of the Ministry of Agriculture and Fisheries acknowledges with gratitude funding support from the United States National Oceanic and Atmospheric Administration grants through the Two Samoas Initiative, which enabled the implementation of this important work.

The Fisheries Division also acknowledges the invaluable continuous technical and financial support of the Secretariat of the Pacific Community (SPC) in establishing the SEMCoS database for data entry and analysis, as well as funding two staff members for an on-site attachment for data analysis and report writing. The Fisheries Division also expresses its appreciation of the technical support provided by Mr Franck Magron, SPC's Reef Fisheries Information Manager for his patience in working from Noumea to fix database difficulties the Division encountered during data entry.

The authors acknowledge the support provided by the European Union for implementing the "Scientific support for the management of Coastal and Oceanic Fisheries" project in the Pacific Islands region, which funded the editing and printing of this report. Its valuable assistance is much appreciated.

Special thanks and appreciation to all village mayors, communities and especially to respondents for their great support in providing information that was asked of them during the survey. This work would not have been possible if they had not provided the needed information.

Last but not least, the authors acknowledge with gratitude the great team work and dedication of their colleagues from three sections of the Fisheries Division — Advisory, Aquaculture and Inshore — for coordinating, leading, and taking part in carrying out the questionnaires. Without their diligent support and team work the authors would have never achieved their set targets as planned. A special word of thanks goes to two of our colleagues, Faasulu Fepuleai and Fatutolo Iene, for working overtime on data entry. All their hard work and effort is much appreciated by the coordinators and supervisors of the survey. Keep up the great team work.

## Contents

---

Acknowledgements.....	1
Contents.....	2
Executive summary.....	4
Demographic characteristics .....	4
Frequency and per capita consumption of seafood .....	4
Fishing profiles .....	4
Fishing catch.....	5
Catch and effort .....	5
1 Overview of Samoa .....	6
1.1 Location and ecology .....	6
1.2 Demographics .....	7
1.3 Status of fisheries in Samoa.....	7
1.4 Food security and nutrition.....	8
1.5 Economy.....	8
1.6 Community-based fisheries management program.....	9
1.7 Gender .....	9
1.8 Samoa PROCFISH/C data.....	9
2 Literature review: Previous socioeconomic surveys conducted.....	10
3 Survey background.....	13
3.1 The Samoa Socioeconomic Fisheries Survey for 2012/2013 .....	13
3.2 Stratification.....	13
3.3 Data collection, storage and management.....	14
4 Survey methodology .....	15
4.1 Number of households .....	16
4.2 Socioeconomic fisheries survey manual .....	16
4.3 Survey logistics.....	16
5 Survey results.....	17
5.1 Demographic characteristics.....	17
5.1.1 Household size and age composition.....	17
5.1.2 Purpose of fishing .....	18

5.2	Fisheries for food security.....	18
5.2.1	Frequency and per capita consumption of seafood .....	18
5.2.2	Source of finfish for household consumption.....	19
5.3	Fisheries for livelihoods .....	20
5.3.1	Income source.....	20
5.3.2	Adult and gender participation in fishing .....	21
5.3.3	Fish marketing.....	22
5.4	Fisheries profile.....	24
5.4.1	Fishing effort.....	24
5.4.2	Fishing catch.....	26
5.4.3	Catch and effort .....	28
6	Conclusions and recommendations.....	30
7	References .....	32
8	Appendix 1: Survey forms used .....	33
9	Appendix 2: Data from the 2012/13 socioeconomic survey .....	43
10	Appendix 3: List of villages surveyed, by strata and list of staff participating in the 2012/2013 socioeconomic survey.....	62

## Executive summary

---

The 2012/2013 Samoa Fisheries Socioeconomic Survey was conducted in order to update the existing Samoan dataset on fisheries, and to gain an understanding of the significance of fisheries for food security and livelihood in Samoa. The survey also provided an opportunity to gain an understanding of fisheries management systems and marine conservation initiatives and their impact on coastal communities and their fishing activities.

In total, 100 villages were surveyed — 56 from Upolu and Manono Island, and 44 from Savaii — resulting in an overall sampling of 30% of all households for each village. The surveyed villages were selected to provide a representation of villages with marine managed areas and those without. Sites were stratified as follows.

- i. Community Based Fisheries Management Program (CBFMP) Upolu;
- ii. CBFMP Savaii;
- iii. Non-CBFMP Upolu;
- iv. Non-CBFMP Savaii;
- v. Inland Upolu;
- vi. Inland Savaii; and
- vii. Marine protected areas (MPAs).

Survey results are summarised below.

### Demographic characteristics

- 881 households surveyed (3.4% of all households in Samoa).
- Average household size is 7.2 persons.

### Frequency and per capita consumption of seafood

#### *Finfish*

- Total finfish consumption of sampled population is 225,968 kg/year (226 mt/year).
- Finfish consumed on average 2.7 days/week.
- Annual per capita consumption is 46.15 kg/year.

#### *Invertebrates*

- Total consumption of sampled population is 2,083,977 kg/year (whole fish equivalent).
- Invertebrates consumed on average 1.31 days/week.
- Annual per capita consumption is 54.74 kg /year.

### Fishing profiles

#### *Boat assets*

- One in every four households owns a boat (most are canoes).

#### *Trip frequency*

- Males fishers from each village make an average of 196 fishing trips per year.

- Female fishers from each village make an average of 162 fishing trips per year.

#### ***Fishing areas***

- Lagoons, coastal reefs and outer reef habitats are mostly targeted for finfish fishing.

### **Fishing catch**

#### ***Total catch***

- The estimated total finfish catch is 9,066.32 mt/year, with an estimated value of WST 89 million (USD 37 million equivalent). The estimated catch of invertebrates is 7,804.42 mt/year with an estimated value of WST 86 million (USD 36 million equivalent) in income generated.
- High percentages of fishers target invertebrates such as octopus, clams, mother of pearl (trochus, turban shell), lobsters and beche-de-mer.

### **Catch and effort**

#### ***Finfish***

- The average frequency of fishing trips is three times a week, and the average time spent fishing is four hours for men and five hours for women.
- The average catch for men per fishing trip is 13.7 kg, and the average catch for women is 10 kg.
- The catch per unit of effort for men is 4.3 kg/hour, and the catch per unit of effort for women is 2.22 kg/hour.

The results of the socioeconomic survey are indicative that fishing plays an important social and economic role in Samoa. The results demonstrate a high annual per capita consumption of fish and invertebrates and high sea food consumption frequency.

The sale of fish and invertebrates accounts for the primary income of 13.68% and secondary income of 8.5% of households surveyed. It is apparent that the domestic fishing sector is moving towards a cash-based economy (as opposed to more traditional subsistence and communal sharing) with finfish being more commonly commercially captured and traded (as opposed to consumed by the household and given as gifts) than invertebrates.

12.46% of adults report that they participate in fishing and average approximately 3.49 fishing trips per week.

The total estimated value of the fish and invertebrate catch amounts to around WST 175 million, which is a significant contribution to domestic productivity for an economy with a GDP of approximately WST 1,429 million.

# 1 Overview of Samoa

## 1.1 Location and ecology

Samoa is made up of nine islands with four main inhabited islands (Savaii, Upolu, Manono and Apolima), situated between 13°S and 15°S latitude and 168°W and 173°W longitude (Fig. 1). Samoa's total land area is 2,830 km<sup>2</sup>, and its reef area is 10,000 km<sup>2</sup>. Samoa has the smallest exclusive economic zone in the Pacific at about 120,000 km<sup>2</sup>. Savaii is the largest island at about 1,700 km<sup>2</sup> and Upolu is the second largest at 1,100 km<sup>2</sup> (SBS 2001). Samoa's capital, Apia, is located on the north coast of Upolu and has a population of 36,735 (SBS 2011). There are 330 villages in Samoa and, for administrative purposes, the country is divided into 41 districts.

The climate of Samoa is tropical with abundant rainfall averaging 2,880 mm/year and an average humidity of 80%. Samoa has two distinct seasons: the rainy season (November–April) and the dry season (May–October). Samoa lies in the cyclone belt and is periodically hit by cyclones, most commonly in the wet season. In 1990 and 1991 two strong cyclones struck the country, damaging houses and plantations and seriously affecting the economy. These two disasters were followed by a large tsunami that struck in 2009, which mostly affected the southern side of Upolu Island.

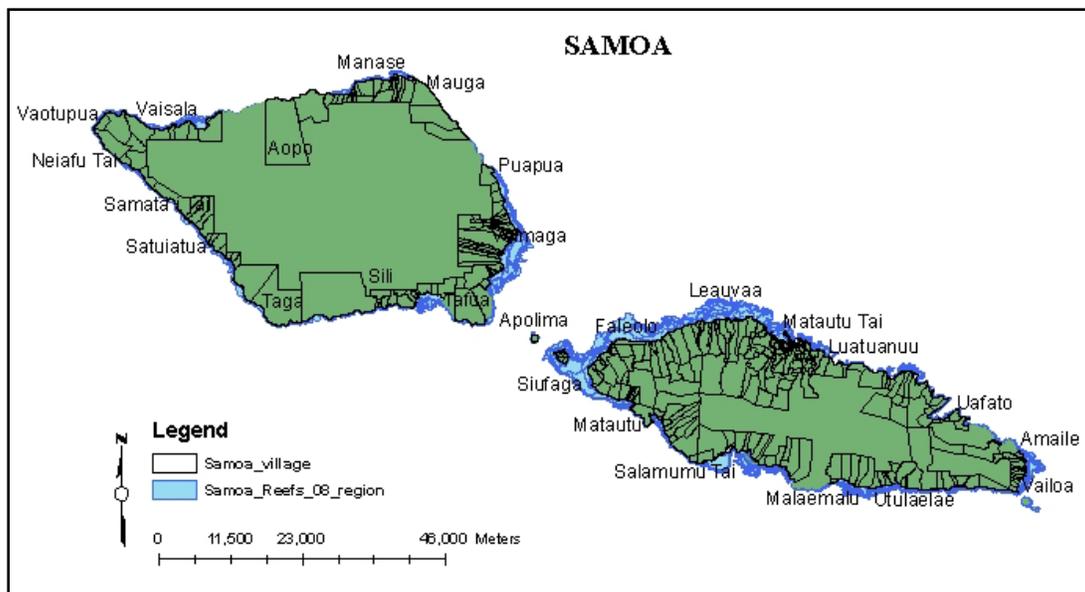


Figure 1. The islands of Savaii and Upolu in Samoa.

## 1.2 Demographics

Samoa's total population is 187,820 people, of which 19.6% live in urban areas (SBS 2011). There are 26,205 households in Samoa, with approximately 7.2 people per household (SBS 2011). Over 79% of Samoa's population is rural, with the majority residing within 1 km of the coast (SBS 2006). The population age structure is presented in Figure 2 below.

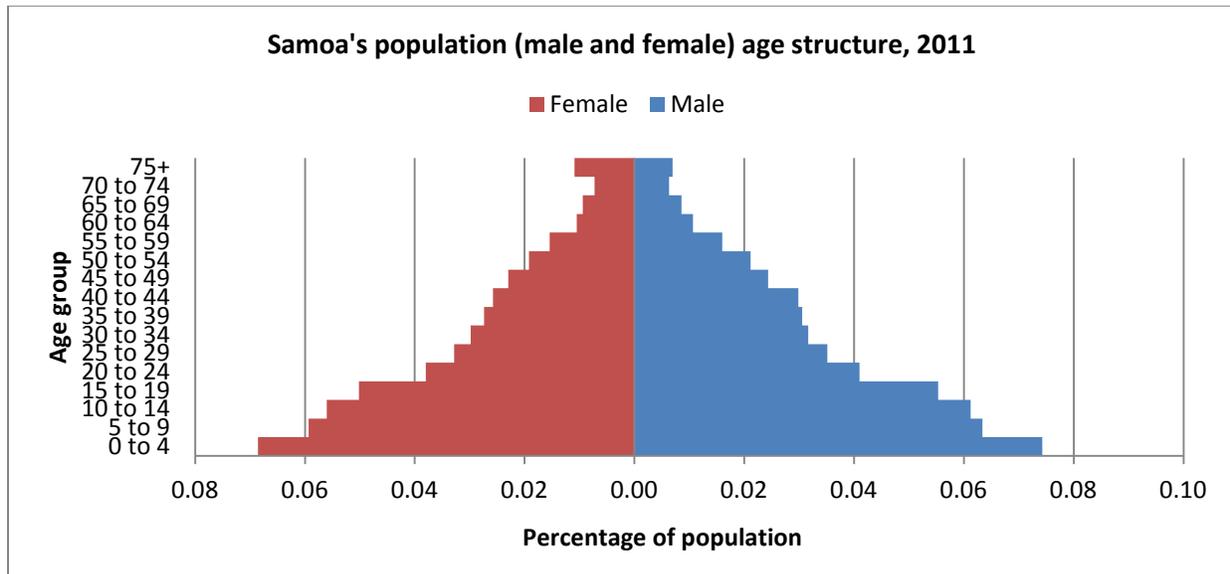


Figure 1: Samoa's population age structure for 2011.

## 1.3 Status of fisheries in Samoa

Most people fish for household consumption (subsistence), although fishing also plays an important role in securing livelihoods for many Samoans. From 1999 to 2009, an average of 25% of households that participated in fishing, fished for the purpose of mixed consumption and sales. Over the same period, an average of 4% of these households fished primarily to sell their catch. In terms of numbers of households, this equates to approximately 325 households deriving their primary source of income from fishing. From 1997 to 2006, of the households participating in fishing, approximately 9% of total household income came from the sale of marine products.

Marine offshore fishing effort consists almost entirely of longline fishing, which is practiced by Samoa's 14 industrial longline vessels and approximately 45 alia catamarans (Gillett 2011). From 2002 to 2007, fishing effort ranged from a low of around 4 million hooks, to a peak of around 7 million hooks, with a catch (primarily albacore tuna, but also yellowfin tuna, big eye tuna, and non-target species) ranging from 1,681 mt to 3,755 mt over the same period (Gillett 2011).

Coastal fisheries are much more diverse, with a range of fishing gear (e.g. nets, spearguns, hook and line, canoes, outboard engines, traps, gleaning) used and species (reef-associated finfish, invertebrates and demersal fish) targeted. The coastal marine catch each year is estimated to be around 4,500 mt (Gillett 2011).

Aquaculture, with the objective of restocking (e.g. giant clams) to alleviate pressure on marine resources and to provide alternative food or livelihood opportunities occurs in Samoa, while tilapia farming is being increasingly promoted to provide alternative food source and commercial potentials.

#### 1.4 Food security and nutrition

Finfish, invertebrates and canned fish constitute a significant proportion of the diet in Samoa. On average, each Samoan consumes fish during 2.8 meals per week and invertebrates 0.8 meals per week. This amounts to an annual per capita consumption of 59 kg of finfish (annual per capital consumption of invertebrates is unknown) (HIES 2006).

Canned fish (or tinned fish) is consumed, on average, during 4.5 meals per week. The annual per capita consumption of canned fish has increased from 30 kg in 1997 to 75 kg in 2006. The reason for this increase is unknown although it may be attributed to reduced participation in fishing; adult participation in fishing dropped from 11% to 7% over the period. Reduced participation in fishing may result in higher dependence on store bought foods, where tinned fish is a relatively inexpensive and widely available protein source.

The results of four studies (census and HIES) indicate that since 1997, 31% of households and 8% of the adult population (>14 years old) participate in fishing activities. Of these households, an average of 73% participate in fishing solely for the purpose of home consumption.

These data are indicative that fishing for food (subsistence) is an important socioeconomic activity in Samoa and those fisheries make a significant contribution to the nutrition of Samoans.

#### 1.5 Economy

Fisheries production in Samoa is highly diverse, with range of fishing gear used, catch size and purpose. Some examples include subsistence fishing with nets, seines and spear guns; small-scale trolling and mid-water fishing at fish aggregation devices, using vessels such as the alia catamaran and canoes; commercial longline fishing; and a fractured history of foreign purse-seine fishing. Samoa also has a history of small-scale aquaculture and mariculture.

Table 1: Contribution of fishing to Samoa's GDP, 2004–2007, displays the contribution of commercial and subsistence fishing to Samoa's gross domestic product (GDP) from 2003 to 2007. Note that this excludes value added from post-harvest activities.

**Table 1: Contribution of fishing to Samoa's GDP, 2004–2007 (in United States dollars).**

Fishing activity	2004 USD ('000)	2005 USD ('000)	2006 USD ('000)	2007 USD ('000)
Commercial fishing	8,775	7,197	7,682	11,987
Subsistence fishing	17,563	18,497	19,858	20,140
Total fishing value	26,338	25,694	27,539	32,127
Samoa's GDP	452,294	496,188	538,680	591,501
<b>Fishing contribution to GDP (%)</b>	<b>5.82%</b>	<b>5.18%</b>	<b>5.11%</b>	<b>5.43%</b>

Source: Gillett 2009

### **1.6 Community-based fisheries management program**

The community-based fisheries management program (CBFMP) was initiated in 1995 with assistance from the Australian Agency for International Development to provide coastal villages in Samoa with much needed advisory assistance. The process used a “bottom-up” approach to management in that each participating village develops its own strategy to manage its marine resources and its environment, rather than being told what to do by a government authority. The Fisheries Division is mandated to develop sustainable conservation and fisheries management measures under the Fisheries Act (1988); therefore, the Fisheries Division works with communities to pursue fisheries development and marine conservation, and to provide technical assistance.

To date, 98 villages work collaboratively with the Fisheries Division under the CBFMP with 73 active Fish Reserves, 1 with protected mangroves only, two other districts; Safata and Aleipata are under MPAs program by the Ministry of Natural Resources and Environment, and the rest were inactive due to some localised and unforeseen issues within their communities (Fisheries Division 2013). The Fisheries Division is working on reactivating all of these fish reserves as well as involving new communities in the CBFMP. One of the conservation and resource management procedures adopted by the communities participating in the program is the establishment of village-owned fish reserves within lagoonal waters. It is a practical management strategy to protect the biodiversity of the marine and fish species and to enhance depleted coastal fisheries resources. The fish reserve areas vary among communities, depending on the lagoon area and also take into consideration that most communities reserve a portion of the marine environment and leave the rest for fishing activities for family consumption.

The CBFMP identifies various communal issues as listed in each village’s Fisheries Management Plan; incorporates bylaws into the Fisheries Act, which legalises communal management initiatives; and assists communities with managing their own marine environment, especially controlling fishing activities from outside villagers.

### **1.7 Gender**

Although formal fisheries employment is male dominated, women play an important role in subsistence fishing activities (mainly gleaning along the shoreline, lagoon and reef tops during low tide) and in fish marketing. Women, traditionally fish inshore and do not use sophisticated fishing gear, and typically target reef-associated finfish and invertebrates.

### **1.8 Samoa PROCFISH/C data**

The coastal component of the Pacific Regional Oceanic and Coastal Fisheries Development Programme (PROCFish/C) conducted fieldwork in four locations around Samoa in June 2005, and August and September 2005. The survey design was similar to the design used for this study and, as such, the data are comparable.

## 2 Literature review: Previous socioeconomic surveys conducted

---

There is much literature and socioeconomic data on Samoa, including fisheries-specific socioeconomic surveys completed in 1978, 1984, 1991, 1997 and 2007. Unfortunately, aside from the 2007 report, attempts to locate earlier reports have been fruitless. Nonetheless, numerous reports are available, including those from: National Census (SBS 2001, 2006 and 2011), Household Income and Expenditure Surveys (1997, 2008), Agricultural Census (1999, 2004, 2009), Asian Development Bank (2009), Food and Agriculture Organization of the United Nations (Gillett 2011) and PROCFish/C/CoFish (Vunisea et al. 2005).

Despite the fact that there are numerous socioeconomic datasets on Samoa, few surveys have adopted the same methodology or collected the same information, with the exception of PROCFish. Therefore, there is little opportunity to conduct a time series comparison. A main recommendation of this report is that any future fisheries socioeconomic survey adopts the current methodology in order to compare results.

Furthermore, it is recommended that the Samoan Bureau of Statistics (SBS) be engaged in future surveys to utilise their resources in sampling, such as trained enumerators, and to ensure that data collected are beneficial to both Fisheries and National Statistics and Planning administrations. It is also recommended that SBS consult Fisheries to ensure that relevant fisheries data are captured in household income and expenditure surveys and censuses (HIES).

**Table 2: Matrix of socioeconomic indicators from the literature review.<sup>1</sup>**

Socioeconomic indicators \ Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Population</b>															
Population			164217		176710					180741					187820
Total households			20521		23059			23261		23813	25123				26205
Average household size	9									8.3					7.2
<b>Participation in fishing</b>															
Adult participation in fishing - male	21%		5%							5%					5%
Adult participation in fishing - female	0.2%		1%							1%					1%
Adult participation in fishing	11%									7%					3%
Household participation in fishing			33%			25%				41%					
<b>Purpose of fishing</b>															
Home consumption (subsistence)	80%		72%							75%			65%		
Mixed consumption and sales			22%							21%			32%		
Selling			5%										3%		
Occupation (formal)			1%									1.3%			
<b>Seafood consumption</b>															
Consumption (finfish - meals/week)										2.8					
Consumption (inverts - meals/week)										0.8					
Consumption (tin fish - meals/week)										4.5					
Per capita consumption (finfish - kg/year)										59					
Per capita consumption (tin fish - kg/year)	30.295									75					
<b>Income source</b>															
% of household income from fishing	9%									9%					
<b>Purpose of fishing</b>															
Home consumption (subsistence)	80%		72%							75%			65%		
Mixed consumption and sales			22%										32%		
Selling			5%							21%			3%		
Occupation (formal)			1%												
<b>Seafood consumption</b>															
Consumption (finfish - meals/week)										2.8					
Consumption (inverts - meals/week)										0.8					
Consumption (tin fish - meals/week)										4.5					
Per capita consumption (finfish - kg/year)				44						59					
Per capita consumption (tin fish - kg/year)	30.295			14						75					

<sup>1</sup> Socioeconomic indicator references: HIES 1997, 2008; Agriculture Census 1999, 2002, 2004, 2009; SBS 2001, 2006, 2008, 2011; Valenia et al. 2006.

Table 2 cont'd

Socioeconomic indicators	Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Boat assets</b>																
Canoe (households owning)				26%										10%		
Boat with motor (households owning)				2%										1%		
<b>Fishing location</b>																
Inshore				88%							86%			72%		
Offshore	6%			10%							4%			9%		
Both				2%							10%			18%		
<b>Fishing effort (trips)</b>																
Inshore														67%		
Offshore														11%		
Both														23%		
Trips (per week)	1.57			3							3.1					
Trip duration (hours)	3.18										3.44					
CPUE (kg/hr)	2.1					1.1		2.7			2.24					
<b>Gear</b>																
Longline				6%										5%		
Fish net	20%			17%										27%		
Fish fence				2%										3%		
Hook & line	20%			26%										27%		
Spear	56%			76%							76%			75%		
Gleaning														29%		
Fish trap														13%		

The above table demonstrates the need for continuity of socioeconomic fisheries surveys. The fragmented datasets and inconsistent survey methodology make it extremely difficult to conduct time series socioeconomic analyses of Samoa's fisheries. For all future censuses, HIES and fisheries socioeconomic surveys, it is recommended that a survey methodology and questionnaire design that are compatible with historical data sets are adopted.

### 3 Survey background

---

As with other Pacific Island countries, fisheries play an extremely vital role in Samoa's economy. Passfield and colleagues (2000) stated that, apart from commercial importance, Samoan fisheries are of major importance to subsistence in contributing to the health of the population. Many aspects of village communities and their use of resources have implications to the overall health of coastal marine ecosystems and the welfare of the people in terms of food security, income generation and cultural practices.

The Two Samoas Initiative, (which addresses Samoa and American Samoa) through its Strategic Plan for Environmental Collaborations, proposes to address shared environmental concerns simultaneously and collaboratively. Under this initiative the Fisheries Division recognised the importance of gathering socioeconomic information to identify possible impacts of management and to improve policy and decision-making for local resource owners and fishing communities. This is the second survey of this kind since 2006. The aim is to help Samoa's Fisheries Division understand the current status of adaptive management, and measure its effectiveness in achieving its goals and objectives. Therefore, funding support provided by United States National Oceanic and Atmospheric Administration through the Two Samoas Initiative enabled us to carry out this survey.

The survey disaggregated fisheries into 'finfish' fisheries and 'invertebrate' fisheries. Stratified random sampling was adopted whereby the sample population was categorised based on varying geographic and fisheries management characteristics; these can, however, generally be described as 'inland' and 'coastal' populations. More detail about the sample population strata is provided below, although the survey mainly focused on rural communities and allowed for gender disaggregation.

#### 3.1 The Samoa Socioeconomic Fisheries Survey for 2012/2013

The survey was implemented in 100 villages in June and July, 2012 (56 in Upolu and 44 in Savaii), with a total of 881 households surveyed — 584 in Upolu and 297 in Savaii. Respondents provided information about their dependency on fishing, seafood consumption and purchasing habits, and fishing activities and habitat preferences.

Samoa's total population in 2011 was 187,820, with an urban population in the Apia area of 36,735 (SBS 2011). During the survey 6,681 people (or 3.56% of Samoa's total population) were interviewed, and the survey was conducted in 100 villages (out of a total of 330 villages in Samoa), with a village coverage of 30%.

#### 3.2 Stratification

All 100 villages surveyed were categorised as being either inland or coastal, and were listed by island. They were also classified by the marine management framework currently in place. The results are presented in Table 3 according to these stratum, with identifiers adopted based on the different geographic and management scenarios. The results are also disaggregated by finfish and invertebrates.

**Table 3: Seven strata of sites used for the survey.**

Identifier	Inland	Coastal	Savaii	Upolu	CBFMP	non-CBFMP	MPA
CBFMP Savaii		X	X		X		
CBFMP Upolu		X		X	X		
Inland Savaii	X		X				
Inland Upolu	X			X			
MPA Upolu		X					X
Non-CBFMP Savaii		X	X			X	
Non-CBFMP Upolu		X		X		X	

CBFMP= community-based fisheries management program

MPA = marine protected area

Coastal villages are defined as villages that reside on the coast or within close proximity of the coast, while inland communities reside away from the coast. This disaggregation provides an opportunity to compare the importance of fisheries for food security and livelihoods by each stratum, and it is especially important in understanding the spatial dependence on fisheries.

Note that villages on Upolu include those on Manono Island.

Management categories are:

- i. Communities under the **CBFMP**;
- ii. Communities that have marine protected areas (**MPAs**) under the Ministry of Natural Resources and Environment community-based program;
- iii. **Inland villages** on Upolu and Savaii that do not have any marine management arrangements, nor resource ownership due to their geographic location; and
- iv. **Non-CBFMP** communities on Savaii and Upolu that do not participate in the CBFMP.

### 3.3 Data collection, storage and management

The survey was based on fully structured, closed questionnaires comprising:

- a household survey that incorporated demographics and consumption patterns for reef and lagoon fish, invertebrates and canned fish; and
- a finfish and invertebrate survey that incorporated data by habitat for each fishery, including fishing location or habitat, fishing effort, catch composition, fishing strategy, purpose of catch, quality control and catch per unit of effort (CPUE).

The questionnaires can be found in Appendix 1.

Additional information was also collected from key community informants and finfish and/or invertebrate marketers to give an overall picture of the community and knowledge about traditional fishing grounds and any vernacular names of fish species.

All data collected were entered into a computing software program, Socio-Economic Manual Companion Software (SEMCoS), developed specifically for this survey design. The dataset is presented in Appendix 2 and the Samoan Fisheries Division manages access to the SEMCoS database.

## 4 Survey methodology

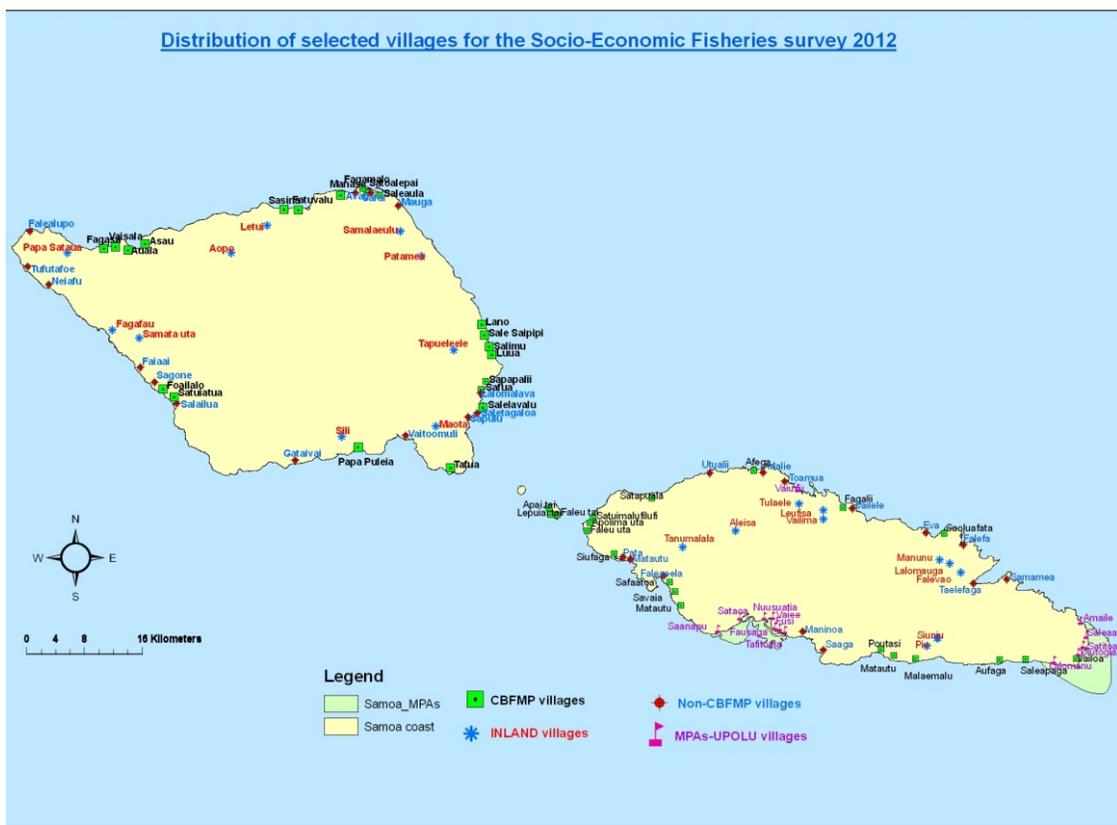
The sampling methodology was adopted from the Socioeconomic Fisheries Surveys in Pacific Islands Manual (Kronen et al. 2007), which can be downloaded at:

[http://www.spc.int/DigitalLibrary/Doc/FAME/Manuals/Kronen\\_07\\_SocioFishSurveys.pdf](http://www.spc.int/DigitalLibrary/Doc/FAME/Manuals/Kronen_07_SocioFishSurveys.pdf).

There were 100 villages selected, consisting of 56 for Upolu, including Manono, and 44 for Savaii, which represented 30% of all Samoan villages. The selection of household numbers was based on 10% of the total household number for each village.

The surveyed villages were categorised into seven regions or areas based on their status and location in order to be representative of all villages in Samoa (Appendix 3 lists each village surveyed by its category).

In total, 881 households were surveyed. Figure 3 shows the distribution of the 100 villages.



**Figure 3: Location of villages involved in the 2012 socioeconomic fisheries survey.**

Enumerators consisted of staff members from three sections of the Fisheries Division — Inshore, Advisory, and Aquaculture — who were trained in asking questions and filling in the questionnaire. Senior staff members were also involved in translating the questionnaire into Samoan. It was

recommended that all survey teams consist of a pair of enumerators to help minimise misunderstanding of the questionnaire and responses to it. The survey approach and methodology were easily adopted by the enumerators because most of them had been involved in previous fisheries surveys, which was an advantage. Each team had a leader who was responsible for verifying the completed questionnaire on a daily basis, ensuring that all information was properly recorded.

#### **4.1 Number of households**

The total number of households surveyed was 881, consisting of 297 from Savaii and 584 from Upolu and Manono islands. The total number of people included in the households was 6,618, consisting of 2,228 from Savaii and 4,390 from Upolu (including Manono).

#### **4.2 Socioeconomic fisheries survey manual**

The socioeconomic questionnaires used for the survey was adopted from the Secretariat of the Pacific Community's "Socioeconomic fisheries surveys in Pacific Islands: a manual for the collection of a minimum dataset". The manual is intended for use by fisheries managers, non-governmental organisations, research institutions and universities, international and regional organisations, and individuals involved in data collection, data analysis and development, implementation and monitoring of coastal fisheries management strategies or measures. The manual covers the use of fully structured questionnaire surveys. This methodology has been shown to be the easiest and most effective in terms of time, finances and human resource inputs.

#### **4.3 Survey logistics**

The socioeconomic survey was carried out over a period of two consecutive weeks, from 25–29 June 2012 on Upolu (including Manono) and 2–6 July 2012 on Savaii. Twenty-four Fisheries Division staff members made up four teams, with six staff in each team. The survey was conducted during normal working hours (9 am to 5 pm) although there were instances where teams worked earlier or later in the day in order to complete their target households assigned for that particular day.

## 5 Survey results

Because significant amounts of data were collected, attempts have been made to focus on presenting socioeconomic results; however, a section has been dedicated to profiling the fishery. The reason for this is that the fishery has direct implications on social considerations in Samoa, such as health, livelihoods and culture. This fishery profile, especially if the survey is repeated, will provide data to determine the effectiveness of management interventions or to identify areas where better management is required.

### 5.1 Demographic characteristics

#### 5.1.1 Household size and age composition

The total number of households surveyed was 881, or 3.4% of Samoa's population. The results indicate that the average household size is eight people, with 51% males and 49% females (Table 4).

**Table 4: Demographic characteristics of each region.**

Region	Total no of households surveyed	Total no of people surveyed	Percentage of males	Percentage of females	Percentage of males ≥ 15 years	Percentage of females ≥ 15 years
Non-CBFMP Upolu	161	1200	51.08	48.92	32.17	32.58
Non-CBFMP Savaii	109	800	53.13	46.88	32.00	30.00
Inland Savaii	55	386	47.41	52.59	34.20	30.31
Inland Upolu	103	728	50.41	49.59	32.83	33.52
CBFMP Savaii	133	1042	50.86	49.14	32.82	32.05
MPA Upolu	124	975	49.74	50.26	31.28	30.77
CBFMP Upolu	196	1487	51.71	48.29	34.50	32.08
	<b>881</b>	<b>6618</b>	<b>50.62</b>	<b>49.38</b>	<b>32.83</b>	<b>31.62</b>

CBFMP = community-based fisheries management program

MPA = marine protected area

### 5.1.2 Purpose of fishing

Male and female fishers are mainly commercially oriented for finfish (Fig. 5). All fishers target mostly coastal reef and lagoon habitats, and only men fish for pelagic fish or in the open seas and mangrove areas; there are a few women, however, who fish on the outer reefs.

For invertebrates, women target mostly soft bottom species, while men mainly glean and dive for clams, octopus, lobster, mother of pearl, and beche-de-mer, and equally target reef tops and mangrove areas.

Most fishers go out exclusively during the day, while the rest fish both night and day, depending on tidal and weather conditions. Reef gleaning is performed only during the day by both men and women while some diving for invertebrates such as lobsters, trochus, giant clams, sea cucumbers is performed at night.

Boats are used mainly by men when diving and/or gleaning, especially for sea cucumbers, trochus, turban shells and seagrapes, while few women use boats when they glean.

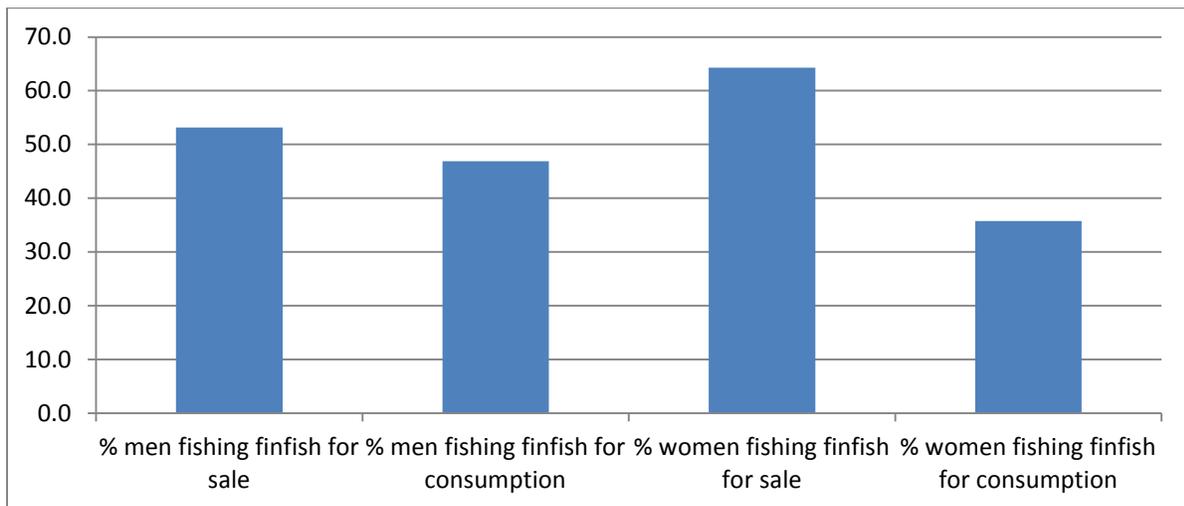


Figure 4: Purpose of fishing by gender.

## 5.2 Fisheries for food security

### 5.2.1 Frequency and per capita consumption of seafood

On average, people consume finfish at three days each week. Total finfish consumption for all surveyed communities is 226 mt/yr. Patterns of seafood quantities consumed vary substantially between communities, with inland communities generally consuming less than coastal communities.

The frequency of consumption is higher in both CBFMP Upolu and Savaii where fresh finfish consumption is about 46 kg/person/year, invertebrates 55 kg/person/year, and canned fish 29 kg/person/year. The average annual per capita finfish consumption for inland communities is 30 kg, while consumption in coastal communities is 53 kg. Similarly, invertebrate consumption in coastal communities averages 63 kg/person/year, while in inland communities, consumption only averages 33 kg/person/year. Conversely, inland communities consume more canned fish consuming 31 kg/year,

which is higher than average annual coastal consumption of 28 kg. This is a function of access to coastal waters for food (Table 5).

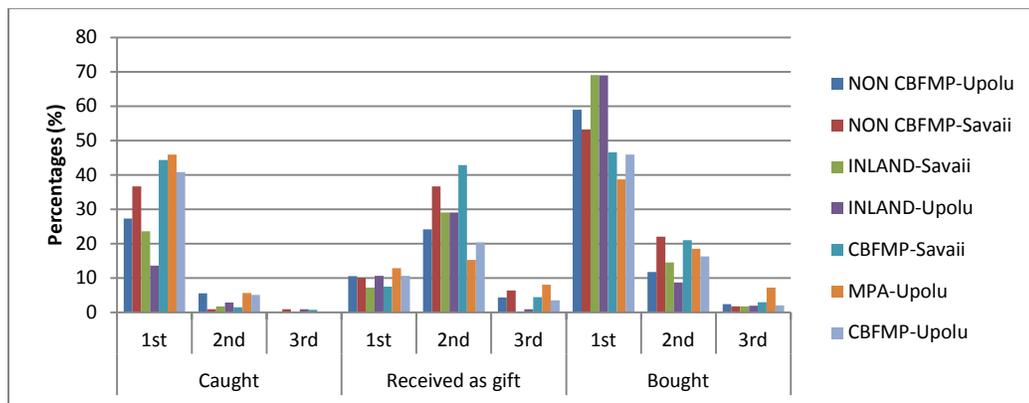
**Table 5: Annual per capita seafood consumption.**

Region	Average per capita consumption		
	Finfish (kg/year)	Invertebrates (kg/year) <sup>2</sup>	Canned fish (kg/year)
Non-CBFMP Upolu	38.82	17.13	29.98
Non-CBFMP Savaii	53.11	80.65	30.81
Inland Savaii	32.57	52.02	27.13
Inland Upolu	26.89	14.20	34.22
CBFMP Savaii	78.84	92.20	27.61
MPA Upolu	43.38	92.45	21.97
CBFMP Upolu	49.45	34.56	28.54
Average	<b>46.15</b>	<b>54.74</b>	<b>28.61</b>

CBFMP = community-based fisheries management plan  
MPA = marine protected area

### 5.2.2 Source of finfish for household consumption

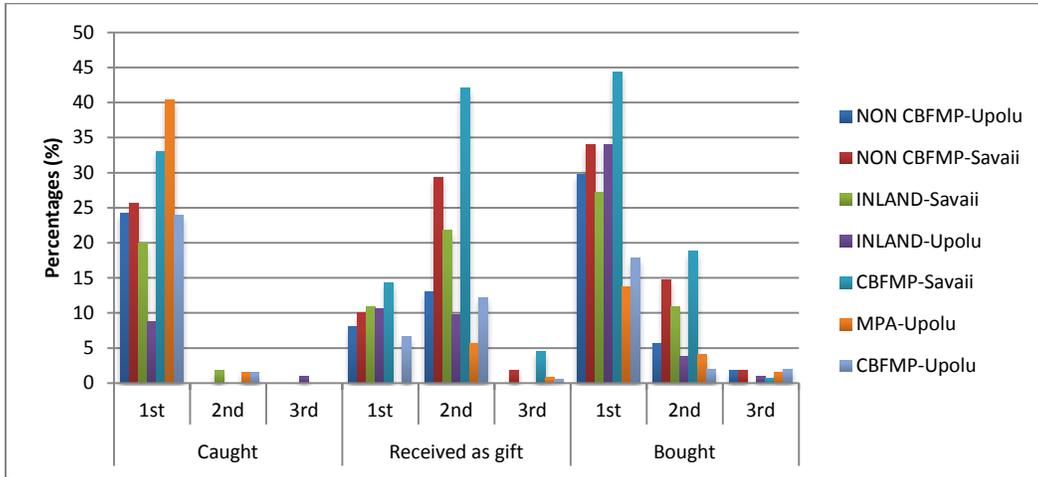
When asked about sources of finfish consumed — whether fished by a family member, received as a gift from neighbours and relatives, or bought from outlets — it was found that seafood is typically acquired from multiple sources. For instance, a family may purchase fish from the market and also receive fish from their neighbours. Therefore, a ranking system was applied to determine the importance of various finfish sources. The ranked sources (Fig. 8) illustrate that in all areas, fish used for family consumption is mainly bought from outlets and more likely to be caught by a family member than received as a gift.



<sup>2</sup> Invertebrate consumption refers to 'whole fish equivalent'. For example, for giant clams, includes weight of shells.

**Figure 8: Sources of finfish for consumption (ranked by importance).**

Similarly, invertebrates are mostly bought from outlets rather than caught by a family member or received as a gift. For MPA Upolu, most invertebrates are caught by a household member (Fig. 9). The next section considers primary sources of income and shows that for all but one village (inland Savaii), salary was the primary income source. This suggests that households have enough cash to buy fish rather than needing to go fishing, which demonstrates an increasing emergence of a cash-based economy in rural areas.



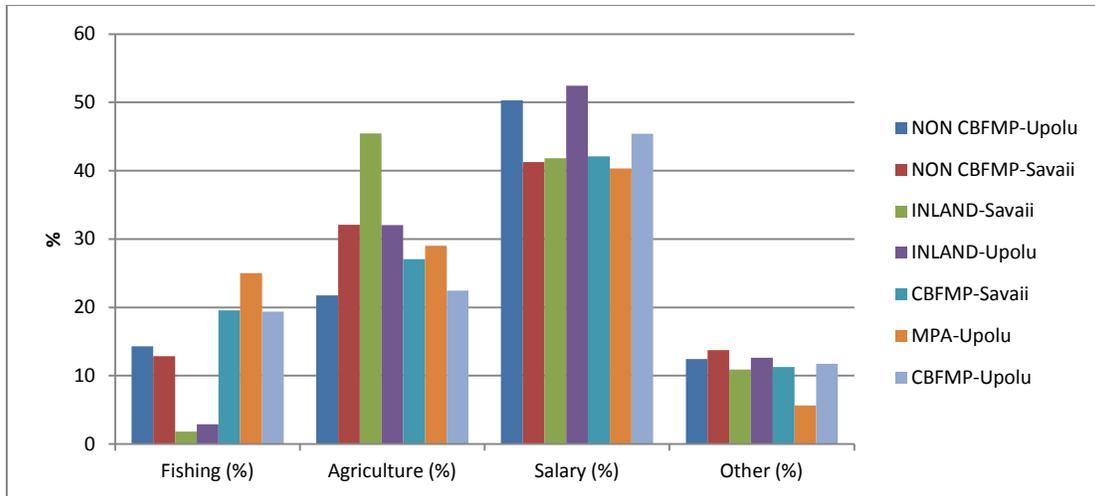
**Figure 9: Sources of invertebrates for consumption (ranked by importance).**

### 5.3 Fisheries for livelihoods

#### 5.3.1 Income source

Overall, the survey found that fishing is third to agriculture and paid salary in terms of income source. Figure 10 shows the different ranks relative to the seven categories.

The percentage of household income derived from agriculture and fishing is fairly similar in communities under MPA Upolu, CBFMP Savaii and CBFMP Upolu, although the results indicate that for all villages, agriculture provides a greater percentage of income than fishing, and that for most villages, salaries are the single greatest income source (Fig. 10).



**Figure 10: First source of household income.**



**Figure 11: Second source of household income.**

Samoa’s 2012 unemployment rate is reported to be 6%, mainly because subsistence farming and fishing is considered to be a form of employment in Samoa. Nonetheless, fishing remains an extremely important source of household income for the villages under study. On average, 14% of households ranked fishing as their first source of household income; the average for coastal communities was higher at 18%. Fishing was ranked as the second most important source of income for, on average, 8.5% of all households.

### 5.3.2 Adult and gender participation in fishing

Survey results indicate that the total number of adult fishers within the seven regions surveyed is 5,566, with 1,918 in Savaii and 3,648 in Upolu (and Manono). Of these, 353 males and 542 females only fish for

invertebrates; 2,611 males and 21 females only fish for finfish; and 1,811 males and 229 females fish for both invertebrates and finfish.

### **5.3.3 Fish marketing**

#### ***5.3.3.1 Where are fish sold?***

The target market outlets vary among the communities. In the CBFMP and MPA sites, fish are mostly sold within the village to individuals and nearby villages and little taken to markets. Most communities consist of both subsistence and small-scale commercial fishers as shown in their marketing patterns. Few fishers supply middlemen and/ or agents and restaurants. Some respondents stated that they supplied middlemen and/or agents and restaurants when prompted by the enumerator.

**Table 6: Places where fish are sold.**

Region	Inside community sales (%)	Outside community sales (%)	To individuals (%)	To shops (%)	To market (%)	To middlemen and/or agents (%)	To restaurants (%)
<b>CBFMP Savaii</b>	90.24	29.27	90.24	2.44	21.95	0	2.44
<b>CBFMP Upolu</b>	87.18	41.03	71.79	2.56	25.64	12.82	5.13
<b>Inland Savaii</b>	100	16.67	100	0	16.67	0	0
<b>Inland Upolu</b>	100	0	100	0	0	0	0
<b>MPA Upolu</b>	88.24	32.35	88.24	5.88	23.53	2.94	2.94
<b>Non-CBFMP Savaii</b>	100	32.14	96.43	7.14	28.57	3.57	10.71
<b>Non-CBFMP Upolu</b>	82.61	21.74	82.61	0	17.39	0	0

### ***5.3.3.2 Preservation and storage***

Figure 13 indicates that most fishers market their catch straight after they arrive on shore, and that refrigeration only occurs for left-over sales and fish that are put aside for family consumption. Most respondents stated that they do not preserve their fish because most of the catch will be sold once displayed.

The use of ice during and after fishing trips for preserving fish for marketing purposes is highly recommended to maintain the high quality of catch for the buyers as well as family members.

Smoking and drying are not commonly practiced in Samoa as in other Pacific Islands, therefore, if a family does not have a refrigerator, then cooking is the only way to preserve food.

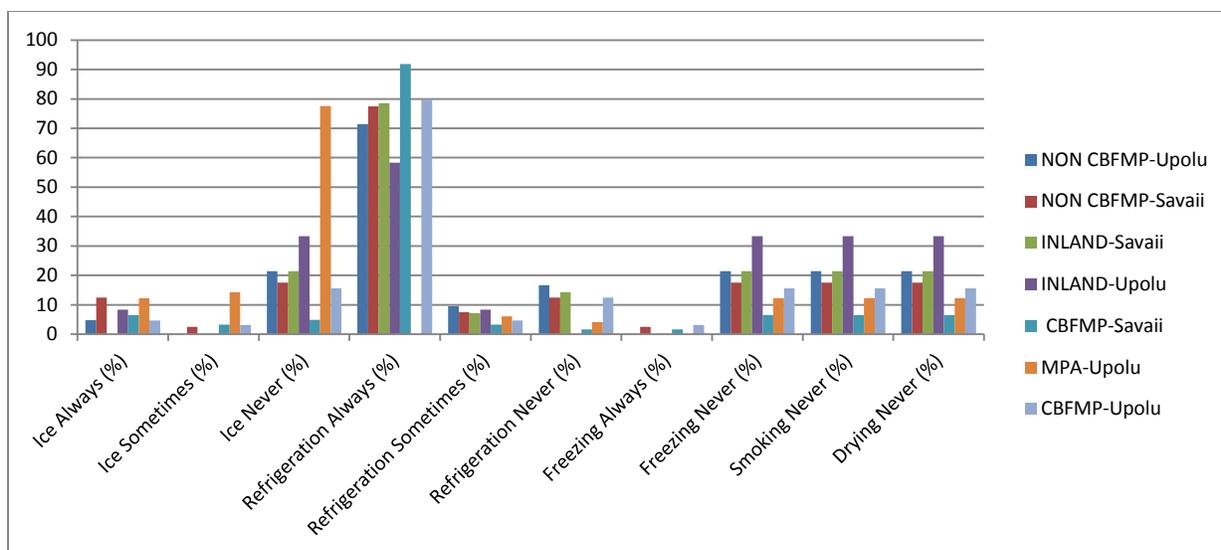


Figure 13: Types of preservation methods used.

## 5.4 Fisheries profile

### 5.4.1 Fishing effort

#### 5.4.1.1 Boat assets

On average, one in every four households owns a boat. Of these, canoes are the most common type, accounting for 90% of all boat types, with sail and motor making up 2% and 8% of boats respectively.

From the surveyed population, no inland communities owned a motor boat. Both non-CBFMP Upolu and non-CBFMP Savaii owned more motorised boats, which provide flexibility for choosing fishing grounds, particularly in outer reefs and deep water.

#### 5.4.1.2 Vessel frequency

The majority of male fishers in coastal areas frequently used boats for fishing, while 80% of those in inland areas do not use a boat for fishing. Similarly, women rarely used boats for fishing.

#### 5.4.1.3 Trip frequency

Of the households that participate in fishing, on average, 196 trips per man per year are made for each village category. The highest frequency is 260 trips per man per year in CBFMP Savaii, and the lowest is 118 trips per man per year in Inland Upolu. The average number of trips per women per year is 162, with 275 being the highest in CBFMP Upolu and the lowest being 52 in inland Upolu.

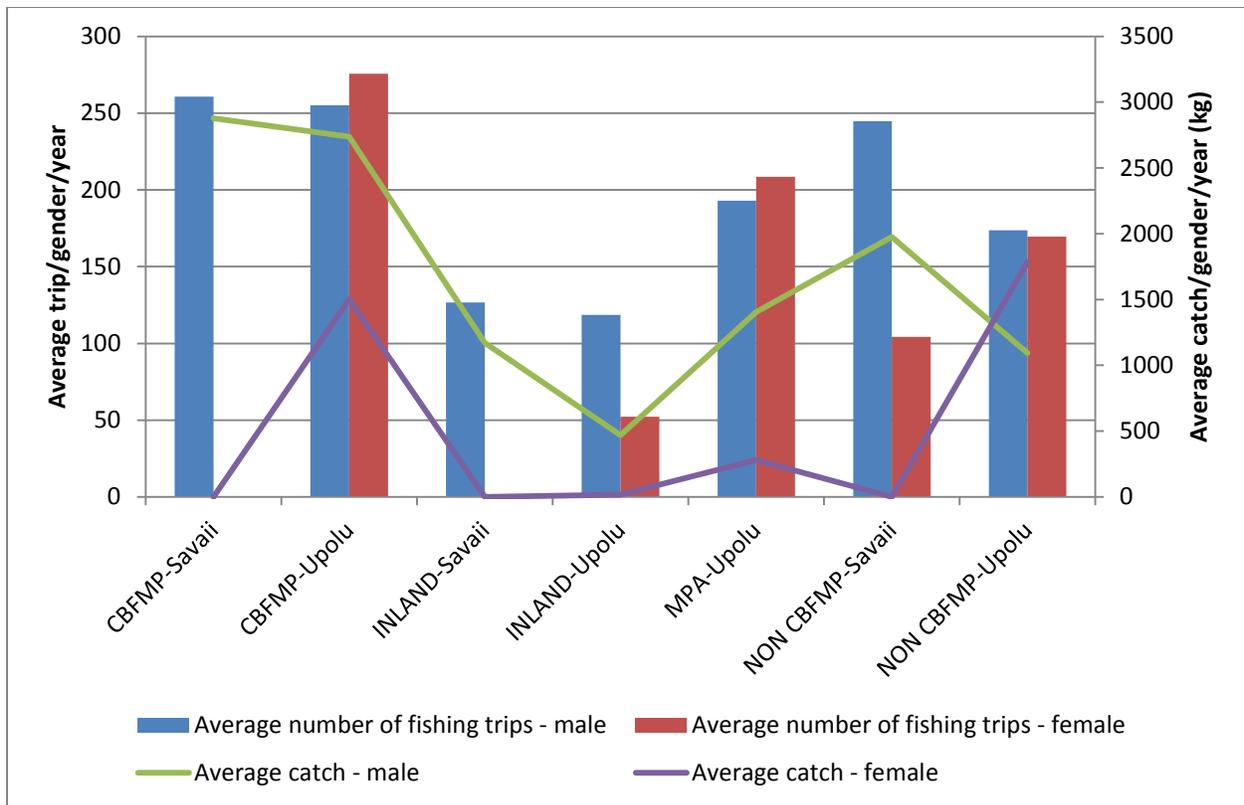


Figure 10: Average annual individual finfish catch and effort by gender.

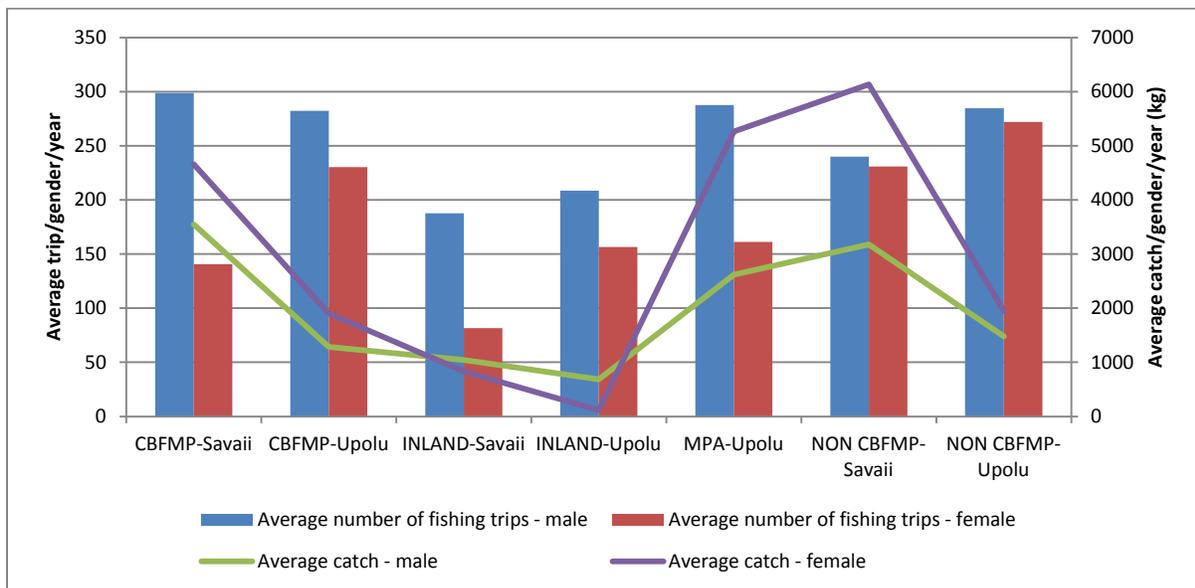


Figure 11: Average annual individual invertebrate catch and effort by gender.

#### 5.4.1.4 Habitat targets

The main habitats targeted by finfish fishers were lagoons, coastal reefs and outer reefs. These areas were mostly fished by men, while women mainly targeted lagoon areas. Male fishers also targeted mangroves and pelagic areas. The data show a high proportion of fishing activity in the lagoon, and coastal and outer reefs habitats (Fig. 16).

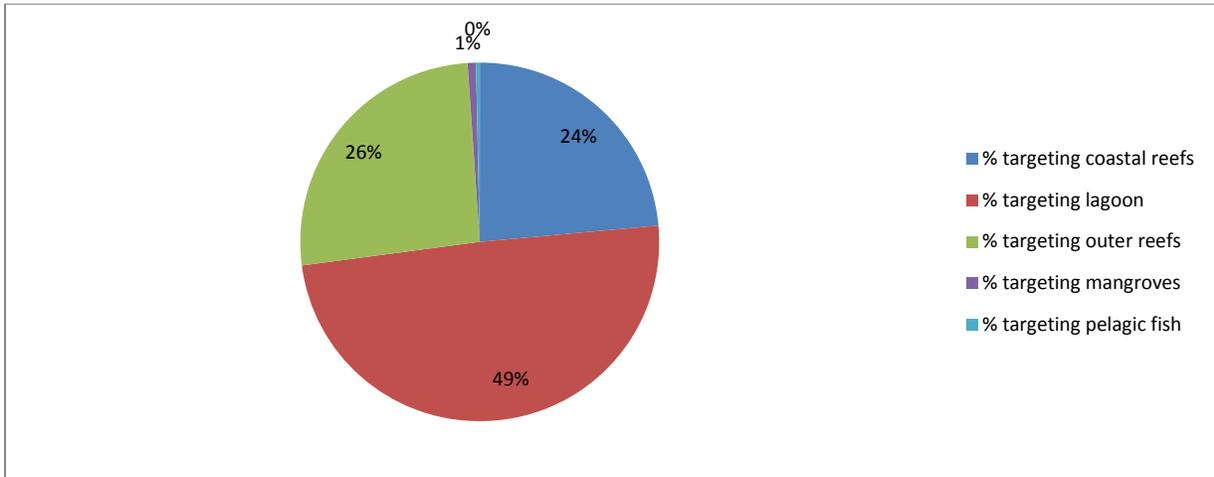


Figure 16: Habitat targeted for finfishing.

### 5.4.2 Fishing catch

#### 5.4.2.1 Total annual catch

The estimated total finfish catch is 9,066.32 mt/year, with an estimated value of WST 89 million (USD 37 million equivalent). Of this total, it is estimated that men catch 8,857.86 mt and women catch 208.46 mt/year (Fig. 17).

The estimated catch of invertebrates is 7,804.42 mt/year with an estimated value of WST 86 million (USD 36 million equivalent) in income generated. Of this total, it is estimated that men diving and/or gleaning catch 5,028.52 mt and women harvesting 2,775.90 mt (Fig. 17).

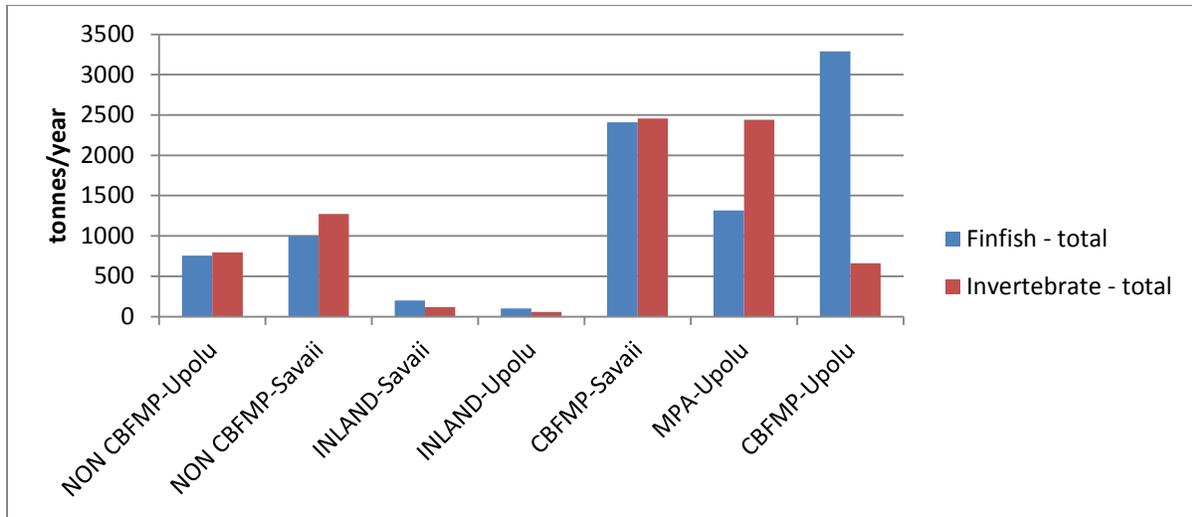


Figure 17: Total annual catch of finfish and invertebrates.

Although not disaggregated by gender, the above figure is interesting because it shows the relative importance of invertebrates. With exception of CBFMP Upolu, the annual catch of invertebrates is greater than or approximately equal to the annual catch of finfish. From this, it can be concluded that invertebrates have an equally important socioeconomic role as finfish.

#### 5.4.2.2 Target species

The diversity of finfish and invertebrate species caught is similar when all selected sites are compared. However, volume varies with *Acanthurus lineatus*, *A. xanoptenus*, *Ctenochaetus striatus*, *Letherinus amboinensis*, *Cetoscarus bicolor*, *Naso unicornis*, *Scarus oviceps*, *Chellinus undulates*, *Crenimugil crenilabis*, *Epinephelus merra*, commonly represented in all sites. Major differences are found when comparing frequency of finfish size classes. Most catches from all sites were categorised by size classes 16–40 cm, while catches from four sites (MPA Upolu) show size classes of 8–40 cm in less than 10% of catches (Fig. 18).

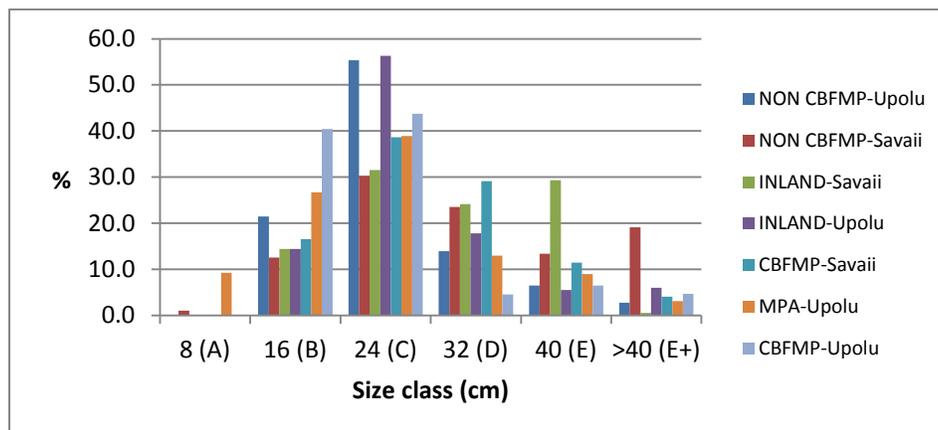


Figure 18: Finfish size distribution.

Size distribution and frequency of invertebrates caught were compared for crabs, lobsters, clams, octopus, urchins and trochus because it was easier to determine their sizes during the survey. However,

difficulties occurred with processed seafood, including bottled beche-de-mer and other species such as *Dolabella auricularia*, sea urchins and seagrape bundles.

Results suggest that all communities have access to ecologically comparable fishing grounds and therefore, similar species diversity. However, using catch characteristics as parameters, fishing pressure seems to concentrate mostly on the lagoon and outer reef (Fig. 19); also, an impact on size classes and certain species in the MPA Upolu site where a size class of 8 cm was recorded. However, the species caught were *Valamugil engeli*, *Chaetodon* spp. and *Balistapus undulatus*, which are generally small and may lead towards fishing impact on certain fish sizes and species.

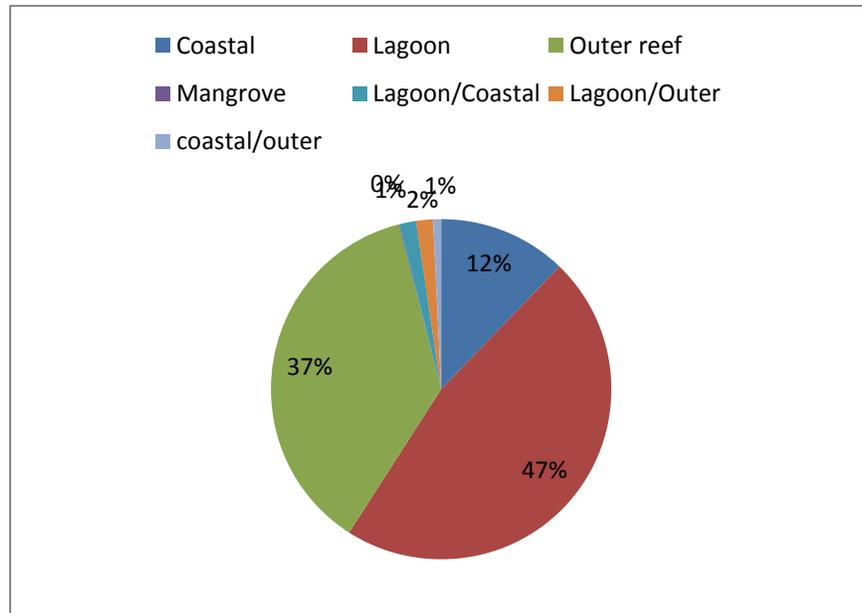


Figure 15: Finfish catch by habitat.

### 5.4.3 Catch and effort

#### 5.4.3.1 Fishing time, fishing techniques, fishing strategies

Both men and women fish three times per week, with men fishing for an average of four hours and catching (on average) 13.7 kg per fishing trip, and women fishing for an average of five hours and catching (on average) 10 kg per fishing trip. Men fish about 10 months out of the year, and women fish for about 9 months out of the year. About 86% of male fishers and 91% of female fishers used one technique per fishing trip. Catch per unit of effort for men is 4.3 kg/hour and for women it is 2.22 kg/hour.

The frequency of fishing for men diving for invertebrates is five times per week for an average of three hours per fishing trip, over 10 months of the year. Gleaning takes place three times per week, for an average of three hours per fishing trip over seven months of the year. Women, on the other hand, spend three hours diving for invertebrates four times per week, for an average of nine months out of the year. Women glean two times per week, for an average of 2.5 hours over seven months of the year (see table in Appendix 2).

The most commonly used technique for fishing is spear fishing (while diving) and is associated with other fishing gear such as snorkel, mask/goggles, and torch if fishing at night. More than 40% of fishers use this technique more frequently than other methods (Fig. 20).

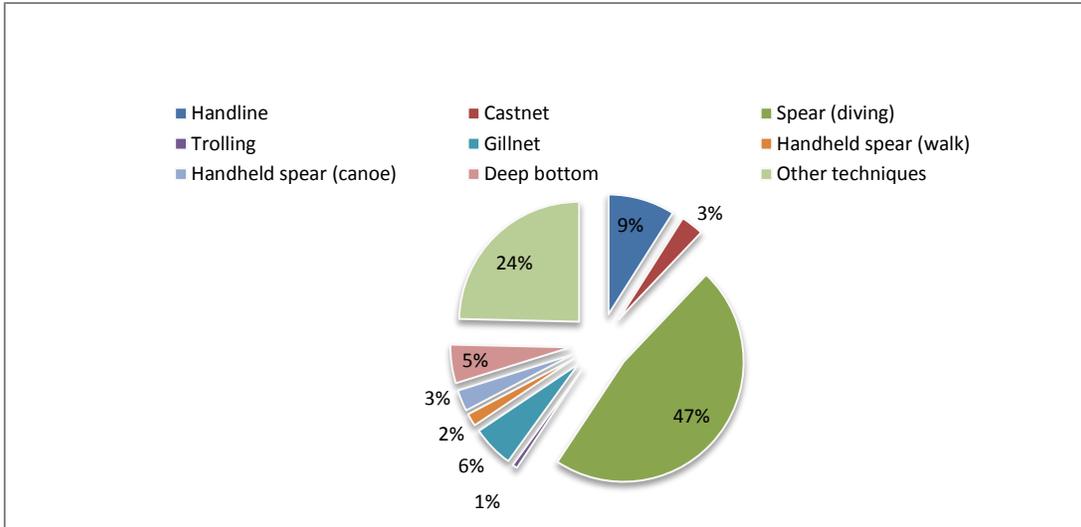


Figure 16: Types of fishing techniques.

## 6 Conclusions and recommendations

---

The results of the socioeconomic survey are indicative that fishing plays an important social and economic role in Samoa. The results demonstrate a high annual per capita consumption of fish and invertebrates and high sea food consumption frequency.

The sale of fish and invertebrates accounts for the primary income of 13.68% and secondary income of 8.5% of households surveyed. It is apparent that the domestic fishing sector is moving towards a cash-based economy (as opposed to more traditional subsistence and communal sharing) with finfish being more commonly commercially captured and traded (as opposed to consumed by the household and given as gifts) than invertebrates.

12.46% of adults report that they participate in fishing and average approximately 3.49 fishing trips per week.

The total estimated value of the fish and invertebrate catch amounts to around WST 175 million, which is a significant contribution to domestic productivity for an economy with a GDP of approximately WST 1,429 million.

These results assist in gaining an understanding of fisheries management and development needed for food security and livelihoods of Samoans. This study also provides information on benefits of communities joining the community-based fisheries management program and its effectiveness in terms catch per unit of effort, total catch and consumption. Fishing remains an extremely important source of household income.

Traditionally, Samoans share their food with neighbours and this is clearly shown by the survey, although there is a clear shift towards a more cash-based economy.

Fishing in rural areas is both for subsistence and artisanal purposes. Interestingly, communities with CBFMP and an MPA have more fishers compared with non-CBFMP and inland villages. Male fishers are mainly commercially oriented for both finfish and invertebrates, whereas women mostly target invertebrates.

Communities are aware of the fisheries regulations that are in place and as a result fishing pressure is concentrated at particular fishing grounds. This may have a direct impact on fish size classes and certain species, and shows the high level of awareness of the regulations. However, more enforcement is needed to ensure that size limits serve to effectively control fishing for undersized fish and invertebrate species. Ongoing resource monitoring systems in place should be continued to regularly monitor these fisheries resources and advice communities to strengthen their management measures in place.

Although there are numerous set of socioeconomic fisheries data sets, few surveys have adopted similar methodology and collected comparable information. Therefore, opportunity is limited to conduct a time series comparison of these data sets. It is highly recommended by this report that any future socioeconomic fisheries survey, the adoption of the survey methodology presented here, as well as

entering the data to the SEMCoS database set up specifically for this purpose. Significant amounts of data were collected during this survey including the “key informant questionnaire” where we interviewed mostly village mayors and elders. Data set is not presented in this report, however, information are documented for future reference of traditional fishing grounds and methods, spawning times and locations, names of any fish or invertebrates that only known for in their village and village fisheries management measures in place. This information is of useful for advisory and awareness programs to further develop our local people’s capacity and knowledge of the importance of sustainable fisheries management and its contribution to food security and livelihoods of all Samoans.

## 7 References

---

- Agriculture Census. 2009, 2005, 2004, 2002, 1999. Samoa Bureau of Statistics and Ministry of Agriculture and Fisheries.
- Fisheries Division. 2013. Annual Report for 2012/2013. Ministry of Agriculture and Fisheries.
- Gillett R. 2011. Fisheries of the Pacific Islands: Regional and national information. FAO Regional Office for Asia and the Pacific, Bangkok Thailand. RAP Publication 2011/01. 290 p.
- Gillett R. 2009. Some thoughts on the Interface between Fisheries and Household Income and Expenditure Surveys (HIES) in the Pacific Islands. Workshop on Using HIES and Censuses in Fisheries Management. Secretariat of the Pacific Community, Noumea, 5pages.
- Household Income and Expenditure Surveys (HIES). 2009, 2008, 2006, 2005, 2004, 2002, 1999, 1997. Samoa Bureau of Statistics and Ministry of Agriculture and Fisheries.
- Kronen M., Stacey N., Holland P., Magron F. and Power M. 2007. Socioeconomic fisheries surveys in Pacific Islands: A manual for the collection of a minimum dataset. Noumea, New Caledonia: Secretariat of the Pacific Community.
- Passfield K., King M., Mulipola A. and Ropeti E. 2000. Report of a household fisheries and dietary survey. Fisheries Division, Ministry of Agriculture, Forests, Fisheries and Meteorology, Apia Samoa.
- Samoa Bureau of Statistics (SBS). 2011. Samoa Population and Housing Census, Tabulation Report v.1, Apia Samoa.
- Samoa Bureau of Statistics (SBS). 2012, 2008, 2006, 2001. Samoa Population and Housing Census, Apia Samoa.
- Samoa Bureau of Statistics. (SBS) 2008. A report on the estimation of basic needs poverty lines, and the incidence and characteristics of hardship and poverty: Poverty Report.
- Valenia S., Mulipola A., Tauaefa A. and Tuaepepe O. 2006. Samoa fisheries socioeconomic report. Fisheries Division, Ministry of Agriculture and Fisheries, Apia Samoa.
- Vunisea A., Friedman K., Awira R., Kronen M., Pinca S., Chapman L., Magron F., Sauni S., Pakoa K. and Lasi F. 2005. Samoa country report: Profiles and results from survey work at Manono-uta, Salelavalu, Vailoa and Vaisala. Pacific Regional Oceanic and Coastal Fisheries Development Programme (PROCFish/C/CoFish) Secretariat of the Pacific Community, Noumea New Caledonia.

## 8 Appendix 1: Survey forms used

### HOUSEHOLD DEMOGRAPHY AND CONSUMPTION SURVEY

#### QUESTIONNAIRE FORM

Target Group:

- Head of household, or
- Women responsible for preparing food for the household

Objective: To gather detailed information on:

- average household size and composition,
- average household consumption pattern,
- average number of fishers by gender, and
- average number of boats per household.

Village	
Household No	
Date	
Name of surveyor	

Person interviewed ( <i>confidential information, names will not be published</i> )			
Name	Age (years)	Gender	
		male	female

HH.1 How many people usually live and eat in your household?	<input type="text"/> enter number of people			
HH.2 What are the ages of the male and female members in this household (include children and older people; please only quote persons living permanently in this household)?	males		females	
	No	age (or year of birth)	No	age (or year of birth)
	1		1	
	2		2	
	3		3	
	4		4	
	5		5	
	6		6	

<p>HH.3 How many people in your household fish or collect on reefs and in the lagoon regularly? (do not include people who only fish once or twice a year )</p>	<p>invertebrate fishers</p> <p>male <input type="checkbox"/> female <input type="checkbox"/></p> <p>finfishers</p> <p>male <input type="checkbox"/> female <input type="checkbox"/></p> <p>invertebrate &amp; finfishers</p> <p>male <input type="checkbox"/> female <input type="checkbox"/></p>																										
<p>HH.4 Does this household own a boat?</p>	<p>yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>↓</p> <p>how many? <input type="checkbox"/></p> <p>↓</p> <p>which type?</p> <p>1. canoe <input type="checkbox"/> sailboat <input type="checkbox"/> motorised <input type="checkbox"/></p> <p>2. canoe <input type="checkbox"/> sailboat <input type="checkbox"/> motorised <input type="checkbox"/></p> <p>3. canoe <input type="checkbox"/> sailboat <input type="checkbox"/> motorised <input type="checkbox"/></p>																										
<p>HH. 5 Where does the cash money in this household come from? (only list the sources of money contributed by any of the people who live here usually) (rank options, 1 = most money, 2 = second most important income source, 3 = third most important income source, 4 = least important income source)</p>	<p>tick <input checked="" type="checkbox"/> source of income rank (1-4)</p> <p><input type="checkbox"/> fishing/seafood collection <input type="checkbox"/></p> <p><input type="checkbox"/> agriculture <input type="checkbox"/></p> <p><input type="checkbox"/> salary <input type="checkbox"/></p> <p><input type="checkbox"/> others (handicraft, etc.) <input type="checkbox"/></p> <p>↓</p> <p>specify: _____</p>																										
<p>HH.6 During an average/normal week, how often do you</p>	<table border="1"> <tr> <td colspan="8">number of days per week:</td> </tr> <tr> <td><input type="checkbox"/></td> <td>or, specify</td> </tr> <tr> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> </tr> </table>	number of days per week:								<input type="checkbox"/>	or, specify	7	6	5	4	3	2	1									
number of days per week:																											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	or, specify																			
7	6	5	4	3	2	1																					

prepare fish for your family? (tick box)	fresh fish								
	other seafood								
	canned fish								

HH.7 On average, how much do you cook per day for your household?	FINFISH (enter no of fish per size class, using size chart – tool used while interviewing)							
	size class	A	B	C	D	E	F	G
	no of fish							
	OTHER SEAFOOD (enter data using size charts – tools used while interviewing)							
	and	or	seafood (name)	no	size	kg		
HH.8 On a day when you prepare canned fish, how many cans do you use on average/normally for the household (enter no of cans):	size of can			no of cans/day				
	small							
	medium							
	large							
HH.9 Where do you normally get your fresh fish from, and which source is the most common?(tick box and rank from 1- 3)	tick <input checked="" type="checkbox"/> rank (1-3)							
	<input type="checkbox"/>	<input type="checkbox"/>	caught by me or someone else from this household					
	<input type="checkbox"/>	<input type="checkbox"/>	get it from someone else (no money paid for)					
HH.10 Where do you normally get your invertebrates (creatures from the sea other than fish) from, and which source being the most common? (tick box and rank from 1- 3)	tick <input checked="" type="checkbox"/> rank (1-3)							
	<input type="checkbox"/>	<input type="checkbox"/>	caught by me or someone else from this household					
	<input type="checkbox"/>	<input type="checkbox"/>	get it from someone else (no money paid for)					
	<input type="checkbox"/>	<input type="checkbox"/>	buy it; name place: _____					

**THANK YOU!**

## FINFISHER SURVEY

Target Group: Fishers (men and women of 15 years and older) from households surveyed

Objective: To get detailed information on average catch size, composition, fishing technique, proportions for subsistence, gift and sale, conservation and preservation capabilities

Village	
Household No	
Date	
Name of surveyor	

Person interviewed (confidential information, names will not be published)			
Name	Age (years)	Gender	
		male	female

F.1 Which areas do you fish (tick box and use charts):

coastal reef	lagoon	outer reef	pelagic/open ocean
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F.2 How often (times/week) do you fish in each of the habitats visited?

habitats:

coastal reef	lagoon	outer reef	pelagic/open ocean	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____ times/per week/month
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____ times/per week/month
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____ times/per week/month

F.3 Do you use a boat for fishing?

always	sometimes	never
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F.4 How long is your normal/average fishing trip including transport to/from fishing site, fishing and landing times? (tick box):

< 2 hours     
  2-6 hours     
  6-12 hours     
  >12 hours

F.5 When do you go fishing? (tick box):

only during the day     
  only during the night     
  day and night

F.6 Do you fish all year?      yes       no

If no, which months do you NOT fish? (tick box):

Jan	Feb	March	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
<input type="checkbox"/>											

F.7 Which techniques do you use? (tick box –FAO technique pixels...)

handline  
 castnet  
 spear (diving)  
 trolling  
 gillnet, mesh size: \_\_\_\_\_ (inch/cm)  
 handheld spear, walking:  canoe:   
 deep bottom line  
 poison, which one? \_\_\_\_\_  
 others, specify: \_\_\_\_\_

F.8 Do you use only one technique per each fishing trip, or do you use several during one trip?

one technique/trip     more than one techniques/trip:

If more than one, which ones do you combine during one trip?

\_\_\_\_\_

F.9 What is your average catch from a normal fishing trip (your catch/share only):

kg                         

size class:                      A      B      C      D      E      F

number of fish:                                   

F.10 On an average/normal fishing trip like above, what fish do you catch? (fill in the names and numbers per size class):

technique you use most:						
name	size class (use chart)					
	A	B	C	D	E	F

F.11 Where do you sell fish to? (tick box):

only inside the community   

only outside the community     which place: \_\_\_\_\_

inside and outside the community     which place: \_\_\_\_\_

F. 12 To whom do you sell? (tick box):

person to person (door-to-door, road side)	<input type="checkbox"/>
shop	<input type="checkbox"/>
market	<input type="checkbox"/>
middleman/agent	<input type="checkbox"/>

F.13 Do you use any preservation method for your catch? (tick box)

		regularly	sometimes	never
<input type="checkbox"/>	ice on fishing trips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	refrigeration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	freezing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	drying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	others, specify _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**THANK YOU**

## INVERTEBRATE FISHER SURVEY

Target Group: Fishers (men and women of 15 years and older) from households surveyed

Objective: To get detailed information on average catch size, composition, fishing technique, proportions for subsistence, gift and sale, conservation and preservation capabilities

Village:	
Household No:	
Date:	
Name of surveyor:	

Person interviewed (confidential information, names will not be published)			
Name	Age (years)	Gender	
		male	female

IF.1 Which areas do you target (tick box and use charts):

### GLEANING:

<input type="checkbox"/> soft bottom (seagrass, sand)	<input type="checkbox"/> mangrove & mud gleaning
<input type="checkbox"/> sand & beach gleaning	<input type="checkbox"/> reef top gleaning

### DIVING:

<input type="checkbox"/> beche-de-mer diving	<input type="checkbox"/> mother of pearl diving trochus, pearl shell etc.
<input type="checkbox"/> lobster diving	<input type="checkbox"/> other diving, clams, octopus

IF.2 How often (times/week) and during which months do you fish in each of the habitats visited?

tick		times/week	no of months/year
	<b>gleaning</b>		
	soft bottom (sand, seagrass)		
	mangrove & mud gleaning		
	sand & beach		
	reef top		
	<b>diving</b>		
	beche de mer		
	lobster		
	mother of pearl, trochus, pear shell, etc.		
	other, such as clam, octopus		

IF.3. How long do you go fishing (including time for transport or walking to/from fishing ground, fishing/collection and landing)

tick	fisheries	duration of trip in hourse				glean/fish at		
		<2	2-4	4-6	>6	day	night	day & night
	gleaning							
	diving							

IF.4 Do you use a boat for fishing?

	always	sometimes	never
gleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
diving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IF.5 On a normal gleaning/fishing trip, what species and how much do you catch? (fill in the names and numbers per size class):

**Collection:**

softbottom (sand, seagrass, etc.	<input type="checkbox"/>
sand & beach	<input type="checkbox"/>
mangroves & mud	<input type="checkbox"/>
reef top	<input type="checkbox"/>

name	total number/ trip	total kg/trip	average size cm	used for		
				cons.	gift	sale

- Diving:**
- beche-de-mer
  - lobster
  - mother of pearl (trochus, pearl shell, etc.)
  - others (clam, octopus, etc.)

name	total number/ trip	total kg/trip	average size cm	used for		
				cons.	gift	sale

IF. 6 For those species that you say you normally sell, answer this question:

species for sale, (copy from above)	processing level	where do you sell?	how often times/week times/month	how much you sell each time? quantity/unit	price you get money/unit

**THANK YOU**

## 9 Appendix 2: Data from the 2012/13 socioeconomic survey

### Demographic characteristics

Region	Total number of households surveyed	Total number of people surveyed	Average household size	Percentage of males	Percentage of females	Percentage of males ≥15 years	Percentage of females ≥15 years
Non-CBFMP Upolu	161.00	1200.00	7.45	51.08	48.92	32.17	32.58
Non-CBFMP Savaii	109.00	800.00	7.34	53.13	46.88	32.00	30.00
Inland Savaii	55.00	386.00	7.02	47.41	52.59	34.20	30.31
Inland Upolu	103.00	728.00	7.07	50.41	49.59	32.83	33.52
CBFMP Savaii	133.00	1042.00	7.83	50.86	49.14	32.82	32.05
MPA Upolu	124.00	975.00	7.86	49.74	50.26	31.28	30.77
CBFMP Upolu	196.00	1487.00	7.59	51.71	48.29	34.50	32.08
	<b>881.00</b>	<b>6618.00</b>	<b>7.45</b>	<b>50.62</b>	<b>49.38</b>	<b>32.83</b>	<b>31.62</b>

### Boat assets

Region	Average number of boats per household	Average number of canoes per household	Average number of sail boats per household	Average number of motor boats per household
Non-CBFMP Upolu	0.273	0.224	0.000	0.050
Non-CBFMP Savaii	0.156	0.119	0.000	0.037
Inland Savaii	0.018	0.018	0.000	0.000
Inland Upolu	0.058	0.019	0.039	0.000
CBFMP Savaii	0.383	0.368	0.000	0.015
MPA Upolu	0.476	0.460	0.000	0.016
CBFMP Upolu	0.388	0.372	0.000	0.015

### Annual per capita consumption

Region	Total population	Total consumption (kg/year)			Average per capita consumption (kg/per capita/year)		
		Finfish	Invertebrates	Canned fish	Finfish	Invertebrates	Canned Fish
Non-CBFMP Upolu	12022	337032	138954	251977	38.82	17.13	29.98
Non-CBFMP Savaii	7934	279157	363362	158780	53.11	80.65	30.81
Inland Savaii	3846	93012	162695	74852	32.57	52.02	27.13
Inland Upolu	7739	139092	62270	184103	26.89	14.20	34.22
CBFMP Savaii	10263	575043	639973	191086	78.84	92.20	27.61
MPA Upolu	10198	338110	477875	165307	43.38	92.45	21.97
CBFMP Upolu	13861	491522	238848	261714	49.45	34.56	28.54
	<b>65864</b>	<b>2252968</b>	<b>2083977</b>	<b>1287819</b>	<b>46.15</b>	<b>54.74</b>	<b>28.61</b>

### Frequency of seafood consumption from household survey

Region	Frequency of finfish consumption (days/week)	Frequency of invertebrates consumption (days/week)	Frequency of canned fish consumption (days/week)
Non-CBFMP Upolu	2.60	1.19	3.35
Non-CBFMP Savaii	2.82	1.54	3.46
Inland Savaii	2.18	1.04	3.53
Inland Upolu	1.97	1.03	3.58
CBFMP Savaii	3.43	2.12	3.32
MPA Upolu	2.75	1.23	2.73
CBFMP Upolu	3.18	1.01	3.09

**First source of income percentages**

<b>Region</b>	<b>Number of households surveyed</b>	<b>Fishing (%)</b>	<b>Agriculture (%)</b>	<b>Salary (%)</b>	<b>Other (%)</b>
Non-CBFMP Upolu	161	14.3	21.7	50.3	12.4
Non-CBFMP Savaii	109	12.8	32.1	41.3	13.8
Inland Savaii	55	1.8	45.5	41.8	10.9
Inland Upolu	103	2.9	32.0	52.4	12.6
CBFMP Savaii	133	19.5	27.1	42.1	11.3
MPA Upolu	124	25.0	29.0	40.3	5.6
CBFMP Upolu	196	19.4	22.4	45.4	11.7

**Second source of income percentages**

<b>Region</b>	<b>Number of households surveyed</b>	<b>Fishing (%)</b>	<b>Agriculture (%)</b>	<b>Salary (%)</b>	<b>Other (%)</b>
Non-CBFMP Upolu	161	6.8	20.5	14.9	19.9
Non-CBFMP Savaii	109	6.4	22.9	17.4	17.4
Inland Savaii	55	7.3	29.1	14.5	14.5
Inland Upolu	103	1.9	20.4	11.7	16.5
CBFMP Savaii	133	10.5	29.3	16.5	15.8
MPA Upolu	124	16.1	31.5	13.7	11.3
CBFMP Upolu	196	10.7	25.0	18.9	11.2

**Source of finfish consumed (ranked by importance)**

Region	Caught			Received as gift			Bought		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Non-CBFMP Upolu	27.33	5.59	0.00	10.56	24.22	4.35	59.01	11.80	2.48
Non-CBFMP Savaii	36.70	0.92	0.92	10.09	36.70	6.42	53.21	22.02	1.83
Inland Savaii	23.64	1.82	0.00	7.27	29.09	0.00	69.09	14.55	1.82
Inland Upolu	13.59	2.91	0.97	10.68	29.13	0.97	68.93	8.74	1.94
CBFMP Savaii	44.36	1.50	0.75	7.52	42.86	4.51	46.62	21.05	3.01
MPA Upolu	45.97	5.65	0.00	12.90	15.32	8.06	38.71	18.55	7.26
CBFMP Upolu	40.82	5.10	0.00	10.71	20.41	3.57	45.92	16.33	2.04

**Source of invertebrates consumed (ranked by importance)**

Region	Caught			Received as gift			Bought		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Non-CBFMP Upolu	24.22	0.00	0.00	8.07	13.04	0.00	29.81	5.59	1.86
Non-CBFMP Savaii	25.69	0.00	0.00	10.09	29.36	1.83	33.94	14.68	1.83
Inland Savaii	20.00	1.82	0.00	10.91	21.82	0.00	27.27	10.91	0.00
Inland Upolu	8.74	0.00	0.97	10.68	9.71	0.00	33.98	3.88	0.97
CBFMP Savaii	33.08	0.00	0.00	14.29	42.11	4.51	44.36	18.80	0.75
MPA Upolu	40.32	1.61	0.00	0.00	5.65	0.81	13.71	4.03	1.61
CBFMP Upolu	23.98	1.53	0.00	6.63	12.24	0.51	17.86	2.04	2.04

**Percentage of adult fishers**

Region	Total no of adults in households surveyed	Total no of fishers in households surveyed	Percentage of fishers from adult population
Non-CBFMP Upolu	777	85	10.9
Non-CBFMP Savaii	496	66	13.3
Inland Savaii	249	21	8.4
Inland Upolu	483	25	5.2
CBFMP Savaii	676	107	15.8
MPA Upolu	605	119	19.7
CBFMP Upolu	990	138	13.9

**Number of fishers by gender and type of fisheries (i.e. finfish and invertebrates)**

<b>Region</b>	<b>Total no of fishers in households surveyed</b>	<b>No of invertebrate male fishers</b>	<b>No of invertebrate female fishers</b>	<b>No of finfish male fishers</b>	<b>No of finfish female fishers</b>	<b>No of finfish and invertebrate male fishers</b>	<b>No of finfish and invertebrate female fishers</b>
Non-CBFMP Upolu	85	9	10	36	0	25	0
Non-CBFMP Savaii	66	7	8	33	0	18	0
Inland Savaii	21	0	3	9	0	8	0
Inland Upolu	25	0	2	13	0	7	0
CBFMP Savaii	107	2	18	43	0	42	0
MPA Upolu	119	13	11	44	2	44	2
CBFMP Upolu	138	4	2	87	0	38	0
	<b>561</b>	<b>35</b>	<b>54</b>	<b>265</b>	<b>2</b>	<b>182</b>	<b>2</b>

**Frequency of fishing trips and average finfish catch by gender**

Region	Average no of fishing trips for men (times/year)	Average no of fishing trips for women (times/year)	Average catch for men (kg/year)	Average catch for women (kg/year)
CBFMP Savaii	260.71		2877.40	
CBFMP Upolu	255.23	275.61	2737.67	1501.92
Inland Savaii	126.63		1170.13	
Inland Upolu	118.51	52.14	468.05	16.75
MPA Upolu	193.04	208.57	1405.97	280.65
Non-CBFMP Savaii	244.67	104.29	1975.34	0.00
Non-CBFMP Upolu	173.65	169.46	1093.07	1784.24
	<b>196.06</b>	<b>162.02</b>	<b>1675.38</b>	<b>716.71</b>

**Frequency of fishing trips and average invertebrate catch by gender**

Region	Average no of fishing trips for men (times/year)	Average no of fishing trips for women (times/year)	Average catch for men (kg/year)	Average catch for women (kg/year)
CBFMP Savaii	298.82	140.65	3549.82	4657.82
CBFMP Upolu	282.44	230.30	1282.62	1900.38
Inland Savaii	187.71	81.52	1045.74	830.85
Inland Upolu	208.57	156.43	684.88	112.15
MPA Upolu	287.68	161.17	2618.00	5262.02
Non-CBFMP Savaii	239.86	230.92	3178.92	6131.44
Non-CBFMP Upolu	284.78	271.89	1481.35	1948.05
	<b>255.70</b>	<b>181.84</b>	<b>1977.33</b>	<b>2977.53</b>

**Total annual finfish catch by gender**

<b>Region</b>	<b>Annual finfish catch for men (mt/year)</b>	<b>Annual finfish catch for women (mt/year)</b>	<b>Total annual finfish catch (mt/year)</b>
Non-CBFMP Upolu	668.02	89.38	757.40
Non-CBFMP Savaii	999.11	0.00	999.11
Inland Savaii	198.20		198.20
Inland Upolu	99.52	0.53	100.05
CBFMP Savaii	2409.01		2409.01
MPA Upolu	1294.13	20.55	1314.68
CBFMP Upolu	3189.88	98.00	3287.88
<b>Total annual finfish catch by gender</b>	<b>8857.86</b>	<b>208.46</b>	<b>9066.32</b>

**Total annual invertebrate catch by gender**

<b>Region</b>	<b>Annual invertebrate catch for men (mt/year)</b>	<b>Annual invertebrate catch for women (mt/year)</b>	<b>Total invertebrate annual catch (mt/year)</b>
Non-CBFMP Upolu	504.60	292.75	797.35
Non-CBFMP Savaii	788.17	486.47	1274.63
Inland Savaii	83.35	33.11	116.47
Inland Upolu	50.97	5.96	56.93
CBFMP Savaii	1538.43	917.55	2455.99
MPA Upolu	1560.86	880.62	2441.48
CBFMP Upolu	502.15	159.43	661.58
<b>Total annual invertebrate catch by gender</b>	<b>5028.52</b>	<b>2775.90</b>	<b>7804.42</b>

### Species diversity

Region	Total no of finfish vernacular names recorded	Total no of invertebrate vernacular names recorded
Non-CBFMP Upolu	40	33
Non-CBFMP Savaii	53	18
Inland Savaii	25	11
Inland Upolu	17	6
CBFMP Savaii	51	27
MPA Upolu	42	27
CBFMP Upolu	50	22

### Purpose of catching finfish

Region	% men fishing finfish for sale	% men fishing finfish for consumption	% women fishing finfish for sale	% women fishing finfish for consumption
Non-CBFMP Upolu	55.88	44.12	50	50
Non-CBFMP Savaii	69.23	30.77	100	0
Inland Upolu	9.09	90.91	0	100
MPA Upolu	68.09	31.91	100	0
CBFMP Upolu	59.65	40.35	71.43	28.57
CBFMP Savaii	67.21	32.79		
Inland Savaii	42.86	57.14		

**Finfish market place and clients**

<b>Region</b>	<b>Inside community sales (%)</b>	<b>Outside community sales (%)</b>	<b>To individuals (%)</b>	<b>To shops (%)</b>	<b>To market (%)</b>	<b>To middlemen and agents (%)</b>	<b>To restaurants (%)</b>
CBFMP Savaii	90.24	29.27	90.24	2.44	21.95	0.00	2.44
CBFMP Upolu	87.18	41.03	71.79	2.56	25.64	12.82	5.13
Inland Savaii	100.00	16.67	100.00	0.00	16.67	0.00	0.00
Inland Upolu	100.00	0.00	100.00	0.00	0.00	0.00	0.00
MPA Upolu	88.24	32.35	88.24	5.88	23.53	2.94	2.94
Non-CBFMP Savaii	100.00	32.14	96.43	7.14	28.57	3.57	10.71
Non-CBFMP Upolu	82.61	21.74	82.61	0.00	17.39	0.00	0.00

**Purpose of catching invertebrates**

<b>Region</b>	<b>Activity type</b>	<b>% men fishing invertebrates for sale</b>	<b>% men fishing invertebrates for consumption</b>	<b>% women fishing invertebrates for sale</b>	<b>% women fishing invertebrates for consumption</b>
Non-CBFMP Upolu	Diving	0	100	0	100
Non-CBFMP Upolu	Gleaning	0	100	0	100
Non-CBFMP Savaii	Diving	0	100	0	100
Non-CBFMP Savaii	Gleaning	0	100	0	100
Inland Savaii	Diving	0	100	0	100
Inland Savaii	Gleaning	0	100	0	100
Inland Upolu	Diving	0	100	0	100
CBFMP Savaii	Diving	0	100	0	100
CBFMP Savaii	Gleaning	0	100	0	100
MPA Upolu	Diving	0	100	0	100
MPA Upolu	Gleaning	0	100	0	100
CBFMP Upolu	Diving	0	100	0	100
CBFMP Upolu	Gleaning	0	100	0	100
Inland Upolu	Gleaning	0	100		

**Habitat targeted by finfish fishers**

<b>Region</b>	<b>Gender</b>	<b>% fishers targeting coastal reefs</b>	<b>% fishers targeting lagoon</b>	<b>% fishers targeting outer reefs</b>	<b>% fishers targeting mangroves</b>	<b>% fishers targeting open waters</b>
CBFMP Savaii	Men	37.70	73.77	42.62	1.64	0.00
CBFMP Upolu	Men	43.86	57.89	47.37	1.75	3.51
CBFMP Upolu	Women	28.57	85.71	57.14	0.00	0.00
Inland Savaii	Men	42.86	21.43	50.00	0.00	0.00
Inland Upolu	Men	27.27	45.45	45.45	9.09	0.00
Inland Upolu	Women	0.00	100.00	0.00	0.00	0.00
MPA Upolu	Men	21.28	55.32	61.70	0.00	2.13
MPA Upolu	Women	0.00	100.00	0.00	0.00	0.00
Non-CBFMP Savaii	Men	25.64	58.97	41.03	0.00	0.00
Non-CBFMP Savaii	Women	100.00	100.00	0.00	0.00	0.00
Non-CBFMP Upolu	Men	29.41	64.71	52.94	0.00	0.00
Non-CBFMP Upolu	Women	37.50	62.50	37.50	0.00	0.00

**Fisheries targeted by invertebrate fishers**

Region	Gender	Percentage targeting soft bottom areas	Percentage targeting mangrove and mud	Percentage targeting reef tops	Percentage targeting beche-de-mer	Percentage targeting mother of pearl	Percentage targeting lobster	Percentage targeting other invertebrates (e.g. clams, octopus)
CBFMP Savaii	Men	11.54	3.85	11.54	15.38	38.46	38.46	46.15
CBFMP Savaii	Women	33.33	0.00	20.00	33.33	13.33	0.00	13.33
CBFMP Upolu	Men	8.33	8.33	0.00	16.67	41.67	33.33	58.33
CBFMP Upolu	Women	41.67	0.00	16.67	16.67	33.33	16.67	25.00
Inland Savaii	Men	20.00	0.00	20.00	0.00	20.00	60.00	40.00
Inland Savaii	Women	0.00	33.33	66.67	0.00	33.33	33.33	33.33
Inland Upolu	Men	0.00	33.33	0.00	0.00	66.67	33.33	0.00
Inland Upolu	Women	0.00	0.00	0.00	50.00	50.00	0.00	100.00
MPA Upolu	Men	10.34	17.24	17.24	17.24	44.83	37.93	34.48
MPA Upolu	Women	27.27	36.36	0.00	36.36	9.09	0.00	45.45
Non-CBFMP Savaii	Men	10.00	0.00	15.00	5.00	45.00	35.00	60.00
Non-CBFMP Savaii	Women	42.86	0.00	28.57	28.57	28.57	0.00	42.86
Non-CBFMP Upolu	Men	15.00	10.00	5.00	25.00	25.00	40.00	55.00
Non-CBFMP Upolu	Women	21.43	7.14	28.57	50.00	28.57	14.29	42.86

### Time spent finfish fishing

Region	Gender	Percentage of time spent fishing during the day	Percentage of time spent fishing at night	Percentage of time spent fishing during day and night
CBFMP Savaii	Men	14.75	22.95	62.30
CBFMP Upolu	Men	24.56	22.81	52.63
CBFMP Upolu	Women	14.29	14.29	71.43
Inland Savaii	Men	7.14	78.57	14.29
Inland Upolu	Men	54.55	18.18	27.27
Inland Upolu	Women	100.00	0.00	0.00
MPA Upolu	Men	19.15	42.55	38.30
MPA Upolu	Women	0.00	100.00	0.00
Non-CBFMP Savaii	Men	20.51	17.95	61.54
Non-CBFMP Savaii	Women	0.00	100.00	0.00
Non-CBFMP Upolu	Men	29.41	20.59	50.00
Non-CBFMP Upolu	Women	25.00	37.50	37.50

### Boat transport for finfish fishing

Region	Gender	Always use a boat (%)	Sometimes use a boat (%)	Never use a boat (%)
CBFMP Savaii	Men	55.74	1.64	42.62
CBFMP Upolu	Men	61.40	7.02	31.58
CBFMP Upolu	Women	57.14	0.00	42.86
Inland Savaii	Men	7.14	7.14	85.71
Inland Upolu	Men	18.18	9.09	72.73
Inland Upolu	Women	0.00	0.00	100.00
MPA Upolu	Men	76.60	6.38	17.02
MPA Upolu	Women	100.00	0.00	0.00
Non-CBFMP Savaii	Men	38.46	5.13	56.41
Non-CBFMP Savaii	Women	0.00	0.00	100.00
Non-CBFMP Upolu	Men	58.82	8.82	32.35
Non-CBFMP Upolu	Women	25.00	0.00	75.00

**Fishing techniques of finfish fishers**

Region	Gender	Handline	Cast net	Spear (diving)	Trolling	Gill net	Handheld spear (used when walking)	Handheld spear (used in canoe)	Deep bottom	Other techniques
CBFMP Savaii	Men	11.48	1.64	77.05	0.00	14.75	1.64	1.64	3.28	4.92
CBFMP Upolu	Men	10.53	1.75	57.89	0.00	24.56	5.26	10.53	8.77	15.79
CBFMP Upolu	Women	28.57	14.29	85.71	0.00	0.00	0.00	14.29	0.00	0.00
Inland Savaii	Men	35.71	0.00	35.71	0.00	0.00	0.00	0.00	7.14	57.14
Inland Upolu	Men	18.18	0.00	63.64	0.00	0.00	0.00	0.00	9.09	27.27
Inland Upolu	Women	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
MPA Upolu	Men	6.38	6.38	74.47	4.26	17.02	4.26	4.26	6.38	10.64
MPA Upolu	Women	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-CBFMP Savaii	Men	15.38	0.00	53.85	2.56	5.13	5.13	2.56	20.51	30.77
Non-CBFMP Savaii	Women	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Non-CBFMP Upolu	Men	5.88	8.82	70.59	2.94	8.82	8.82	8.82	8.82	2.94
Non-CBFMP Upolu	Women	0.00	12.50	75.00	0.00	12.50	0.00	0.00	12.50	12.50

### Finfish fishing strategies

Region	Gender	Frequency of fishing (times/week)	Average duration of fishing trip (hours)	Average number of months fished per year	Use one technique per trip only (%)
CBFMP Savaii	Men	5.00	3.58	10.67	95.08
CBFMP Upolu	Men	4.89	3.68	10.26	82.46
CBFMP Upolu	Women	5.29	4.07	8.57	71.43
Inland Savaii	Men	2.43	5.79	9.93	71.43
Inland Upolu	Men	2.27	3.09	10.36	81.82
Inland Upolu	Women	1.00	3.00	3.00	100.00
MPA Upolu	Men	3.70	4.21	9.87	85.11
MPA Upolu	Women	4.00	6.50	9.00	100.00
Non-CBFMP Savaii	Men	4.69	4.85	10.32	92.31
Non-CBFMP Savaii	Women	2.00	10.00	12.00	100.00
Non-CBFMP Upolu	Men	3.33	3.22	8.82	94.12
Non-CBFMP Upolu	Women	3.25	3.69	10.38	87.50

### Invertebrate fishing strategies

Region	Gender	Frequency of fishing (times/week)	Average duration of fishing trip (hours)	Average number of months fished per year	Activity type
CBFMP Savaii	Men	6.10	3.61	11.00	Diving
CBFMP Savaii	Women	4.14	3.36	9.36	Diving
CBFMP Savaii	Men	4.50	2.58	9.67	Gleaning
CBFMP Savaii	Women	1.43	2.50	8.13	Gleaning
CBFMP Upolu	Men	5.27	2.59	10.27	Diving
CBFMP Upolu	Women	6.14	3.14	10.71	Diving
CBFMP Upolu	Men	3.50	3.50	4.50	Gleaning
CBFMP Upolu	Women	1.67	3.25	7.50	Gleaning
Inland Savaii	Men	4.67	3.33	9.00	Diving
Inland Savaii	Women	1.12	3.50	7.00	Diving
Inland Savaii	Men	2.00	3.00	9.00	Gleaning
Inland-Savaii	Women	1.23	1.75	9.00	Gleaning
Inland Upolu	Men	3.00	1.50	12.00	Diving
Inland Upolu	Women	3.00	4.00	4.00	Diving
Inland Upolu	Men	6.00	5.00	8.00	Gleaning
MPA Upolu	Men	5.30	3.16	10.59	Diving
MPA Upolu	Women	3.50	2.42	7.25	Diving
MPA Upolu	Men	3.17	3.33	8.50	Gleaning
MPA Upolu	Women	2.17	1.33	5.33	Gleaning
Non-CBFMP Savaii	Men	5.47	3.07	10.67	Diving
Non-CBFMP Savaii	Women	4.25	3.63	10.75	Diving
Non-CBFMP Savaii	Men	2.00	2.20	10.40	Gleaning
Non-CBFMP Savaii	Women	4.67	3.33	10.67	Gleaning
Non-CBFMP Upolu	Men	6.22	3.30	9.43	Diving
Non-CBFMP Upolu	Women	6.11	3.21	10.56	Diving
Non-CBFMP Upolu	Men	3.20	2.60	5.80	Gleaning
Non-CBFMP Upolu	Women	2.25	3.25	5.63	Gleaning

**Finfish catch rates by gender**

<b>Region</b>	<b>Average catch for men (kg/trip)</b>	<b>Average catch for women (kg/trip)</b>	<b>CPUE for men (kg/hour)</b>	<b>CPUE for women (kg/hour)</b>	<b>Average annual catch for men (kg/year)</b>	<b>Average annual catch for women (kg/year)</b>
CBFMP Savaii	19.77		5.92		3032.64	
CBFMP Upolu	14.88	12.14	6.00	3.26	3166.32	1859.06
Inland Savaii	15.01		3.19		1273.44	
Inland Upolu	8.25	1.55	3.39	0.52	508.53	16.75
MPA Upolu	13.31	2.31	4.88	0.35	1531.26	280.65
Non-CBFMP Savaii	14.62	16.69	3.62	1.67	1960.66	722.19
Non-CBFMP Upolu	9.89	18.12	3.05	5.32	1253.72	2230.30

**Preservation and storage methods for finfish**

Region	Ice Always (%)	Ice Sometimes (%)	Ice Never (%)	Refrigeration Always (%)	Refrigeration Sometimes (%)	Refrigeration Never (%)	Freezing Always (%)	Freezing Sometimes (%)	Freezing Never (%)
Non-CBFMP Upolu	4.76	0.00	21.43	71.43	9.52	16.67	0.00	0.00	21.43
Non-CBFMP Savaii	12.50	2.50	17.50	77.50	7.50	12.50	2.50	0.00	17.50
Inland Savaii	0.00	0.00	21.43	78.57	7.14	14.29	0.00	0.00	21.43
Inland Upolu	8.33	0.00	33.33	58.33	8.33	25.00	0.00	0.00	33.33
CBFMP Savaii	6.56	3.28	4.92	91.80	3.28	1.64	1.64	0.00	6.56
MPA Upolu	12.24	0.00	14.29	77.55	0.00	6.12	4.08	0.00	12.24
CBFMP Upolu	4.69	3.13	15.63	79.69	4.69	12.50	3.13	0.00	15.63

**Preservation and storage methods for finfish (cont'd)**

Region	Smoking Always (%)	Smoking Sometimes (%)	Smoking Never (%)	Drying Always (%)	Drying Sometimes (%)	Drying Never (%)	Others Always (%)	Others Sometimes (%)	Others Never (%)
Non-CBFMP Upolu	0.00	0.00	21.43	0.00	0.00	21.43	0.00	0.00	0.00
Non-CBFMP Savaii	0.00	0.00	17.50	0.00	0.00	17.50	0.00	0.00	0.00
Inland Savaii	0.00	0.00	21.43	0.00	0.00	21.43	0.00	0.00	0.00
Inland Upolu	0.00	0.00	33.33	0.00	0.00	33.33	0.00	0.00	0.00
CBFMP Savaii	0.00	0.00	6.56	0.00	0.00	6.56	0.00	0.00	0.00
MPA Upolu	0.00	0.00	12.24	0.00	0.00	12.24	0.00	0.00	0.00
CBFMP Upolu	0.00	0.00	15.63	0.00	0.00	15.63	0.00	0.00	0.00

**Total annual finfish exports (extrapolated total annual finfish catch, consumption and exports for region)**

Region	Total finfish catch (mt/year)	Total finfish consumption (mt/year)	Total finfish exports (mt/year)
CBFMP Savaii	2409.01	718.80	1690.21
CBFMP Upolu	3287.88	614.40	2673.47
Inland Savaii	198.20	116.26	81.93
Inland Upolu	100.05	173.86	-73.81 <sup>3</sup>
MPA Upolu	1314.68	422.64	892.04
Non-CBFMP Savaii	999.11	348.95	650.16
Non-CBFMP Upolu	757.40	421.29	336.11

**Total annual invertebrate exports (extrapolated total annual invertebrate catch, consumption and exports for region)**

Region	Total invertebrate catch (mt/year)	Total invertebrate consumption (wet weight mt/year)	Total invertebrate exports (mt/year) <sup>4</sup>
CBFMP Savaii	2455.99	1473.35	982.64
CBFMP Upolu	661.58	911.09	-249.51
Inland Savaii	116.47	335.82	-219.35
Inland Upolu	56.93	167.88	-110.95
MPA Upolu	2441.48	2117.79	323.69
Non-CBFMP Savaii	1274.63	812.76	461.88
Non-CBFMP Upolu	797.35	423.09	374.26

<sup>3</sup> Negative value indicates that the community is a net importer of finfish

<sup>4</sup> Negative value indicates that the community is a net importer of invertebrates

## 10 Appendix 3: List of villages surveyed, by strata and list of staff participating in the 2012/2013 socioeconomic survey

List of villages in each management strata categories

<b>CBFMP Upolu</b>	<b>Non-CBFMP Upolu</b>	<b>MPA Upolu</b>	<b>Inland Upolu</b>
1. Fagalii	1. Vaitele	1. Vaiusu	1. Tulaele
1. Saoluafata	2. Eva	2. Satitua	2. Leufisa
2. Vailoa Aleipata	3. Falefa	3. Saleaumua	3. Manunu
3. Saleapaga	4. Taelefaga	4. Lalomanu	4. Lalomauga
4. Aufaga	5. Samamea	5. Tafitoala	5. Piu
5. Matautu, Falealili	6. Saaga Siumu	6. Fusi	6. Siuniu
6. Malaemalu	7. Maninoa Siumu	7. Nuusuatia	7. Vailima
7. Poutasi	8. Matautu Falelatai	8. Sataoa	8. Aleisa
8. Matautu uta Lefaga	9. Pata	9. Saanapu	9. Tanumalala
9. Savaia	10. Utualii	10. Vaiee	10. Falevao
10. Safaatoa	11. Malie	11. Fausaga	
11. Siufaga Falelatai	12. Toamua	12. Ulutogia	
12. Satuimalufilufi	13. Faleaseela	13. Amaile	
13. Apolima uta			
14. Faleu Manono uta			
15. Faleu Manono tai			
16. Lepuiai Manono tai			
17. Apai Manono tai			
18. Satapuala			
19. Afega			
<b>CBFMP Savaii</b>	<b>Non-CBFMP Savaii</b>	<b>Inland Savaii</b>	<b>Summary:</b>
1. Salelavalu	1. Falealupo	1. Aopo	CBFMPs = 40
2. Sapapalii	2. Tufutafoe	2. Letui	Non-CBFMP = 27
3. Safua	3. Avao	3. Patamea	MPA-Upolu = 13
4. Salimu Faga	4. Safa'i	4. Samalaeulu	INLANDS = 20
5. Luua Faga	5. Faiaai	5. Fagafau	<b>Totals =100</b>
6. Sale Saipipi	6. Sagone	6. Samata uta	
7. Lano	7. Sala'ilua	7. Sili	
8. Saleaula	8. Mauga	8. Maota	
9. Satoalepai	9. Vaitoomuli	9. Tapueleele	
10. Fagamalo	10. Gataivai	10. Papa Sataua	
11. Manase	11. Satagalua, Salelologa		
12. Fatuvalu	12. Sapulu, Salelologa		
13. Sasina	13. Neiafu		
14. Asau	14. Lalomalava		
15. Vaisala			
16. Fagasa			
17. Foailalo			
18. Satuiatua			
19. Papa Puleia			

20. Tafua			
-----------	--	--	--

**Detailed list of villages per team per day**

Dates	Team 1	Team 2	Team 3	Team 4
25 June, Mon	Amaile (3)	Matautu Falealili (5)	Sataoa (7)	Tanumalala (3)
	Saleaumua (9)	Siuniu (2)	Nuusuatia (5)	Faleseela (12)
	Satitoo (8)	Piu (1)	Vaiee (6)	Safaatoa (7)
	Ulutogia (3)	Malaemalu (3)	Fusi (17)	
		Poutasi (6)	Fausaga (4)	
	23	17	39	22
26 June, Tue	Vailoa (6)	Saaga (6)	Tafitoala (5)	Savaia (6)
	Lalomanu (11)	Maninoa (6)	Saanapu (16)	Matautu Lefaga (12)
	Aufaga (6)			
	Saleapaga (7)			
	30	12	21	18
27 June, Wed	Taelefaga (3)	Vailele (50)	Matautu Falelatai (3)	Malie(32)
	Samamea (1)	Leufisa (5)	Siufaga Falelatai (7)	Afega (27)
	Falevao (7)		Pata (7)	
	Lalomauga (5)			
	Falefa (19)			
	35	55	17	59
28 June, Thur	Saoluafata (10)	Fagalii (25)	Apolima (6)	Faleu Tai (5)
	Manunu (20)	Vailima (23)	Satuimalufilufi (9)	Apai Tai (1)
	Eva (3)		Faleu uta-Manono (20)	Lepuiai Tai (3)
				Utualii (8)
	33	48	35	17
29 June, Fri	Tulaele (7)	Aleisa (25)	Satapuala (16)	Vaiusu (30)
	Toamua (11)			
	18	25	16	30
2 <sup>nd</sup> July, Mon	Salailua (10)	Tufutafoe (7)	Aopo (6)	Patamea (8)
	Satuiatua (3)	Neiafu (9)	Letui (4)	Samalaeulu (14)
	Foailalo (5)	Falealupo (8)	Sasina (7)	Mauga (3)
	Sagone (9)	Papa Sataua (4)		
	27	28	17	25
3 <sup>rd</sup> July, Tue	Faiaai (5)	Fagasa (3)	Fatuvalu (3)	Safai (4)
	Samata uta (7)	Vaisala (8)	Avao (4)	Manase (2)
	Fagafau (5)	Asau (17)	Fagamalo (6)	Saleaula (7)
			Satoalepai (4)	

	17	28	17	13
4 <sup>th</sup> July, Wed	Lano (11)	Lua (4)	Sapapalii (13)	Tapueleele (4)
	Sale Saipipi (10)	Satagaloa, Salelologa (4)	Lalomalava (6)	Salimu (4)
			Safua (4)	
	21	8	23	8
5 <sup>th</sup> July, Thur	Salelavalu (13)	Sapulu, Salelologa (16)	Vaitoomuli (9)	Gataivai (15)
			Maota (4)	Sili (13)
			Tafua (6)	Papa Puleia (3)
	13	16	19	31

List of Fisheries Division staff participating in the 2012/2013 socioeconomic survey

Team 1	Team 2	Team 3	Team 4
Joyce Samuelu Ah-Leong	Ulusapeti Tiitii	Autalavou Tauaefa	Maria Sapatu
Tauvae Su'a	Sesilia Luamanuvae	Mamoe Gie	Clifton Sa'e
Faasulu Fepuleai	Justin Aiafi	Ferila Samuelu	Tevita Apulu
Taumate Niu	Moso Lesa	Fatutolo Iene	Lui JJ Bell
Faamanatuga Itagia	Joe Tiatia	Tuluiga Taito	Solomona Tufuga
Kilifi Sue	Tavita Uaine	Enoka Tavita	Rilloy Tautalagia