

# FOOD SECURITY AND AGRICULTURE PRODUCTION ASSESSMENT

REPUBLIC OF PALAU | FEBRUARY 2017

ROUND 2

## SUMMARY

On the 23<sup>rd</sup> of March, 2016 the Republic of Palau declared a state of emergency due to drought conditions induced by the recent El Niño phenomenon. The National Oceanic and Atmospheric Agency in April 2016 declared Palau in the Extreme Drought Level 3 of 4, observing that the cumulative rainfall for Koror for the first part of the year was the lowest recorded since 1951. The primary source of water in Palau is the Ngerimel Reservoir, and during the droughts peak, it held only 19% of its normal capacity. As a result, tight water restrictions were implemented along with regulation of irrigation activities. However, the impact this had on agriculture and food security was relatively unknown.

To understand the impact of El Niño drought on food security and agriculture production, a survey team was deployed on 24<sup>th</sup> August 2016. 127 household surveys were collected across the states of Peleliu, Angaur and Kayangel.

These sites were selected by the Government as the most 'vulnerable areas' during the drought. The below report provides an insight into the food security and agriculture trends. The surveys were funded by USAID – Office of U.S Foreign Disaster Assistance.

The second survey was deployed on 1<sup>st</sup> of February 2017 and 112 household surveys were collected in this round across Peleliu, Angaur and Kayangel, to compare and solidify results gathered in the first round. This was coupled with government training on using the Kobo Toolbox – an online/offline data collection and analysis software.

Overall, the results of both surveys reveal the impact of the drought on food security and agriculture production is **minimal**. This can be attributed to the following reasons:

- The majority of food consumed by Palauans is imported and very little is grown at a subsistence level. The high reliance on imported foods has deflected the overall potential impact of the drought on food security (the most common foods – apart from taro and fish – are purchased at local supermarkets or stores);
- The agriculture sector only comprises a small percentage of livelihoods in Palau (only 11% of those surveyed engage with some form of subsistence living);
- The impact of the drought on crop production was minimal with all major crops producing the same amounts comparative to 6 months ago.

However, this does not mean that the food security of those surveyed is not vulnerable to disasters. For example, if a typhoon or flooding were to compromise ports (both sea and air), this could potentially disrupt the supply of imported foods, and cause significant security issues for the country. This report examines and provides evidence for the trend towards imported foods.

Upon consultation with government staff with government staff and the National Emergency Management Office (NEMO), the intensity of El Niño was felt mainly in the WASH sector. This

resulted in a three-week period in April 2016 with limited water supply and the ‘browning’ of trees across the country. The Government of Japan provided emergency relief goods (water containers and water bladders) through the Japan International Cooperation Agency. Then, in May 2016 the rains returned.

The report is divided into the following six sections: General Information, Food Security, Agriculture Production, Fisheries Production, Livestock Production and Water Management. Additionally, the report offers a set of recommendations for FAO and the Government of Palau, based on the data compiled in this report. *FAO is grateful for the support and contributions of the Pacific Academic Institute for Research (PAIR) in collecting data to formulate this report.*

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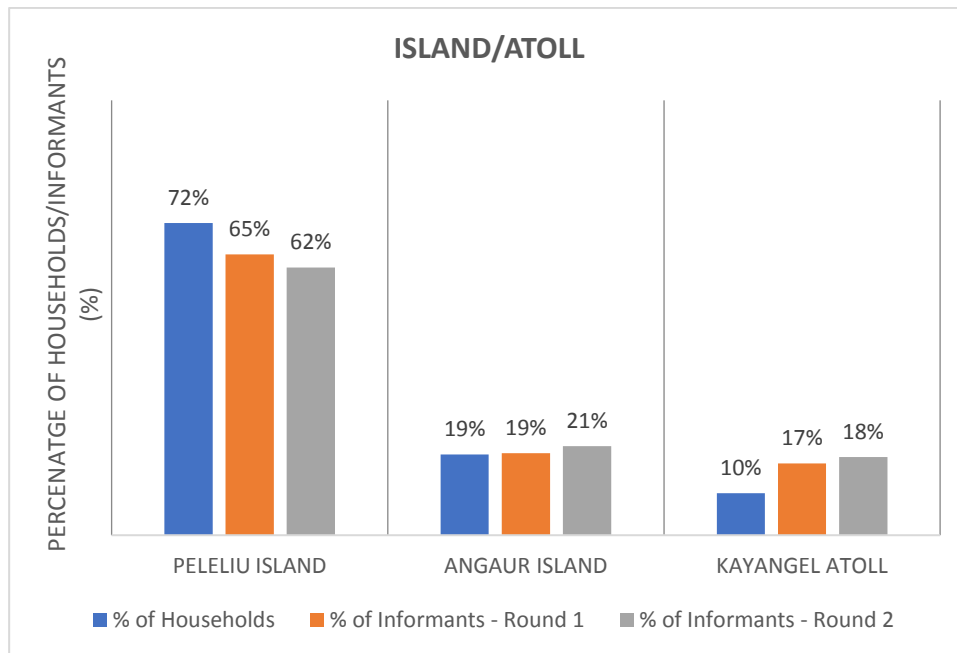
## 1. GENERAL INFORMATION

This section outlines the social and economic characteristics of the households that participated in the survey. This section provides an overview of the demographic nature of the households including: age of participants, household size, education levels and common livelihoods. In total, 112 households were surveyed In Round 2.

### 1.1 Assessor – Organization

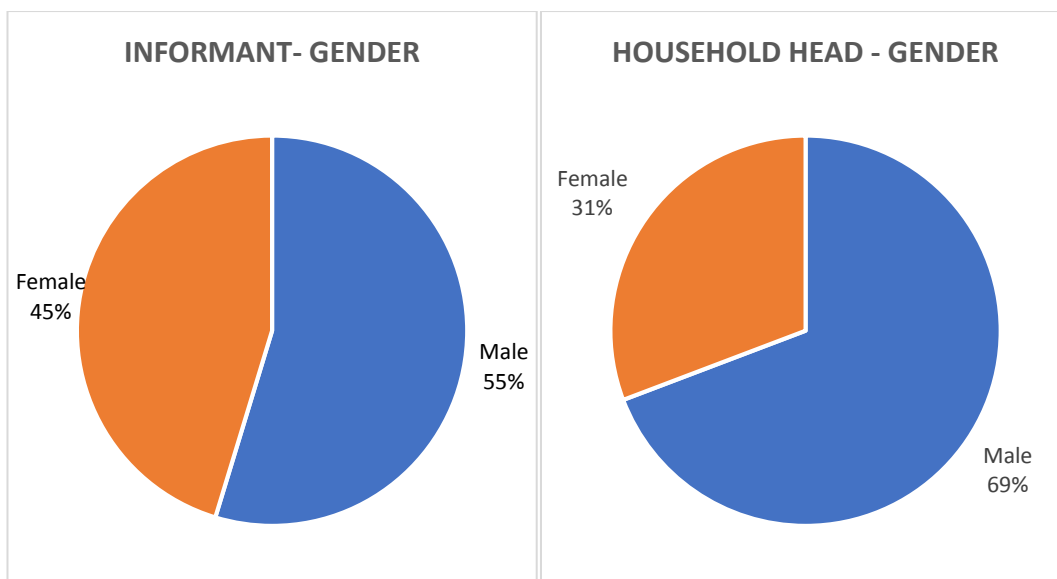
- All surveys collection was carried out by Pacific Academic Institute for Research (PAIR) this survey round.

### 1.2 Island/Atoll



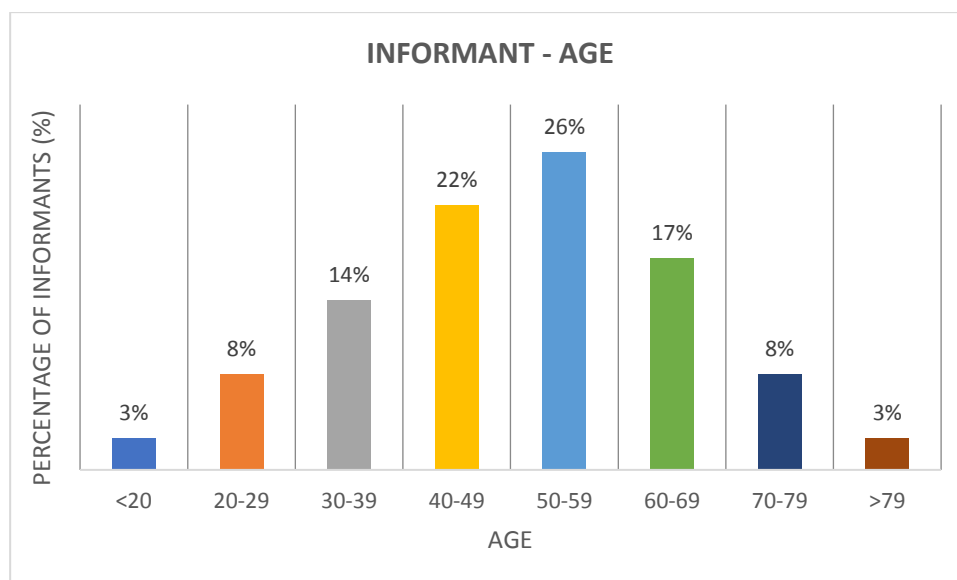
- The ratio of informants generally reflects the relative ratio of the total number of Palauan households on each of the three islands/atolls.
- Household on Palau Island are slightly under-represented, while households from the Kayangel Atoll are slightly over-represented in the survey Round 2.
- These ratios are very similar to those from Round 1, with minor fluctuations.
- The youngest informant in survey Round 2 was 18 years old and the oldest 85 years old.

### 1.3 Gender



- **The gender split for informants is representative for Palau, with 45% female compared to 55% male respondents in survey Round 2.** The 2015 Population Census reported 46% female and 54% male split in Palau’s population.<sup>1</sup>
- This is a slight improvement from Round 1, where 43% of informants were female.
- The gender split for household heads is less well balanced, with only 31% female compared to 69% male household heads reported, exactly the same balance as in Round 1.
- **Survey results suggest that men are twice as likely to be household heads in comparison to women.**

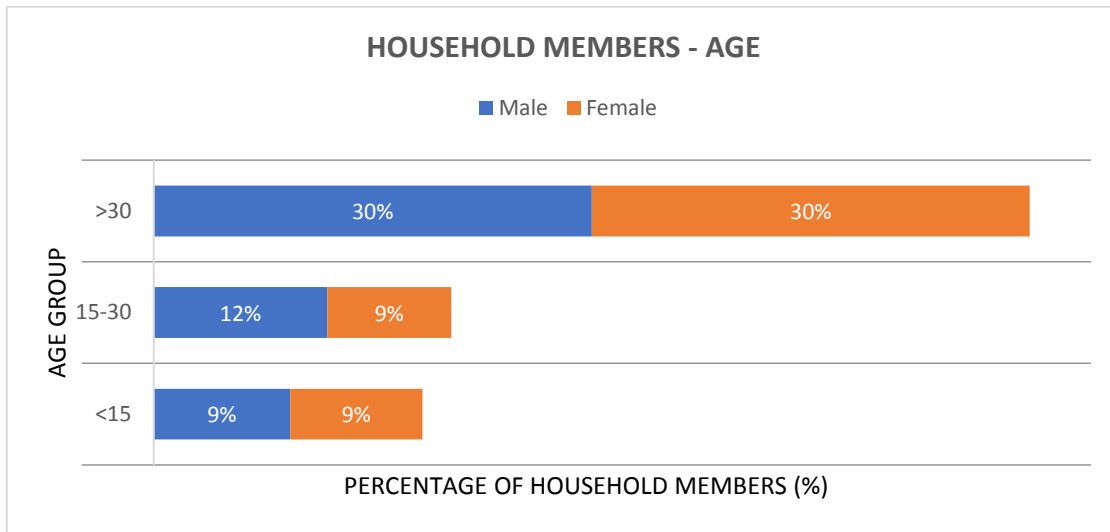
#### 1.4 Age



- **The largest proportion of informants, just over 1 in 4 of those interviewed, are in the 50-59 age group.** This was also the case in Round 1.
- Both the average and median age of informants in Round 2 was 51. The 2015 Population Census reports the median age of 33.5 for Palau.
- This high representation of older age groups is likely caused by a combination of:

<sup>1</sup> 2015 Census of Population, Housing and Agriculture for the Republic of Palau, Office of Planning and Statistics, Bureau of Budget and Planning.

- i. the surveyed areas having a large population of older people (this large population of older people is shown in the next chart).
- ii. the informants more likely to being one of the older people within the household.
- These findings are very similar to those of Round 1.



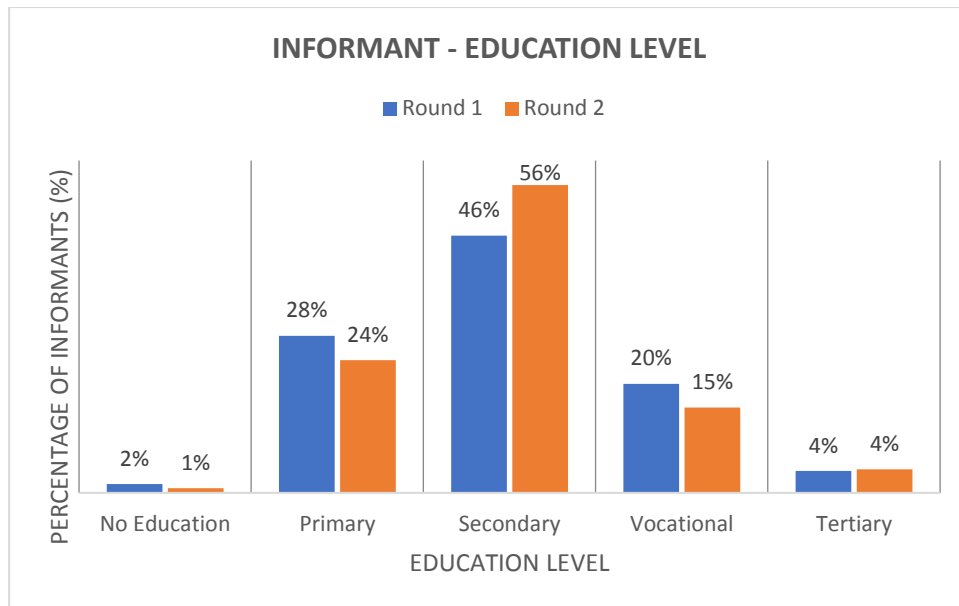
- **By far the greatest proportion of household members are adults (>30 years old).** This group accounts for 60% of all household members reported in the surveyed households.
- This suggests an aging population within the survey area.
- 21% of the household members are young adults (15-30 years old).
- 18% of the household members are children (<15 years old).
- Within each age group, a roughly a even split was reported between males and females, with the exception of young adults (15-30).
- **Surveyed households reported a slightly larger proportion of young adult male (15-30) household members in comparison to young adult female household members.**
- Findings for the age and gender of household members are very similar to Round 1.

### 1.5 Household Size

Survey Round	Total No. of Households	Total No. of Household Members	Average Household Size
Round 1	127	411	3.24
Round 2	112	340	3.04

- **There were a total of 340 household members across the 112 households surveyed** (5 households have been removed from this particular statistic as anomalies).
- This gives an average household size of 3.04 people per household, slightly less than that of the households surveyed in Round 1, at 3.24 people per household. The 2015 Census reported an average household size of 3.4 people per household.

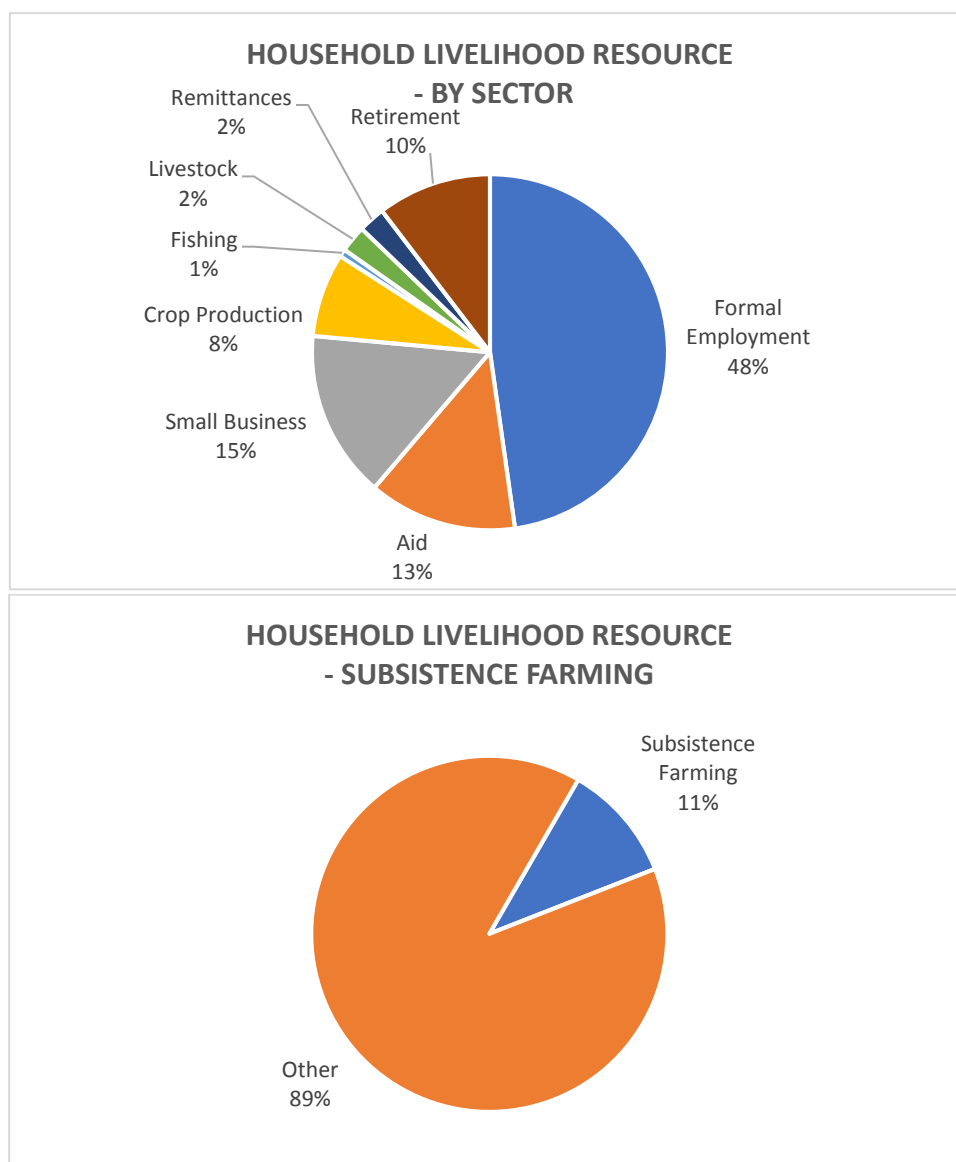
### 1.6 Education Level



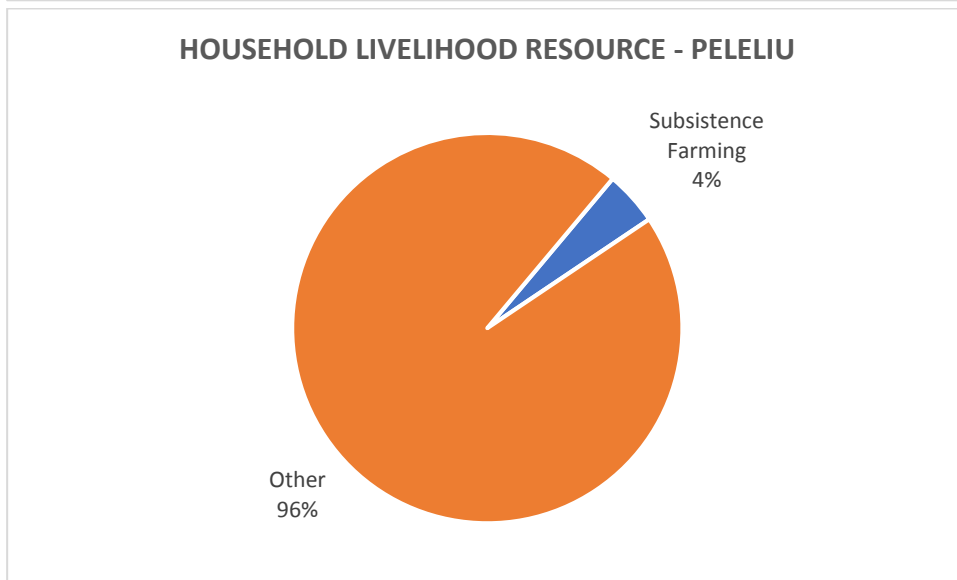
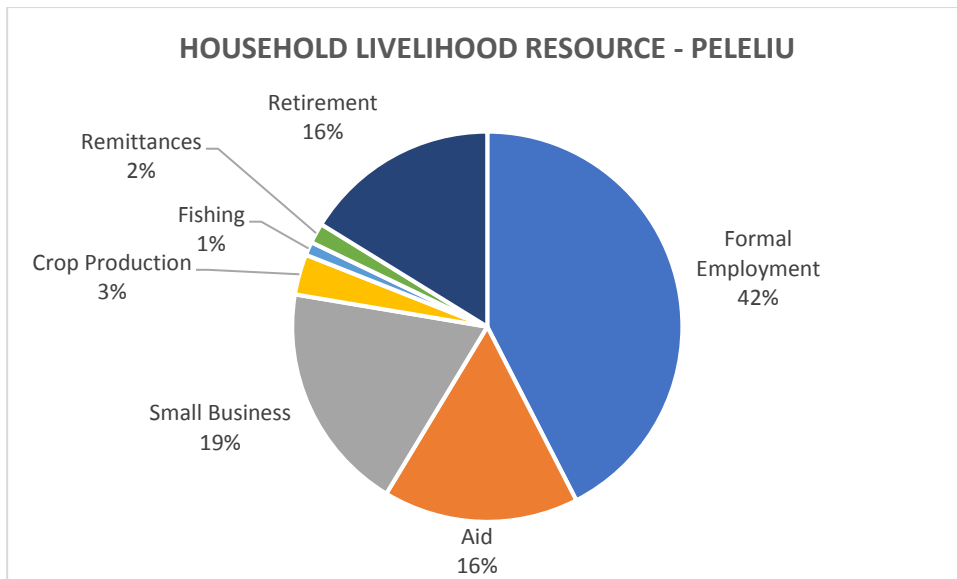
- **The highest level of education reported by informants was secondary schooling, with 56%, or over half of informants having been educated to this level.** This is a notable increase from 47% of informants in Round 1.
- 24% of informants have been educated to primary level only, a slight decrease from 28% in Round 1.
- The next most common highest level of education is vocational at 15%, down from 20% in Round 1.
- Only a small number of informants have been educated to tertiary level (4% again), and an even smaller number have received no formal education (1%, down from 2%).



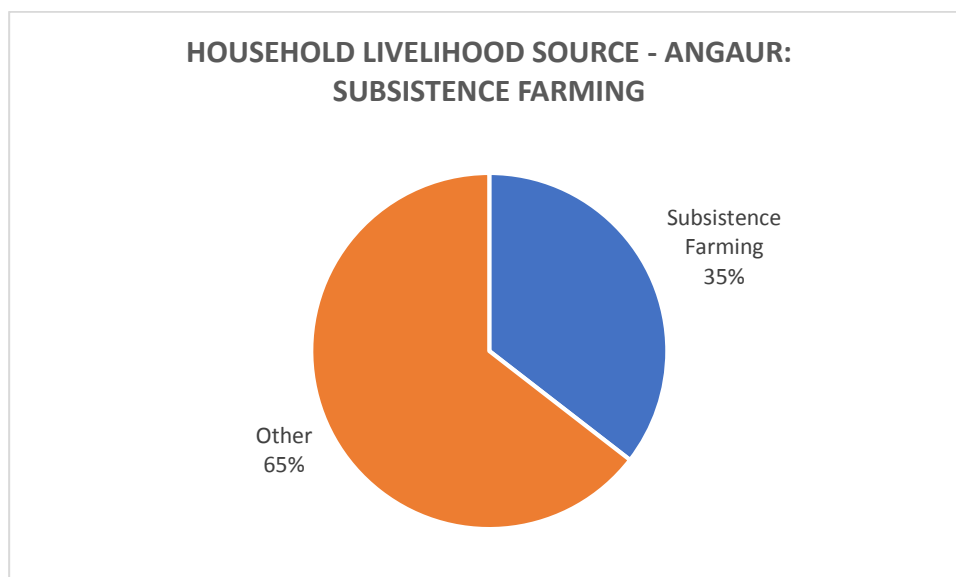
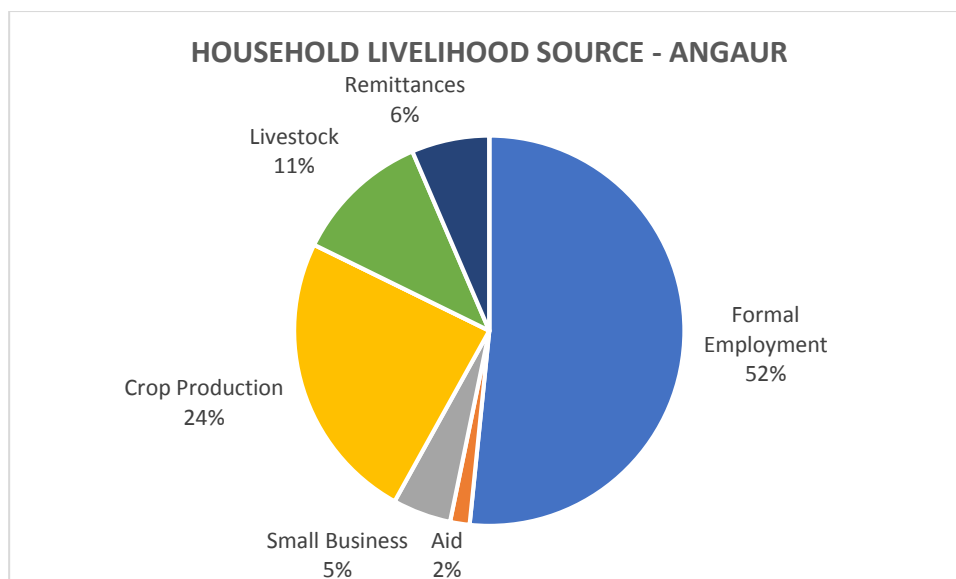
## 1.7 Livelihood Resource



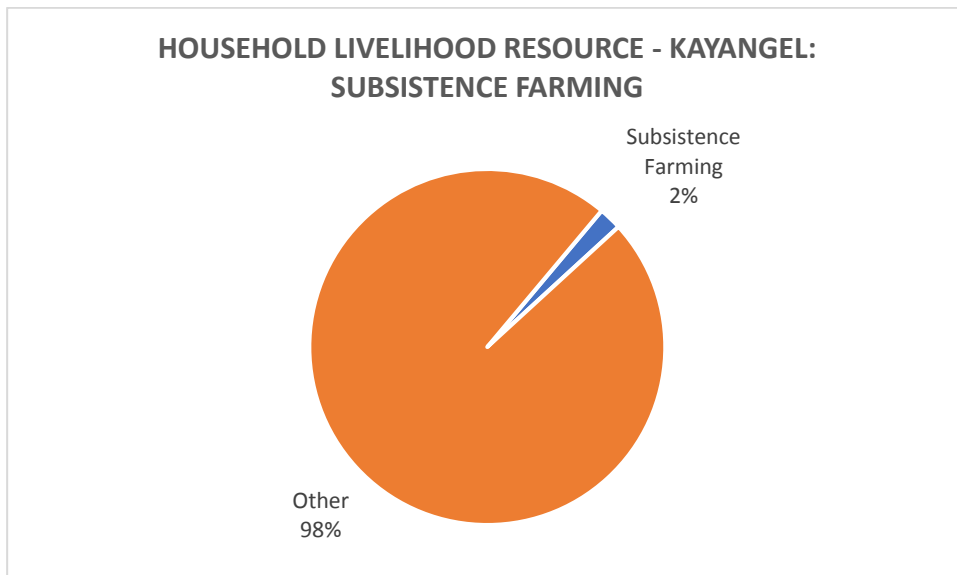
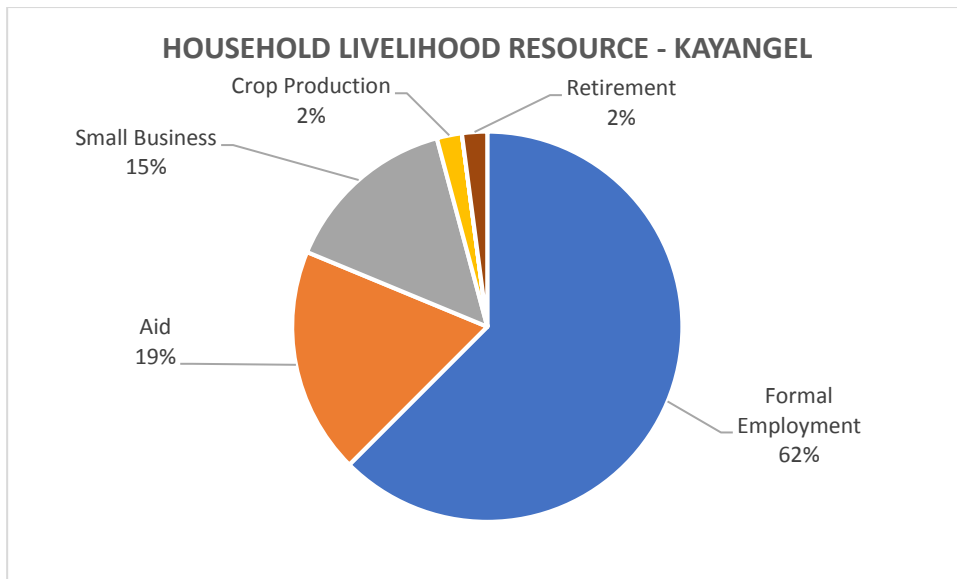
- **The most common livelihood resource for a household is formal employment, supporting 48% of surveyed households.** This is much more common than any of the other livelihood resource, increasing from 42% of households in Round 1.
- Small business is the second most common livelihood resource, supporting 15% of surveyed households.
- **In Round 1, aid was the second most common livelihood resource, but has dropped to third position this time around, supporting 14% of households, likely due to retirement being made a separate option for this survey round.**
- Third most common livelihood resource is retirement funds, supporting 10% of surveyed households.
- Crop production is in fourth place, supporting 8% of households.
- **For only a small proportion of households, subsistence farming (including crop production, livestock rearing and fishing) is the main livelihood resource,** just as in Round 1, up only slightly from 8% to 11%.
- The main livelihood resources for the three islands/atolls surveyed are very distinct, showing different demographics of informants from the three locations. This can be seen in the following charts, separated by island/atoll.



- **For Peleliu Island, formal employment is the most important livelihood resource**, supporting 42% of surveyed households.
- Small business is the second, with 19% of households relying on this livelihood.
- Retirement and aid closely follow in the third and fourth place, at 16% of households each.
- **Subsistence farming is an insignificant livelihood source for households on Peleliu Island.** Only 4% of households were relying on subsistence farming as their primary livelihood source.
- 3% of households reported relying on crop production as their main livelihood resource.
- 1% reported relying on fishing as their main livelihood resource.
- No households on Peleliu Island reported relying on livestock as their main livelihood resource.



- **Formal employment is the most common livelihood resource for households on Angaur Island, supporting 52% of the surveyed households.**
- However the second and third most common livelihood resources are crop production and livestock at 24% and 11% respectively.
- **Subsistence farming is an important livelihood resource, supporting more than one third of surveyed households on Angaur Island.** 36% of surveyed households on Angaur Island report that their main livelihood resource is subsistence farming (including crop production, livestock rearing and fishing).
- **A much much larger proportion of surveyed households on Angaur Island reported relying on subsistence farming than on Peleliu or Kayangel islands – 36% of surveyed households on Angaur Island in contrast to the 4% of surveyed households that reported subsistence farming on Peleliu Island or the 2% that reported subsistence farming on Kayangel Atoll.**
- **Only 2% of surveyed households on Angaur Island reported relying on aid, in comparison to 16% on Peleliu and 19% on Kayangel Islands.**
- No households on Angaur Island reported relying fishing or retirement funds for their main livelihood resource.



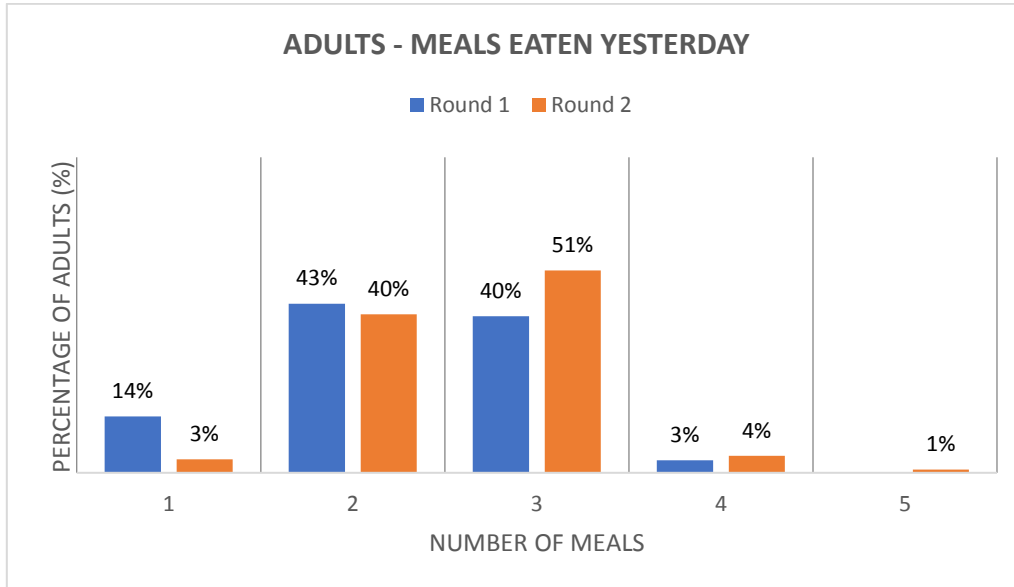
- **Formal employment is the most common livelihood resource for Kayangel households, just as for the other two islands.** Formal employment was reported the main livelihood resource for the greatest proportion of surveyed households on Kayangel - 63% in comparison to 52% reported on Angaur Island or 42% reported on Peleliu Island.
- **Aid was a main livelihood resource for 19% of surveyed households on Kayangel.** This is similar to 16% of surveyed households that reported relying on aid on Peleliu, but in notable contrast to just 2% of surveyed households who reported the same on Angaur Island.
- **For Kayangel Atoll, only 2% of the households' main livelihood resource is subsistence farming** (including crop production, livestock rearing and fishing), even lower than just 4% reported on Peleliu Island.
- No households reported relying on fishing, livestock or remittances as their main livelihood resource on Kayangel Atoll.



## 2. FOOD SECURITY

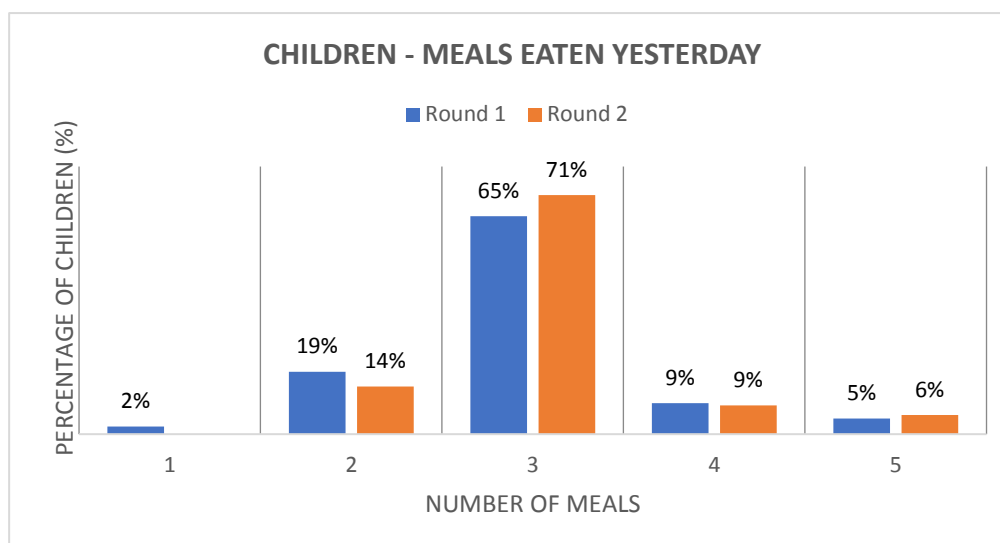
This section offers an understanding into the diets and eating habits of the households interviewed across the three states. More specifically, it highlights the following details: (1) meal frequency, (2) the type of food consumed (and amount), and (3) where food is commonly sourced.

### 2.1 Meal Frequency – Adults



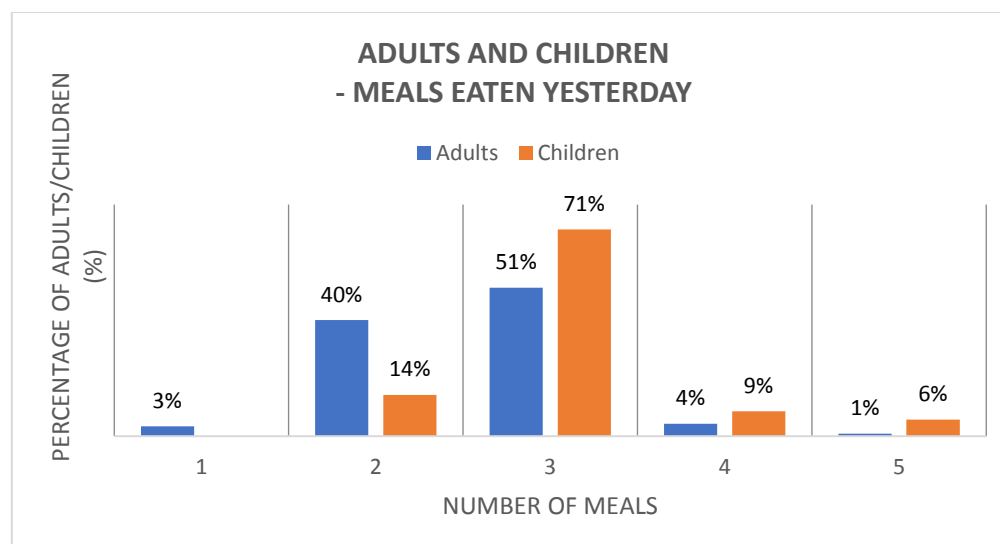
- **Just over half the surveyed households reported that adults ate 3 meals in the day before the survey, a notable increase from 40% of surveyed households that reported this in Round 1.** The greatest proportion of surveyed households gave this response this survey round.
- In Round 1, the largest proportion of households reported that adults ate 2 meals in the day before the survey. The proportion of households reporting 2 meals for adults has slightly decreased from 43% in Round 1 to 40% in Round 2.
- **Only 3% of surveyed households reported adults eating just 1 meal in Round 2, a significant decrease from 14% of surveyed households reported in Round 1.**

## 2.2 Meal Frequency – Children



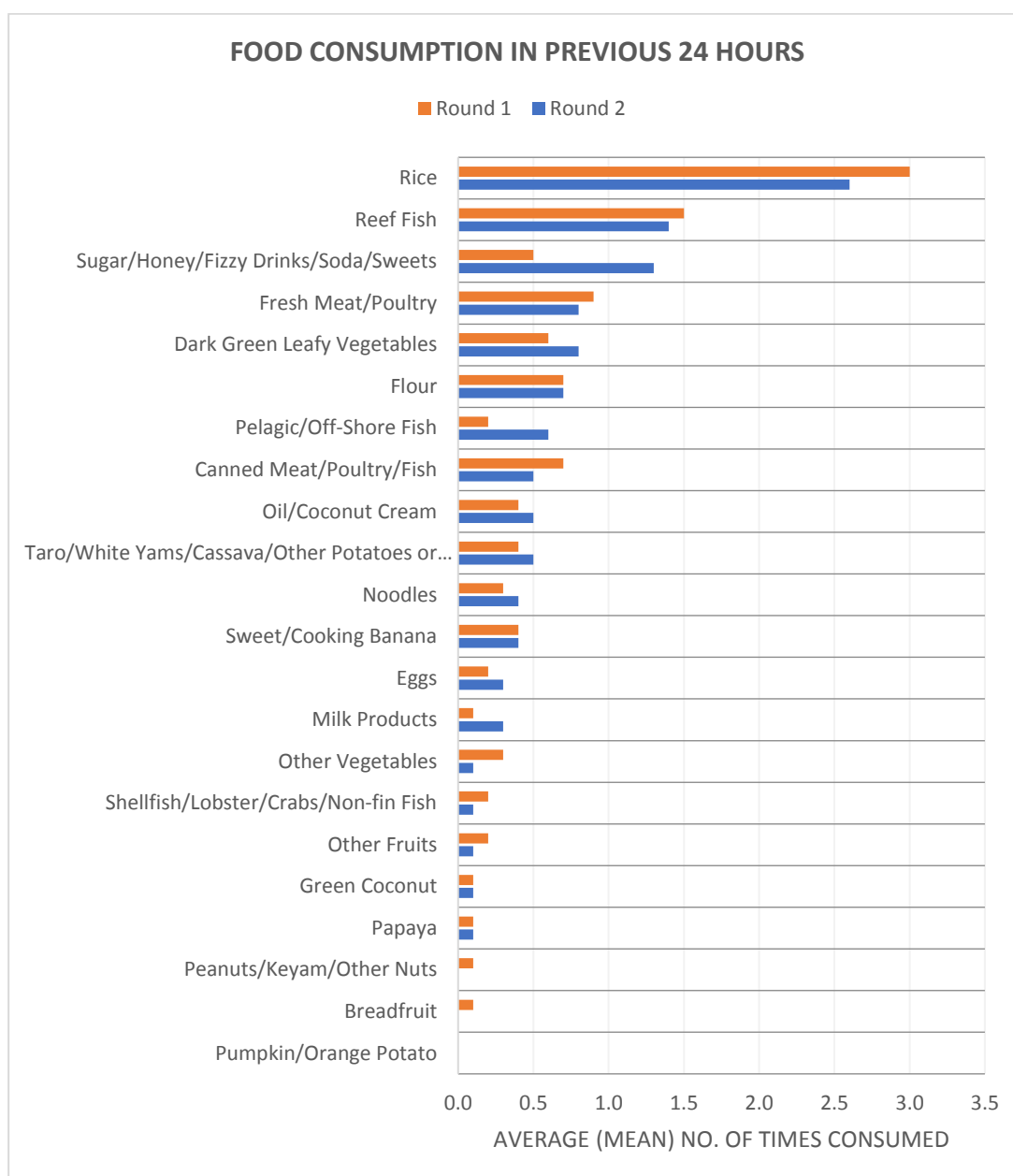
- **71% of surveyed households reported that children ate 3 meals in the day before the survey was conducted, up slightly from 65% of surveyed households reported in Round 1.**
- The proportion of households reporting children eating 2 meals in the day before the survey slightly decreased – 14% in Round 2, down from 19% in Round 1 – almost exactly the corresponding the increase in the proportion of households where children were reported eating 3 meals.
- **Children were reported eating 3 or more meals in a notably larger proportion of surveyed households in Round 2.** 86% of households reported that children ate 3 meals or more a day in survey Round 2, in contrast to 79% of surveyed households that reported the same in Round 1.
- **No children were reported to be eating only 1 meal this time around.**

## 2.3 Meal Frequency – Adults & Children



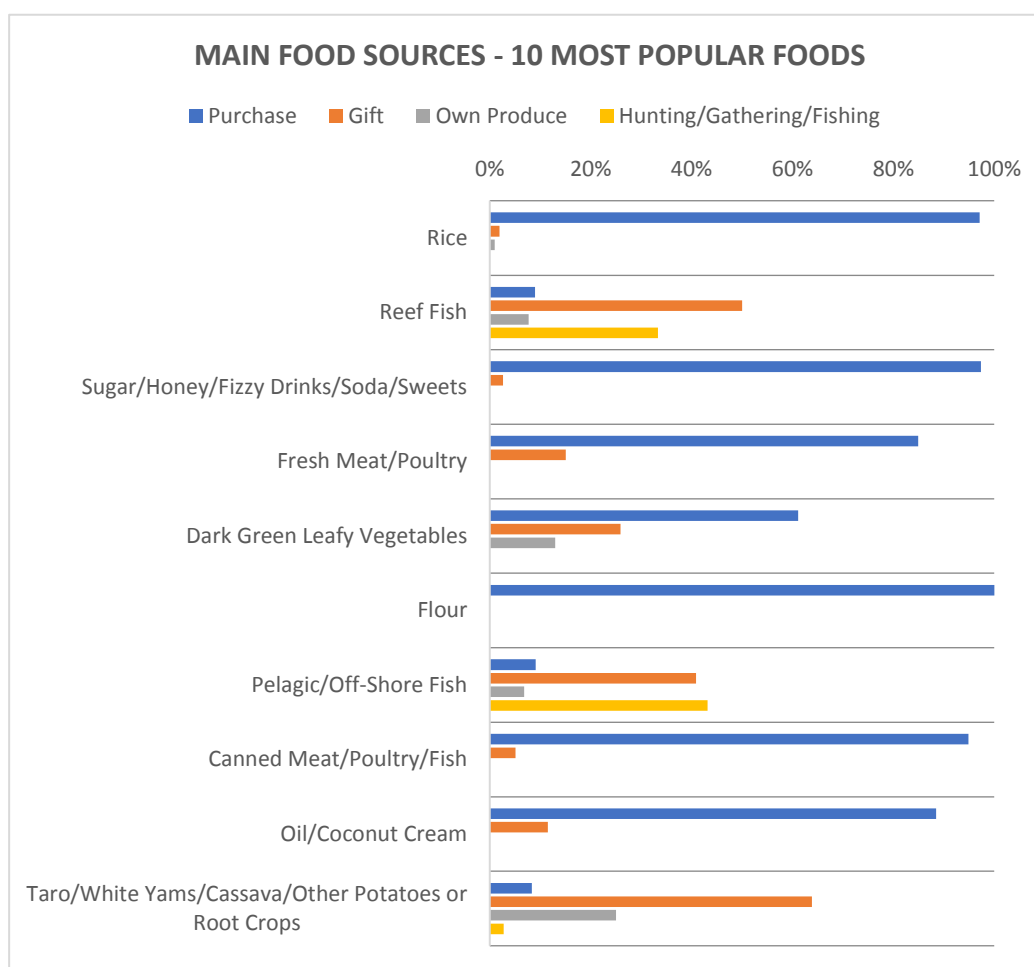
- The above chart compares the results for the number of meals eaten by adults and children in Round 2.
- A greater proportion of surveyed households reported children eating 3, 4 and 5 meals, while conversely, a greater proportion of households reported adults eating 1 or 2 meals.
- **Children are eating on average were reported eating more meals per day, just as was the case in survey Round 1.**

## 2.4 Food Type



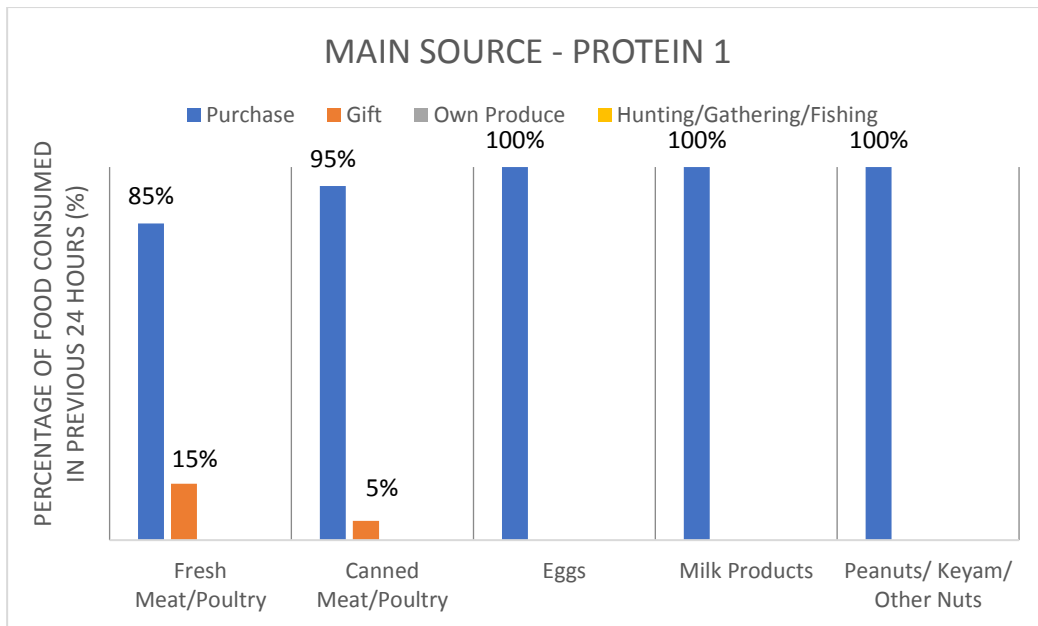
- Informants were asked how many times they consumed various foods over the previous 24 hours.
- **Rice is by far the most frequently consumed food, on average eaten 2.6 times in the previous 24 hours** and maintaining its leading position from Round 1. By far the most commonly given response to this query was 2, namely the vast majority of households, more than 87% of those surveyed, reported eating rice two times in the past 24 hours.
- **Reef fish is again the second most frequently consumed food, eaten on average 1.4 times in the previous 24 hours.**
- **Sugar/honey/fizzy drinks/soda/sweets is third, consumed on average 1.3 times in the past 24 hours**, up from sixth position in Round 1. This is likely at least partially due to the addition of fizzy drinks and soda in this option, not included for Round 1.
- No other foods were consumed 1.0 or more times on average in the previous 24 hours.

## 2.5 Food Source

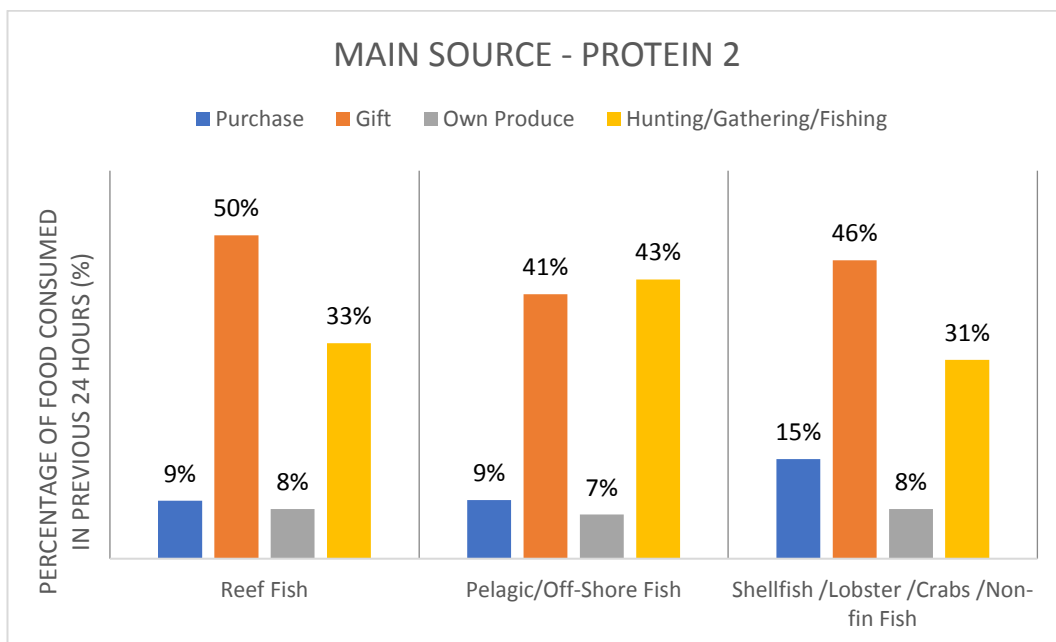


- The above chart concentrates on the main food sources of the 10 foods consumed the most by households in the previous 24 hours.
- **The majority of these foods, 7 out of 10, were purchased by the household. This is down slightly from 8 out of 10 purchased in Round 1.** The difference is due to taro/white yams/cassava, grown by the household in majority of cases, now joining the 10 most consumed foods. Other vegetables, purchased in majority of cases, dropped from 10<sup>th</sup> to 15<sup>th</sup> place in Round 2.
- **The remaining 3 foods, reef fish, pelagic/off-shore fish and taro/white yams/cassava were most often obtained as gifts or through hunting/gathering/ fishing by household members.**





- **Except for fresh fish, over 80% were purchased of protein sources were purchased, even fresh meat/poultry, eggs and nuts.**
- 15% of households consuming fresh meat or poultry in the previous 24 hours received this food as a gift.



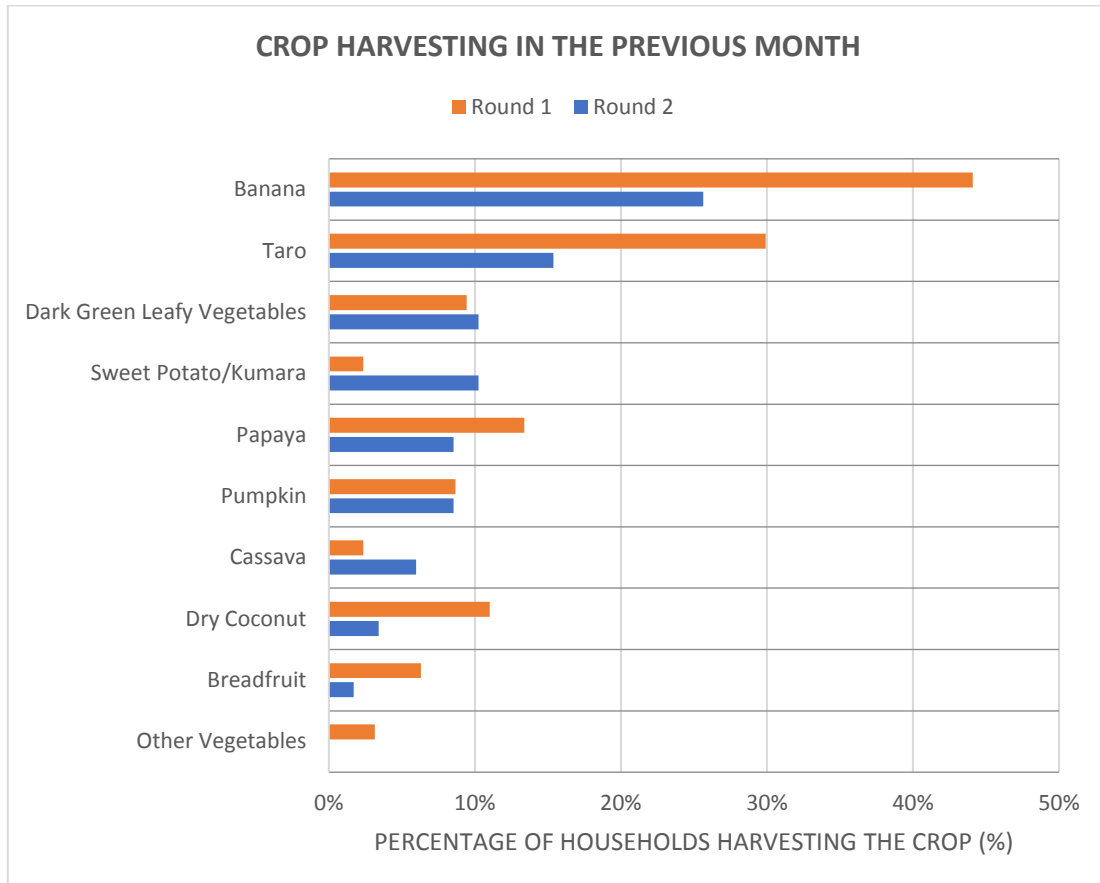
- **Fresh fish and seafood are protein sources that were most frequently received as gifts.**
- Household members' own fishing and collecting activities were the second most common source of seafood protein.
- **Households rarely reported purchasing fish and seafood products.** The most commonly purchased items in this category were shellfish/lobster/crabs, and these were purchased by only 15% of surveyed households that reported consuming these foods in the previous 24 hours.



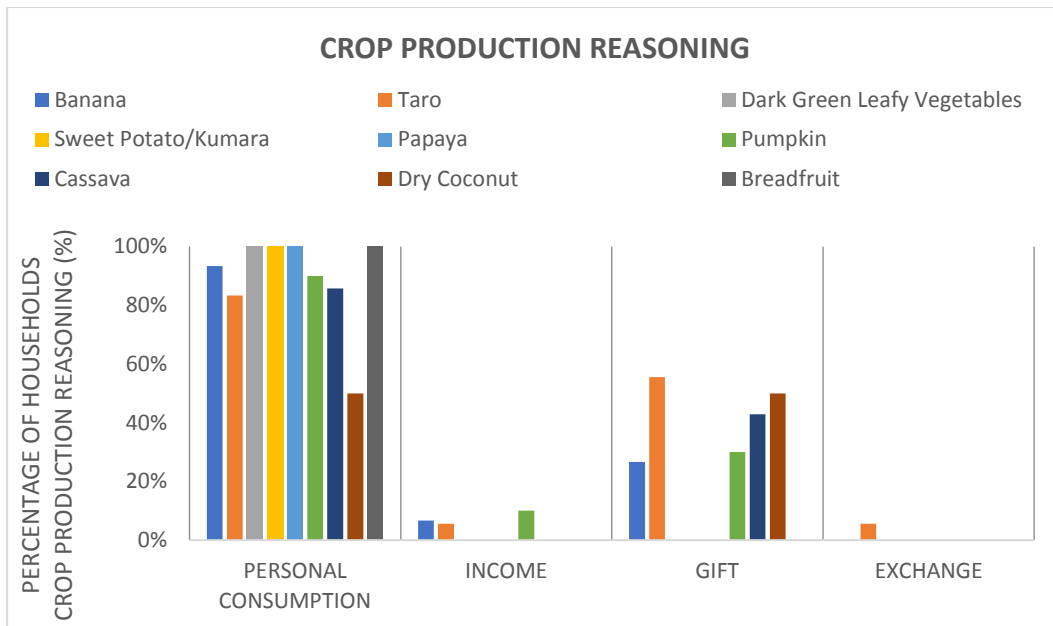
### 3. AGRICULTURAL PRODUCTION

This section provides an overview of agriculture production in Palau. The survey asked interviewees about 12 types of common fruits and vegetables harvested in Palau. For these foods the following is examined, (1) what is harvested (including amount and cost) and (2) for what purpose they have cultivated the crop.

#### 3.1 Crop Harvesting



- **More than half of the households did not harvest any food crops over the previous month, just as in Round 1.**
- In fact, there is a **general decrease in crops harvested from Round 1**, likely due to a seasonal adjustment.
- Bananas were again the most popular crop, harvested by 26% of households over the previous month.
- The only other crop harvested by more than 1 in every 10 households was taro, at 15%.
- **Only two crops were harvested by a larger number of households in Round 2 - sweet potato / kumara and cassava.** Sweet potato/kumara was harvested by 10% of households in Round 2 versus 2% of households in Round 1, and cassava, harvested by 6% of households in Round 2 in comparison to 2% of households in Round 1.



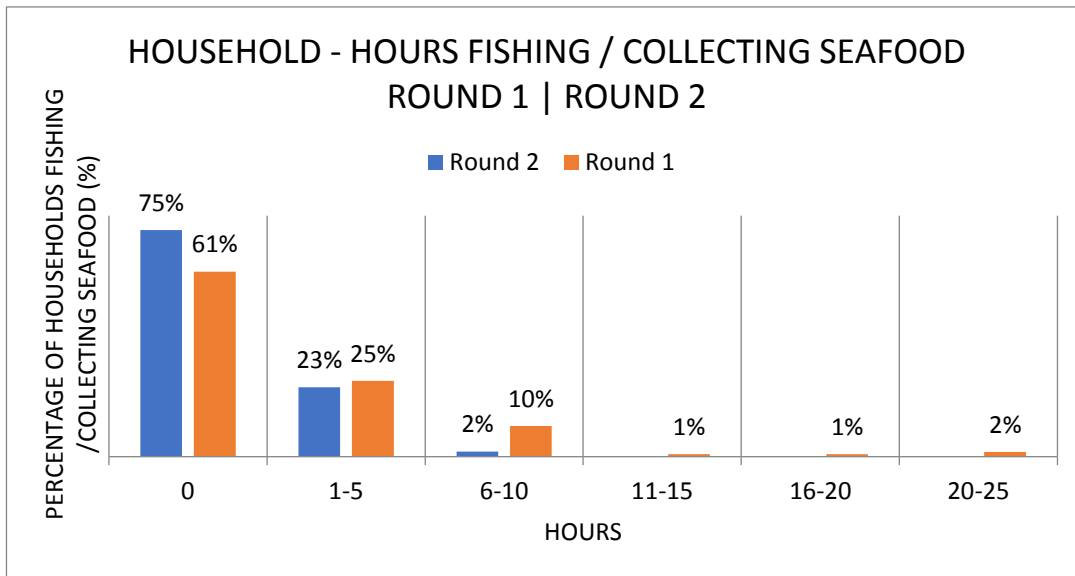
- **The vast majority of food crops grown by households were for personal consumption.**
- For 8 of the 9 food crops harvested by surveyed households, over 80% were producing them for personal consumption.
- Dry coconut was the crop grown for gifting purposes in half the households, with half of the households growing this crop reporting this intended purpose.
- **Producing crops for income was a relatively insignificant motivation for growing crops**, and even in this case of the most popular crop for sale, pumpkin, only 10% of households growing it had the intention of selling it for income.

## 4. FISHERIES PRODUCTION



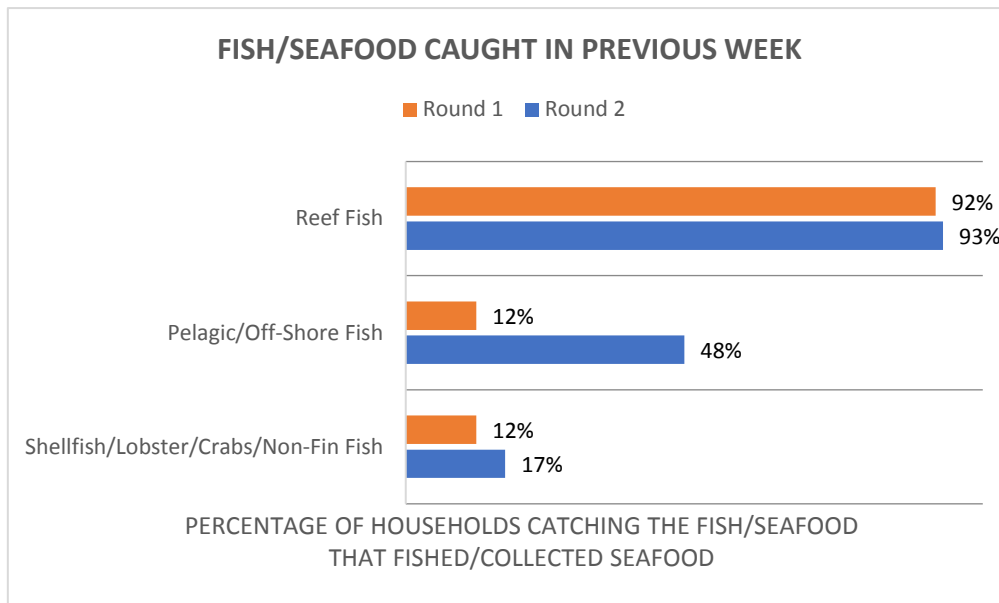
This survey section focuses on three seafood sources commonly caught or collected in Palau: reef fish, pelagic/off-shore fish and shell-fish/lobster. To understand fishing habits and production the questions were tailored to capture: (1) the time households spent fishing/collecting seafood, (2) the amount households were catching and (3) the reason why they caught/collected seafood.

### 4.1 Time Spent Fishing/Collecting Seafood

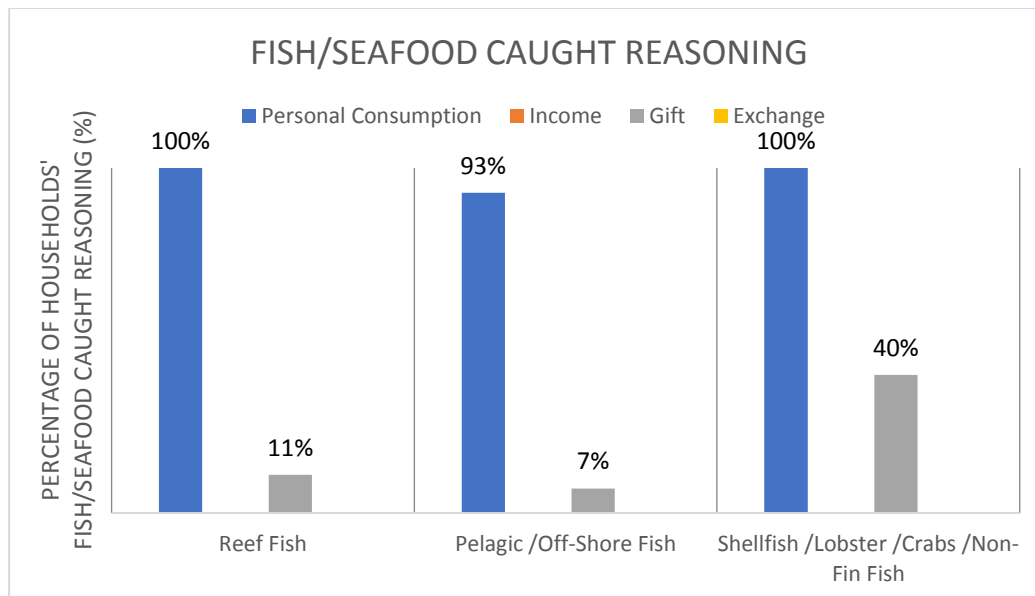


- **75% of households did not go fishing or collect seafood over the week before the survey, increasing from 61% of households in Round 1.**
- No households went fishing or collected seafood for more than 10 hours over the week before the survey in Round 2. 10% of surveyed households reported doing so in Round 1.
- Fishing and seafood collection varies across the islands and atoll areas of Palau.
- **96% of people surveyed on Angaur Island did not go fishing, compared to only 76% of people surveyed on Kayangel Atoll and 68% of people on Peleliu Island.**

## 4.2 Fish/Seafood Caught



- **Of all of the households catching fish/collecting seafood, the vast majority caught reef fish, 93%, up slightly from 91% in Round 1.**
- Pelagic/off-shore fish were caught 48% of those households, a big increase from just 12% in Round 1.
- Shellfish/lobster/crabs/non-fin fish were collected by just 17% of those households, a slight increase from 12% in Round 1.



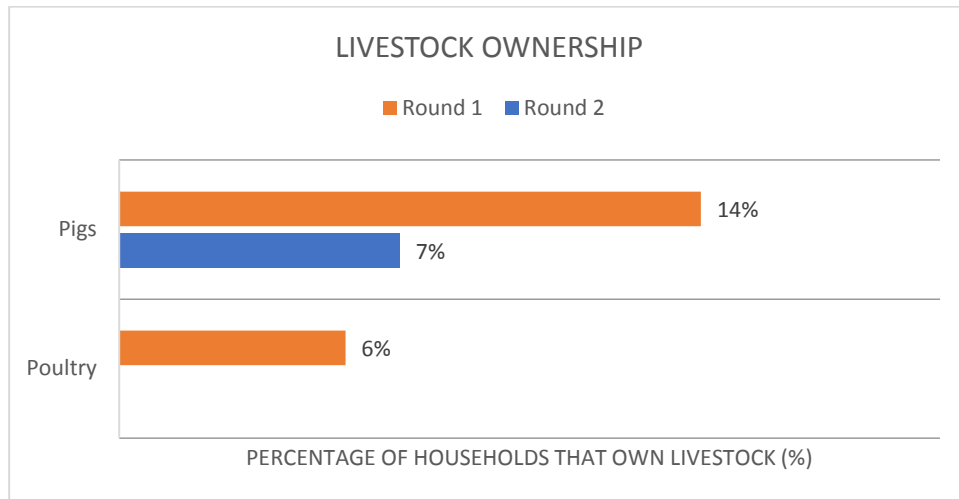
- **For all fish/seafood, over 90% of surveyed households reported catching or collecting for personal consumption, by far the most common response.** These results generally reflect Round 1 survey findings.
- All surveyed households that reported catching/collecting shellfish, lobster, crabs and non-fin fish reported doing so for personal consumption. This is a significant increase from 83% reported this in Round 1.
- **None of the households reported catching fish for income or exchange purposes this survey round.**



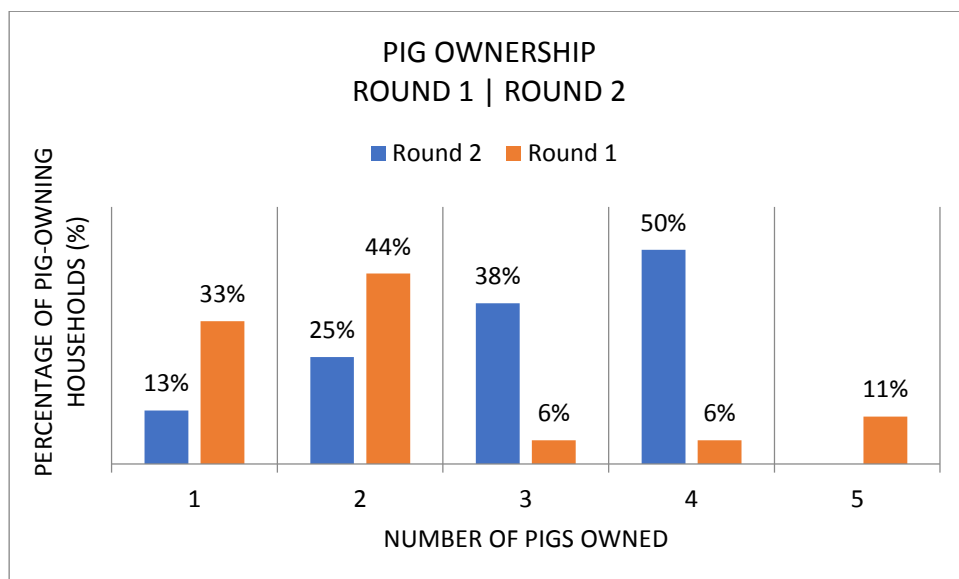
## 5. LIVESTOCK PRODUCTION

This section provides an overview of household livestock production focusing on poultry (chickens and ducks) and pigs. The following was captured: (1) the number of households that owned livestock, (2) how many they owned and (3) for what purposes they used the household livestock.

### 4.1 Pigs & Poultry



- **Ownership of livestock is not common.** Only 8 surveyed households reported owning pigs and no households reported owning poultry this survey round.
- There was a notable decrease in the proportion of households reporting owning livestock in comparison to Round 1.
- Pig ownership prevalence down by half from 14% to 7%, and poultry (chicken or ducks) was not reported to be owned by any of the surveyed households in Round 2, down from 6% of households in Round 1.



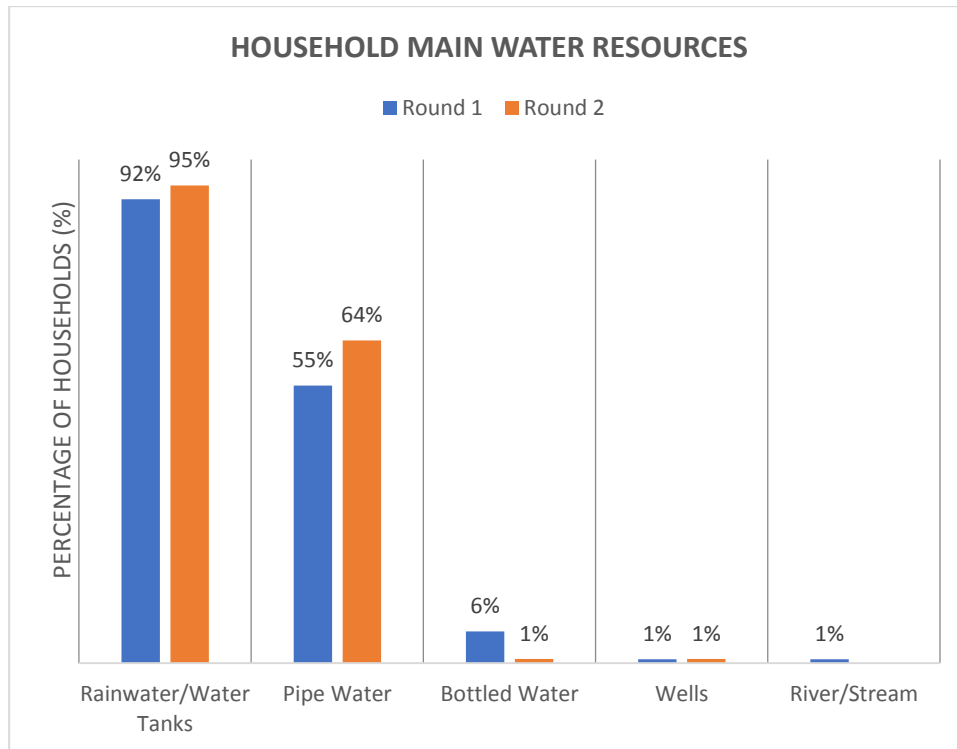
- The highest number of pigs owned by any one household is 4.
- Of the 8 households that own pigs, none of them responded that they had slaughtered for home consumption, sold or exchanged any of their livestock over the previous month.



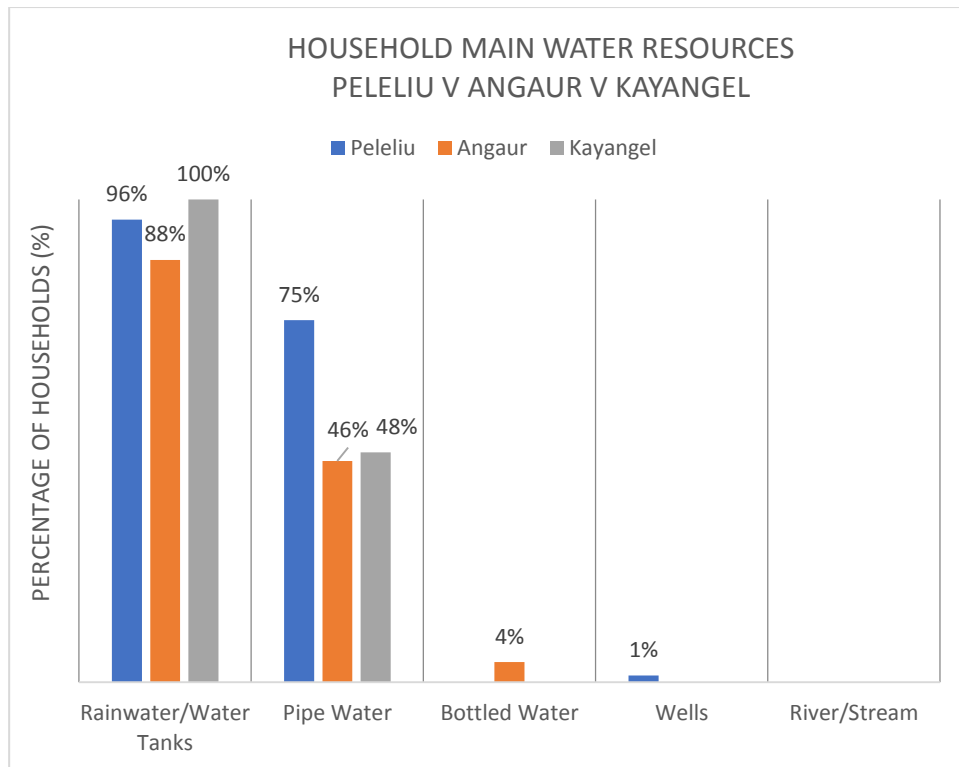
## 6. WATER MANAGEMENT

This section provides a summary of water usage and habits among the surveyed households. Two key areas were surveyed: (1) the household's main source of water and (2) water collection responsibility.

### 6.1 Main Water Resource

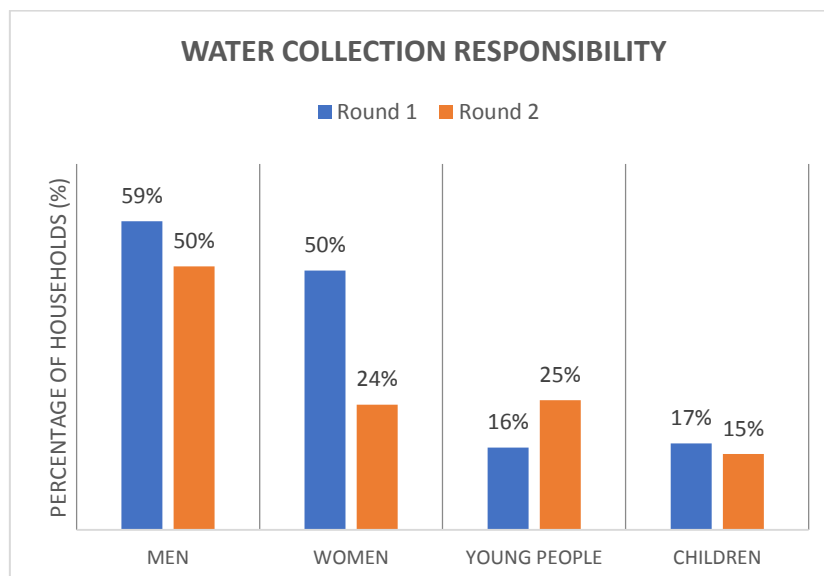


- **Rainwater/water tanks are the most popular water source, used by almost every household for their water needs.** 95% of surveyed households reported that they relied on rainwater/water tanks, up from 92% of surveyed households in Round 1.
- **Pipe water was the second most-commonly used water source, used by almost two thirds of the surveyed households.** Pipe water usage increased to 64% of surveyed households in Round 2 from 55% of surveyed households in Round 1, suggesting increased access to pipe water for Palauan households.
- All other water resources were relatively insignificant.



- **The vast majority of households across the Islands/Atoll rely primarily on rainwater and water tanks for their household water supply.**
- Pipe water the next most significant source of water, but is more common on Peleliu Island than Angaur Island and Kayangel Atoll.
- Bottled water, wells and rivers are not significant sources of water for any of the households.

## 6.2 Collection Responsibility



- **Men bear the greatest responsibility for collecting household water.** Men were responsible for water collection in 50% of surveyed households, down from 59% of surveyed households reported in Round 1.
- Young people are the next most likely group to be responsible for collecting water at 25%, up from 16%.



- The proportion of responsibility for women collecting water has dropped significantly from Round 1, 50% to just 24%.
- Children are responsible for collecting water only 15% of the time, down from 17% in Round 1.
- **All but one these percentages has decreased from Round 1, indicating less sharing of water collection responsibility.**