



# Socio-economic assessment of Hihifo district, the pilot site for the Pacific Adaptation to Climate Change (PACC) project in Tonga



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## EXECUTIVE SUMMARY

The Pacific Adaptation to Climate Change (PACC) project in Tonga focuses on water resources management, and Hihifo district in Tongatapu was selected as the site for the pilot project. The aim of the project is to develop the Hihifo communities' capacity to protect and manage their water resources, in order to reduce their vulnerability to the impacts of climate variability and change.

This report presents the findings of a socio-economic assessment (SEA) that was carried out in Hihifo district in late 2010 and early 2011. The purpose of the assessment was to examine the current socio-economic situation in Hihifo, the current situation regarding water supply, and the health situation, as well as capturing the attitudes and experiences of people with regard to climate change impacts. Data were collected through a household survey and a focus group discussion.

The results of the household survey indicate that the communities in Hihifo are disadvantaged socially and economically. About 50% of households earn wages but these are mostly low, and most households said that their income often falls short of meeting basic needs because of the high cost of living.

Hihifo has an unreliable water supply, due to a combination of natural, governance and technical factors. The fragile and thin water lens is increasingly vulnerable as water demand increases. This is compounded by droughts, which may also increase with climate change. There is a lack of community participation in the management of the precious water resources, partly due to a disconnect between the water committee and the community. The water committees also face technical issues, such as breakdown of pumps and leaking pipes.

Rainwater is the main source of drinking water in Hihifo, but although people are drinking rainwater this does not necessarily mean they own a water tank. Collecting drinking water from a neighbour, village hall, church building or school is very common in Tonga.

The villages were mostly unsatisfied or very unsatisfied with the village piped water supply, and many do not pay their bills as a result.

The focus group revealed that there is very little transparency in the work of the water committees, and most people do not understand what is going on. It was suggested that water committees need to communicate more often, be transparent with the community, and make information available to the community. The communities need to understand the problems, what the committee is doing about the problems, the options, opportunities and limitations. The water committees also need to follow up consumer feedback so they feel they are working together in addressing problems.

The following ways forward were identified by the focus group to address the priority issues:

- Put a water meter in every household;
- Establish solar water pumps for village water supply;
- Construct additional water tanks;
- The water committees need to improve their governance; and
- Transparency and closeness between the water consumer and the water committee should be improved.

The information from the SEA will contribute to design of the PACC project, and will also provide a baseline for measuring change that may occur in the future as a result of PACC project interventions.



# 1. INTRODUCTION

Tonga is one of 14 countries and territories participating in the regional Pacific Adaptation to Climate Change (PACC) programme. PACC is the largest climate change adaptation initiative in the Pacific region, and has three main areas of activity: practical demonstrations of adaptation measures; driving the mainstreaming of climate risks into national development planning and activities; and sharing knowledge in order to build adaptive capacity. The goal of the programme is to reduce vulnerability and to increase adaptive capacity to the adverse effects of climate change in three key climate-sensitive development sectors: coastal zone management, food security and food production, and water resources management. The programme began in 2009 and is scheduled to end in December 2014.

In Tonga, stakeholder consultations at the beginning of the project identified water resources management as the priority sector, and Hihifo district was selected as the site for the pilot project. The aim of the project is to develop the Hihifo district communities' capacity to protect and manage their water resources, in order to reduce their vulnerability to the impacts of climate variability and change. The project will collect information on current water demand and supply, climate (current and projected), and local experience (traditional knowledge) and use it to identify, evaluate, design and demonstrate appropriate water management technologies.

This report presents the findings of a socio-economic assessment (SEA) that was carried out in Hihifo district in late 2010 and early 2011, during the situational analysis stage of the project. The assessment aimed to collect data on the current socio-economic situation in Hihifo, through a household survey and a focus group discussion. This information will contribute to design of the PACC demonstration project, and will also provide a baseline for measuring change that occurs in the future.

## 2. BACKGROUND

The Government of Tonga endorsed the selection of the Hihifo district in Tongatapu as the pilot site for the PACC project (Figure 1). The Hihifo district, which is located in the northwestern end of Tongatapu island, is made up of six villages; from the south these are Fo'u'i, Ha'avakatolo, Kolovai, 'Ahou, Kanokupolu, and Ha'atafu (Figure 2).

The communities of Hihifo are very vulnerable to natural disaster. With elevation ranging from 0.5 m to 2 m above mean sea level, they have experienced regular inundation over the years (MECC, 2010, p. 15). The participation of Hihifo village communities in the PACC project is a good opportunity to build their resilience to cope with the future impacts of climate change.



Figure 1. Map of Tongatapu (source: Google Maps, 2011).



Figure 2. Hihifo district, PACC pilot site (source: Google Maps, 2011).

The social structure in Hihifo district reflects Tongan society generally. Tongan society has been ruled by a monarchy since the 10th century AD. The King is at the top of the social pyramid, with nobles in the middle and often the highest rank in their village and estate. Commoners are at the bottom of the social pyramid. This structure has remained mostly unchanged through the centuries, except for the recent emergence of a new elite class of educated and business people, earning the same social status and privileges as nobles. The sustainability of the socio-economic structure of Tongan society through the years has been partly due to the principle of reciprocity (Latukeyu, 1975, p. 9).

The establishment of the Constitution in 1875 was a landmark change for commoners. For the first time, commoners were given rights to own and inherit land. However, the Constitution also formally established traditional chiefs as landed estate and they were expected to grant land from their estate to their subjects for dwelling and farming purposes. In return, commoners were expected to use their land productively to fulfil their obligations. Detail of the landed estate in Hihifo is outlined in Table 1 below.

Table 1. Traditional landed estate in Hihifo district.

Village name	Estate owner
Fo'ui	Noble Vaha'i
Ha'avakatolo	Noble 'Ahome'e
Kolovai	Noble Ata
'Ahau	Government
Kanokupolu	Royal (King)
Ha'atafu	Government

Figure 3 shows the electoral boundaries which were effective in the general election in November 2010. There are 10 constituencies in Tongatapu and each constituency can elect a representative to Parliament. However, the District Officers are still operating under the old system which divides Tongatapu into seven districts. It is a task for the new government to realign the old district system with the new constituency electoral system; this will support the development of local government and will strengthen the relationship between the constituencies through their representatives with the national government.

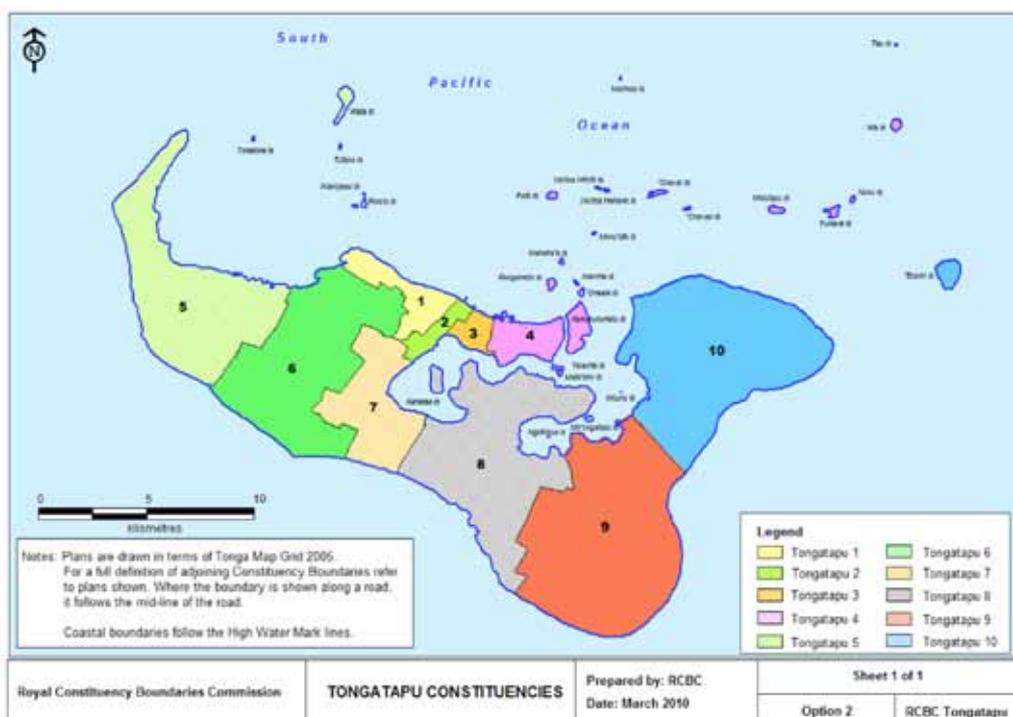


Figure 3. The 10 constituencies in Tongatapu (source: PMO, 2010).



## 3. METHODOLOGY

### 3.1. Socio-economic assessment objectives

The objectives of the SEA were to:

- Produce a baseline report on the socio-economic situation at the PACC pilot site;
- Assess the current situation of the water supply in the villages;
- Identify the health situation of the people of Hihifo in relation to the quantity and quality of water; and
- Capture the attitudes and experience of people with regard to the negative impacts of climate change.

### 3.2. Survey design and implementation

The questionnaire had four sections:

- Household information: basic demographic information, education and employment, economic activities and source of income, household expenditure, other assets, land ownership, energy sources for lighting and cooking, transportation access, community participation;
- Water resources: source of drinking water, village piped water supply issues;
- Human health; and
- Environmental vulnerability.

A mixed style of questions was used, with predominately multiple choice and short open-ended questions to allow a variety of responses from participants.

A community collaborative approach was taken for the selection of the survey team. A community member from each of the six villages was selected as an enumerator and nominated by the PACC project Hihifo Steering Committee as a representative of the village. Training and pilot testing were carried out with the enumerator team before commencing fieldwork.

The survey was carried out in November 2010. The PACC Technical Working Group targeted a 100% response rate from the six PACC project villages. According to the 2006 Kingdom of Tonga Census figures, there were a total of 401 households in the six Hihifo villages (a household was defined as a group of people living together in the same household or 'api' and having their evening meal together). In fact, a total of 354 households were surveyed across the six villages, falling short of the target sample. However, this may reflect a change in number of households since 2006.

### 3.3. Quality of results

The following data issues were identified:

- There was a discrepancy in number of households interviewed in comparison with 2006 Census figures, especially Kolovai and Ha'atafu;
- There was a high number of incomplete questionnaires, particularly the sections on health and environmental vulnerability;
- The capacity and commitment of enumerators led to an issue with completeness, accuracy and integrity of data;
- There was limited time available to conduct the survey which may have affected completeness of data collected;
- There was also limited time for data entry and cross checking, which again may have affected the final dataset.

In the following report, where data from the household survey were insufficient these are supplemented by data from the 2006 Kingdom of Tonga Census.

### 3.4. Focus group discussion

A focus group meeting was conducted in 2011. The 13 participants were members of the Hihifo District Water Committee, Fo'ui Village Water Committee and the Ha'avakatolo Water Committee. Thirteen participants attended the meeting.

The objectives of the meeting were twofold: to discuss the governance issues related to the supply and management of groundwater in the Hihifo district; and to discuss issues for the completion of the SEA report, such as capacity needs assessment and how to address the discrepancies from the survey results.

## 4. SUMMARY OF THE SURVEY RESULTS

### 4.1. Household demographic details

A total of 354 households were surveyed in the six villages (Table 2). The total population of the six PACC pilot villages, according to the 2006 Census is 2,353: 1,163 males and 1,190 females. The Hihifo PACC villages can be grouped according to the size of village population and number of households as follows:

- Two big villages: Kolovai (108 households (124 in 2006 Census)) and Fo'ui (79 households (83 in Census)). Each of these villages has a population of over 500. Together they have slightly over half the total population of the site sample and half the total number of households (combined population: 1,191; 208 households).
- Two medium villages: 'Ahau (57 households) and Kanokupolu (38 households (51 in Census)). These two villages each have a population of slightly over 350 and over 50 household (combined population: 691; 110 households).
- Two small villages: Ha'atafu (38 households) and Ha'avakatolo (44 households). Each of these villages has a population of slightly over 230 (combined population: 471; 82 households).

Table 2. Households surveyed in the PACC SEA, compared with the 2006 National Census.

Villages	2006 Census			PACC Survey Nov 2010		
	Total HH	Headed by		Total HH	Headed by	
		Male	Female		Male	Female
Kolovai	124	99	25	108	88	22
Fo'ui	83	65	18	79	67	12
Ha'avakatolo	44	31	13	40	31	8
Ahau	57	42	15	57	45	12
Kanokupolu	51	40	11	38	31	5
Ha'atafu	38	28	10	32	11	5
<b>Totals</b>	<b>397</b>	<b>305</b>	<b>92</b>	<b>354</b>	<b>290</b>	<b>64</b>

### 4.1.1. Gender

A total of 1,190 females were counted by the 2006 Census, slightly outnumbering the total number of males, 1163, by 27. The sex ratio varies slightly for each village. Kolovai, Ha'avakatolo and Ha'atafu all have more females than male. Note, the 2006 Census national sex ratio is 103:100, with males outnumbering females (Figure 5).

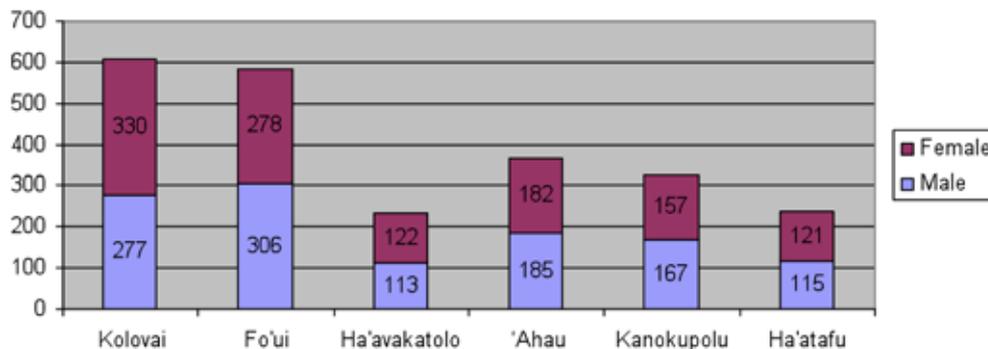


Figure 5. Total population by sex (from the 2006 National Census).

The heads of household were predominantly male, ranging from 68–87% in the different villages (Figure 6). The overall percentage of heads that were female was 19%, which is 4% above the national level of 15%.

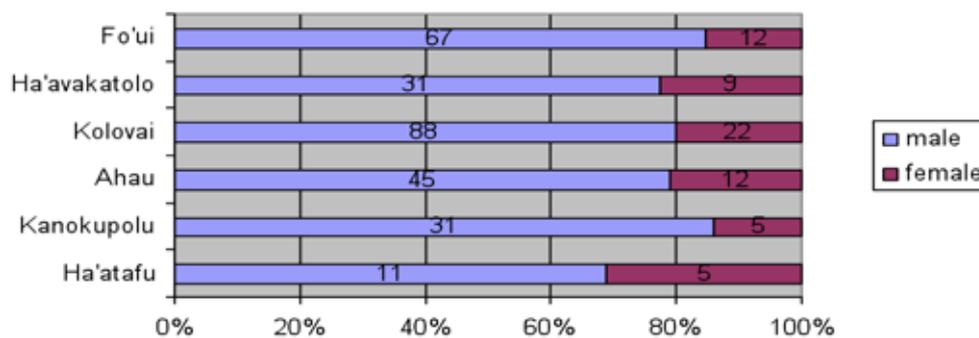


Figure 6. Gender distribution of heads of households.

### 4.1.2. Population and age

The Hihifo population has a young age distribution, with 45% of the total population under 20 years of age and 17% over the age of 50 (Figure 7). This is consistent with the overall Tongatapu age structure seen at the 2006 Census, which is described as the classic pyramid structure, bottom heavy and narrowing at the top. The median age in the 2006 Census was 21 years of age. Figure 8 shows a breakdown in the age distribution of the population per village.

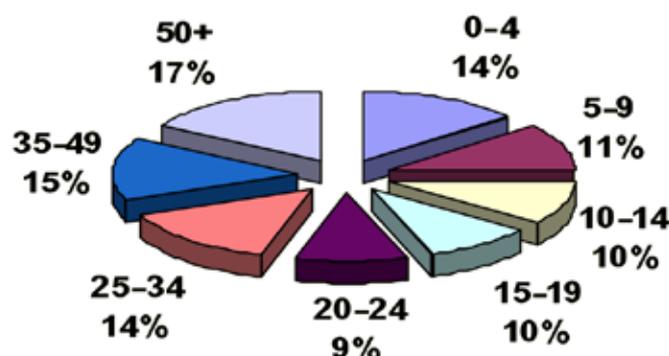


Figure 7. Age distribution of the people of Hihifo.

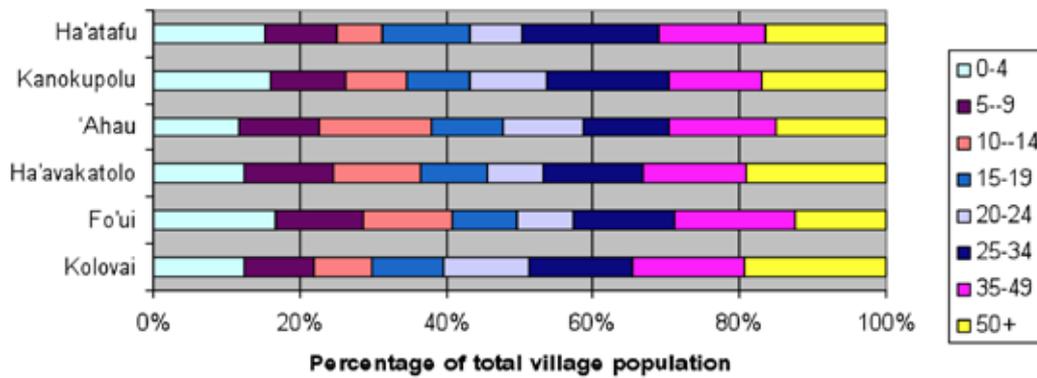


Figure 8. Age distribution within the villages of Hihifo (from the 2006 National Census).

#### 4.1.3. Permanence of households

Over 95% of survey respondents claimed to have lived in the Hihifo district for over 16 years. The vast majority of the Hihifo community are families and relatives that have been established for many generations in the Hihifo region.

Although the questionnaire did not ask about international migration, there was evidence that many households have family members residing overseas by the high percentage of the population receiving international remittances (see Figure 9).

#### 4.1.4. Sources of household income

The questions on income focus on cash and exclude in-kind and non-cash income. Figure 9 shows the main sources of income in the six villages. Overall, wages and salaries account for near 50% of total income in Hihifo. Nearly 30% of all income is derived from the household's own agricultural production activities, including women's craft productions. A high percentage of households also received overseas remittances.

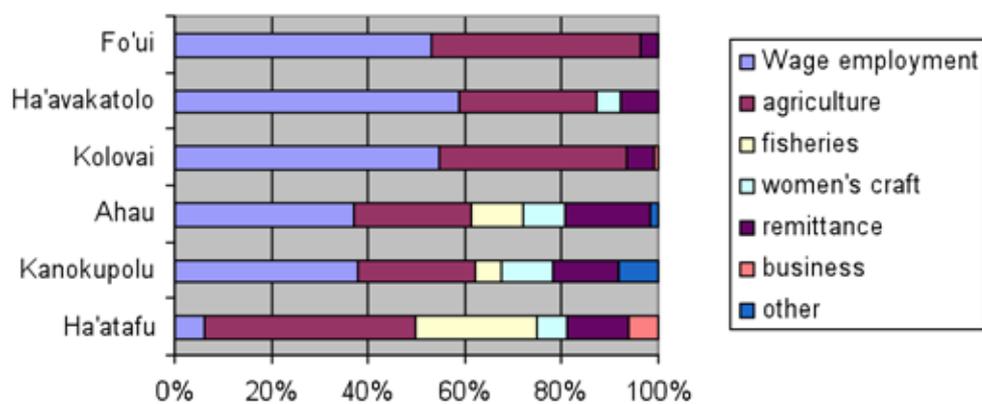


Figure 9. The main sources of income in the six villages, according to the household survey.

### 4.1.5. Amount of household incomes

The majority of households earn a fortnightly income of between T\$100 and T\$200 (Figure 10). The majority of the Hihifo population earns less than T\$200, making it generally a low cash income area.

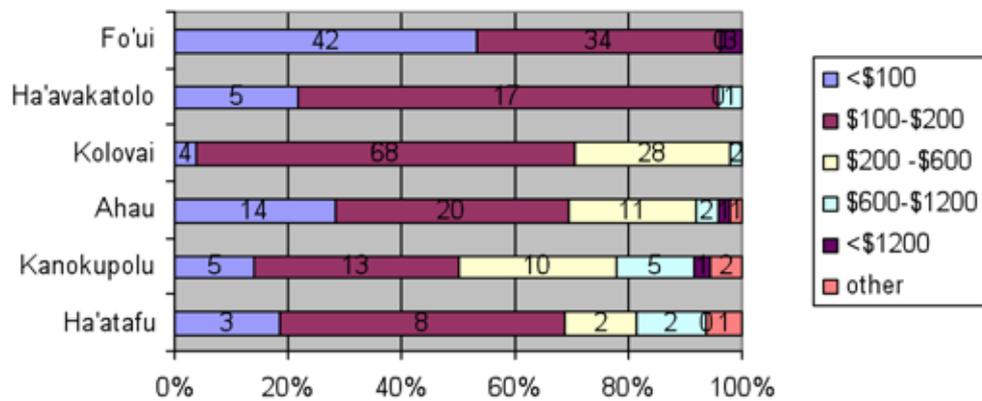


Figure 10. Average fortnightly income in the six villages.

Slightly over 50% of households in Hihifo receive an annual income of less than T\$5000, and three-quarters earn less than T\$7000 (Figure 11). A small percentage earn over T\$30,000.

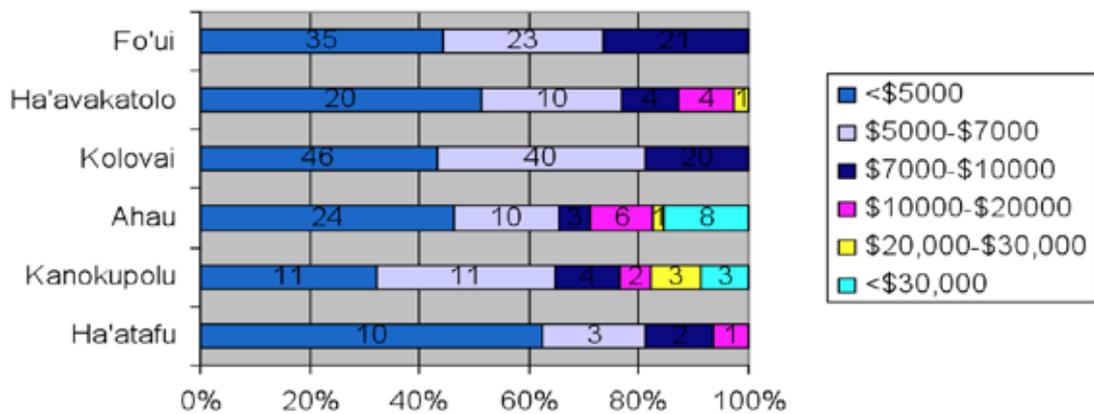


Figure 11. Average annual income.

A high proportion of households in each village receive regular remittances, ranging from 68% in Ha'atafu to up to 98% in Fo'ui (Figure 12). For over half of these, the amount is under T\$500 per month (Figure 13).

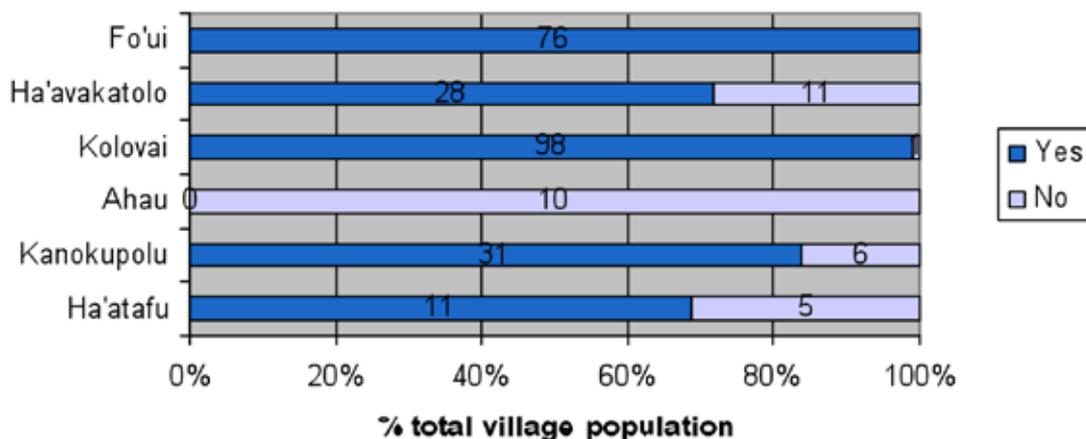


Figure 12. Respondents receiving regular remittances.

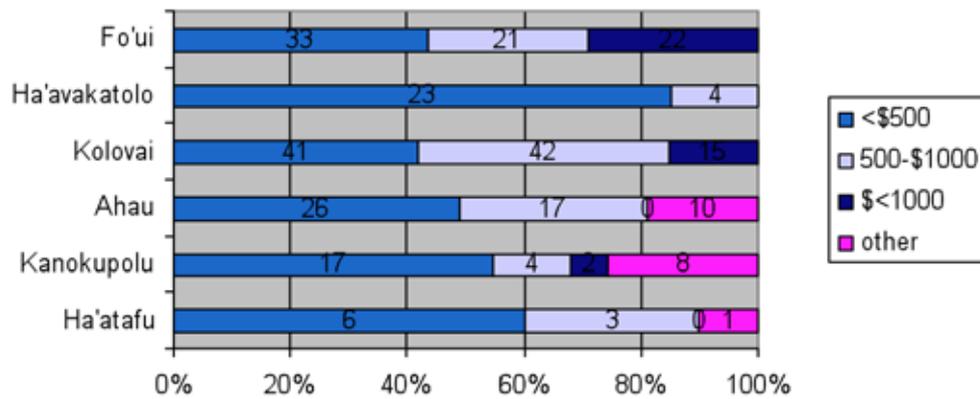


Figure 13. Average monthly remittances.

#### 4.1.6. Household assets

Ownership of vehicles and fishing boats varies in each village (Figure 14). The majority of residents in Kolovai own a vehicle, while in Ha'atafu about half do not own a vehicle.

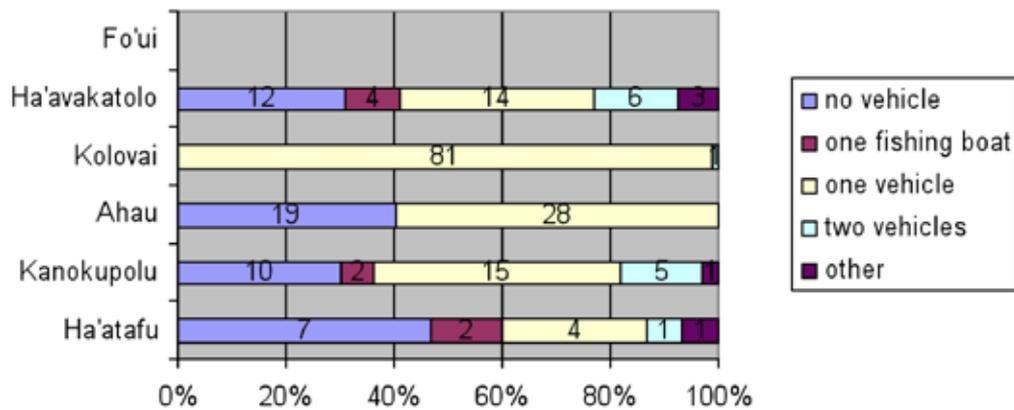


Figure 14. Ownership of vehicles and boats.

#### 4.1.7. Housing

Over 75% of households have wooden houses, with concrete the second most popular construction material (Figure 15). Over 80% of households have flush toilets (Figure 16). Because of the high use of flush toilet systems, access to regular and reliable piped water is crucial.

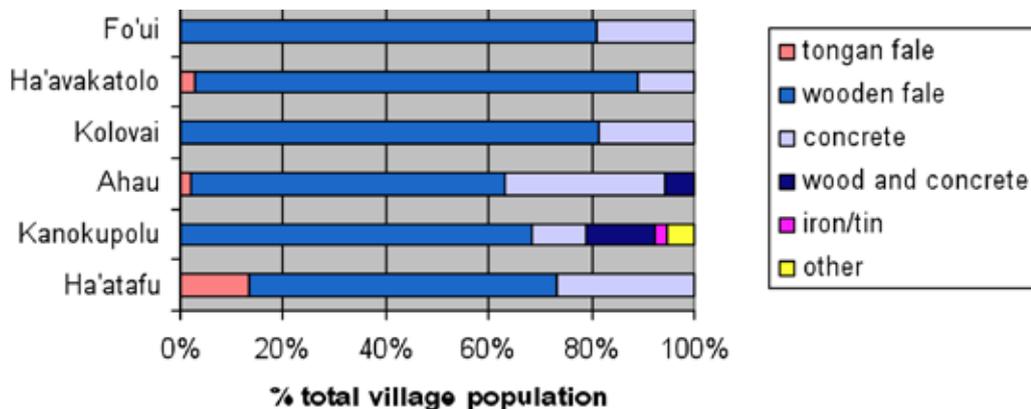


Figure 15. Construction material of residential homes.

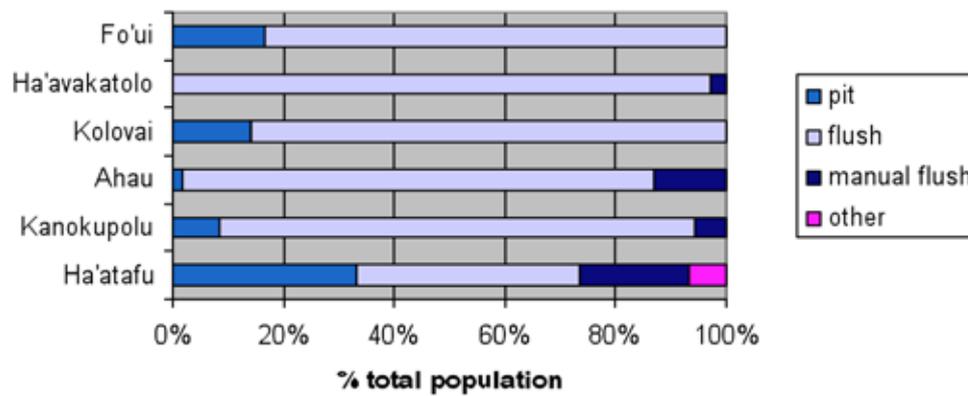


Figure 16. Latrine types.

#### 4.1.8. Household power

Nearly all households depend on electricity for lighting and about 20% in Fo'ui and Kolovai use electricity for cooking. Gas and firewood are commonly used as energy sources for cooking in Ha'avakatolo, 'Ahau and Ha'atafu, while kerosene is the main source of energy for cooking in Fo'ui, Kolovai and Kanokupolu (Figure 17).

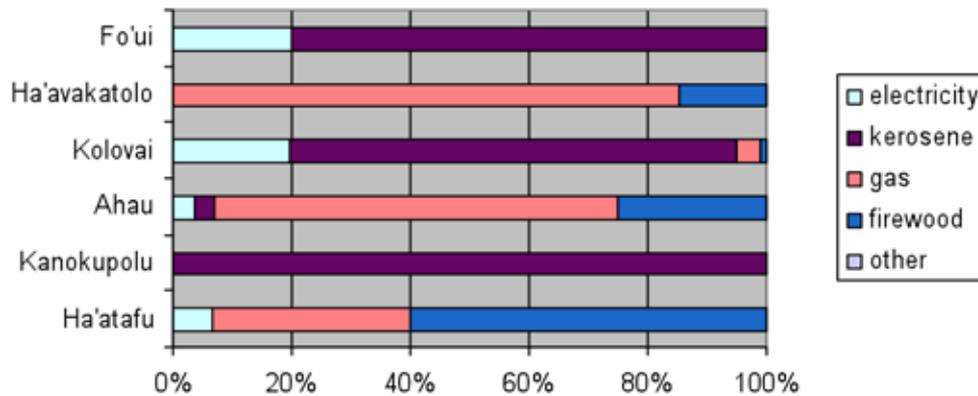


Figure 17. Energy source for cooking.

#### 4.1.9. Land ownership

The land tenure system in Tonga is based on the Land Act 1927 which stipulates that all land belongs to the Crown and is divided into three estates: Royal, Chiefs and Government. All male commoners, when they reach the age of 16 years, are entitled to access two pieces of land either from the Chief or Government estate: a small piece of land within the village for residential purposes known as a 'town allotment'; and an 8 acre piece of land for agricultural purposes known as a 'tax (or bush) allotment'. The land owner does not hold full ownership rights until obtaining registration of land through the Ministry of Lands. However, this land system has not been working in practice for some time due to increasing population and limited land available.

Slightly over 60% of households were living on a town allotment registered to a family member of the household (Figure 18). Ownership of tax (bush) allotments was slightly lower, at 55% (Figure 19). For those who did not have registered town and tax allotments, they were care takers and living on land that belonged either to family members or the estate owner.

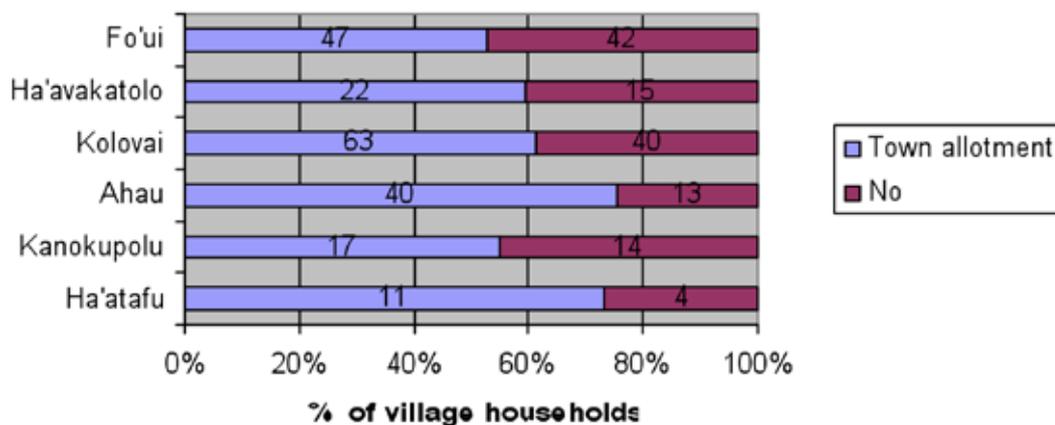


Figure 18. Ownership of town allotments.

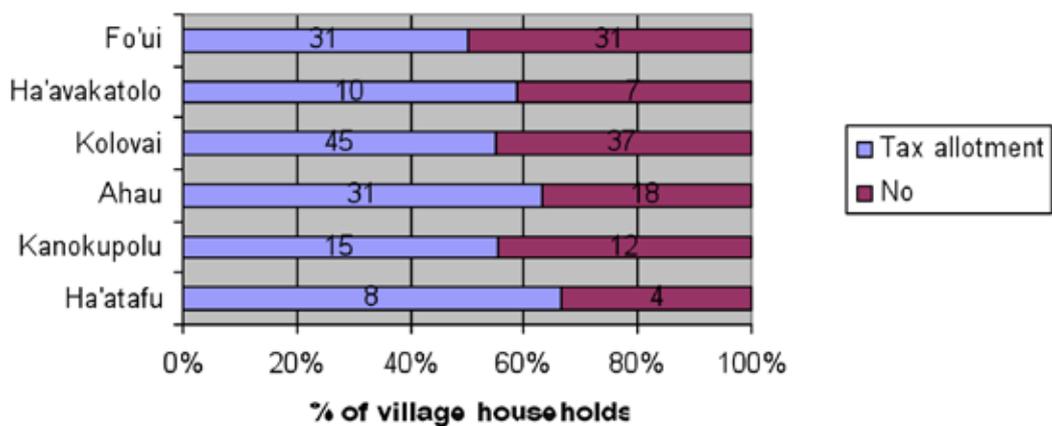


Figure 19. Ownership of tax (or bush) allotments.

#### 4.1.10. Transportation and road infrastructure

The two main types of transportation are private vehicles and private or village-owned buses (Figure 20). There is no public transportation in Tonga. There is very little use of bicycles or other means of transport. Apart from in Ha'avakatolo and Kanokupolu, less than 50% have their own vehicle. Buses are widely used by people in all villages for transportation to the capital Nuku'alofa, probably because it is more economical.

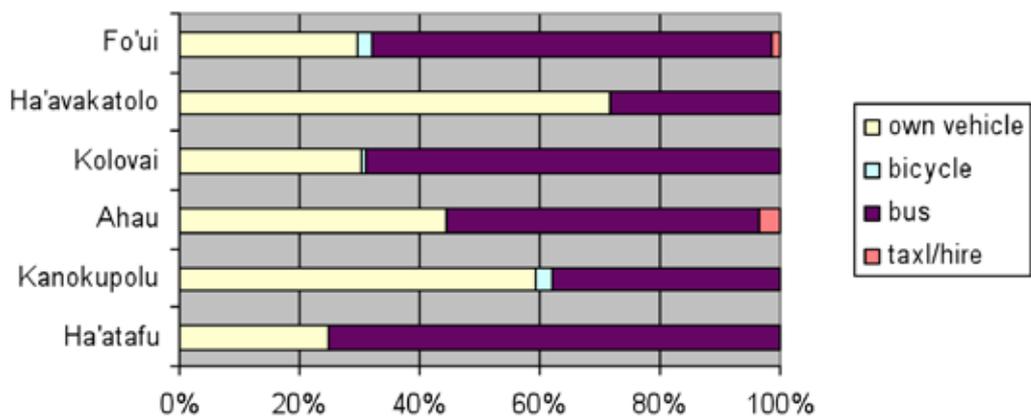


Figure 20. Main modes of transport.

In the village of Kanokupolu, 60% are satisfied with the conditions of the road in the residential area. However, more than 80% of respondents from the villages of Fo'ui and Kolovai perceived the conditions of their road in the residential areas to be very unsatisfactory. Similarly, the data from the other villages, 'Ahou (60%), Ha'atafu (50%) and Ha'avakatolo (40%), testified to the very unsatisfactory conditions of the road in their residential areas (Figure 21).

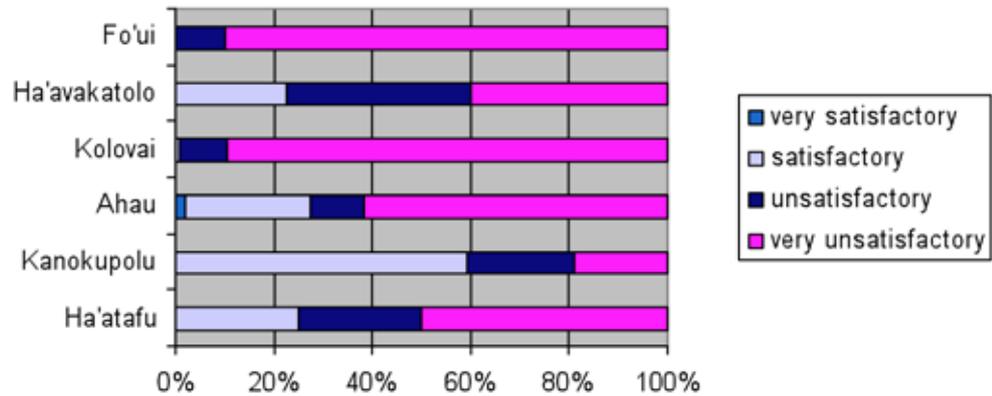


Figure 21. Perceptions of road conditions in residential areas.

Close to 100% respondents from Fo'ui and Kolovai villages perceived the conditions of the road to the bush allotments to be satisfactory (Figure 22); but the rest of the villages had higher percentages who found the road to the bush allotments to be very unsatisfactory: Ha'avakatolo (82%), 'Ahou (55%), Ha'atafu (50%), and Kanokupolu (22%).

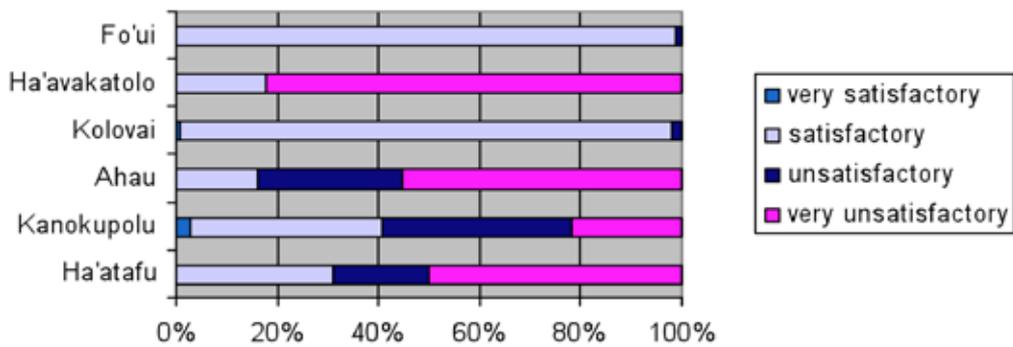


Figure 22. Perceptions of road conditions to bush allotments.

## 4.2. Water resources

### 4.2.1. Sources of drinking water

Rainwater is the main source of drinking water in Hihifo. One hundred percent of the respondents from the village of Fo'ui, Ha'avakatolo, Kolovai, and Ha'atafu stated they drink rainwater (Figure 23). However, a small percentage of households in 'Ahou (4%) and Kanokupolu (<2%) villages drink from the village piped water supply.

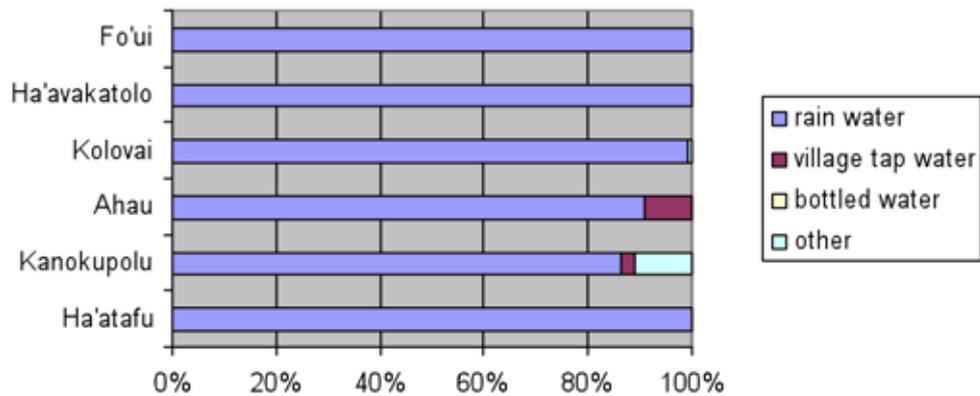


Figure 23. Source of drinking water.

Although people are drinking rainwater, this does not necessarily mean they own a water tank. Collecting drinking water from a neighbour, village hall, church building or school is very common in Tonga.

Ownership of water tanks is judged to be important as it will help households manage low rainfall and drought periods, an anticipated impact of climate change. Close to 100% of households in the villages of Ha'akatolo and Ha'atafu own a water tank (Figure 24). Water tank ownership in the other villages ranged from 42% in Fo'ui, to 62% in Kolovai, 65% in 'Aha'u, and 75% in Kanokupolu. Unfortunately, the survey did not collect information as to the status of the water tanks. But observations and anecdotal evidence are that although people may own a water tank, most of them are either leaking or not connected to the roof.

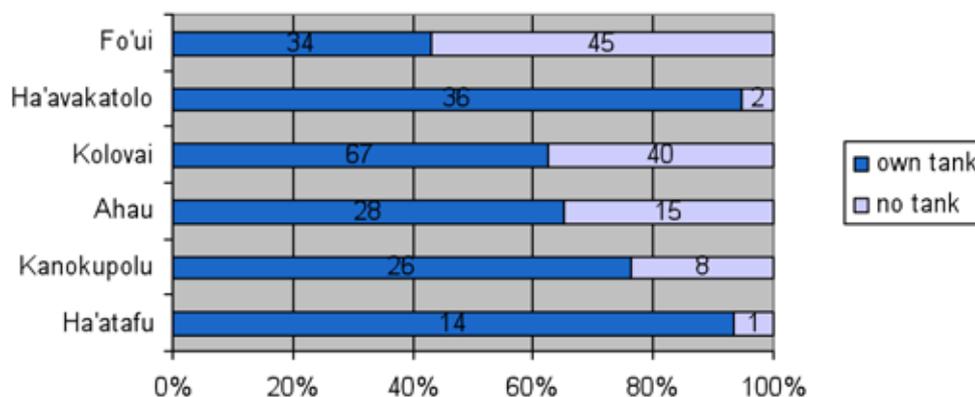


Figure 24. Percentage of households with rainwater tanks.

With the increasing availability of bottled water in the shops, this has become an alternative source of drinking water. Figure 25 shows that between 6% and 27% in all the villages bought bottled water. The majority do not buy bottled water for drinking.

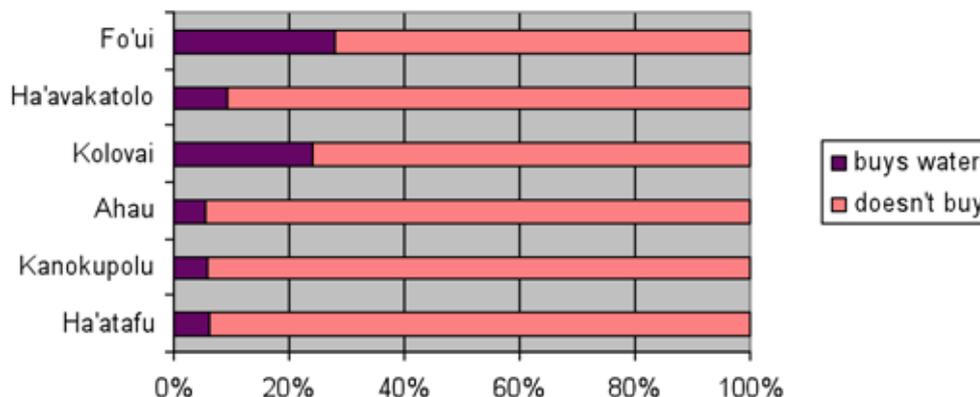


Figure 25. Percentage of households that regularly buy bottled water.

#### 4.2.2. Village piped water

With the exception of Ha'avakatolo and Kolovai, all other villages were mostly unsatisfied or very unsatisfied with the village piped water supply (Figure 26).

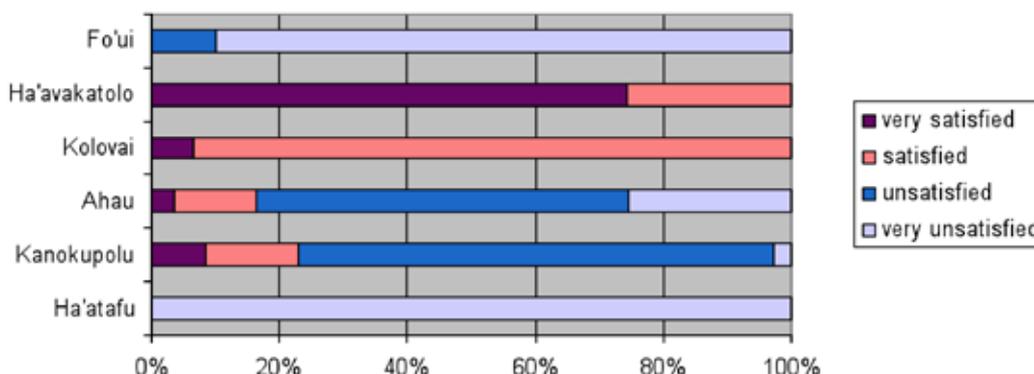


Figure 26. General perception of village water supply service.

Consistent with their high rating of very satisfactory with the water supply services, 95% of Ha'avakatolo households pay their water bills regularly (Figure 27). However, although 95% of households in Kolovai stated they are satisfied with the services, less than 10% pay the bills regularly and the majority (90%) only sometimes pay their water bills. Similarly, about 90% of households in Fo'ui sometimes pay their water bills. About 50% of households pay their water bills regularly in Kanokupolu and 'Ahau village.

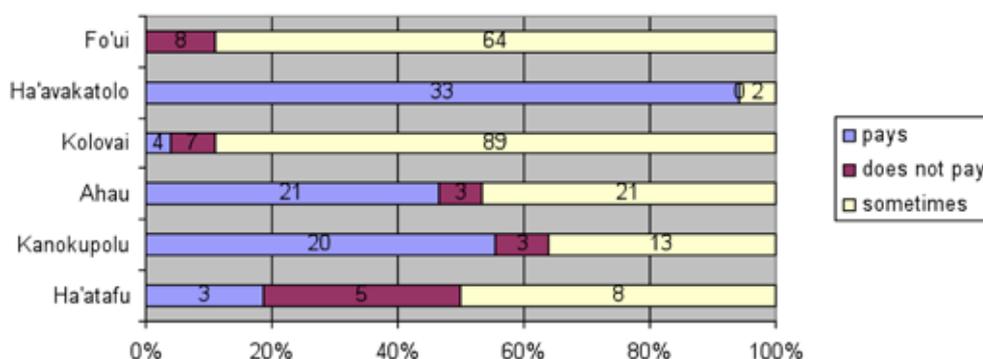


Figure 27. Percentage of households paying water bills.

Apart from Kolovai where all the respondents (100%) stated that their water is too expensive, the most common reason for not paying the monthly water bill was because there is no water (Figure 28). “Why pay if there is no water coming out of the tanks?” stated one of the respondents. Other reasons for not paying monthly water bills include 82% and 10% of respondents from Fo’ui and ‘Ahu respectively not happy with the governance and village water committee.

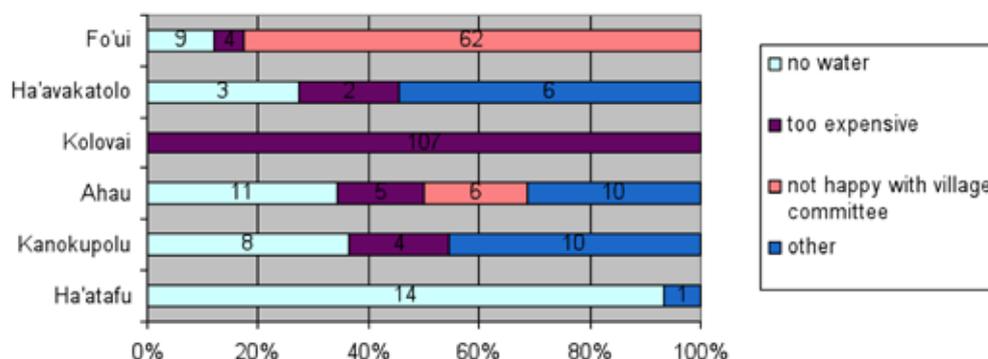


Figure 28. Reasons for not paying water bills.

Apart from Ha’avakatolo village, the other villages perceived that one of the main causes of village water problems is people not paying their monthly bills (Figure 29). The problems perceived by Ha’avakatolo included technical issues, issues with the water committee, and others. Technical issues include breakdown of the water pump, no petrol, and lack of technical know-how.

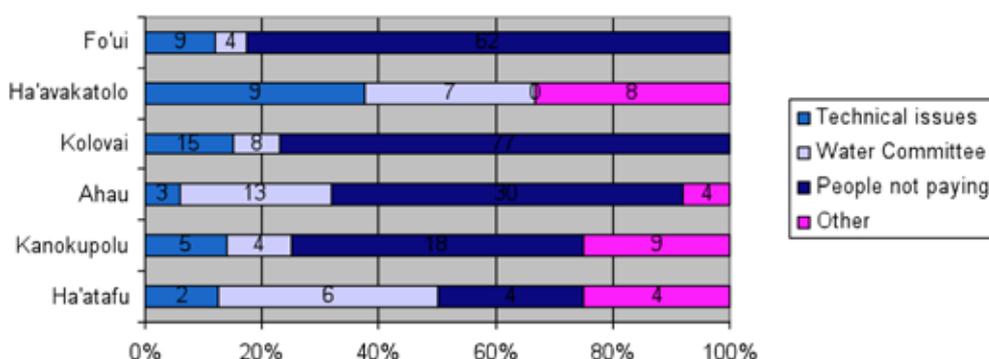


Figure 29. Perceived causes of village water problems.

In order to address the village water problems, all villages apart from Ha’avakatolo supported setting up of communal rainwater catchments and tanks as the best solution (Figure 30). Ha’avakatolo, on the other hand, was more interested in empowering their village water committee. There was also some support from the villages of ‘Ahu, Kanokupolu, Ha’atafu and Ha’avakatolo for household water tanks, and also introducing water meters to encourage a user-pays system.

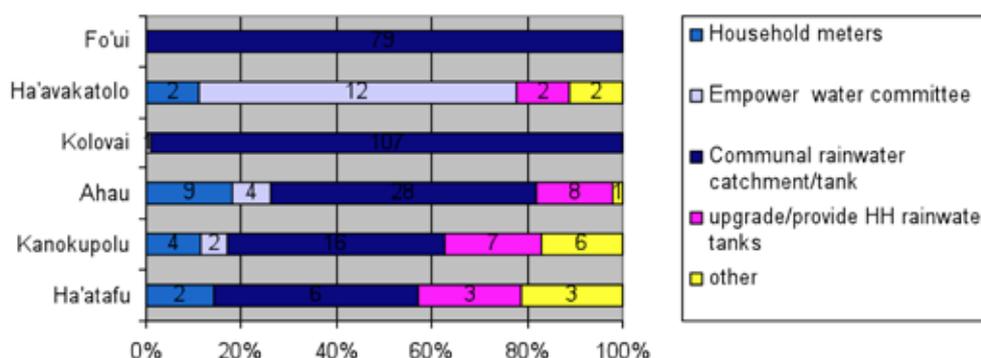


Figure 30. Proposed solutions to water supply problems.

### 4.3. Health and water

There were only three questions in this section. The first question asked participants to list any water-related diseases that she or he may have suffered in the past such as diarrhoea, typhoid, or skin diseases. The second question was focused on the possible causes, for example using contaminated water. The third question asked respondents to list the name(s) of family members, age, type of sickness and costs or expenses incurred to cure them from the diseases.

PACC aims to improve the resilience and adaptability of communities to the impacts of climate change, and improved health is considered to be part of this. The SEA team was interested not only in the linkages of water quality to health in the communities, but also the costs to stay healthy.

Unfortunately, the response to this section was very poor and the SEA team cannot present any results or make any conclusion on this issue in this report.

### 4.4. Environmental vulnerability

In September 2010, environment vulnerability assessments were conducted in five villages (Ha'atafu, Kanokupolu, 'Ahu, Kolovai and Fo'ui) by the Pacific Community-focussed Integrated Disaster Risk Reduction Project (PCIDDR) under the National Emergency Management Office (NEMO). A key output of the PCIDDR work in Hihifo is that each of the villages now has a Community Disaster Risk Management Plan, with village committees established to oversee the plan. The PCIDDR has now set up 84 Community Disaster Risk Management Plans throughout Tongatapu, Ha'apai, Vava'u and the Niuas.

The questionnaire section on environmental vulnerability was not fully answered by respondents, which may be attributed to the fact that these issues had already been addressed by the PCIDDR community emergency plans, which cover the same information.

Figure 31 shows people's perceptions of the main threats posed by environmental phenomena. There is a significant difference in these perceptions in the different villages. The main perceived threat for the bigger villages of Fo'ui and Kolovai was cyclones, with 62–65% of the populations citing this as their priority concern. In Kanokupolu the key concern is drought, whereas in 'Ahu it is coastal inundation. In both the small villages of Ha'atafu and Ha'avakatolo, 75% and 84% identified drought as the priority environmental threat.

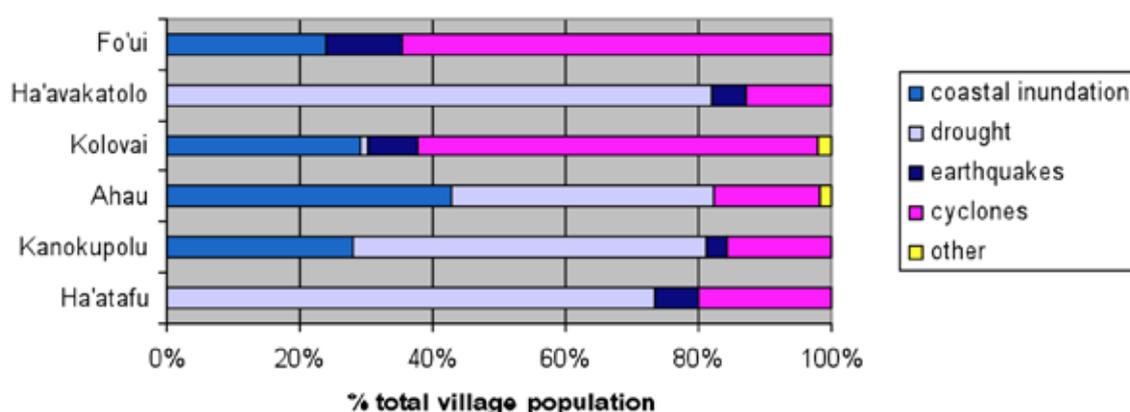


Figure 31. Perceived main environmental threat.

Respondents were asked their views on the priority environmental concern for their village (Figure 32). The majority identified access to water resources as the key priority issue in all villages except Ha'avakatolo, which currently has 24 hour access to piped water. Sixty-five percent of Ha'avakatolo respondents proposed having a community wall around the village borders as their main concern. In Fo'ui, Kolovai and Ha'atafu there was a 100% response rate that the water supply issue is the priority environmental concern.

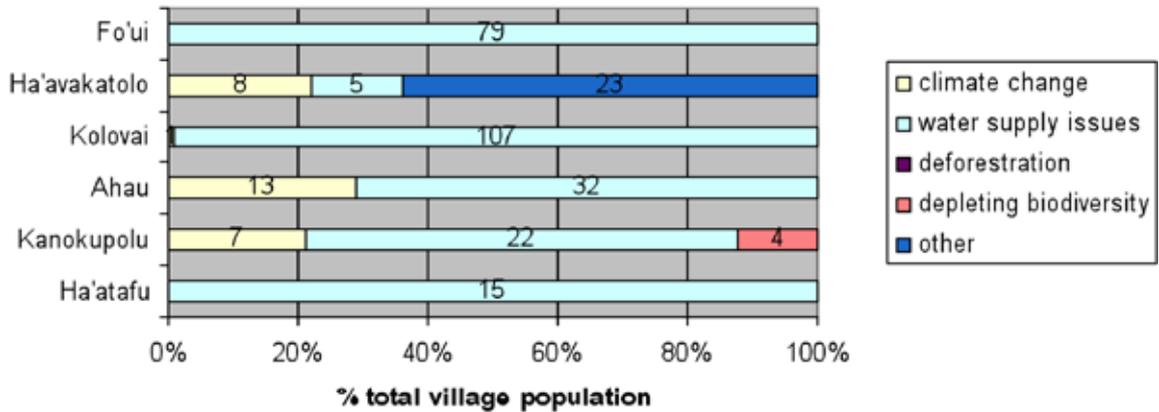


Figure 32. Perceived priority environmental concern for the village.

Finally, given the vulnerable status of Hihifo villages, willingness to relocate as an adaptation strategy to environmental emergencies was asked. While the degree of willingness was high in the bigger villages of Kolovai and Fo'ui (95%), in the small communities of Ha'avakatolo and Ha'atafu less than half of households were willing to take that option (Figure 33).

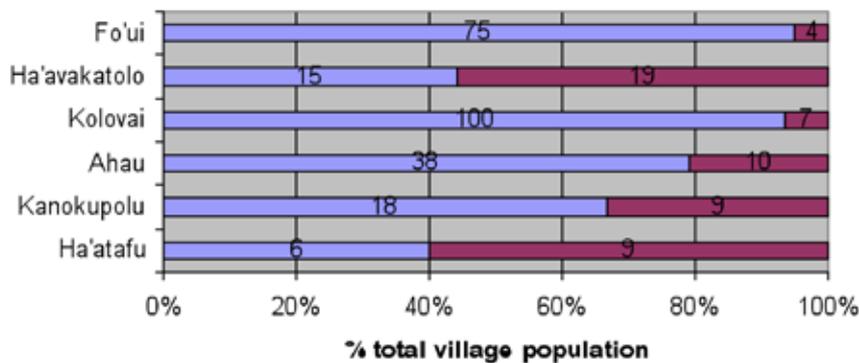


Figure 33. Willingness to relocate to avoid natural disasters and environmental impacts.

## 5. RESULTS FROM THE FOCUS GROUP MEETING

### 5.1. Governance and management of village water resources

Governance here refers to the process of decision-making for the management of water in the Hihifo district. Many projects aiming to improve supply and distribution of water to communities fail to recognise the importance of the governance component. Water resources, like any other natural resources, need to have a clearly defined management system, and lack of such a system can cause social conflict and lead to mismanagement.

The management of village water is under the Public Health Act (1992). Through the years, the Public Health Department has worked with rural villages to set up village committees to be responsible for the management of their water resources. The Tonga Water Board was set up later under the Water Board Act (2000) to supply and distribute water in the towns of Nuku'alofa, 'Ohonua, Pangai and Neiafu.

There are three water management committees in the pilot site:

- The Hihifo District Committee which covers four villages: Kolovai, 'Ahau, Kanokupolu and Ha'atafu;
- Ha'avakatolo Village Water Committee; and
- Fo'ui Village Water Committee (named in the Constitution as Lolopaongo Water Board).

Of these three committees, only one – the Fo'ui Village Water Committee – has a draft constitution. The other two manage their water resources under the old system of responding when there is a need. However, both support the idea that a constitution will be useful in improving their responsibilities towards water consumers.

Members of the water committees are elected at the regular village meetings. There is no specific time for elections of water committee members, unless there is a need to dissolve and re-elect a new committee. The Fo'ui Constitution is proposing that members are elected every three years. All the three committees meet when there is a need. The draft Fo'ui Constitution proposes that meetings be held on a monthly basis.

The common positions in the water committees are:

- Chair and vice;
- Secretary and vice;
- Treasurer and vice;
- Plumber;
- Water fees collector.

Basic responsibilities common to all the three water committees are ensuring that:

- Water reaches every family;
- Water runs for 24 hours; and
- The monthly rate is affordable for each family.

Some of the immediate needs of all the three water committees include:

- Increase the number of potable water pumps to meet the demand;
- Increase the volume of water collection by increasing the number of water tanks.

The draft constitution for the Lolopaongo Water Board outlines its objectives as follows:

- To seek financial and technical assistance for the improvement village water;
- To inform the Village Council, Government and donors of priority needs regarding water in Fo'ui; and
- To protect groundwater from contamination by chemical or other sources.

Water fees are charged as a monthly flat fee per family. However, the majority in the meeting strongly expressed their wish to introduce a user-pays system, where a water meter is set up for each household. The current monthly rates (which all at the meeting thought very high) are:

- Hihifo (Kolovai to Ha'atafu): \$17;
- Ha'avakatolo: \$6 and \$4;
- Fo'ui: \$10;
- Resorts: \$250.

There is very little transparency in the work of the water committees, and most people do not understand what is going on. In the focus group meeting it was suggested that water committees need to communicate more often, be transparent with the community, and make information available to the community. The communities need to understand the problems, what the committee is doing about the problems, the options, opportunities and limitations, the monthly fees in relation to the costs, etc. The water committees also need to follow up consumer feedback so they feel they are working together in addressing problems. This will help to reduce the number of complaints and non-payment of monthly fees. It will also improve people's understanding and they will be more patient with the situation.

Three priority issues related to the work of the village water committees were expressed at the meeting:

- Monthly fees are too expensive, especially in relation to the low income of many families;
- There is insufficient water supply in the reservoir;
- They are unable to collect the monthly fees from the families.

The following ways forward were identified to address the priority issues:

- Resources are needed to put a water meter in every household;
- Establish solar water pumps for village water supply;
- Construct additional water tanks;
- The water committees need to improve their governance; and
- Transparency and closeness between the water consumer and the water committee should be improved.

## 5.2. Capacity assessment and development

A two-level capacity approach was discussed at the focus group meeting. Table 3 summarises the current level of capacity and ways to develop this in order to assist the effective implementation and monitoring of project activities.

Table 3. Suggestions for building capacity.

Capacity	Current level	Ways to improve capacity
<p><i>Communities:</i></p> <ul style="list-style-type: none"> <li>i. Understanding of the project objectives, activities and process</li> <li>ii. Understanding of the work of the water committee</li> </ul>	<ul style="list-style-type: none"> <li>i. Limited to those who attended the awareness workshop</li> <li>ii. Low</li> </ul>	<ul style="list-style-type: none"> <li>i. Hold a free awareness workshop in each village</li> <li>ii. Hold monthly public meetings for the committee to discuss with the communities</li> </ul>
<p><i>Water committee:</i></p> <ul style="list-style-type: none"> <li>i. Understanding of the technical requirements for the maintenance of water supply</li> <li>ii. Understanding their responsibilities, such as being accountable to the consumers</li> </ul>	<ul style="list-style-type: none"> <li>i. Only a few hold the technical know-how and skills</li> <li>ii. Low</li> </ul>	<ul style="list-style-type: none"> <li>I. Conduct a technical workshop</li> <li>ii. Conduct training on good governance and leadership skills</li> </ul>

### 5.3. Harmonisation with other donors' activities

There are other aid programmes currently being implemented in the pilot villages in Hihifo. This presents good potential for collaboration with PACC, and also to learn and apply lessons to PACC activities.

During the last five years, the Hihifo district has received over half a million Tongan pa'anga of international development funding assistance for water supply and coastal protection purposes. These resources have improved village groundwater pumping and distribution systems and household rainwater harvesting tanks for some villages, however some problems persist.

Table 4 identifies donor projects for the Hihifo district that have been disbursed through the Aid Management Division, Ministry of Finance and National Planning. Other sources of international development assistance include the GEF Small Grants program, Canada Trust and UNDP.

Table 4. Recent aid projects in the Hihifo district.

	Project	Location	Donor	Year Funded	Total Grant (TOP)	Project output
1	Fo'ui Water Committee	Fo'ui	Government of Japan (GGP)	2008/09	172,259.35	Upgrade Fo'ui water system
2	Vili'anga Okooko Cooperative Society	'Ahau	Government of Australia (AusAID)	2004/05	29,430.00	Construct six piggery fences
3	Komiti Vai Fakavahe Hihifo	Hihifo	Government of Australia (AusAID)	2006/07	72,162.50	Upgrade Hihifo water system
4	Kulupu Fakalalaka Fakakolo	Ha'atafu	Government of Australia (AusAID)	2008/09	41,860.00	Construct 10 plastic water tanks
<b>TOTAL</b>					<b>315,711.85</b>	

## 6. CONCLUSION

The results of the household survey indicate that the communities in Hihifo are disadvantaged socially and economically. About 50% of households earn wages but these are mostly low. Most households said that their income often falls short of meeting basic needs because of the high cost of living. The 30% of the households that rely on agriculture, fishing and handcraft for their income are further affected by inundation, drought and other negative impacts of climate.

Hihifo has battled for decades with unreliable water supply, due to a combination of natural, governance and technical factors. First, the fragile and thin water lens, which is increasingly vulnerable as water demands and droughts increase. There is a lack of community participation in the management of the precious water resources, in part due to a disconnect between the water committee and the community. All water committees are faced with technical issues, from engine breakdown to leakages. The assessment saw the opportunity to engage communities in technical capacity development in order to improve and maintain service delivery to all the households in Hihifo.

Even though the PACC pilot project is focusing on groundwater, the team felt that it was important to also gather information on the drinking water supply. It was clear from the survey that the majority of households drink rainwater collected in water tanks. However, the survey also indicated that a fair proportion of most of the villages does not own a water tank and they have to collect their drinking water either from a neighbour or the community hall.

The focus group revealed that there is very little transparency in the work of the water committees, and most people do not understand what is going on. It was suggested that water committees need to communicate more often, be transparent with the community, and make information available to the community. The communities need to understand the problems, what the committee is doing about the problems, the options, opportunities and limitations, the monthly fees in relation to the costs, etc. The water committees also need to follow up consumer feedback so they feel they are working together in addressing problems.

The following ways forward were identified by the focus group to address the priority issues:

- Put a water meter in every household;
- Establish solar water pumps for village water supply;
- Construct additional water tanks;
- The water committees need to improve their governance; and
- Transparency and closeness between the water consumer and the water committee should be improved.

In the past several donors have attempted to help the communities of Hihifo to address the problem with their groundwater, but without much success. The focus group discussion with members of the different water committees in Hihifo confirms their frustration in facing this problem for so long. They are looking forward to PACC helping them to resolve this problem once and for all.

This assessment report provides baseline information about the current status of the pilot sites at the commencement of the PACC project. This will contribute to designing, implementing and monitoring of project activities, and ultimately to achieving the goal of the PACC project, which is to reduce vulnerability of the communities of Hihifo to drought.

## REFERENCES

- Latukefu, S. (1975) *The Tongan Constitution: A brief history to celebrate its Centenary*. Government Printing, Nuku'alofa, Tonga.
- Ministry of Environment and Climate Change (2010) *Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management 2010–2015*. Nuku'alofa, Tonga.

# APPENDIX 1: SURVEY QUESTIONNAIRE (TONGAN VERSION)

SAVEA'I 'A E TU'UNGA FAKA SOSIALE MO 'EKONOMIKA 'OE VAHENGA HIHIFO,  
TONGATAPU PEA MO 'ENAU MATU'UAKI 'A E FELILIUAKI 'OE 'EA

**Taumu'a 'oe Savea: Ke tanaki ha fakamatala mei he ngaahi 'api fekau'aki moe tu'unga:**

1. fakasosiale mo faka'ekonomika lolotonga 'oe kakai 'i he ngaahi kolo 'oe vahenga Hihifo;
2. 'oku 'iai 'a e ma'u'anga vai fakakolo 'i he vahenga Hihifo moe anga 'e nau ngaue'aki 'a e vai;
3. mo'ui lelei 'a e kakai 'o Hihifo 'i he 'ene fekau'aki moe ma'u'anga vai; pea mo
4. hono uesia 'a e kakai moe 'ataakai 'oe vahenga Hihifo 'ehe feliliuaki 'oe 'ea.

*Nouti 1: Koe 'api 'oku faka'uhinga'i 'i he pepa savea ni ki ha falukunga kakai 'oku nau nofo fakataha 'i ha 'api pe feitu'u pea nau ma'u me'atokoni fakataha 'i he efiafi kotoa.*

## KONGA 1: FEHU'I FEKAU'AKI MOE NGAHI 'API

### A. TU'UNGA FAKASOSIALE MO FAKA'EKONOMIKA

#### Ko e Kolo

Hingoa 'o e Kolo \_\_\_\_\_

Hingoa 'oe Ma'u Tofi'a \_\_\_\_\_

Hingoa 'o e tokotaha savea \_\_\_\_\_

#### Ko e 'Api

1. Hingoa 'oe 'ulu 'oe 'Api \_\_\_\_\_

2. Tangata/Fefine (T/F) \_\_\_\_\_

3. Ta'u Motu'a \_\_\_\_\_

4. Fa'ahinga 'oe 'Api (siakale'i mai e tali 'oku tonu)

i. famili (tamai, fa'e, fanau) ii. matu'a 'ikai ha fanau

iii. kainga (kui, mokopuna, etc) iv. me'a kehe (fakamatala'i) \_\_\_\_\_

5. Tokolahi 'oe kakai 'oku nofo 'i he 'ap \_\_\_\_\_

6. Na'e nofo 'i fe'ia 'a e 'api ni 'i he ta'u 'e 5 kuo hili? (siakale'i e tali 'oku tonu)

i. Hihifo, Tongatapu ii. Kolo kehe 'i Tongatapu (hingoa 'oe kolo) \_\_\_\_\_

iii. 'Eua iv. Ha'apai v. Vava'u

v. Ongo Niua vi. Tali kehe (fakamatala'i) \_\_\_\_\_

7. Koe ha e fuoloa ho'o mou nofo 'i Hihifo ni (siakale'i e tali 'oku tonu)

i. ta'u 'e 0-5 ii. ta'u 'e 6-10 iii. ta'u 'e 11-15 years iv. 'ova he ta'u 'e 16

#### Tu'unga Fakaako mo Fakangaue

*Nouti 2: tu'unga fakaako*

*te'eki ta'u ako (preschool)*

*kei ako*

*a. lautohi*

*e. kolisi*

*f. 'Univesiti (tertiary)*

*'osi e ako*

*a. ngata he lautohi*

*e. lava e kolisi*

*f. mata'itohi (Dip, BA, MA, Phd)*

*tu'unga fakaako kehe \_\_\_\_\_*

Nouti 3: tu'unga fakangaue (lolotonga)

- i. fakapule'anga
- ii. kautaha 'ikai fakapule'anga (NGO)
- iii. pisinisi
- iv. ngoue - (a) kai pe (e) fakapa'anga
- v. toutai - (a)kai pe (e) fakapa'anga
- vi. faama (puaka, pulu, moa etc.) (a) kai pe (e) fakapa'anga
- vii. ngaue fakamea'a/tatongitongi
- viii. ngaue faka'api
- ix. penisoni
- x. toulekeleka
- xi. kei kumi ngaue
- xii. ngaue kehe (fakamatala)\_\_\_\_\_

8. Fakafonu e tepile ngaue'aki'a e Nouti 2 moe 3.

Lisi mai e hingoa 'oe kakai kotoa 'oku nofo 'i 'api ni	Ta'u	Tangata (T) Fefine (F)	Tu'unga fakaako (fakafonu 'o fakafehoanaki ki he tali 'ihe Nouti 2)	Ngaue (fakafonu 'o fakafehoanaki ki he tali 'i he Nouti 3)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

9. Fakafonu mai 'a e tepile ko 'eni (fa'ahinga pe 'oku nau kei 'i he ako)

Hingoa (fa'ahinga pe 'oku kei ako)	Ta'u	Tangata (T) Fefine (F)	Kalasi moe hingoa 'oe 'apiako
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

## Ngaue Faka'ekonomika moe Pa'anga Hu Mai

10. Koe ha e tefito'i ma'u'anga pa'anga ho mou 'api?

- i. ngaue pa'anga                      ii. ngoue                      iii. toutai                      iv. ngaue fakamea'a  
v. li silini mei muli                      vi. pisinisi                      vi. founa kehe \_\_\_\_\_

11. Kapau koe ngoue ho'o tali ki he fehu'i 10, 'oku ke ngaue'aki e kemikale fakangoue?                      'lo/'Ikai

12. Kapau koe toutai ho'o tali ki he fehu'i 10, koe ha e founa toutai 'oku ke ngaue'aki?                      i. taumata'u

- ii. paa ika                      iii. kupenga                      iv. uku                      v. fana 'one                      vi. founa kehe \_\_\_\_\_

13. Kapau koe ngaue fakamea'a ho'o tali ki he fehu'i 10, koe ha e koloa fakaenatula/'akau 'oku ke ngaue'aki?

- i. hiapo/ngatu                      ii. lou'akau/lalanga                      iii.'akau kehe (tatongitongi) \_\_\_\_\_

14. Siakale'i mai 'a e faka'avalisi 'oe pa'anga hu mai 'i he uike 'e 2 kotoa pe (TOP\$)

- i. < \$100                      ii. \$100- \$200                      iii. \$200-\$600  
iv. \$600-\$1200                      v. > \$1200                      vi. tali kehe \_\_\_\_\_

15. Siakale'i mai e faka'avalisi 'oe pa'anga hu mai fakalukufua 'i he ta'u? (TOP)

- i. <\$5000                      ii. \$5000 - \$7000                      iii. \$7000-\$10,000  
iv. \$10,000-\$20,000                      v. \$20,000-\$30,000                      vi. >\$30,000

16. 'Oku fa'a ma'u ha seniti li mai mei he famili/kainga 'i muli                      'lo/'Ikai

17. Kapau 'oku 'io, 'oku faka'avalisi ki he pa'anga 'oku li mai 'eho famili mei muli he mahina?

- i. <\$500                      ii. \$500 - \$1000                      iii. >\$1000                      iv. tali kehe \$ \_\_\_\_\_

## Ngaahi Fakamole Tu'upau

18. Koe ha fua e ngahi fakamole tu'uma'u ho mou 'api ki he mahina?

- i. me'atokoni \$ \_\_\_\_\_                      ii. fefononga'aki \$ \_\_\_\_\_                      iii. 'uhila\$ \_\_\_\_\_                      iv. vai \$ \_\_\_\_\_  
v. veve \$ \_\_\_\_\_                      vi. initaneti \$ \_\_\_\_\_                      v. TV \$ \_\_\_\_\_                      vi. me'a kehe \$ \_\_\_\_\_  
@. fakamole fakamahina \$ \_\_\_\_\_

19. Koe ha e ngaahi fakamole tu'uma'u ki he ta'u?

- i. misinale \$ \_\_\_\_\_                      ii. totongi ako \$ \_\_\_\_\_                      iii. totongi no \$ \_\_\_\_\_                      v. me'e kehe \$ \_\_\_\_\_  
@ fakamole fakata'u \$ \_\_\_\_\_

## Ngaahi Koloa Kehe Faka'api

20. Siakale'i mai e ngaahi koloa kehe 'i homou 'api

- i. 'ikai ha me'alele                      ii. 'ikai ha vaka                      iii. vaka 'e 1                      iv. me'alele 'e 1  
v. me'alele 'e 2                      iv. koloa kehe \_\_\_\_\_

21. Siakale'i mai e fa'ahinga fale 'oku mou nofo ai.

- i. fale tonga                      ii. fale papa                      iii. fale piliki                      iv. fale piliki moe papa  
v. fale kapa                      vi. fale pepa                      vii. tali kehe (hiki mai) \_\_\_\_\_

22. Siakale'i mai e fale si'i (malolo) 'oku mou ngaue'aki

- i. falemalolo ponu                      ii. falasi                      iii. lingi vai                      iv. fale kehe \_\_\_\_\_

### Ma'u'anga Ivi

23. Ko e ha e ma'u'anga ivi 'oku maama ai ho 'api?

- i. 'uhila (diesel)                      ii. kalasini                      iii. tali kehe (hiki'i mai) \_\_\_\_\_

24. Koe ha e ma'u'anga ivi 'oku ke ngaue'aki ki he feime'atokoni?

- i. 'uhila (diesel)                      ii. kalasini                      iii. kasa                      iv. fefe  
v. tali kehe \_\_\_\_\_

### Ma'u Kelekele

25. Siakale'i mai e tali 'oku tonu

- i. 'Api kolo 'oku lesisita 'i he taha 'oe memipa 'oe 'api \_\_\_\_\_ ('lo/'Ikai)  
ii. Kapau 'oku 'ikai, koe 'api kolo 'o hai? \_\_\_\_\_ (tokanga'i/nofo totongi/lisi)  
iii. 'Api 'uta 'oku lesisita 'i he taha 'oe memipa 'oe 'api \_\_\_\_\_ ('lo/'Ikai)  
iv. Kapau 'oku 'ikai, koe 'api 'uta 'o hai? \_\_\_\_\_ (tokanga'i/lisi)  
v. 'Ikai ha 'api 'uta

### Fefononga'aki

26. Koe ha e founga anga maheni e fefononga'aki 'i homou 'api?

- i. me'alele pe 'amautolu                      ii. pasikala                      iii. pasi                      iii. taxi/hire  
iv. saliothe/hoosi                      iv. founga kehe \_\_\_\_\_

27. Koe ha 'a e tu'unga 'oe hala pule'anga 'i homou kolo?

- i. sai 'aupito                      ii. sai pe                      iii. kovi                      iv. kovi 'aupito

28. Ko e ha e tu'unga 'oe hala pule'anga ki 'uta?

- i. sai 'aupito                      ii. sai pe                      iii. kovi                      iv. kovi 'aupito

### Siasi

29. Koe ha e siasi 'oku ke kau ki ai? \_\_\_\_\_

### Memipa ki he Komiti he Kolo

30. Ko e ha e komiti he kolo 'oku kau ki ai ha memipa 'i ho 'api?

Hingoa (T/F)	Hingoa 'oe komiti

## E. MA'U'ANGA VAI – TU'UNGA MA'A MO HONO NGAUE'AKI

### Ma'u'anga Vai Inu

31. Ko e ha ho'o ma'u'anga vai inu?

- i. tangike vai 'uha    ii. vai paipa fakakolo    iii. vai fakatau    iv. tali kehe \_\_\_\_\_

32. 'Oku ke fakatau vai?    'lo/'Ikai

33. Kapau 'oku 'io, koe ha e lahi 'oe vai 'oku ke fakatau he uike?

- i. hina vai 'e fiha \_\_\_\_\_    voliume \_\_\_\_\_ mls

34. Koe ha e lahi 'oe pa'anga 'oku ke fakamoleki ki hono fakatau e vai he uike? \$ \_\_\_\_\_

35. 'Oku 'iai ha'o tangike vai?    'lo/'Ikai

36. Kapau 'oku 'ikai, 'oku ke 'utu vai 'uha mei fe?

- i. kaunga'api    ii. 'api siasi    iii. feitu'u kehe \_\_\_\_\_

37. Koe ha e lahi/voliume 'oe tangike vai? \_\_\_\_\_ kalani/lita

38. Ko hai na'a ne fakapaanga ho'o tangike vai?

- i. Ko au    na'e fiha \$ \_\_\_\_\_

- ii. polokalama tokoni    hingoa 'oe tokoni \_\_\_\_\_

39. Kapau 'oku 'ikai teke inu e vai paipa fakakolo, koe ha hono 'uhinga?

- nanamu faito'o    ii. 'ikai ma'a    iii. ilifa ki he siemu    iv. 'uhinga kehe \_\_\_\_\_

### Vai Paipa Fakakolo

40. 'Oku ke ngaue'aki e vai paipa fakakolo ki he ha?

- i. fo    ii. kaukau    iii. inu    iv. fakainu monumanu (pulu/hoosi)  
iv. fu'ifu'i ngoue    v. fakama'a moe ngaue faka'api    vi. me'a kehe \_\_\_\_\_

41. Ko e ha e taimi 'oku lele lelei ai e vai fakakolo?

- i. houa 'e 24 hours    ii. mei he \_\_\_\_\_ ki he \_\_\_\_\_    iii. feto'aki    iv. mate 'aupito

42. Ko e ha e tu'unga ho'o fiemalie ki he vai paipa fakakolo?

- i. fiemalie 'aupito    ii. fiemalie pe    iii. 'ikai fiemalie    iv. kovi 'aupito

43. Kapau 'oku 'ikai teke fiemalie, koe ha e 'uhinga?

- i. 'ikai ma'a e vai    ii. fu'u mamafa    iii. ifo kona pea nanamu  
iv. lahi e taimi oku 'ikai lele    v. 'ikai pe ke lele e vai    vi. 'uhinga kehe \_\_\_\_\_

44. 'Oku ke totongi ma'u pe ho'o mo'ua vai fakamahina?    'lo/'Ikai/timi pe e ni'ih

45. Kapau 'oku 'ikai totongi ho'o vai, koe ha e 'uhinga?

- i. ikai lele 'a e vai    ii. fu'u mamafa    iii. Komiti Vai    iv. 'uhinga kehe \_\_\_\_\_

### Tefito'i Palopalema 'oe Vai Paipa Fakakolo

46. Kuo lahi e ngaahi polokalama tokoni mei muli kuo nau tokoni mai 'i he ngaahi ta'u kuo hili ke fakalaka e ma'u'anga vai 'a Hihifo moe kei palopalema pe. Koe ha e 'uhinga 'oku kei palopalema ai pe 'a e vai paipa fakakolo 'a Hihifo ni?

- i. fakatekinikale    ii. Komiti Vai    iii. 'ikai totongi vai e kakai  
iv. 'uhinga kehe \_\_\_\_\_

**Solova'anga 'oe Palopalema ki he Vai Paipa Fakakolo**

47. Koe ha e solova'anga 'oe palopalema 'oe vai paipa 'a Hihifo?

- i. fakamita e vai 'a e ngaahi 'api
- ii. fakaivia e fa'unga pule 'oe Komiti vai
- iii. fokotu'u tangike vai fakakolo
- iv. fakalelei'i/fakalahi tangike vai he ngaahi 'api
- v. 'uhinga kehe \_\_\_\_\_

**F. MO'UI LELEI – FEKAU'AKI MOE MA'U'ANGA VAI.**

48. Katakai 'o siakale'i mai e ngaahi mahaki kuo puke ai ha taha ho mou 'api he ta'u ni?

- fakalele
- ii. mofi tengi
- iv. mofi taifoti
- v. ponua
- tane
- vi. veli e kili
- vii. hangatamakia
- mahaki kehe \_\_\_\_\_

49. Koe ha e 'uhinga ne puke ai e memipa ho mou 'api?

- i. to'u mahaki
- ii. 'uli e vai inu
- iii. 'uli/'ikai ha vai paipa fakakolo
- iv. 'uli 'ataakai
- v. 'ikai ma'a e to'onga mo'ui (unhygienic)
- vi. tali kehe \_\_\_\_\_

50. Katakai 'o fakafonu mai e tepile fekau'aki moe memipa ho mou 'api ne nau puke he mahina 'e 12 kuo hili.

Hingoa (T/F)	Ta'u	Hingoa 'oe Mahaki	Fakamole \$

**H. UESIA MEI HE FELILIUAKI 'A E 'EA (VULNERABILITY ASSESSMENT)**

51. Katakai 'o fakafika mai e anga hono uesia ho mou 'api 'i he ngaahi ta'u kuo hili 'e he feliliuaki 'a e 'ea moe ngaahi fakatamaki fakaenatula, kamata mei he fika 1 ki he uesia lahi taha pea fai hifo ai ki he uesia si'i taha ?

- i. tafea/hake 'a e tahi [ ]
- iii. mofuike [ ]
- ii. la'ala'a [ ]
- iv. afa/matangi malohi [ ]
- v. fakatamaki kehe \_\_\_\_\_

52. Koe ha e 'uhinga 'oku uesia lahi ai ho mou 'api 'e he fakatamaki fakaenatula moe feliliuaki 'a e 'ea?

Fakatamaki	'Uhinga 'oe uesia
i. tafea/hake e tahi	eg. tafea ho mau 'api – mataatahi



PACC – building adaptation capacity in 14 Pacific island countries and territories



## PACIFIC ADAPTATION TO CLIMATE CHANGE (PACC) PROGRAMME

The PACC programme is the largest climate change adaptation initiative in the Pacific region, with activities in 14 countries and territories. PACC is building a coordinated and integrated approach to the climate change challenge through three main areas of activity: practical demonstrations of adaptation measures, driving the mainstreaming of climate risks into national development planning and activities, and sharing knowledge in order to build adaptive capacity. The goal of the programme is to reduce vulnerability and to increase adaptive capacity to the adverse effects of climate change in three key climate-sensitive development sectors: coastal zone management, food security and food production, and water resources management. PACC began in 2009 and is scheduled to end in December 2014.

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