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Secretariat
of the Pacific
Community

Applied Geoscience and Technology Division

Nabaka Village WASH Survey – Piloting Data Collection Tools for A Fijian Coastal Community, Fiji

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SOPAC SURVEY REPORT (PR153a)

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Applied Geoscience and Technology Division

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This report may also be referred to as SPC SOPAC Division Published Report 153a

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- Turaga ni Koro, Apete Naikolo; and the
- Nabaka village development committee for their assistance in conducting the survey.

Big Vinaka Vakelevu to the community members for welcoming us in the village and taking part in the community consultation process. Special thanks to Mr Peni Suveinakama for all his support and guidance during the assessment.

CONTENTS

1. INTRODUCTION

In 2011, the water services team from the Water & Sanitation Programme (WSP) of the Secretariat of the Pacific Community (SPC) conducted a water and sanitation assessment within the village of Nabaka. The WASH (Water Supply Sanitation and Hygiene) assessment report detailed, through community consultations, key issues and recommendations in the area(s) of:

I. Water supply
II. Governance
III. Sanitation

This report is therefore a detailed follow up review of the status of the various water sources, sanitation types and key hygiene behaviours of the Nabaka Village Community.

The Water Point Mapper (WPM) tool is a mapping tool designed by the UK based charity WaterAid. The mapper is a simple mapping tool used by development practitioners in water & sanitation to map the status and condition of water and sanitation points. The WPM tool has been used globally in Africa and Asia, the research work compiled in this study serves as the pilot study of the practical application of the WPM tool in a Pacific context.

"The WPM is a free and simple monitoring tool designed to generate powerful maps showing the status of water supply services. Based on a Microsoft Excel spreadsheet, it instantly converts water point data into Google Earth compatible maps without the need for complex GIS software or an internet connection. These maps can be saved as images for printing or inclusion in reports. The Mapper is aimed at local government planners and water, sanitation, hygiene field practitioners working on district, sub-district and village level water supply programmes."

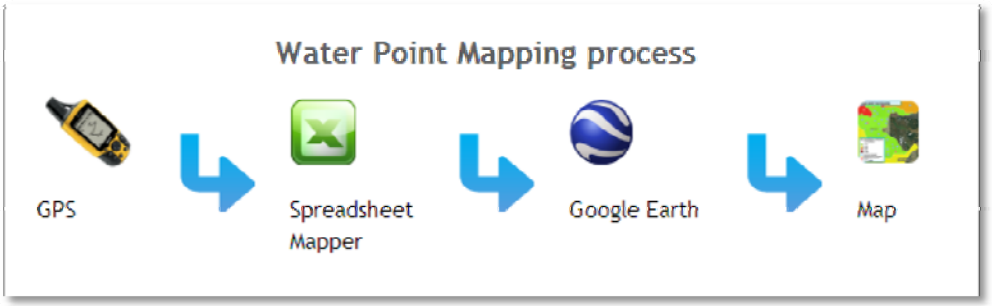


Figure 1: Water Point mapping process (UK, 2011).

2. AIM

The main areas:

1. Collect and verify household information in three key areas of WASH:

   a) The key types of drinking water supply sources.
   b) The types of sanitation systems available and in-use in the community.
   c) Evaluate baseline information on:

      (i) Hygiene and the practice hand-washing; and
      (ii) household drinking water treatment/storage practices.

3. SECONDARY AIM

A secondary aim of the activity was also to pilot the use of new field data collection tools:

1. Pilot the use of the WPM software in a Pacific island context.
2. Pilot and field test the use of two field data collection units: a mobile phone based application and a GPS handheld unit- Juno SB.

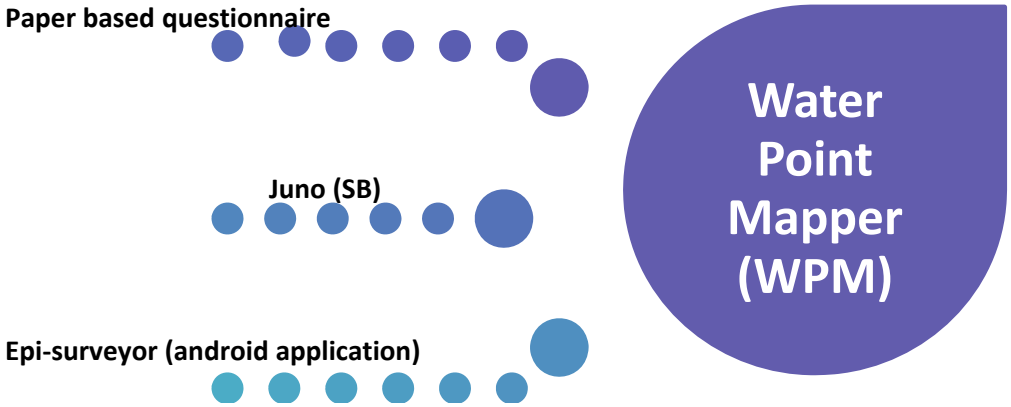


Figure 2: Data collection tools used with Water Point Mapper (its same for above and below).

4. PILOT COMMUNITY

Nabaka Village is a rural Fijian community located approximately 40 km outside of Suva along the Kings Road. The community is composed of approximately 29 households, and have a total population of 183 persons (community) although the survey conducted found this number to be lower with 135 persons present at the time of the study. The village is located on the coast where community livelihoods are primarily subsistence agriculture and fishing supplemented with work in the private sector (35%) and work in the civil service sector (24%). The Nabaka village community are also actively involved within the FLMMA. The FLMMA network is a part of a marine conservation program which seeks to empower local Pacific communities through sustainable coastal marine resource management. The locally-managed marine protected areas program (LMMAs) is a Pacific wide network of communities, researchers, and conservation scientists who work in close partnership with local Pacific island people in sustainable coastal resource management.

Figure 3: Nabaka Village (source: Beukeringet et al, 2007).

5. METHODOLOGY

This study consisted of household interviews and surveys of rainwater tanks (sanitary survey risk assessments). The team as composed of 6 staff, 1 community technical expert and 2 community representatives. Nabaka village community development representatives were also able to assist in the information collection/household interviews. Annex 1 contains the program for the visit.

The survey was divided into two teams collecting information from each household:

I. Team 1 household interviews/observers; Iva Bakaniceva, and Arieta Sokota.
II. Team 2 rainwater tank survey team; Joy Papao, Mereoni Ketewai, and Rodney Lui.

Two village community reps were also present during the visit to Nabaka and they were able to offer additional information household information.

Figure 4. SPC staff with community reps conducting sanitary surveys of rainwater tanks, Nabaka.

The key findings of the survey have been classed into the following categories:

1. Employment by household head.
2. Drinking water source by type.
3. Sanitation.
4. Hygiene and drinking water storage and treatment practices.

6. DISCUSSION

6.1 Employment by household head − Nabaka Village

Information by household indicates that 20% of the community in Nabaka do not have formal employment. Despite this, they equally contribute in terms of household chores, fishing, farming and cooking.

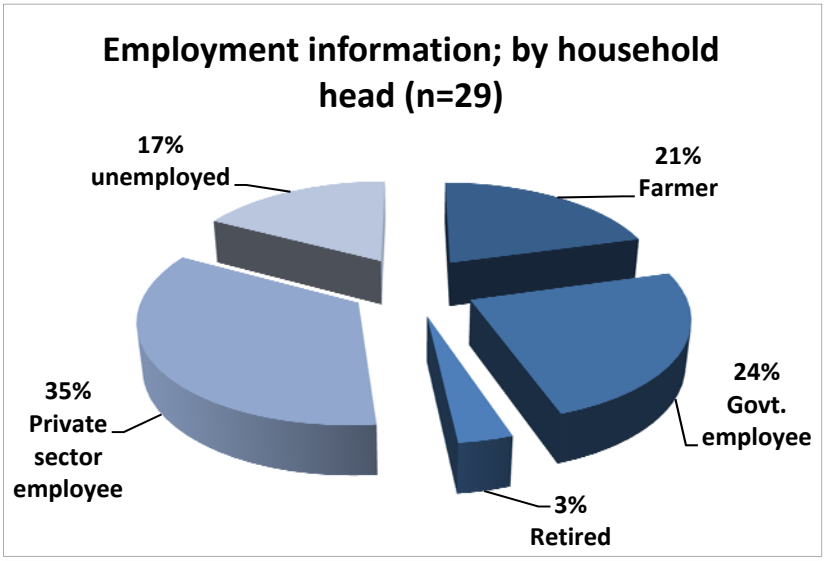


Figure 5. Employment information by head of household.

6.2 Drinking water source by type

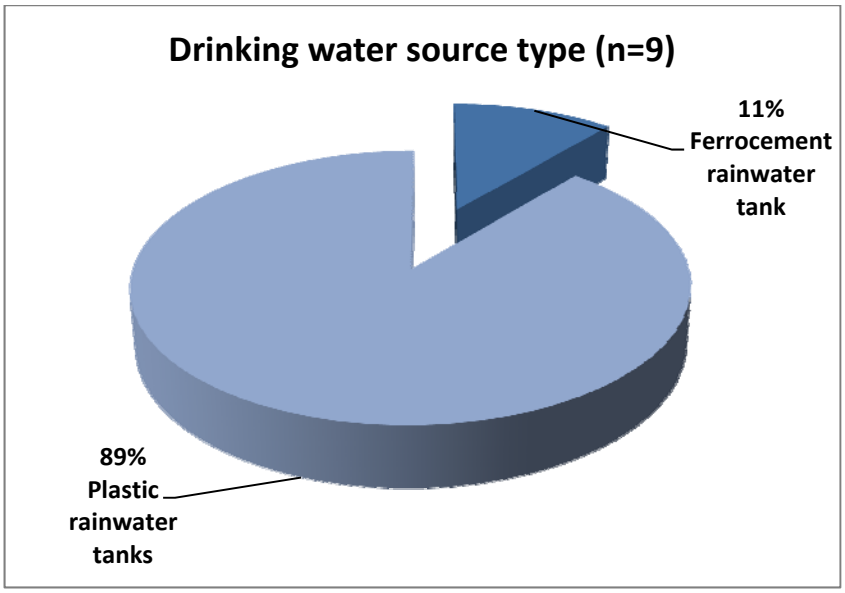


Figure 6: Drinking water source types available in Nabaka.

Drinking water in the village of Nabaka is mainly provided through eight drinking water tanks which are strategically placed within the community as source tanks for a group of households. Typically one 15,000 L tank would offer drinking water for around 3-6 households. The above chart highlights a large percentage of the community dependent on a single type of drinking water source.

Key risk: drinking water source by type

- The risk identified is vulnerability to drought/drier seasons with lower rainfall as rainwater systems rely on a steady supply of rainwater to recharge the water in tanks. A supplementary drinking water source is recommended for the village of Nabaka.
- Regular operation and maintenance of rainwater tanks is the responsibility of households, although a regular community managed program to clean, maintain and flush tanks during wet seasons is currently not implemented in the village. The water sub-committee would be a good mechanism to achieve this.

6.3 Drinking water sources and associated risk (sanitary survey scores)

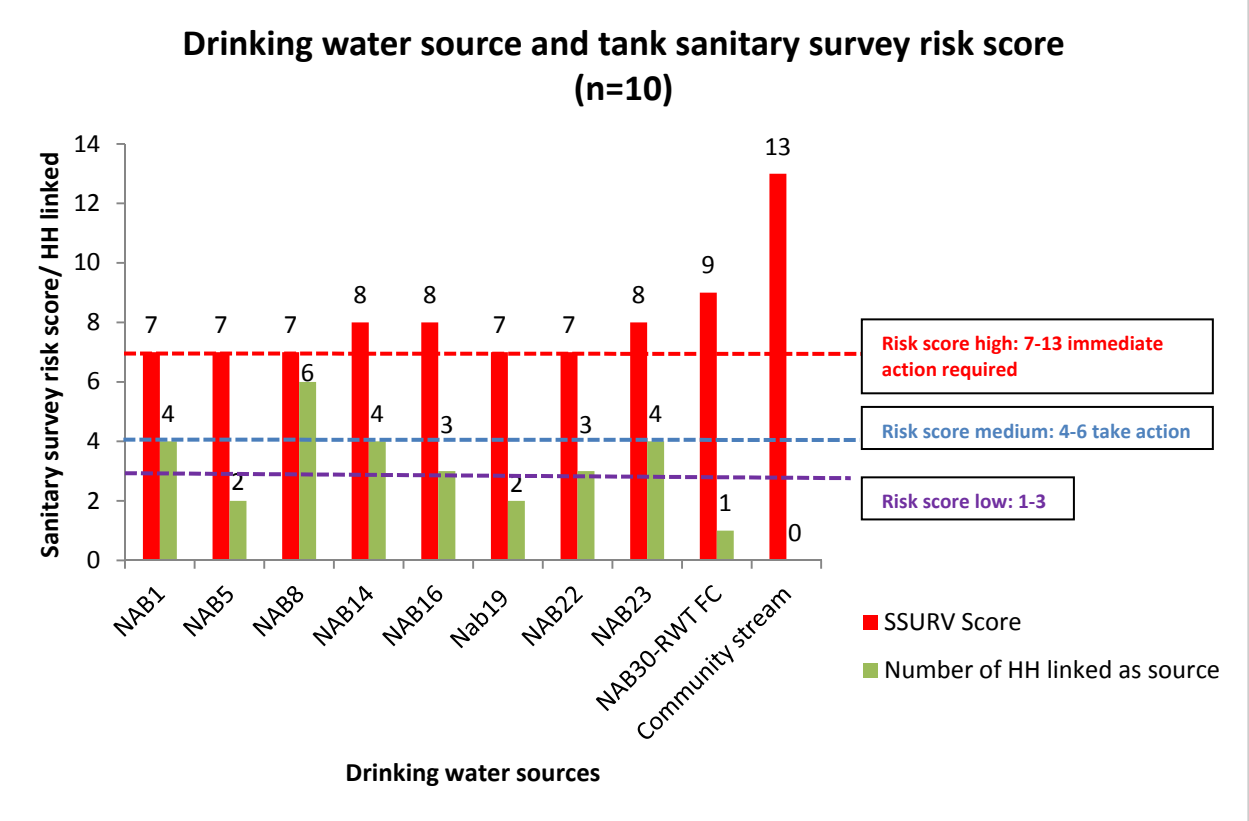


Figure 7: Sanitary survey risk assessment rating on household water tanks. Note: SSURV – means sanitary survey scores.

The survey team were able to conduct risk assessments of each rainwater tank. The risk assessment is a visual confirmation of all risks which may impact the quality of the drinking water; the assessment is comprised of 13 identifiable risk factors. The survey included a total of 9 drinking water tanks (1 ferrocement community hall tank and 8 plastic rainwater tanks attached to household dwellings). The key findings here indicate:

- 17 households linked to rainwater tank systems with a risk rating of 7 **(immediate action required)**
- 11 households linked to rainwater tank systems with a risk rating of 8 **(immediate action required)**
- 1 household linked to a ferrocement community tank with a risk rating of 9 **(immediate action required)**

Key risk: drinking water sources and associated risk

The key risk in this section of reviewing the drinking water sources is that all nine rainwater tanks are clearly at a high level of risk and any risk factor at (7-13) and immediate action is recommended to mitigate or remove the identified risks in each system.

6.4 Sanitation types available

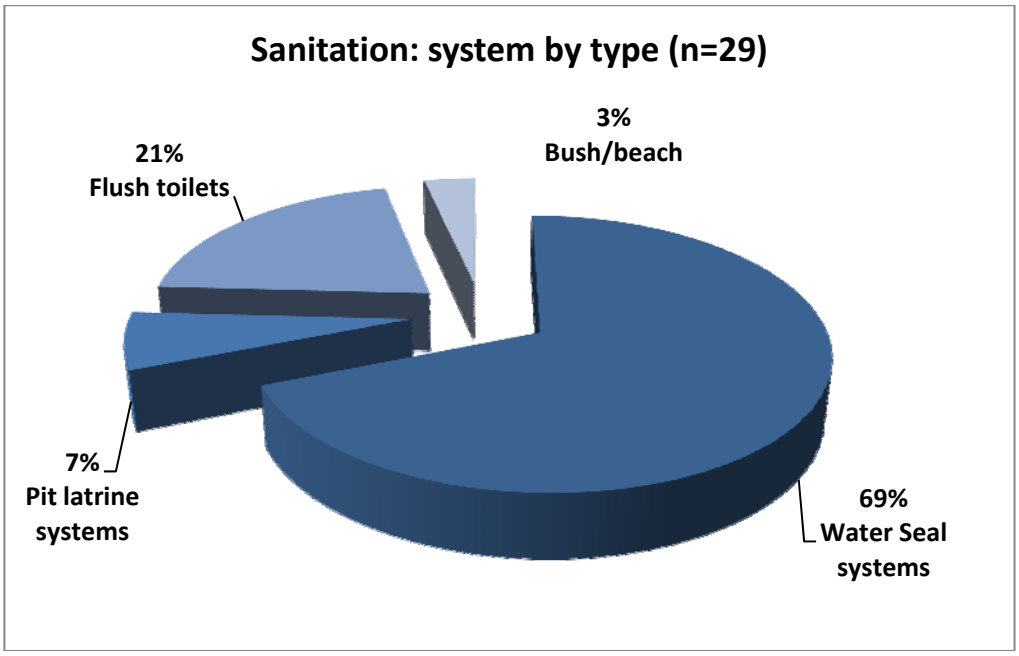


Figure 8: Sanitation types available in households in Nabaka.

The key types of sanitation being used by the community of Nabaka highlights 90% using "wet" sanitation, it is however noted that these "wet" sanitation systems used flush water collected from rainwater barrels in individual households. Also noted in this section, is the use of pit latrine and 'bush/beach' defecation in Nabaka.

Key risk: sanitation

The practice of open defecation and pit latrines although minimal (10%) still represents a likely risk to health and hygienic sanitation. Better awareness of the health benefits of improved sanitation are likely options to curb an increase in "at risk" sanitation type systems.

6.5 Hygiene practices; hand washing

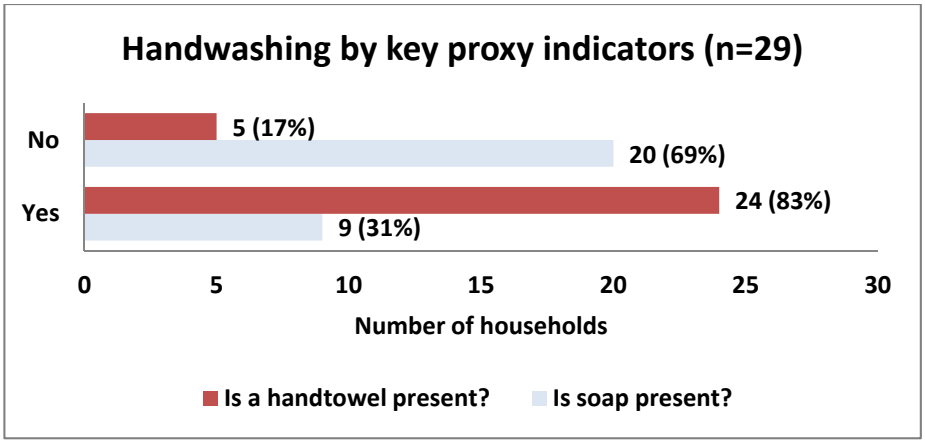


Figure 9: Hygiene practices, proxy indicators for hand-washing.

Hand washing behaviour in this study was observed in two key respects;

(i) The presence/absence of soap and towel in individual sanitation facilities; and
(ii) The distance of taps to sanitation facilities (toilets).

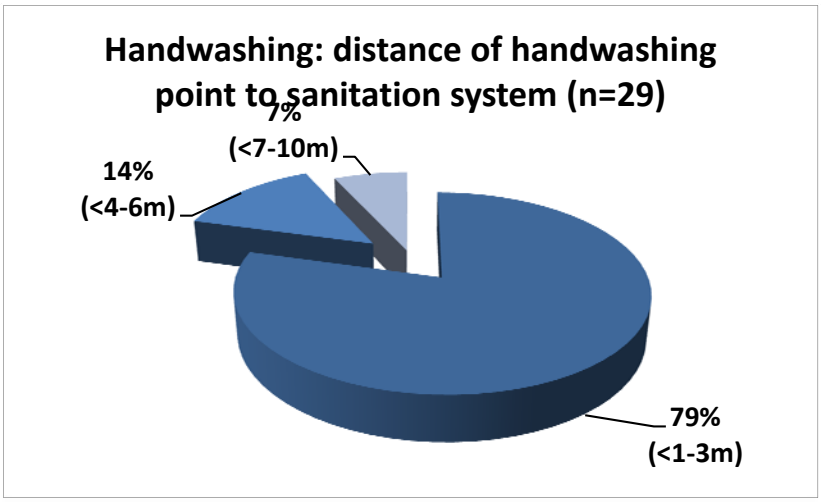


Figure 10: Hand-washing proxy indicators- distance to taps.

The likelihood for people to practice hand-washing was taken as the distance of tap to toilets. It was noted in this results area that at least 79% of households were within a reasonable distance for people to be able to access water which should increase the likelihood of practising hand washing. The assumption in this result area is that the further away tap stands are from toilets, the less likely people are to wash their hands after visiting the toilet.

Key risk; hygiene practices-hand washing

Washing of hands ideally is a good indicator of the level of hygiene within a community. This however is not always an easy area to assess and also quantify as there are more complex issues other than just the presence of water, soap, handtowels and tap distance from toilets. This aside the key risk that can be identified is that the key elements of hand washing are: soap, water, and a towel are essential in minimising the risk of disease and sickness.

6.6 Drinking water storage and treatment practices

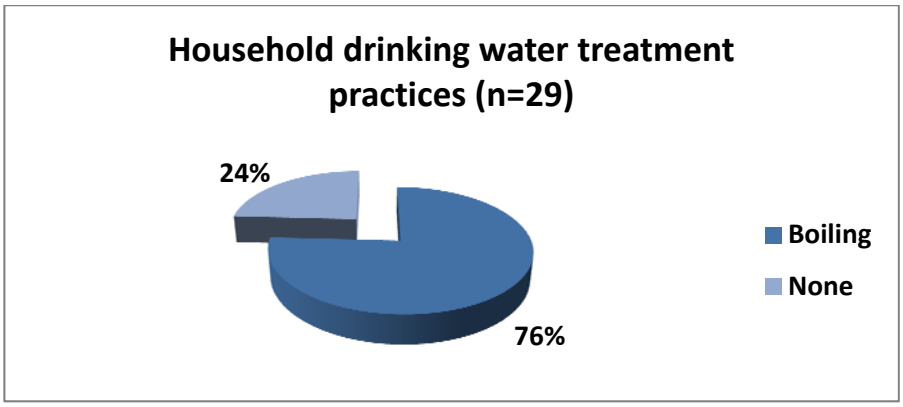


Figure 11: Drinking water treatment practices in Nabaka.

The practice of treating water by boiling was noted to be prevalent mostly in the case of pre-treating drinking water for children and older members of households. Withstanding this, most households are able to drink water directly from rainwater tanks without boiling. The practice of boiling was also noted to be in competition with fuel (firewood or otherwise) used primarily for cooking.

Hydrogen sulphide (H_2S) preliminary water quality tests

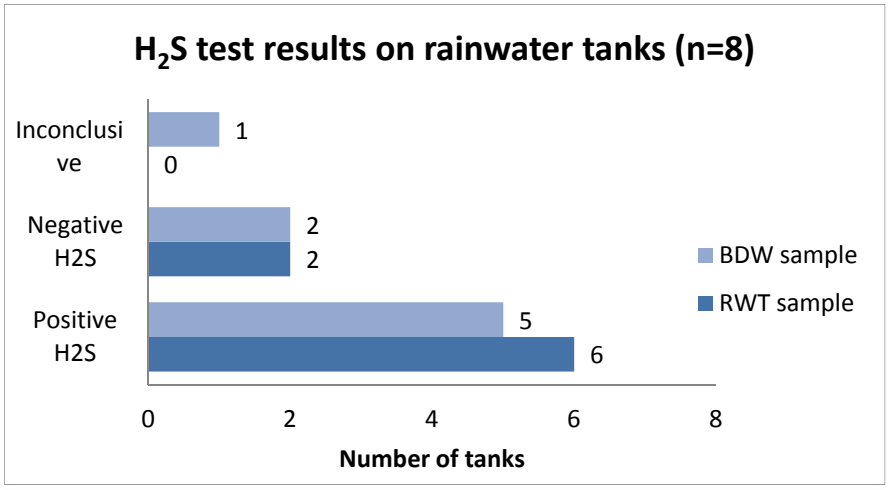


Figure 12: H_2S test results on rainwater tanks, BDW- Boiled drinking water and RWT- Rainwater tank.

Hydrogen sulphide tests offer a preliminary snapshot of the indicator organisms present which are most likely to be associated with disease causing pathogens in water. Testing of water samples were conducted on both rainwater samples taken directly from rainwater tanks (RWT sample) and boiled drinking water samples from households after boiling, cooling and storage in water bottles. Based on these results, it is hereby assumed that even though boiling is practised, there is no marked improvement in the removal of pathogens present. This assumption then leads us to assume that either of two things may be occurring, they are:

(1) Boiling water may be practised but effective boiling may not be practised which means households may not be boiling water long enough (rolling boil for two mins) to effectively kill most bacteria/pathogens; or
(2) Safely boiled water may be cooled and placed in previously unclean bottles and containers effectively re-contaminating clean boiled water.

Key risk: drinking water storage and treatment practices

A key risk here is that households are at risk of consuming drinking water which might contain potentially harmful bacteria and contain pathogenic material. H_2S water tests are not conclusive tests for water quality but instead are an indicator of the quality of water and the pathogens present.

6.7 Governance community development: Eco-Eng (Fiji) feedback discussion

A community wastewater engineer from Eco-Engineering- Fiji, Mr Viliame Jeke was able to facilitate a lessons learned shared session with community members present. The men's group from Nabaka had returned after lunch from work in the vegetable plots. The following comments were noted as part of this session:

- A large number of community members were concerned about the cleaning of plastic rainwater tanks especially when bailing/flushing scum from the base of rainwater tanks.
- Community members present noted that information sharing from all partners working within Nabaka could be done better to improve community knowledge and perception of various development issues.
- A compost toilet (CT) which was built as part of the Fiji-Locally Managed Marine Areas (FLMMA) project work was built for community use over a year ago. The CT remained locked and unused at the time of the visit.

A suggested recommendation for the community of Nabaka would be that the village development committee invest in planning yearly activities around key issues in water and sanitation, with a clear plan for action on improving the current status of water and also sanitation in the community. Community and household-wide education plans with concrete sessions on drinking water quality community-based management is a recommended opportunity as an action for the village of Nabaka. The community governance diagram of the Nabaka development committee as outlined in the structure below, indicates distinct differentiation between Water and Health. It is recommended that the water sub-committee be merged or closely linked to the CC sub-committee as this is clearly a sector impacted by climate variation in the near future.

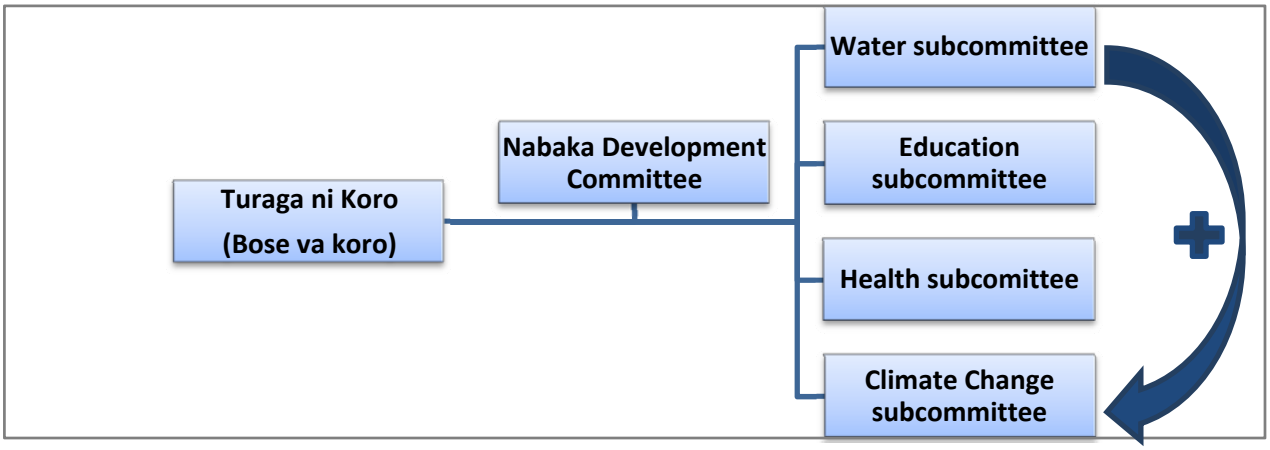


Figure 13: Governance structure of Nabaka Village development committee.

7. KEY RECOMMENDATIONS

The recommendations presented below are referenced with respect to the key findings, identified risks and recommendations. The sections are as follows:

1. Drinking water sources
2. Sanitation
3. Hygiene (hand washing)
4. Drinking water storage and treatment practices
5. Governance and community development actions.

Table 1. Key recommendations from WASH survey information.

WASH aspect	Key recommendation	Potential action/follow-up
Drinking water sources	• Alternative sources to drinking water is recommended as a coping strategy to reduce community vulnerability to drier periods. • A likely issue of contention to support alternative drinking water sources is sourcing drinking water from a nearby borehole. Community discussions between landowners and the Nabaka village development committee would need to be brokered to prepare community contingency plans for drier periods.	• An existing plan to link the large 50, 000 litre tank to the piped water supply system could potentially minimise the risk of water shortage in future for Nabaka. • Discussions with Water Authority Fiji can be initiated to ensure a piped drinking water source is available to fill the large community drinking water tank. This should be able to counter water demand during periods of low rainfall. A community fund to ensure sustainable operation and maintenance would be essential to any follow-up plans.
Sanitation/ wastewater	• Given the proximity to the coastline and the need to conserve water, it is recommended that dry sanitation options be explored only with strong community participation and ownership. • Local community interest in grey	• A compost toilet (CT) has been built in the community and will need better planning with strong community interest in the use, maintenance and operation of the CT in order to be an effective option to current

	water designs from Votua[1] example could be piloted for use within the community.	sanitation systems. • The Votua wastewater project household based examples on grey water disposal designs is a likely design for replication in Nabaka.
Hygiene (hand washing)	• Awareness on the importance on proper hand washing with "soap, clean water, and a handtowel" after key times such as visiting the toilet, handling diaper changes, cooking, eating is essential in fostering good hygiene practices in the community.	• NGOs such as LLEE and PCDF have community based WASH programs which could be of benefit to the community of Nabaka. • Simple hand washing awareness and 'how to' properly hand wash sessions can be done as part of the health sub-committee's work with youth, children and mothers/caregivers.
Drinking water storage and treatment practices	• Key information and awareness on household drinking water treatment and storage practices will need to be shared with the community and households to safeguard drinking water quality and safety.	• Information and IEC materials from the '*Keeping your community drinking water quality safe'* toolkit can be shared with local community members along with associated activities and training with local NGO partners such as LLEE.
Governance and community development actions	• It is recommended in this section that the village community development committee liaise with key NGO WASH partners such as PCDF, LLEE to discuss opportunities on awareness, community led WASH programs available for Fiji communities. • A former recommendation from a 2011 SPC report was to involve youth and women's groups into the 4 key sub-committees in the community governance section − this is also reiterated in this section to assist communities achieve improved representation.	• Community based water quality trainings with key health messages be conducted in the community with concrete, agreed action plans would be a possible opportunity to explore. SPC-WSP team could potentially link in partners from the Pacific WASH Coalition partners to assist and link actions with assistance. • Youth/ women's groups can be better represented in the community governance structure. This recommendation could be already an ongoing aspect of the community structure.

[1] Refer to Votua design from ppt (Annex 2)

8. CONCLUSION

The Nabaka WASH survey from this field work was clearly indicated:

- A strong reliance on drinking water from rainwater sources with 89% of the community dependent on plastic rainwater tanks and 11% on large ferrocement tanks. A backup source of drinking will need to be a clear priority for the water (suggested WASH sub-committee).
- Community awareness and education on the connections between health, water, sanitation and proper hygiene is a clear area of community based interventions in which the community of Nabaka will be able to benefit from.
- An introduction to the sanitary surveys of rainwater tanks and the need to understand risk reduction efforts through do-able actions within a rainwater tank system will be of great benefit to the people of Nabaka.
- Increasing access to improved sanitation and alternative sanitation types is an area the Nabaka village development committee should look into.
- Improved planning around drought and climate impacts on drinking water sources should be a high priority for the suggested *Climate Change and WASH sub-committee.*

Additional recommendations and potential follow up actions are highlighted in the recommendations component of this report. If these actions are implemented into the larger development aspirations and goals of the Nabaka development plan, it would be of great benefit to the community of Nabaka to have such an area articulated into detail and prominence in the overall village planning processes.

This report would also like to acknowledge the assistance and collaborative effort of the village headman of Nabaka, the development committee for their fortitude in assisting the WASH team in their efforts to collect field data and information during this exercise.

9. ANNEXES

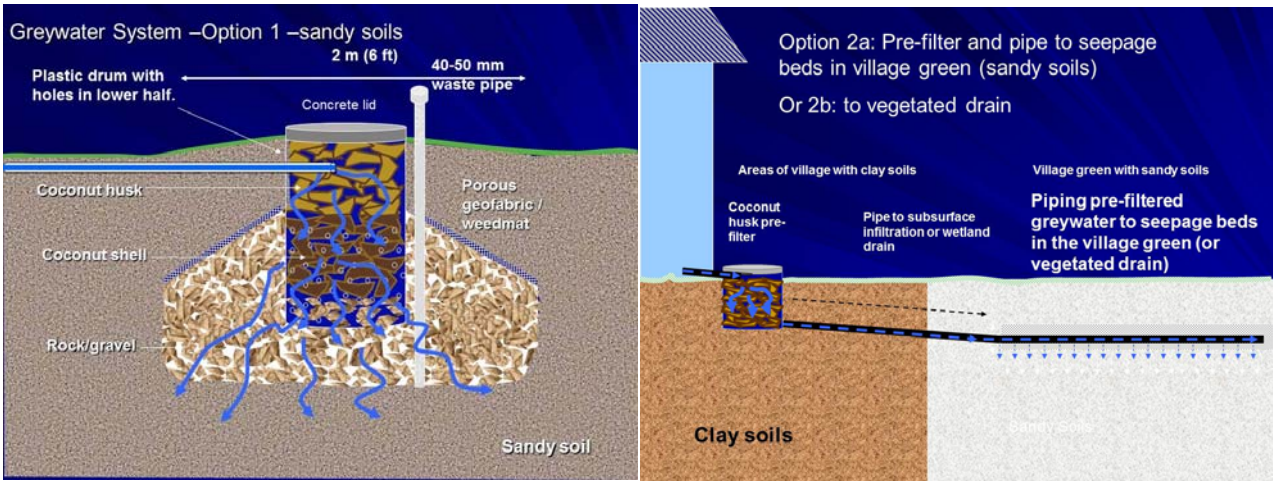
A Nabaka village survey schedule

Information collected from all 29 households included sanitation system by type and also basic hygiene practices through proxy indicators; presence/absence of soap, use of a towel for hand washing and also distance of hand washing facility away from sanitation system.

Day schedule of WASH survey.

Schedule for Nabaka follow up assessment [14/11/12]	**Comments/notes**
• Team meet up at SOPAC office and travel to Nabaka 9 - 10 am	Staff travel
• Meeting with Community development committee 10 - 10:30 am and discussion on work for the follow up	Community development committee are briefed on the work to be conducted and assistance required before team move out and conduct household surveys.
• Household surveys 10:30 am - 1 pm	Household surveys of water and sanitation systems using Water Point Mapper formatted forms.
• Lunch 1 - 2 pm	Working lunch with community reps.
• Team debrief and presentation from Mr Vili Jeke (Votua Community based wastewater project, Coral Coast Suva) 2 - 3 pm	Team debrief and compile information on WPM and forms collected using GIS work, and data entry. PPT presentation by Vili Jeke to communities on community managed wastewater systems and facilitate a question and answer session with the community.
• Team discussion and next steps with community on some of the work completed- key findings etc. and other issues/challenges for the community (3 - 4 pm)	Team finalises some of the final support to Nabaka and also share points with Development Committee, and key contacts with SPC/WSP.
• SPC/SOPAC team finalise and return to Suva (4 - 5 pm)	SPC staff travel to Suva.

B Votua wastewater (grey water) disposal household design options



This design is the grey water disposal system for households being used by the Votua wastewater project in Sigatoka, Fiji.

C Mapping results using Water Point Mapper (WPM)-software

The water point mapper software allows users to enter in water and sanitation field data into a spread sheet which then generates a map which can be viewed in Google earth. The Google earth map is interactive and allows users to graphically visualise WASH information for a specific point. The insert below is a snapshot of the final Google earth map indicating water source field information available for Nabaka by the types of drinking water sources.

D Data collection tools and the Water Point Mapper (WPM)

The water point mapper (WPM) information can be found via the link:

http://www.waterpointmapper.org/.The technical assistance of UK based charity WaterAid staff was invaluable to novice users.

Key contact: Technical officer (WaterAid UK) Mr Joseph Pearce JosephPearce@wateraid.org

E Data collection tools

The principal data collection tools and key discussion notes are discussed briefly below:

1. Paper based forms; the WASH survey form was printed and assigned to team members. Sufficient background and understanding in WASH and also of various sections such as interview type questions vs. observation/proxy indicators is crucial when using paper based forms. Delivery in the vernacular is an important aspect of using forms and cultural sensitivities are highlighted for all team members.
2. Episurveyor application on android phones: in addition to the use of the paper forms a mobile phone based data collection tool was also used by the team to trial field effectiveness. The link to the app and information is available via: https://www.magpi.com/login/auth
3. Juno SB handheld GPS units: The Juno SB handhelds are able to perform the same function as that of the Episurveyor application with added technical accuracy in capturing GPS points. The handheld also has a camera attached to the system which is also able to capture detailed photographs of individual systems. Some of the key issues in the use of Juno SBs are:
    - The costs of units are expensive, and also require additional software with paid licenses in order to run the user interface from a PC.
    - Strong field training and understanding of the software are key requirements to using a JUNO SB.
    - Use and understanding of GIS software will enable users to efficiently use all the available features of the Juno SB unit.