

Annex A Household Survey Results and Analysis

A.1 Survey Results and Analysis

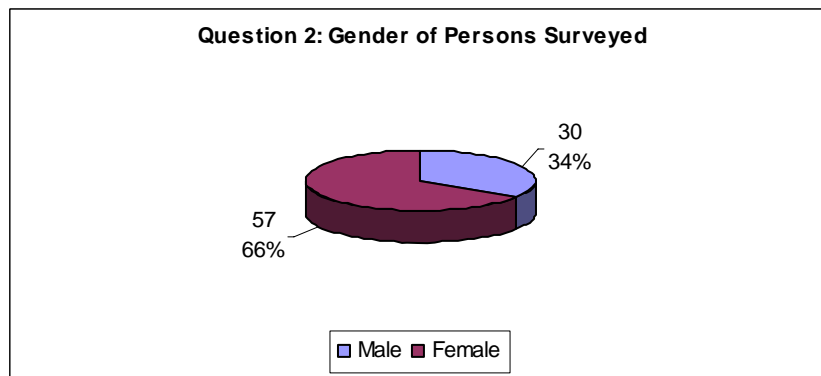
The following results are presented in accordance with the questions in the Household Survey (see Annex 2). Analysis and description is provided on each question, with some comparisons made between the survey sample, Kiritimati Island and national Kiribati data¹.

A.1.1 Background Information

Gender

As discussed in Section 3.1, the survey was undertaken in a stratified manner to ensure an appropriate cross-section of the community was sampled. Likewise, the survey was targeted at both men and women respondents. Figure A.1 shows the relative percentages for men and women surveyed, 34% and 66% respectively.

Figure A.1 Number of Men and Women Surveyed

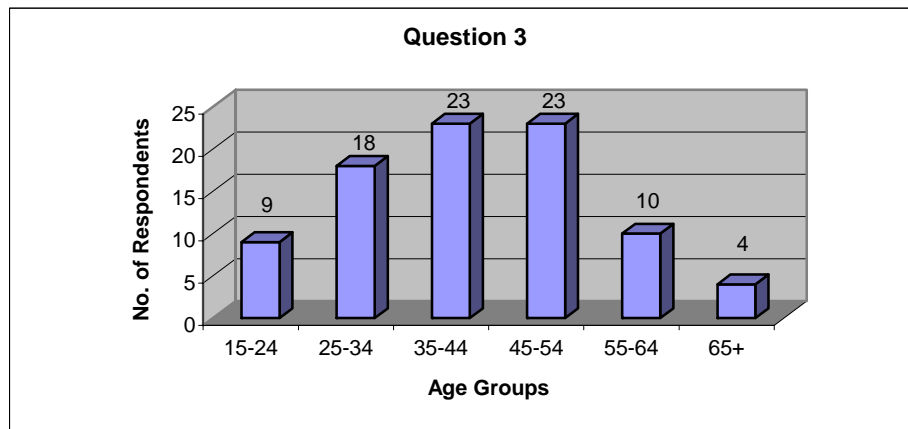


Care was taken by the survey team to ensure a mix of respondents. However the higher number of women surveyed is a reflection of the high proportion of women in Kiribati who are the primary caregivers and as such are at home during the day – i.e. when the survey was being conducted. The higher proportion of women surveyed has the positive effect of strengthening the quality of the data collected. This is due to women being the manager of the household, particularly in relation to water usage (cooking, bathing, washing and other domestic uses) and financial management.

Age

The survey covered a wide range of age groups (Figure A.2), with the majority of respondents in the 35-44 and 45-54 age groups. The average age of the respondents was 41.5 years.

¹ Kiritimati Island and Kiribati data is based on the 2005 Census.

Figure A.2 Age Classification

Household Size

The average household size of the surveyed properties was 9.5 persons, which is substantially higher than the 2005 Census figures for Kiritimati Island and Kiribati; 6.7 persons and 6.3 persons respectively (Figure A.3a). This large difference is largely due to high household numbers in Tabwakea village (11.3 persons) and Banana village (10.1 persons). Approximately 16% of households have 13 or more persons (Figure A.3b). One of the key issues affecting the large household size in Tabwakea is multiple families living on one lease (with relatives) whilst awaiting new land releases in other parts of Tabwakea or New Banana / Main Camp. Some of these are new immigrants to Kiritimati Island and other residents are first and second generation families granted land following colonial copra production in the late 1970s. Visual observations and anecdotal evidence suggests that London is also experiencing overcrowding; sometimes up to 20 persons sharing a two roomed government house. The slow rate of land release by the Government will continue to foster hardship within the community. This places greatest pressure on villages such as Tabwakea, where a much larger proportion of the population are unemployed or rely on informal income sources such as fishing and cutting copra.

The high household size in Banana village may be due to the village being contained (in surface area) for the last 10-15 years due to the village's proximity to the Banana freshwater lens. The slow release of lease plots will also be contributing to overcrowding on existing leases and government houses. The relatively low household size in Poland, when compared with the overall survey results, may be because more than 20 of their youth are boarding at schools in London, Tabwakea Fanning Island or South Tarawa.

Key Implication for Project Design No. 1: The household water supply and sanitation systems need to be designed for households of 9-10 persons each and not the Kiribati national average of 6.3 persons or the Kiritimati Island average of 6.7 persons.

Figure A.3a Average Household Size, including Comparisons with 2005 Census for Kiritimati Island and Kiribati

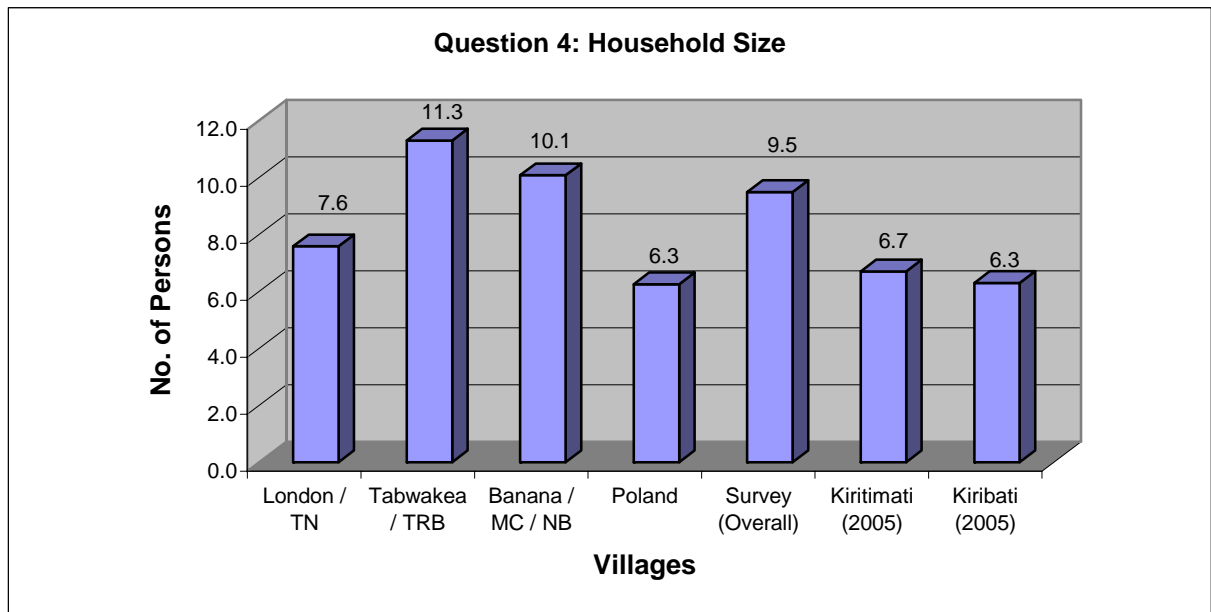
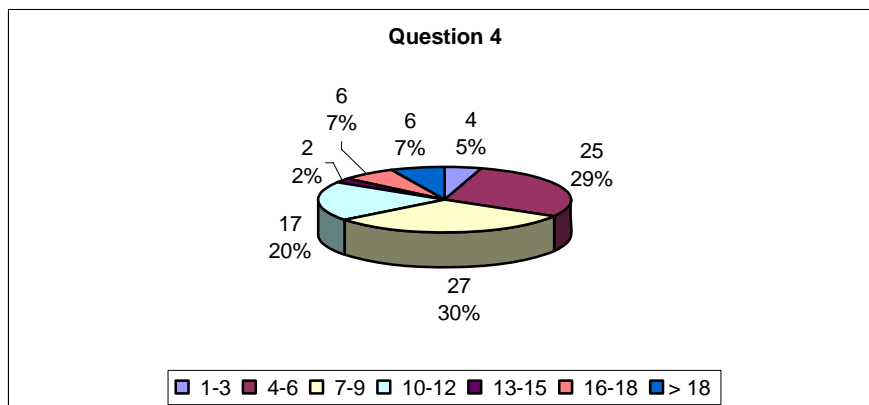


Figure A.3b Household Size by Breakdown of No. of Persons



Housing

The distribution of housing across the survey was relatively evenly split between government and private dwellings (Figure A.4). The largest variations are noticeable at the village level, where London, Banana and Poland villages are dominated by government housing, whilst Tabwakea is dominated by private housing (Figure A.5). This reflects the government’s policy of Tabwakea (and future land developments north of Tabwakea) as a private leaseholding village.

Figure A.4 Type of House/Dwelling

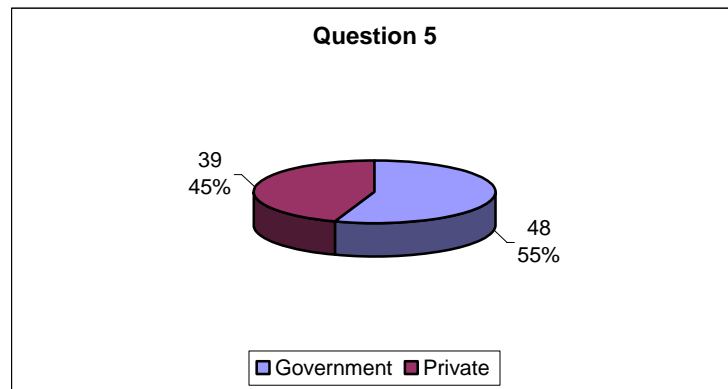
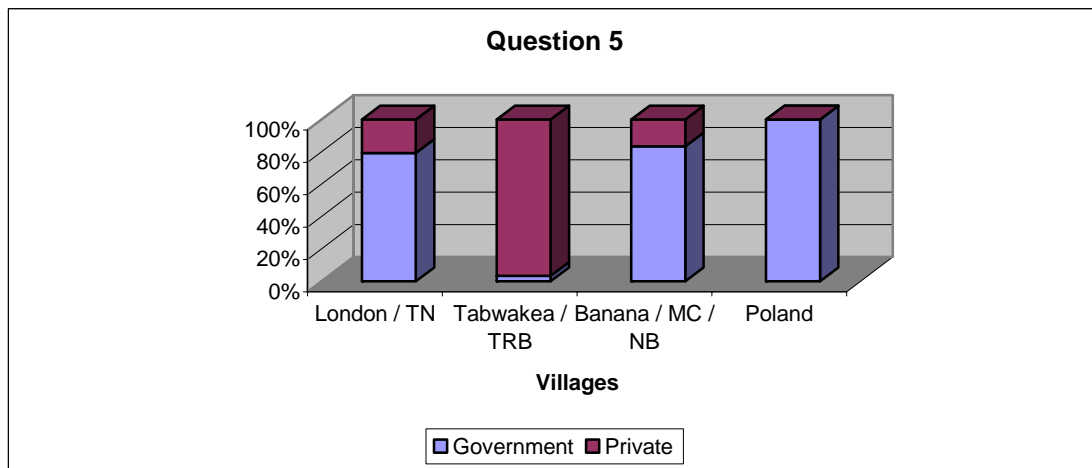


Figure A.5 Type of House/Dwelling by Villages



Village Preference

Following the testing phase, an additional question was added to the Background Information section to assess the respondent’s preference for continuing to live in their current village, or potentially live in another village in Kiritimati Island. Some 25% of respondents indicated that they would prefer to live in another village in Kiritimati Island (Figure A.6). Of those that would prefer to live in another village, the majority (63%) suggested Tabwakea (Figure A.7). The home villages of those that would prefer to live in another village are mostly from London and Banana; 46% and 36% respectively (Figure A.8).

A theme emerging from this data is that those respondents who would prefer to live in Tabwakea are predominantly from Government houses. This may be a reflection of the quality of government housing or may be a desire to reside on their own lease and construct their own home, as is possible in Tabwakea. It is important to realise that the majority of respondents (75%) are happy to continue residing in their present village.

Figure A.6 Village Preference

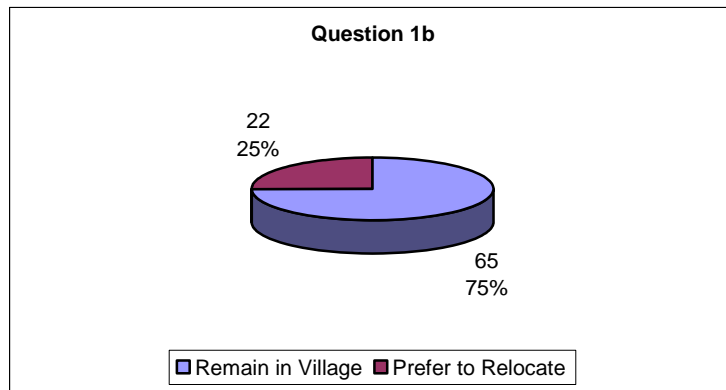


Figure A.7 Preferred Village for Relocation in Kiritimati Island

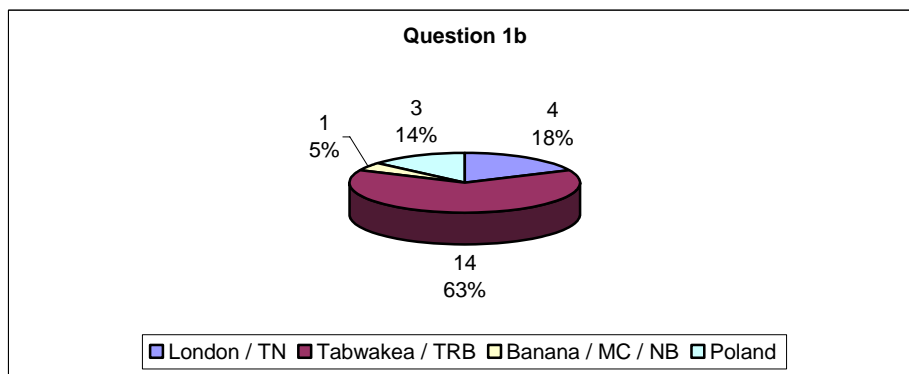
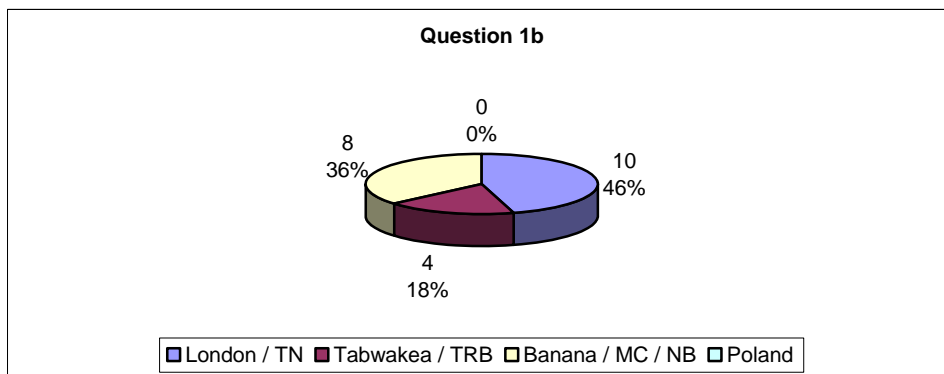


Figure A.8 Home Villages of those Respondents who would prefer to relocate



A.2.1 Household Water Supply

Water Usage and Water Sources

The average per capita water usage is similar across the island at 51.8 litres per person per day (Figure A.9). Poland recorded the highest usage with 55.3 l/p/d and Banana the least usage with 48.8 l/p/d. These water usage figures are higher than the actual usage rates for 2007, as taken from the MPLID records. The differences are highlighted in Table A.1.

Table A.1 Water Consumption Data from MPLID Records² (2007) and Household Survey (2007)

Village	MPLID Records (l/p/d)	Household Survey (l/p/d)
London / TN	42.1	53.2
Tabwakea / TRB	28.9	52.3
Banana / MC / NB	27.1	48.8
Poland	25.6	55.3

The figures for MPLID provided water in Table A.1 do not take into account non-revenue or unallocated water. These raise the daily usage figures by more than 50%, which in the case in Poland has unaccounted for water (UFW) of 58%. The London and Tabwakea supply system from Decca and Four Wells lenses has a UFW of 47%³. Recently, a water tanker has been supplying the hospital and some private homes with water directly sourced from the Decca lens, as there is not sufficient supply to some areas of London. This tanker service would account for approximately an additional 3 l/p/d⁴ for London.

There are only 4 households in Banana with consumption meters and there are no functional production meters on the Banana gallery. As such, there is no current method to determine how much water is being produced or consumed in the Banana system. Banana receives piped water for 1-2 hours each day. Therefore the data supplied for Banana as part of the household survey is a more reliable figure upon which to design the future water supply.

When asked about how many litres each person requires each day, the vast majority of respondents replied with a figure that was lower than their estimates of current usage; 51.8 l/p/d on average for current usage compared with 33 l/p/d on average for estimated daily needs (Figure A.10).

² Courtesy of Water and Sanitation Division of MPLID.

³ Based on production and consumption data from MPLID Water and Sanitation Division for 2007.

⁴ 1 tanker load per day (5,000L) for population of 1,800 persons in London.

Key Implication for Project Design No. 2: Daily water supply to London and Poland should be planned for approximately 70-80 l/p/d as these villages have limited or no access to usable groundwater. Tabwakea and Banana should be planned for approximately 50-60 l/p/d as these villages have access to reasonable quality groundwater for non-potable uses.

Dissimilarities between villages are most evident when analysing the source of water. For example, London and Poland are dominated by piped water usage whereas Tabwakea and Banana use a mixture of piped water and well water (Figure A.11). In the case of London and Poland the high use of piped water is primarily because there is contamination of groundwater from petrochemicals and septic systems (London) and brackish groundwater (Poland). In Tabwakea, there is relatively easy access to good quality groundwater which is used predominantly for bathing, washing, flushing toilets and other household uses (gardening and pigs) (Figure A.13). As Figure A.18 indicates, residents in Tabwakea are keen to have wells improved to support their water supply regime. In Banana, the high usage of well water is likely as a result of extremely limited piped water supply (sometimes only 1 hour per day) and also because some houses do not have access to the piped supply. Like Tabwakea, Banana has access to good quality groundwater as it is situated on the southern edge of the Banana freshwater lens.

Key Implication for Project Design No. 3: The design needs to incorporate multiple water sources (potable and non-potable) for multiple household uses where possible. For Tabwakea and Banana, where residents have access to groundwater, new well construction and improvements for existing wells should be supported for non-potable use.

The use of rainwater as a potable water source is limited across all villages on Kiritimati Island. Anecdotal evidence from a number of respondents suggests that the island is currently in a dry period which may account for some of the low usage of rainwater tanks. Figure A.18 indicates that all respondents in Poland and approximately 1 in 6 households in London, Tabwakea and Banana would like to see an improvement in their rainwater supply. It is proposed as part of the *Existing Infrastructure Survey*⁵ that all rainwater storages be examined to assess the quantity, capacity, material, status (many seem in disrepair) and estimate of current water level. The low use of rainwater storages may also be as a result of poor maintenance which contributes to leaks.

Key Implication for Project Design No. 4: Subject to confirmation from the results of the *Existing Infrastructure Survey*, the design needs to incorporate rainwater tanks into the available options for potable water supply. Ability of private leaseholders to afford rainwater tanks also needs to be factored into the design.

⁵ Survey undertaken as part of ADB TA 4456-KIR (Phase 2) covering every property on Kiritimati Island.
TA No. 4456 – KIR: Preparing the Outer Islands Growth Centers Project – Phase 2, Kiribati - SKM

Figure A.9 Average Total Water Usage

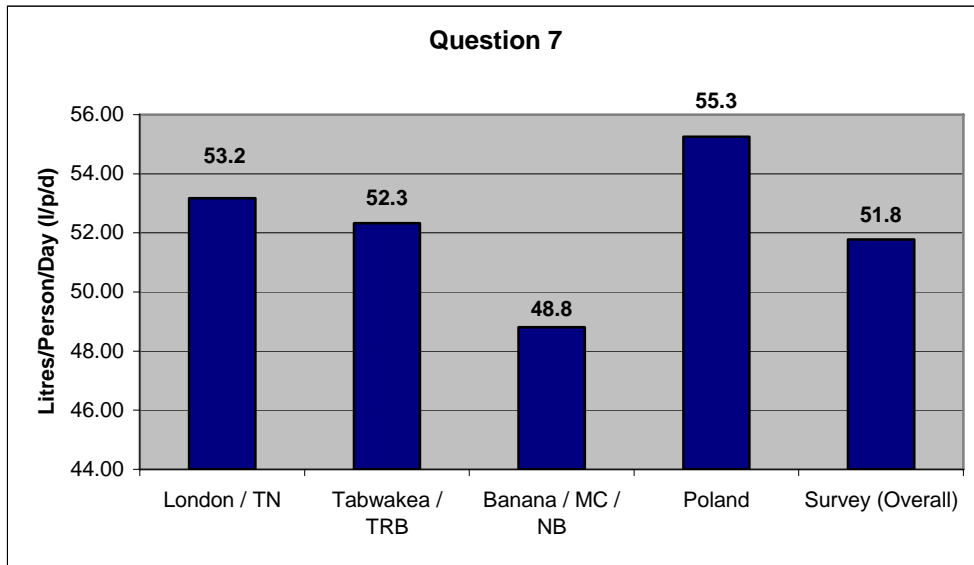


Figure A.10 Question 8 – How Many Litres Does a Person Require Each Day?

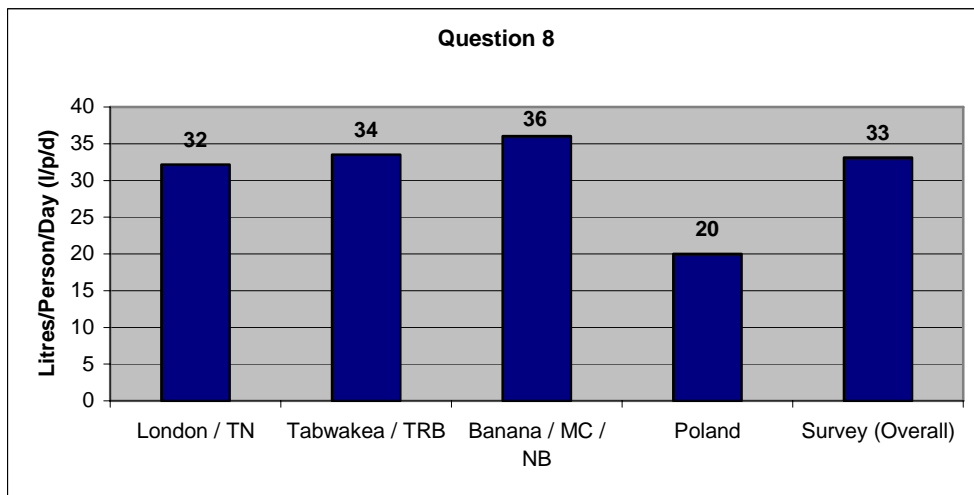


Figure A.11 Daily Water Usage Percentages By Source

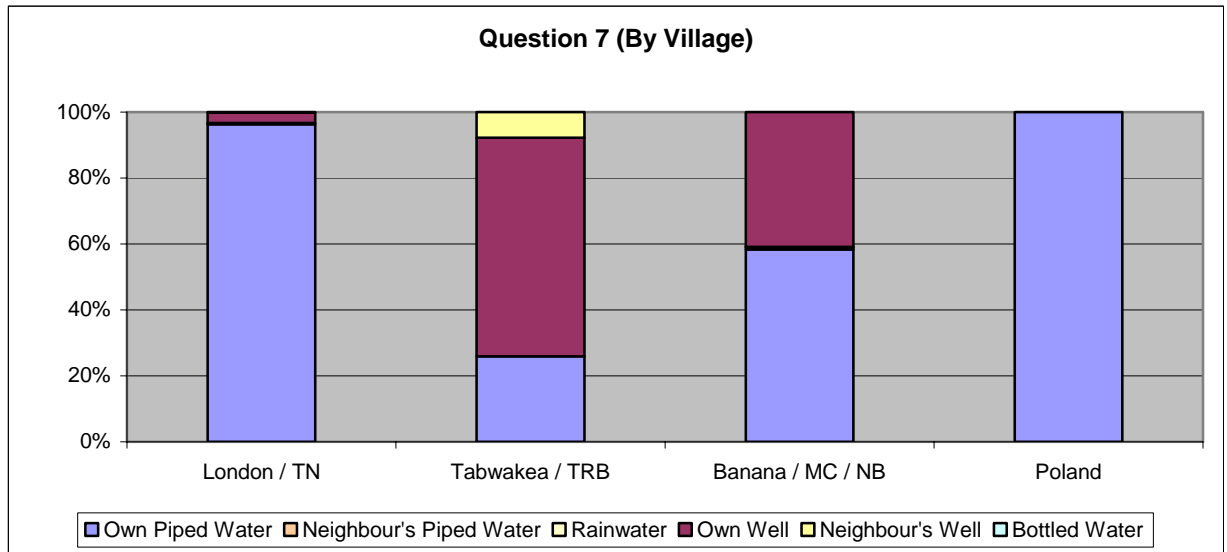


Figure A.12 Average Daily Usage for Piped Water (Own)

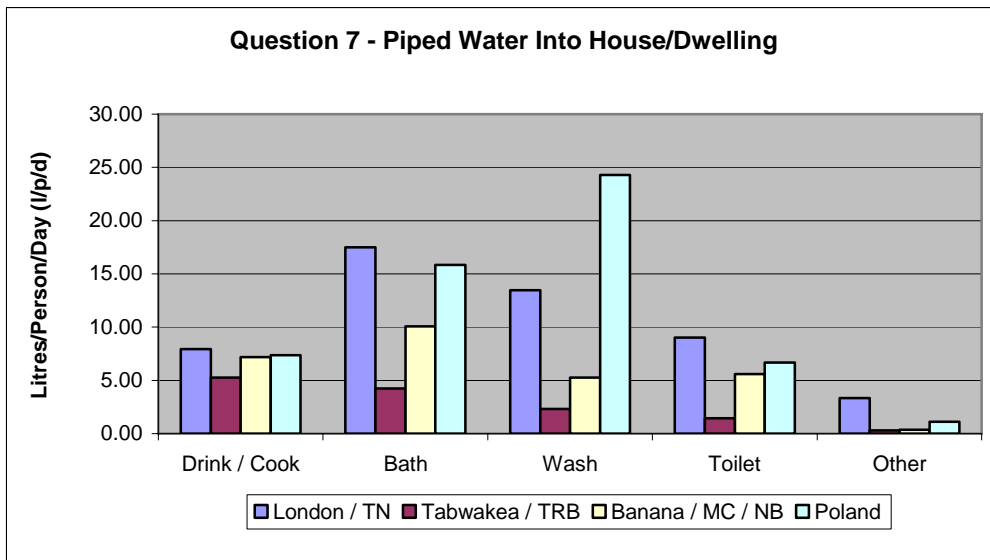
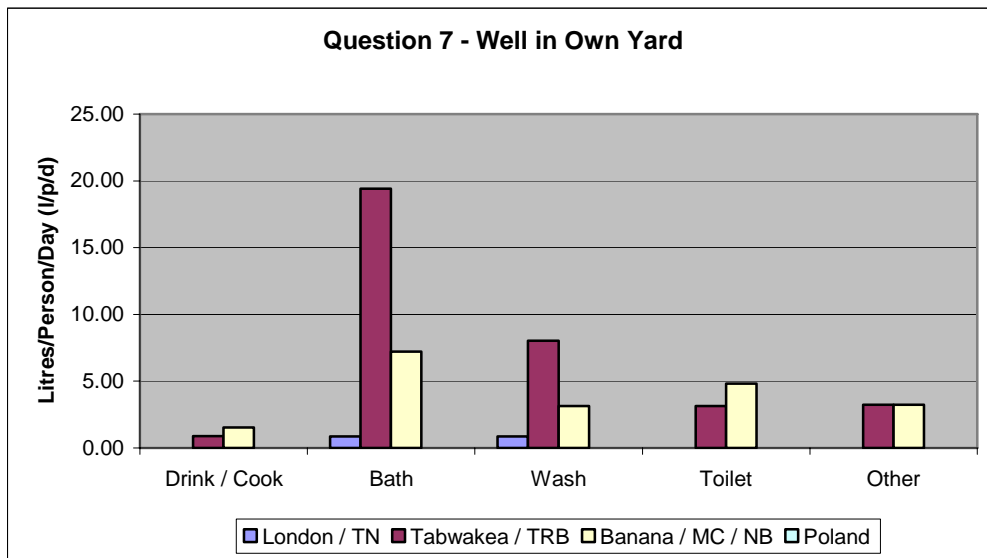


Figure A.13 Average Daily Usage for Well Water (Own)



Supply, Taste, Colour and Any Other Water Issues

A lack of regular water potable supply is a major issue for a number of households on Kiritimati Island. Some 44 of 76 respondents (58%) identified that they experienced a lack of supply at some portion of the day (Figures A.14 to A.17). In London 55% of respondents experience lack of supply, most for 1-2 hours each day, often in the mornings. Some households state they go without water for 12 hours and others up to 3 days. Lack of supply also occurs when “it is calm – no wind”⁶; obviously making the linkage between the wind pumps at Decca and Four Wells and the piped supply. In Tabwakea, 14 of 22 (64%) respondents with piped water experience problems with supply. As with London, there was a variety of responses; from 1-2 hours per day, to 12 hours per day, to 10pm to 9am, to up to 3 days. Many households are requesting additional low-flow 500L tanks. This is primarily due to constrained supply, large household size, and the large number of freehold and leasehold plots where two or three households reside together (each with their own houses) and share one piped supply. Many households in Tabwakea are also not connected to the system (i.e. do not have a low-flow tank) and many other households have been disconnected for non-payment of water bills.

Figure A.18 also draws attention to the need to improve the piped water supply. Some 19 of 24 respondents (79%) in Banana would like to see an improvement in the piped water supply. As noted, Banana at present is only receiving piped water supply for 1-2 hours each day, usually in the morning. A common response from those surveyed in Banana was that they would like to receive piped water supply 24 hours a day. Like Tabwakea, some houses are not connected to the system and as such have no low-flow tank. The Banana supply system is outdated and was not enhanced during the KWASP project as it was assumed that Banana was to be relocated away from the Banana freshwater lens to New Banana during the KWASP implementation period. It has been confirmed that Banana village will remain in its current

⁶ Personal Communication, 22 October 2007, London.

location with no expansion in surface area and therefore the village should be a priority for water supply system improvements.

All respondents from Poland indicated that they do not have issues with supply, taste or colour of their piped water. Field observations by the Project Team (Hydrology and Engineering) have confirmed that the current supply rate is easily sufficient for the current population and that the water is of a high quality when it reaches households (i.e. it is being chlorinated effectively by the Poland Water and Sanitation Technician).

Key Implication for Project Design No. 5: A key objective of the Project needs to be to improve the supply of potable water to a standard that all households have supply for 24 hours a day, 7 days per week (particularly for Banana village).

Key Implication for Project Design No. 6: Provision should be made for additional connections and household low-flow tanks for lease plots which have more than one household residing there.

Figure A.14 Response to Lack of Supply in Piped Water Supply – Total

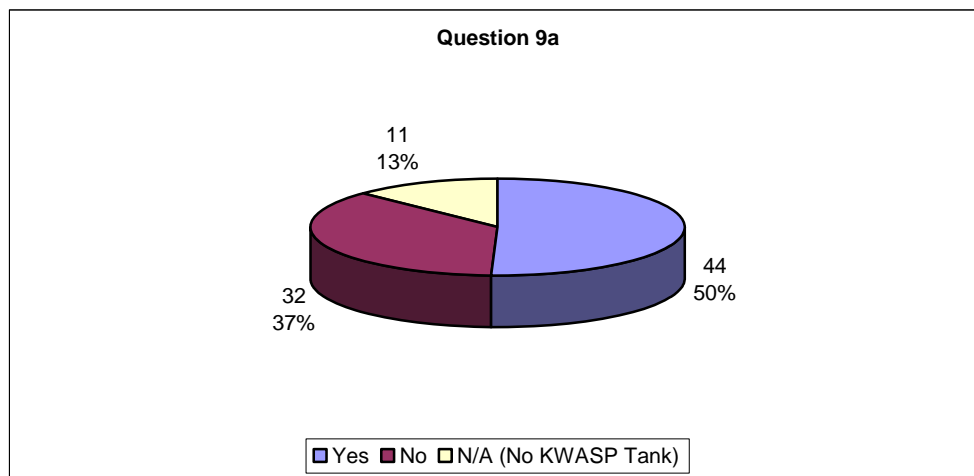


Figure A.15 Lack of Supply in Piped Water – London / TN

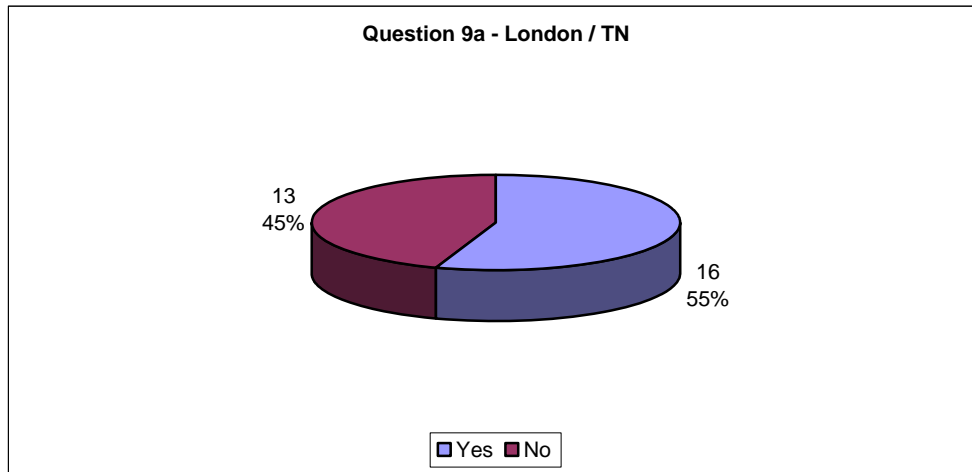


Figure A.16 Lack of Supply in Piped Water – Tabwakea / TRB

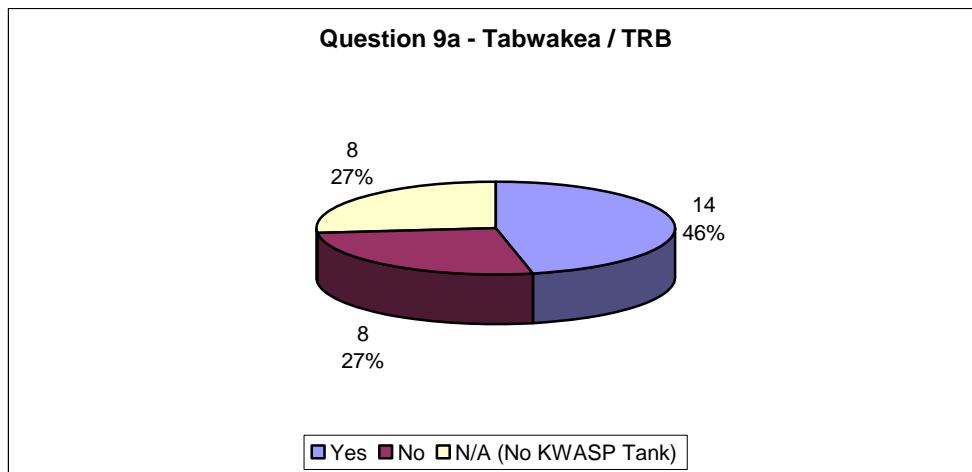


Figure A.17 Lack of Supply in Piped Water – Banana / MC / NB

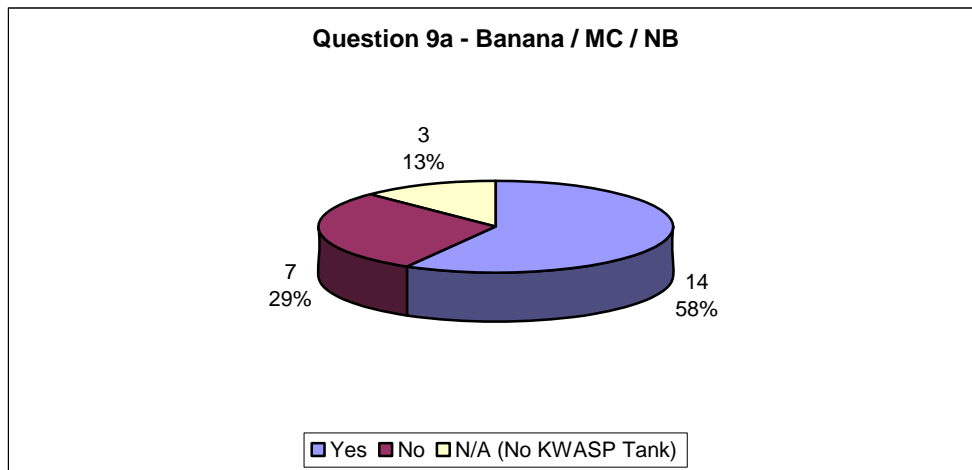
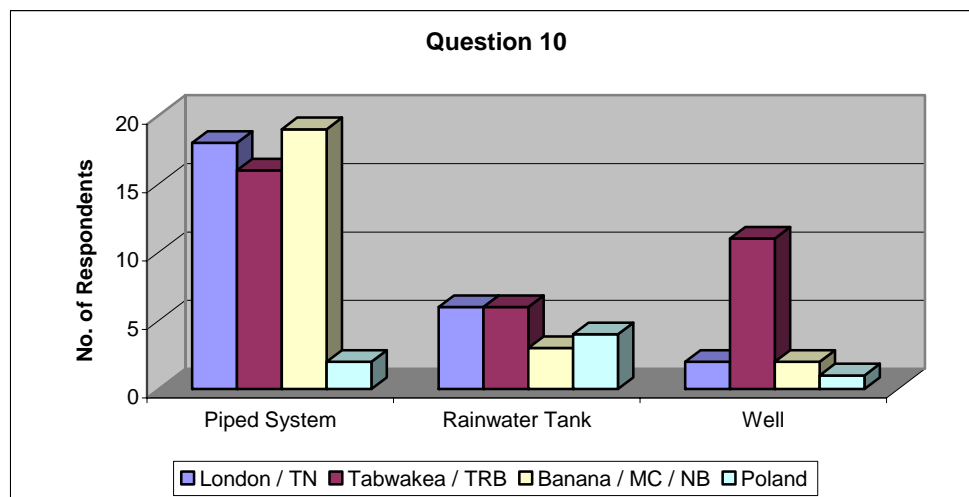


Figure A.18 Respondents Seeking Improved Water Supply Infrastructure



The vast majority of respondents indicated that there were little to no taste or colour issues with their piped water supply. Figures A.19 and A.20 highlight that only 4 of 76 (5.3%) and 2 of 76 (2.6%) of respondents have an issue with taste and colour respectively. The most common issue with taste and colour was the presence of small insects in the water – described as *Minmino* in I-Kiribati. Two respondents commented that there needs to be more chlorination of the water. This has been further supported by the Project Team (Hydrology and Engineering) who have found *e-coli* and *coliforms* in virtual all parts of the London, Tabwakea and Banana systems, both at source and at demand points.

Key Implication for Project Design No. 7: The design needs to ensure that adequate treatment occurs for piped water along the entire system.

There were a number of other issues raised by the respondents regarding their piped water supply, namely:

- Leaking pipework;
- Illegal connections into the trunk mains;
- Faulty household meters;
- Cost of water and billing; and
- No connections / low-flow tanks.

The issue of cost of water was the most common amongst the above list. A number of respondents believe the price should be the same as South Tarawa – i.e. a flat rate of A\$10/month regardless of usage. Linked to water pricing is the issue of leakages, faulty meters, and poor quality service generally, which contribute to customers lack of willingness to pay bills which they believe are incorrect.

Figure A.19 Response to Issues of Poor Taste in Piped Water Supply

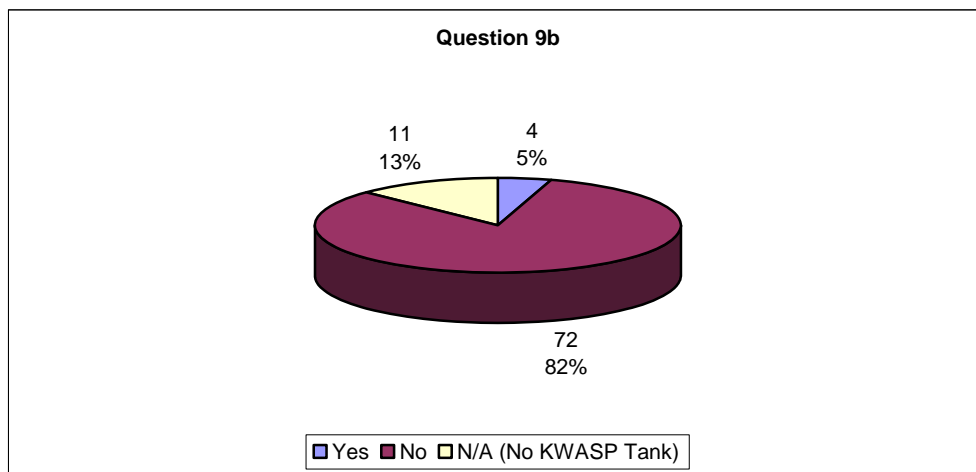
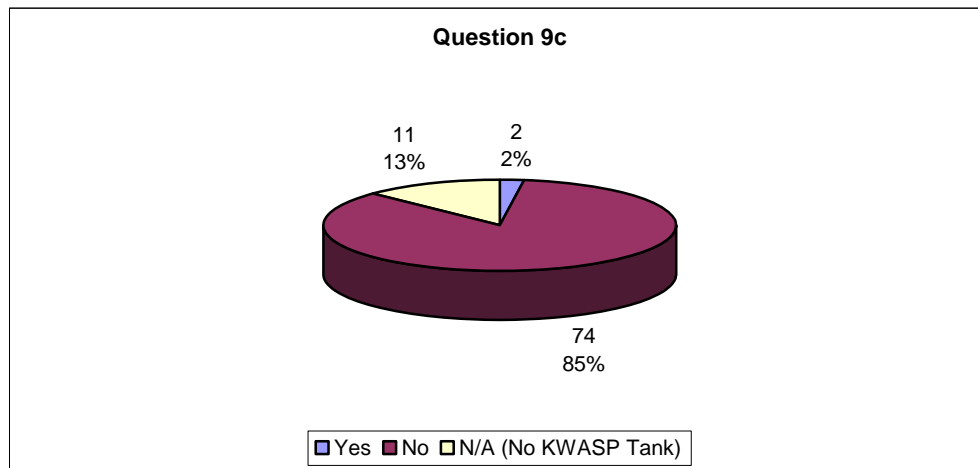


Figure A.20 Response to Issues of Poor Colour in Piped Water Supply



Health

The vast majority of respondents (89%) stated that they had not had any water-related illnesses in the past year in their household. Health data from Kiritimati Island health clinics for the 2002-2006 period indicate that 6.2% of the population was diagnosed with some form of gastrointestinal illness (diarrhoea or dysentery). The majority of these cases were diarrhoea. Significantly, these statistics only reflect the number of people who attended the village clinics/ hospital and as such the actual number of people with diarrhoea is likely to be much higher⁷.

Nearly all use of rainwater and bottled water was mentioned by households in the survey for consumption by infants and children. It would appear many households understand the linkages between poor quality water, gastrointestinal illness and childhood mortality.

When asked which method of water treatment the household uses, most (85%) respondents stated some form of treatment (i.e. boil, filter or boil and filter). The vast majority of respondents boil their water prior to use (82%). This is an effective treatment technique for most waterborne bacteria, but will not eliminate *Giardia* or *Chryptosporidium*. Some respondents also stated that they would boil their water some or most of the time and not use any other treatment for the remaining time.

Key Implication for Project Design No. 8: The Project should incorporate an education and awareness program to continue promoting household water treatment techniques and the linkages to public health and personal hygiene.

⁷ Personal Communication, Head Doctor, Kiritimati Island Hospital, 19 November 2007.

Figure A.21 Households with Water Related Sickness in the Past Year

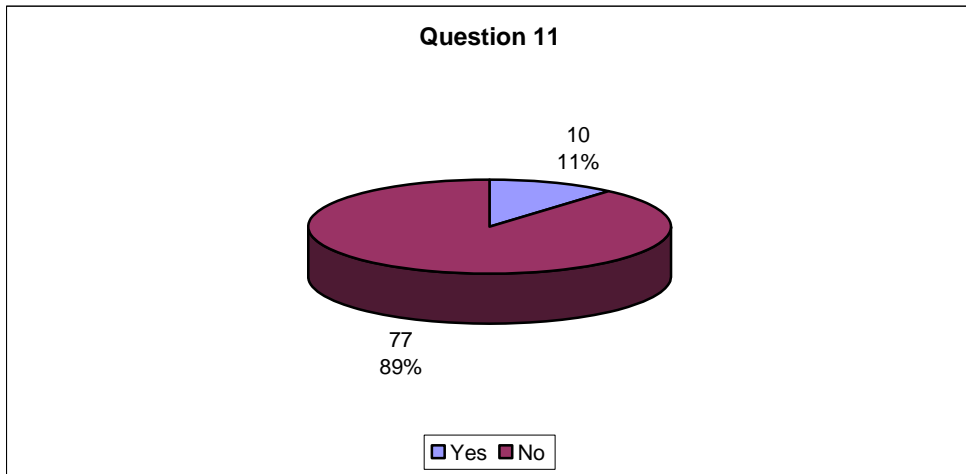
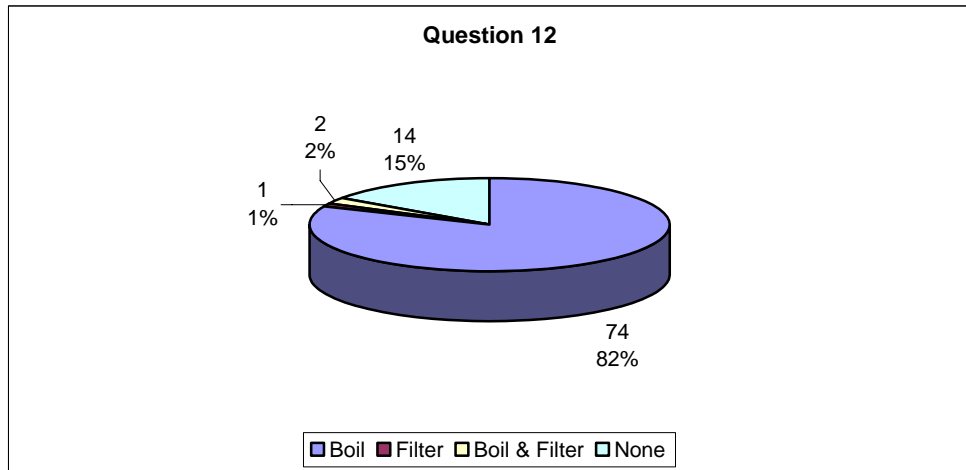


Figure A.22 Water Treatment Techniques Used by Respondents



Water Pricing and Willingness to Pay

When asked whether the Kiribati Government should charge for supplying water, 77% of respondents believed that they should (Figure A.23). However when it comes to willingness to pay for this service more than half of respondents believe the service should be free or A\$2.00 per month – 22% free and 32% A\$2.00/month (Figure A.24). The average monthly fee for water from all of the respondents equated to A\$4.03.

Contrary to MLPID records⁸, the majority of surveyed households (82%) responded that they pay their water bills. Most households probably responded truthfully – in that they pay some of their water bill each month. In most cases though the records show that very few households pay their water bill in full each month.

Many respondents commented that the price of water should be reduced to match the monthly charge of South Tarawa – i.e. A\$10.00/month. Interestingly, the model in South Tarawa operates at a flat rate, regardless of water usage⁹. Although this may be preferred by the residents from a financial standpoint, this practice doesn't encourage any appreciation of the value of water and the price of water relative to usage.

Of the 18% of households that do not pay their water bill, the reasons given were: (i) they did not receive a bill or (ii) they do not have a piped water connection. A number of the respondents also commented that meters were either not working effectively or were not present at all.

Key Implication for Project Design No. 9: The Project should maintain the practice of charging households for provision of water and ensure that billing is regular and accurate, based on reliable metering systems.

Figure A.23 Should the Government be charging for the provision of water?

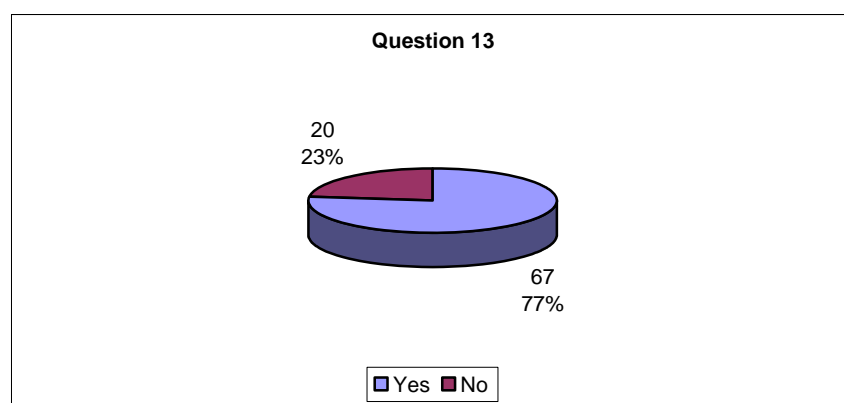


Figure A.24 How much would you be willing to pay per month?

⁸ Based on finance records from the Water and Sanitation Division of MLPID.

⁹ Water supply is rationed, with supply only provided every second day in South Tarawa.

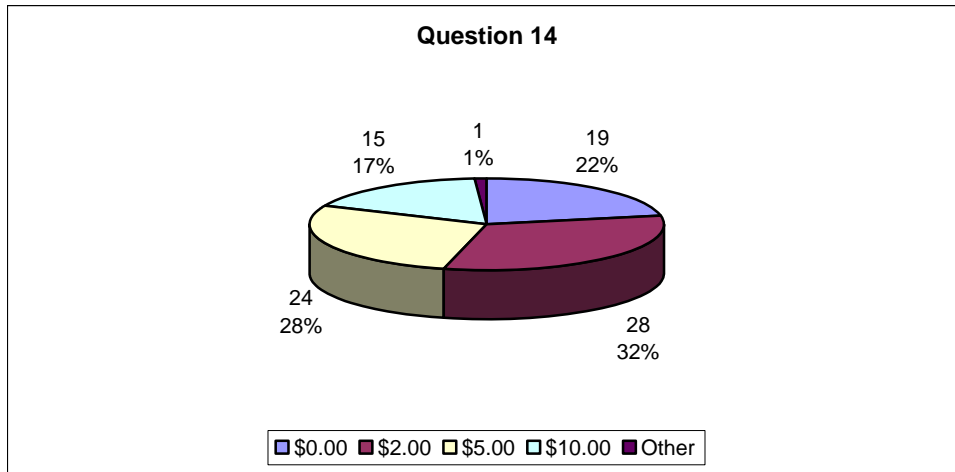
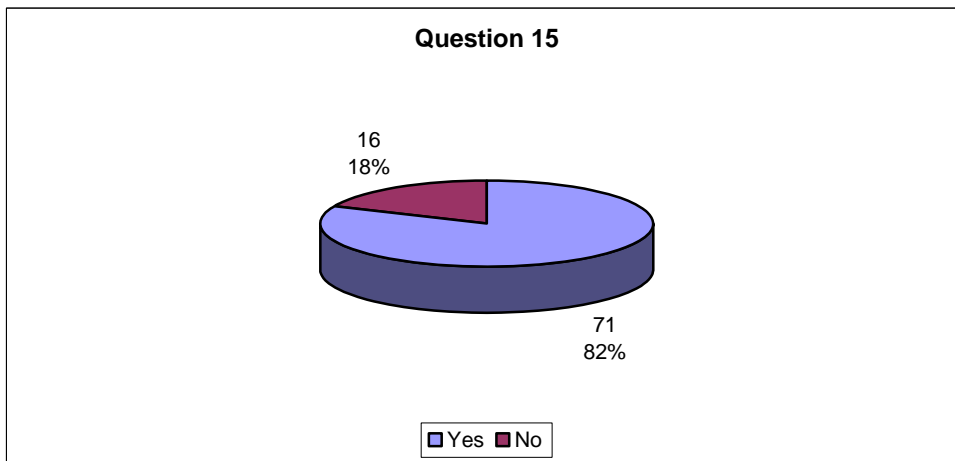


Figure A.25 Do you pay your water bill?



A.3.1 Household Sanitation

Sanitation Systems – Current Usage and Preferences

There are a variety of sanitation systems in use on Kiritimati Island. The most common systems are pedestal with cistern flush (45), bush (45), ocean beach (37) and pedestal with bucket flush (25) (Figure A.26). There are small numbers of households who use compost toilets, pit latrines, the lagoon beach, neighbours toilet and squat toilets with bucket flush.

Table A.2 Comparison of Percentage of Households with Various Sanitation Systems from 2005 Census and Household Survey

Sanitation System	2005 Census		Household Survey				
	Kiribati	Kiritimati	Kiritimati	London / TN	Tabwakea / TRB	Banana / MC/ NB	Poland
Pedestal toilet w/ cistern flush	23.2%	35.5%	51.7%	82.8%	30.0%	41.7%	50.0%
Pedestal toilet w/ bucket flush	29.8%	37.9%	28.7%	17.2%	33.3%	41.7%	0.0%
Ocean beach	30.0%	8.4%	42.5%	37.9%	66.7%	12.5%	75.0%
Bush	27.0%	12.8%	51.7%	20.7%	63.3%	70.8%	75.0%

The types of sanitation systems used in each village are distinctly different. London is characterised by a high number of pedestal toilets with cistern or bucket flush. This is a reflection of the large number of government houses, the majority of which have cistern flush toilets as a standard feature. In London, where there are flush toilets in nearly every house, 38% of people practice beach defecation and approximately 1 in 5 practice bush defecation (Figure A.27). This is also common in other parts of Kiribati, particularly South Tarawa, where beach defecation is often preferred over flush toilets due to cultural norms and traditions.

Beach and bush defecation (67% and 63% respectively) is even more prevalent in Tabwakea village (Figure A.28). The large household size in Tabwakea and Banana is also putting strain on sanitation systems, with respondents noting that they “sometimes need to go elsewhere due to crowding”. Access to flush toilet (cistern or bucket flush) is lower than London at 30% and 33% respectively. This is an indication of the relative cost of installing and maintaining a toilet/septic system over other forms of sanitation as the majority of houses in Tabwakea are on private freehold and leasehold plots.

In Banana another mix of systems is utilised (Figure A.29). Some 42% of households have a cistern flush pedestal toilet and another 42% have a bucket flush pedestal toilet. A large proportion of the population in Banana (71%) use the bush as an alternative sanitation system. Beach defecation is much lower in Banana (13%) due to the village being some distance from the coast (1-1.5km) as compared to London and Tabwakea.

Residents in Poland, like the other villages on Kiritimati Island, use a variety of sanitation systems (Figure A.30). Of the small sample of respondents (4), 75% practiced beach and bush defecation, with 2 out of 4 households having a cistern flush pedestal toilet.

Of the total respondents, a small number noted that they do not have any form of formal sanitation system and must therefore practice beach and bush defecation or use their neighbour's toilet. The strong desire for assistance is evident in these household's responses – "we feel uncomfortable about not using a real toilet", "no toilet so using the sea" or simply "we need a toilet".

Respondents were clearly not in favour of compost toilets with comments such as "no compost toilet because of the cockroaches". Some respondents who have compost toilets have stopped using them. However, there are still a small number of people who still use and prefer compost toilets. The project should not look to alter this practice but at the same time acknowledge that compost toilets are not preferred by the majority of the population.

Of the 52 respondents who included the pedestal toilet with cistern flush in their 1,2,3 ranking of preference (Question 16), only one respondent did not place the sanitation option as most preferred (i.e. Ranked 1). Of the 45 respondents with pedestal toilet with cistern flush, all ranked this option as their preferred system.

Five options received more than 10 votes from the respondents, namely: pedestal toilet with cistern flush (52); bush (45); ocean beach (35); pedestal toilet with bucket flush (18); and compost toilet (13). Of these five options pedestal toilet with cistern flush and pedestal toilet with bucket flush were the most preferred with scores of 1.0 and 1.1 respectively (Figure A.31).

When asked whether they were currently satisfied with their sanitation system, 69% of respondents answered yes (Figure A.32). However of the 60 who responded that they were satisfied, 54 (90%) have a pedestal toilet with either a cistern or bucket flush system. Therefore the majority of unsatisfied households are those without cistern or bucket flush sanitation systems and are located in Tabwakea and Banana villages (Figure A.33).

Key Implication for Project Design No. 10: The design should be aimed at supplying all households with an improved sanitation system. The preferred option should be pedestal toilets with bucket flush facilities as this requires less maintenance and less water than cistern flush systems. The ability of private leaseholders (both now and in the future) to afford this system needs to be a high priority.

Key Implication for Project Design No. 11: The Project should not install compost toilets because of very low community and government acceptance of the technology as trialed extensively under the KWASP project.

Figure A.26 Sanitation Systems Used – Total Survey

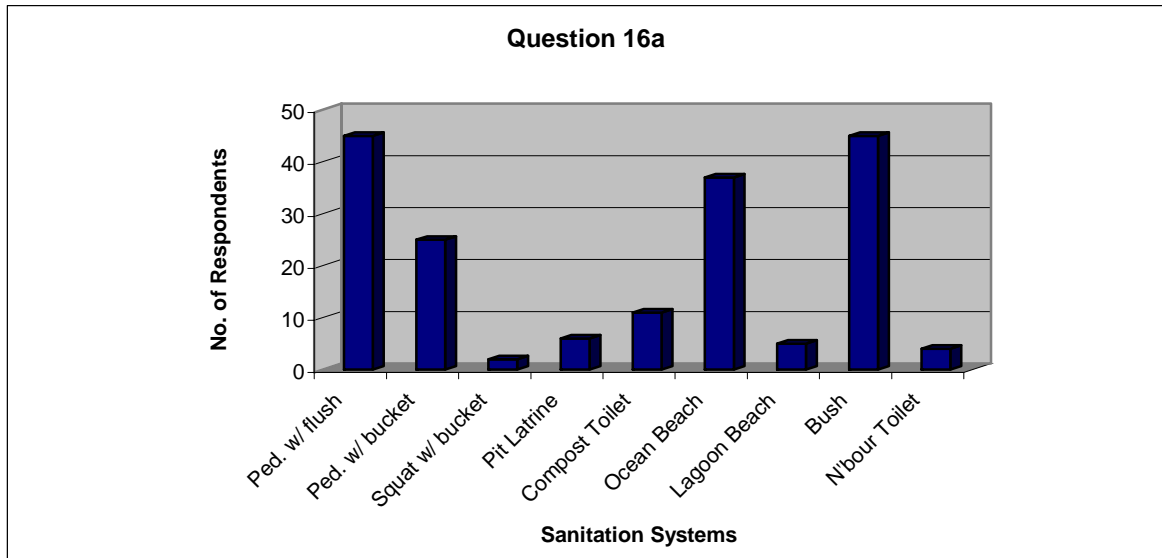


Figure A.27 Sanitation Systems Used – London / TN

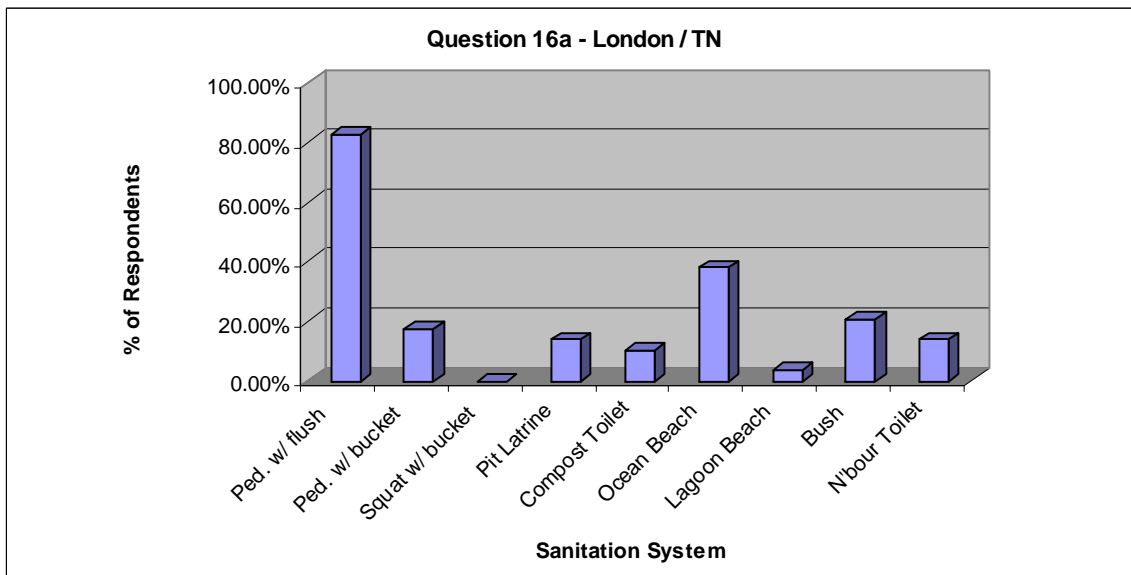


Figure A.28 Sanitation Systems Used – Tabwakea / TRB

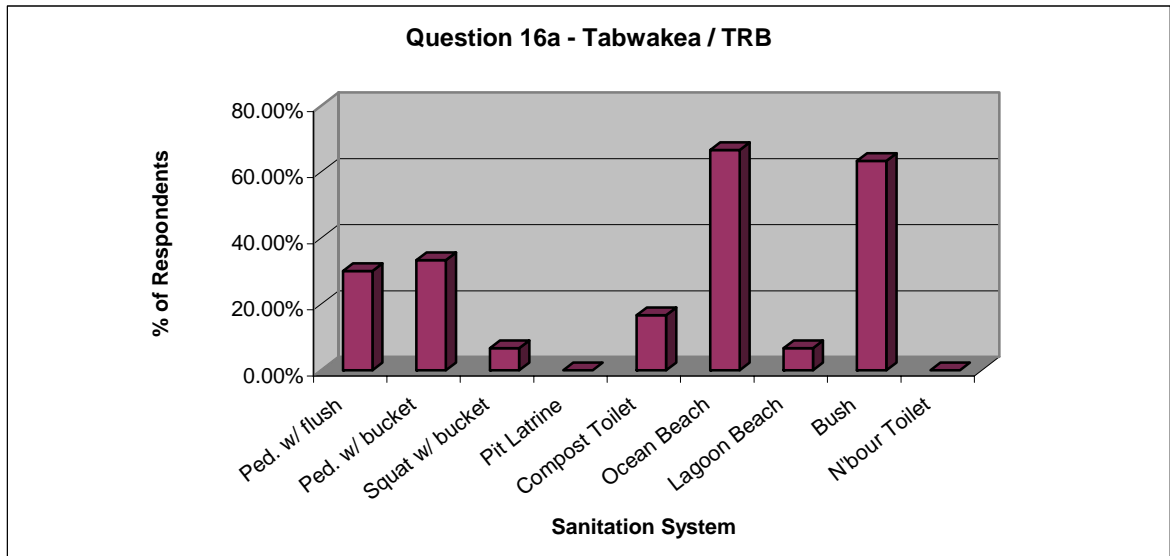


Figure A.29 Sanitation Systems Used – Banana / MC / NB

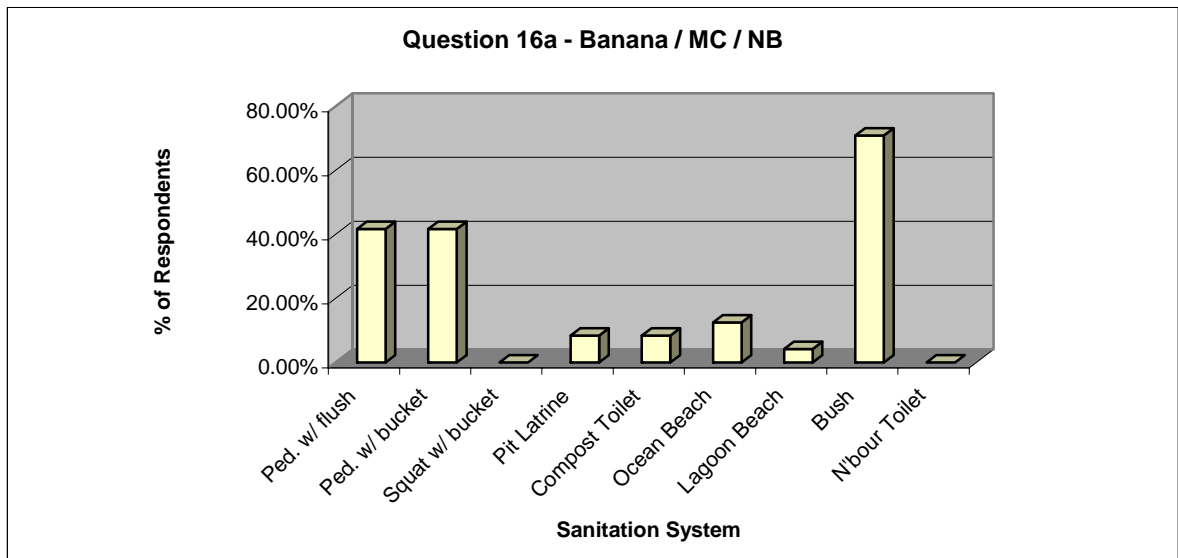


Figure A.30 Sanitation Systems Used – Poland

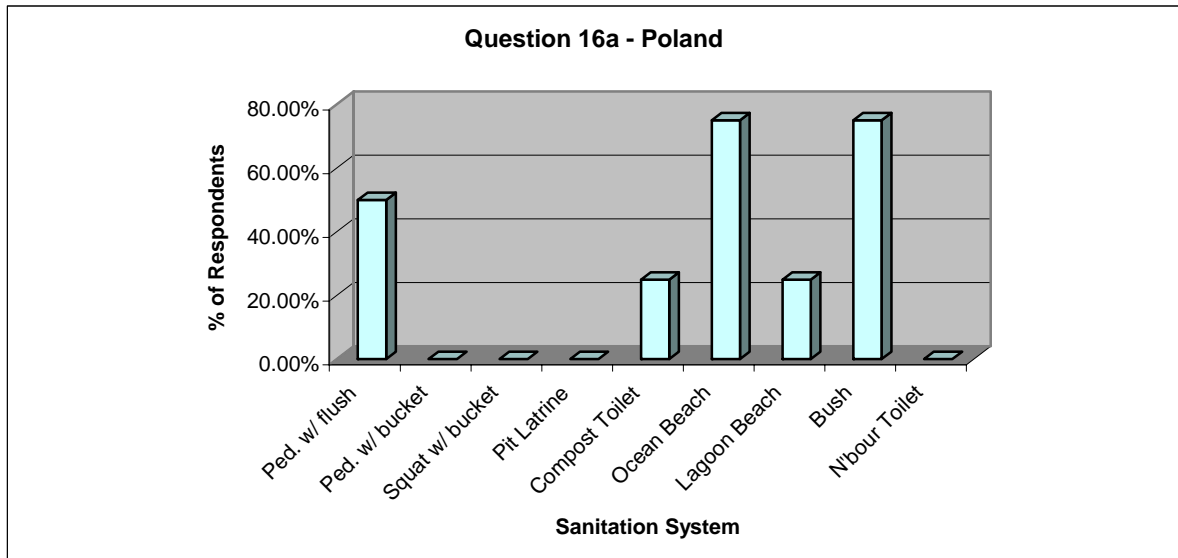
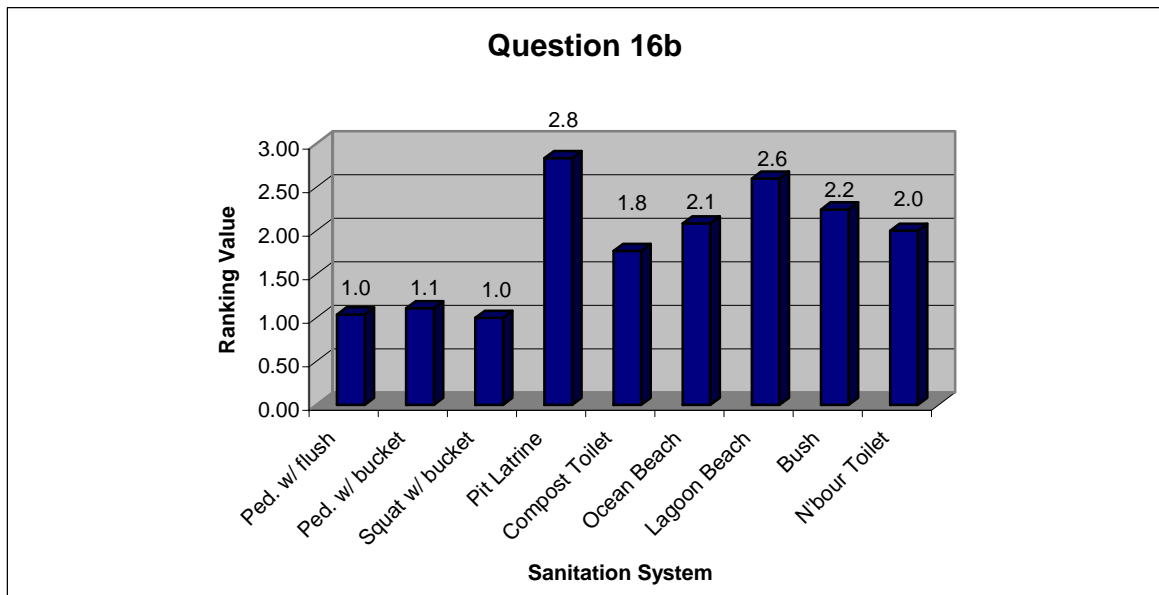


Figure A.31 Ranking of Sanitation Systems



NB: 1 – Most Preferred and 3 – Least Preferred

Figure A.32 Are you satisfied with your current sanitation system?

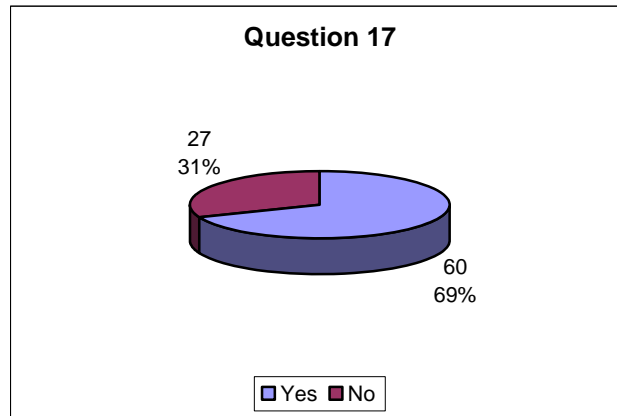
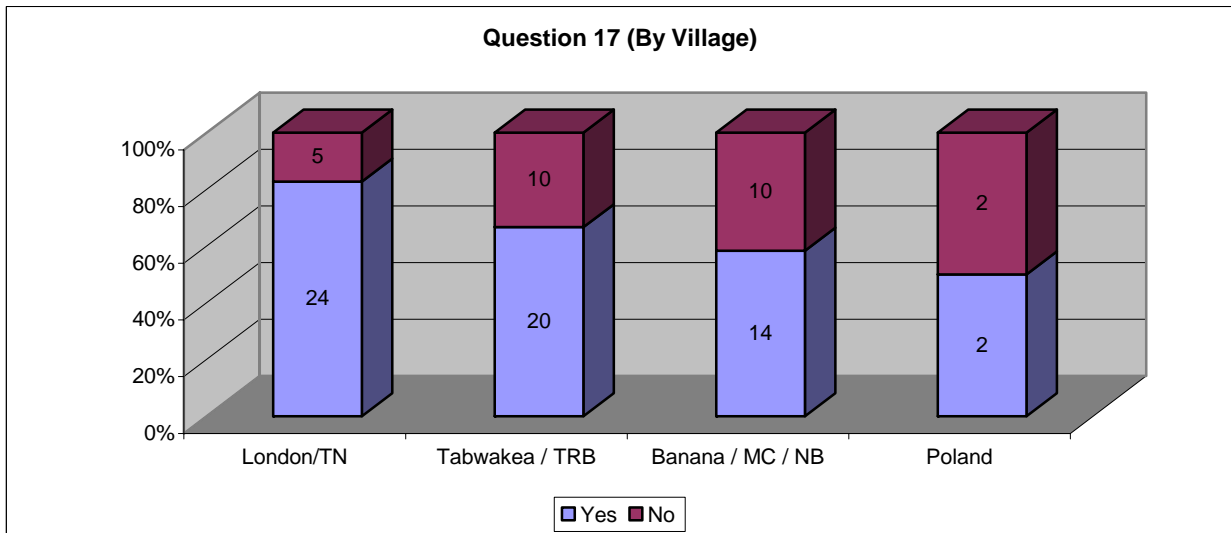


Figure A.33 Satisfaction with current sanitation system by village



Septic Systems

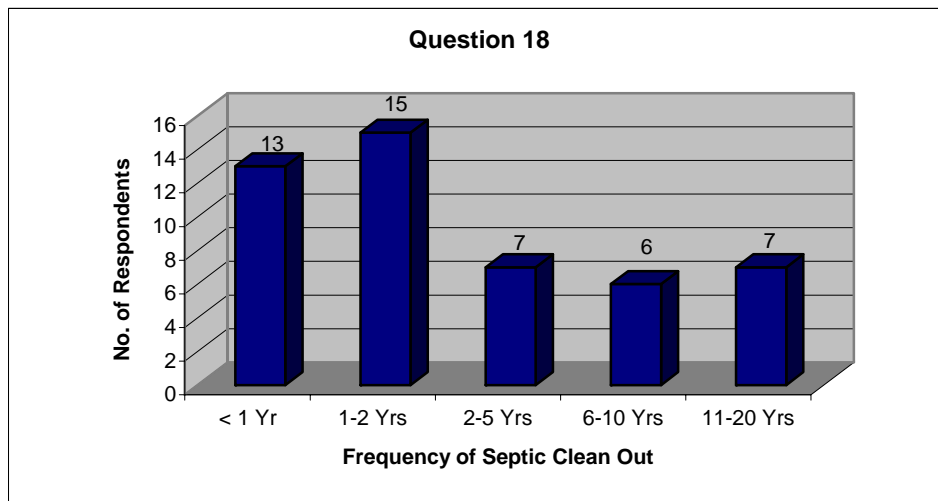
Question 18 of the household survey asked about the regularity of cleaning out septic tanks (for households that have septic systems). Some 48 respondents provided an estimate of the frequency of cleaning out their systems (Figure A.34). The average period across the respondents was approximately 4 years and 2 months. Despite this average the majority of respondents (28 of 48) recorded cleaning their septic tanks out every 2 years or less, some households every 2-3 months. This indicates that a large proportion of septic tanks are not working effectively. Septic tanks should only require cleaning out or pumping approximately every 5 years in equatorial regions like Kiritimati Island. The high rate of filling could be caused by poor design and construction (typically concrete block), high household numbers, no separation of liquid and solid matter or a combination of all these factors.

A number of households commented that they required a new septic system to replace broken units. Other households noted that septic tanks required fixing as they were experiencing odour issues. One household with a

pedestal toilet with cistern flush commented that they did not even have a septic tank. It is unsure what type of solids retention system they were using, if any.

Key Implication for Project Design No. 12: The Project needs to ensure that all septic systems are cleaned out under a regular and systematic pumping regime. The project also needs to ensure that any education and awareness program includes instruction in use and maintenance of septic systems.

Figure A.34 Frequency of Cleaning Out Septic Tanks

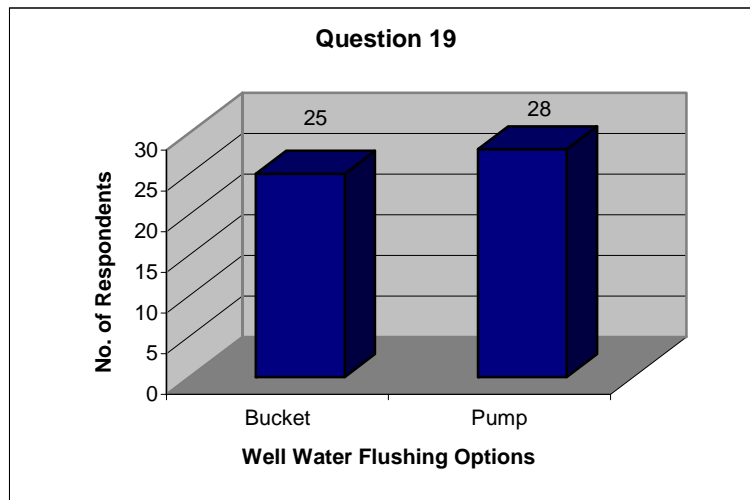


Well Water for Flushing Toilets

When asked about willingness to use well water for flushing toilets (either by bucket or pump), more than half (58%) of the surveyed households responded positively (Figure A.35). This indication, combined with the strong desire from Tabwakea for well improvement (Figure A.18) suggests that there is strong support for toilets that can be flushed with well water. For households close to the ocean it has even been suggested that sea water could be carried to the house and used for flushing toilets¹⁰. The importance of wells and their implication for design has already been discussed in the ‘multiple source-multiple use’ section, in which wells in Tabwakea and Banana (and potentially Poland) should be constructed or existing wells improved to support non-potable uses (such as toilet flushing).

¹⁰ Personal Communication, Women’s Association Focus Group, 31 October 2007, London.

Figure A.35 Preference to Flush a Toilet Using Well Water by Bucket or Pump



A.4.1 The Environment

Detailed analysis of the responses to the two environmental questions have been undertaken by the Environmental Specialist and are contained in the Initial Environmental Examination.

A.5.1 Willingness to Pay and Income / Expenditure

Detailed analysis of the responses to the three household income and expenditure questions have been undertaken by the Financial Analyst. This analysis also includes comparisons with the recently completed Income and Expenditure Survey, conducted by the Government of Kiribati in 2006. A brief description of income and expenditure is listed in Section 4.2 above, in the context of poverty and hardship assessment. For full details, see the Financial Analysis and Economic Analysis Working Papers.

Annex B Household Survey (English and I-Kiribati Translation)

Introduction

The following survey is being conducted as part of the ‘Outer Islands Growth Centres Project’, funded by the Asian Development Bank (ADB) and the Government of Kiribati. The information you provide will assist the project team in assessing options for improved water supply and sanitation for Kiritimati Island. All personal information will remain confidential, including the respondents identity.

Thank you for your time to complete this important survey.

Personal Information

1. a) Village: London Tabwakea Banana Poland
 b) Would you prefer to live in another village? If yes, circle. Yes No
2. Sex: Male Female
3. Age:
4. Number of People Living in the House/Dwelling: _____
5. What type of House/Dwelling do you have? Government Private
6. Interview Date:

Component 1 – Water Supply

7. Which of the following water supply systems do you have at you home and for what purpose do you use each?

Please also estimate the water usage, in litres per person/per day for the different systems.

Type	Drinking / Cooking	Bathing	Washing	Flushing Toilet	Other Uses
Piped water into house/dwelling					
Piped water from neighbour					
Rainwater tank					
Well in own yard					
Well in neighbours yard					
Bottled water					

8. How many buckets (20L) do you think each person requires each day?

9. Do you have problems with your piped water supply? For instance:

- Do you run out of water? How often: _____
- Does it have taste poor? How often: _____
- Does it have poor colour? How often: _____
- Any other issues? Comment: _____

10. Do you think you need better:

- Piped system Rainwater tank Well

11. a) Do you think anyone in you family got sick from water during the last year?

b) If yes, did the sick person received treatment, and how much were the medical costs?

12. How do you treat your drinking water?

- Boil Filter Boil & Filter None

13. Do you think the Government should be charging for the provision of water?

- Yes No

14. How much would you be willing to pay per month for a 24 hour, 7 days a week and good quality piped water supply?

- Nothing \$2 \$5 \$10 Other: _____

15. Do you pay you water bill?

- Yes No

If no, then why? _____

Component 2 – Sanitation

16. Where do you go to the toilet? Please rank three options that you prefer (1 – Highest and 3 – Lowest).

Ranking

- | | |
|---|--------------------------|
| <input type="checkbox"/> Pedestal toilet with flush cistern | <input type="checkbox"/> |
| <input type="checkbox"/> Pedestal toilet with bucket flush | <input type="checkbox"/> |
| <input type="checkbox"/> Squat toilet with bucket flush | <input type="checkbox"/> |
| <input type="checkbox"/> Pit Latrine | <input type="checkbox"/> |
| <input type="checkbox"/> Compost toilet | <input type="checkbox"/> |
| <input type="checkbox"/> Ocean beach | <input type="checkbox"/> |
| <input type="checkbox"/> Lagoon beach | <input type="checkbox"/> |
| <input type="checkbox"/> Bush | <input type="checkbox"/> |

17. a) Are you currently satisfied with your household sanitation system? Yes
 No

b) If no, would you prefer a different system? Please comment:

18. If you have a Septic Tank, how often do you have it cleaned out?

19. Would you be willing to use well water to flush you toilet with a:

- Bucket Pump

Component 3 – Environment

20. With regards to Government efforts to manage fish and bird problems, what do you see as the major environmental issues on Kiritimati Island? And, what do you think Kiritimati Island will look like when your children grow up?

21. Who is responsible for management of these problems?

Component 4 – Household Income and Expenses

22. Monthly expenses on (A\$):

Income	
Formal Employment	
Informal / In-Kind Income	
Expenses	
Food	
Clothing	
Housing (rent, repair)	
Transport	
Water	
Power	
Telephone	
Education	
Health	
Others	

23. How many persons in the household contribute to income? _____

24. How much does your household save per month, if any? _____

We thank you for your participation in this important survey.

Introduction

Te kaka e aio e karaoaki bwa iteran te karikirake ibukin abamakorona nako Kiribati. Are e a manenaki iroun te Asian Bank Development (ADB) ao te tautaeka ni Kiribat, Ami rongorongo ake kam anga a na rangi ni ibuobuoki nakoia kain te tiim ni karikirake aio ibukin kakaean angan karikirakean tamaroan te ran ma te kai-n –nakotari iaon Kiritimati. Ami kaeka ake kam anga ana bon bane n tabuaki kaotinakoia,

Ko rab'a n am tai ae ko anga ibukin kabaninan te kakaea aio.

Personal Information

1. a) Am kawa: London Tabwakea Banana Poland
- b) Ko tangiria ni kani manga maeka n te kawa teuana? Ngkana ngaia, kamronna.
Eng Aki
2. Sex: M'ane Aine
3. Am ririki:
4. Maitia aomata aika maeka n am auti: _____
5. Rinanin am auti? Auti te tautaeka Bon am kateitei
6. Tain te maroro:

Makoro 1 – Water Supply

7. Rinea kaekin rokon te ran n am auti ae ko kakabongana ao bukin tera?
Taiako naba ni katautaua maitin te ran are e kabonganaki ibukin temanna ke tao inanon te bongina.

Rinanin rokon te ran	Mooi / Kuuka	Tebotebo	Uati	Kaitiakan te Kain-nako taari.	Tabeuariki
Katikan bwaibu n ran nakon ami auti.					
Katikan bwaibu n ran mai irouia kain rarikim					
Tangke ni karau					
Am m'anib'a					
Aia m'anib'a kain rarikim					
Man te titoa					

8. N am iango iraua te b'aketi n ran (20L) ae e tau ibukin temanna n te bongina?

9. Iai am kanganga ma b'aibu n ran ake a tiki nakon am auti? Ao ibukin anne:

- E babane am ran? Manra: _____
- E buakaka nimakina? Manra: _____
- E buakaka tarina ? Manra: _____
- Bwai riki tabeua? Anga am iango _____

10. N am iango ko tangira tamaroan riki :

- Are katikaki n te b'aibu n ran Tangke ni karau Manib'al

11. a) N te ririki ae nako ao iai n am utu ae e a tia n aoraki man te ran? _____

c) Ngkana iai; ao te aoraki anne e anganaki ana b'ain-aoraki, ao iraua boon ana b'ain-aoraki.

12. Tera arom nakon nimam te ran?

- Kaburoa Raumeaia Kaburoa ao Raumea Akea

13. N am iango ao e riai te tautaeka ni kaboa kamanenakin te ran?

- Eng Aki

14. Kanga iraua ae ko tangiria ni kab'aka ibukin teuana nam'akaina ae e maiu inanon 24 te aoa ao e rangi n nakoraoi n akea te kanganga man te ran anne.?

- Akea \$2 \$5 \$10 Tabeua riki:
- _____

15. Ko kakab'aka boon am ran?

- Eng Aki

Ngkana _____ koaki, _____ ao _____ bukin
tera? _____

Component 2 – Kain-nakotari ao te ran are e buakaka are nako man te roki

16. Ko na nakotari ia? Taiaoka karinani teniua aika ko kabonganai (1 – eta and 3 – nano). Rinania

- | | |
|---|--------------------------|
| <input type="checkbox"/> Te bo are iai ana tangke n ran | <input type="checkbox"/> |
| <input type="checkbox"/> Te bo are akea ana tangke | <input type="checkbox"/> |
| <input type="checkbox"/> Te bo are e nim ma aontano ae | <input type="checkbox"/> |
| <input type="checkbox"/> M'aruarua | <input type="checkbox"/> |
| <input type="checkbox"/> Te kamkamka | <input type="checkbox"/> |
| <input type="checkbox"/> Taari | <input type="checkbox"/> |
| <input type="checkbox"/> Te nama | <input type="checkbox"/> |
| <input type="checkbox"/> Buakonikai | <input type="checkbox"/> |

17. a) Ko kukurei n am kai-n-nakotari ae ko kakabongana ngkai? Eng Aki

d) Ngkana ko aki, ao ko tangiria b'a e na bitaki? Taiaoka anga am iango:

—

18. Ngkana ko kabongana te Septic Tank, Ningai am tai ni kakaitiakia?

19. Tera ae ko ko tangiria ni kabongana ibukin anakin ranin te manib'a ni kaitiaka am kain-nakotari?

- B'aketi B'am

Component 3 –Otab'anin

20. Ni kaineti ma ana anga te tautaeka ibukin kawakinan te ika ma mannikiba, kanga n am taratara tera te oi ni kanganga nakon te otabanin iaon Kiritimati? Ao tera am iango n tarakin Kiritimati nakon taai aika ana roko.

21. Antai tabena kanganga akanne?

Component 4 – Household Income and Expenses

22. Te kabanemane n teuana namakaina (A\$):

Karakem'ane	
B'akab'ai	
Itinanikun te B'akab'ai	
Kabanemane	
Amarake	
Kunnikai	
Auti (boona, onob'ai)	
M'am'ananga	
Ran	
Iti	
Taraboon	
Reirei	
B'ain-aoraki	
Tabeaua riki	

23. Iraman n am auti aika a karekem'ane? _____

24. Iraua am kaiko mane n teuana nam'akaina? _____

We thank you for your participation in this important survey.

Annex C Summary Poverty Reduction and Social Strategy (SPRSS)

I. POVERTY ANALYSIS AND STRATEGY	
A. Linkages to the National Poverty Reduction Strategy and Country Partnership Strategy	
<p>1. Policy Setting The improvement of basic services and infrastructure in the outer islands, particularly for water supply and sanitation, is a key sector as part of the <i>ADB Country Strategy 2006-2007</i> for the Republic of Kiribati. In addition, the country poverty partnership agreement states that a key hardship (poverty reduction) strategy must: (i) improve the level of basic services; (ii) improve the opportunities for employment in the outer islands (including Kiritimati Island); and (iii) slow the migration of outer islanders to South Tarawa. The Government of Kiribati has also made a commitment to the Millennium Development Goals (MDGs), including Goal 7, environmental sustainability, which is of greatest relevance to this Project. In particular, within Goal 7 are two key targets: (i) halving the proportion of people without sustainable access to safe drinking water by 2015 (Target 10); and (ii) increased access to improved sanitation by 2015 (Target 11).</p>	
<p>2. Project Background The Project influenced area (PIA) covers all four villages on Kiritimati Island, namely <i>London</i> (inc. Tennessee and North London), <i>Tabwakea</i> (inc. Terawanbakoa), <i>Banana</i> (inc. New Banana and Main Camp) and <i>Poland</i>. The Project will enhance the village settlements in Kiritimati Island through improved household water supply and sanitation systems, including greywater. The improved water supply and sanitation systems will provide opportunities for hardship reduction through: (i) improved health status and well-being of residents by reducing the incidence of waterborne diseases; (ii) creation of new job opportunities during construction; (iii) improved water resource protection and management, including household wells; and (iv) and assist in creating an enabling environment for private sector development in Kiritimati Island, including tourism.</p>	
B. Poverty Analysis Intervention	Targeting Classification: General
<p>The Project has been assigned a targeting classification of general intervention as it is concerned with providing an enabling environment for economic growth in Kiritimati Island. There is also justification for the Project to be classified as a targeted intervention, given its direct impact within a specific geography (TI-Geography) and the Project's contribution to Goal 7 of the MDGs (TI-MDG).</p>	
<p>1. Key Issues</p> <p>Defining Poverty. The terms poverty / poor, or <i>te kainnano ni kainnano</i>, is particularly offensive in Kiribati and causes insult when used to describe a person or group of people. Hardship, or <i>te maiu ni kanganga</i>, is the term commonly used in Kiribati and describes one who is: (i) having difficulty in providing for the family's needs; (ii) is living on credit; or (iii) is <i>bubuti</i> – regularly asking for favors (including begging) from relatives and friends. Despite this distinction, it is still possible to estimate the percentage of the population who are in economic hardship. At present, some 16% of Kiritimati Island residents are below the Food Poverty Line for outer islands in Kiribati, which equates to A\$202 pc p.a. and 24% below the Poverty Line for outer islands, which is A\$243 pc p.a.</p> <p>Project Beneficiaries. The total Project beneficiaries will be the existing population of 5,965 persons (2007) and a target population of 11,300 persons in 2015, which is equivalent to 100% of the Kiritimati Island population. Based on the Household Survey and Existing WSS Infrastructure Survey (November 2007), some 58% of households identified that they experienced a lack of piped water supply. In the case of Banana village (where 65% of households receive piped water), supply is only available for between 1-2 hours each day. At present, well water is used for all household water needs (both potable and non-potable) by 49% of households in Tabwakea village and 35% of households in Banana. In Kiritimati Island, 69% of households have a septic system, of which 66% are pedestal toilets with a flush cistern, 30% are pedestal toilets with a bucket flush and 4% are squat toilets.</p> <p>Overcrowding and Landlessness. The extremely slow pace by which state lands have been released in Kiritimati Island, combined with steady in-migration from Tarawa, is continuing to cause overcrowding issues in London, Banana and in particular Tabwakea village. The vast majority of landless families are</p>	

able to reside with extended family members. However sometimes there is insufficient space and they must then be housed in, or adjacent to, church *maneabas*, or become squatters either within the villages or in the bush (estimated to be 8 families, November 2007).

Income/Expenditure Inequality. Traditional I-Kiribati culture is structured around equality and even distribution of resources including the practice of *bubuti*. As this egalitarian framework begins to breakdown, from increasing monetization, there is a growing inequality between different sections of the community. This is a growing trend in Kiritimati Island, as displayed in the differences between the villages of London and Tabwakea, where on average residents in London earn more than twice that of residents in Tabwakea. Differences between villages are also seen in land ownership. The majority of land in London, Banana and Poland villages is state land, with government housing provided. In contrast, Tabwakea village and parts of Banana village are a mix of freehold and private 25-year leasehold plots, with differing levels of housing quality and level of services. As such, there is a clearly 2 levels of urban population in Kiritimati Island, each with specific needs, attitudes and aspirations.

2. Design Features

Water Supply. A core principle underpinning the water supply component of the Project design is “multiple sources for multiples uses”. Practically, this entails the construction of new wells and the improvement of existing wells in the villages of Tabwakea, Main Camp/ New Banana, Banana and Poland. This provides the residents of these villages with multiples sources of water, particularly for non-potable uses (such as flushing toilets, watering gardens and feeding livestock). By using wells for approximately one third of water requirements (30 l/p/d), average households in Tabwakea can potentially save A\$51 in water bills per month and households in Banana potentially A\$45 per month. In addition, the reduced dependence on the key groundwater reserves by Tabwakea and Banana villages for non-potable uses is beneficial for more sustainable management of the lenses. To support low-income earners, particularly from Tabwakea village, the Project will provide the option of spreading the initial cost of connecting to the water supply system (approx. A\$120) over a period of 6-12 months.

Sanitation, including greywater. The design preference for septic systems is aligned with the aspirations of the vast majority of residents in Kiritimati Island. Historically, a standard has been set by government housing, all of which have septic systems, with cistern flush toilets. The Project design proposes the installation of pedestal toilets with a bucket flush, where possible, with flush water sourced from local wells (except in London village where well water is high contaminated by petrochemicals). Greywater systems (evaporation basins) will apply equally for all villages, government and private.

Conceptual framework. Given the depth of socio cultural norms and values influencing the use of traditional defecation methods, as well as attitudes towards the environmental and waste management, the Project design emphasizes as far as possible that the Project is equally about the provision of infrastructure as it is about community development/mobilization and institutional change.

II. SOCIAL ANALYSIS AND STRATEGY

A. Findings of Social Analysis

1. Key Issues

Socio-Cultural Norms and Values to Water Supply and Sanitation. Kiribati culture has for generations enabled the I-Kiribati to live sustainably within their environment, primarily in low density outer island settings. Traditionally, I-Kiribati have obtained freshwater from shallow wells and practiced beach and bush defecation which is the preferred form of toilet on outer islands. This is supported by lessons learnt from other water and sanitation projects in Kiribati which note that although “safer” sanitation systems had been installed, beach defecation has only decreased slightly, indicating a reluctance to depart from traditional practices. Recent surveys in South Tarawa and Kiritimati Island indicate that even when people have access to a cistern-flush toilet, many prefer to practice beach and to lesser degree, bush defecation, or a combination of both methods. There is also a strong aversion to change within I-Kiribati society. As such, any community or institutional changes should be framed around long-term goals as short-term programs will inevitably fail.

Public Health. Kiribati has the fourth lowest human development index of all the Pacific developing member countries. In Kiritimati Island, the most common reported illnesses are (i) cold/flu – 75%; (ii) respiratory illnesses – 22%; (iii) fever – 15%; and (iv) diarrhoea – 5%. The total percentage of the

population suffering from water-borne illness is 6.27%, based on available health data. Significantly, these statistics only reflect the number of people who attended the village clinics/ hospital and as such the actual number of people with water-borne illness (diarrhoea, dysentery and some hepatitis) will be much higher, perhaps as much as 5 times higher (i.e. 30%). Health benefits are assumed to accrue starting from 2011 and include income loss avoidance and medical cost avoidance as a result of reduced illness. Through an improved environmental situation, the population exposed to water-borne will be reduced with associated reduction in medical costs and in the number of workdays and school days lost due to sickness. It is estimated that the potential annual health benefits will range between A\$33,100 and A\$52,700 from 2011 to 2040. The net present value (NPV, using a 10% discount rate) of health benefits that is attributable to the Project during the period 2011 to 2040 is estimated at A\$451,000.

B. Consultation and Participation

Participation was ensured during the implementation of the TA through a variety of consultative methods with key stakeholders; at the level of central government departments, government owned enterprises and the urban council, and at the level of Project communities, churches and other community groups, such as women's associations and youth associations. A survey of 87 households (13% of households in Kiritimati Island) was also undertaken, following radio announcements regarding the project, including its goals and objectives. The Household Survey confirmed the need to upgrade both water supply and sanitation services in all Project villages. An Existing WSS Infrastructure Survey, covering 100% of properties was also undertaken.

A number of focus groups were held with churches, government and community groups, namely: (i) Kiritimati Urban Council; (ii) Island Church Council; (iii) youth group leaders; (iv) women's association; (v) hotel, pet fish, diving and fisherman associations; (vi) the private sector and (vii) central government decision makers. In addition to group meetings, individual meetings were held with a range of households and individuals as part of both field observations and design validation.

A Stakeholder Analysis and Community Participation Plan was developed and provided the framework for effective interaction with Project stakeholders (see Appendix 17).

The level of consultation and participation (C&P) envisaged during the Project implementation and monitoring is:

Information sharing Consultation Collaborative decision making
Empowerment

C. Gender and Development

1. Key Issues

The Project adopted a participatory approach to incorporating gender considerations, acknowledging that women play a vital role in the water and sanitation sectors, including personal hygiene practices. Women are the primary managers of domestic water and promoters of home and community-based sanitation activities, waste disposal and environmental management. However, whilst women play an active role in decision making at the household level, within I-Kiribati society it is customary that community level decision making is largely the domain of men. Key challenges lie in successfully involving women in community action; in which working with the Women's Association will be a key objective.

2. Key Actions

Gender plan Other actions/measures No action/measure

A primary aim of the Information, Dissemination, Education and Awareness (IDEA) Program will be to work closely with women, most likely through the Women’s Association, as they are the key audience for education and awareness activities. It is proposed that women play a key role in both the Community Steering Committee and the Water User Groups, which will be established as part of the Community Mobilization component of the Project.

It is accepted that women have a greater chance of disease given the increased contact with water from household responsibilities (especially cooking and washing) and as such will benefit disproportionately from the improvement in sanitation, water quality and village environment as a result of the Project. The Project is also aiming to ease the burden of collecting well water or water from neighboring areas by supplying piped water to all households (for drinking, cooking, bathing, washing and cleaning). For both existing and new wells, the Project will be supplying a *Tamana* pump (hand pressure pump), which will also ease the burden of collecting well water for non-potable uses by rope and bucket.

III. SOCIAL SAFEGUARD ISSUES AND OTHER SOCIAL RISKS

Issue	Significant/ Limited/ No Impact	Strategy to Address Issue	Plan or Other Measures Included in Design
Involuntary Resettlement	No Impact	No resettlement is required as part of the Project, as such, no Resettlement Plan is required.	<input type="checkbox"/> Full Plan <input type="checkbox"/> Short Plan <input type="checkbox"/> Resettlement Framework <input checked="" type="checkbox"/> No Action
Indigenous Peoples	No Impact	There are no Indigenous Peoples in Kiritimati Island as all residents are internal migrants from the Gilbert Islands Group of Kiribati or elsewhere. Kiritimati Island is state lands, with no customary lands.	<input type="checkbox"/> Plan <input type="checkbox"/> Other Action <input type="checkbox"/> Indigenous Peoples Framework <input checked="" type="checkbox"/> No Action
Labor <input checked="" type="checkbox"/> Employment opportunities <input type="checkbox"/> Labor retrenchment <input type="checkbox"/> Core labor standards	Limited	Up to 70 medium-term jobs will be created during the construction phase of the Project. This will directly benefit up to 280 people in Kiritimati Island, given the current dependency ratio. Skilled low income earners should be the first to benefit from employment opportunities. In addition, it is proposed that some components of the sanitation infrastructure can be undertaken via community contracting (i.e. CBOs).	<input type="checkbox"/> Plan <input checked="" type="checkbox"/> Other Action <input type="checkbox"/> No Action
Affordability	Limited	(i) All physical infrastructure improvements will be 90-100% subsidized by the GoK (ii) Program to spread initial connection cost for water supply over a 6-12 month period. (iii) Revolving Fund in place to assist residents with no credit rating to access funds through commercial or development banks for housing	<input checked="" type="checkbox"/> Action <input type="checkbox"/> No Action

Other Risks and/or Vulnerabilities <input type="checkbox"/> HIV/AIDS <input type="checkbox"/> Human trafficking <input checked="" type="checkbox"/> Others (Public Health and Awareness)	Limited	improvements. IDEA Program to provide training and development to public health staff, village leaders, school teachers, women's association members	<input type="checkbox"/> Plan <input checked="" type="checkbox"/> Other Action <input type="checkbox"/> No Action
IV. MONITORING AND EVALUATION			
<p>The types of social indicators included in the Design and Monitoring Framework are: (i) socioeconomic surveys; (ii) health benefit reports; (iii) Community Steering Committee reports; (iv) IDEA Program reports, including details on involvement of women, youth and schools; (v) GoK socioeconomic statistics; and (vi) Community User Groups reports.</p>			