



Watershed Interventions for Systems Health in Fiji (WISH Fiji)



Report on 2022 “Impacts and Interventions” Workshop

Held at the Holiday Inn, Suva, Fiji

12-13 October 2022

Bloomberg
Philanthropies

OCEAN INITIATIVE



WISH+
Watershed Interventions
for Systems Health Plus





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Back cover: WISH Fiji intervention site at Bureta, Ovalau © Zoomfiji

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Report on 2022 “Impacts and Interventions” Workshop






The **Watershed Interventions for Systems Health in Fiji (WISH Fiji)** project is a collaborative, research-to-action approach that has worked within watershed units to reduce risk of water-related disease and improve downstream ecosystem health. Between 2018 and 2022, WISH Fiji was implemented in 29 communities across 5 watersheds in Fiji, located within Central, Eastern and Northern divisions.

WISH Fiji is designed to reduce risks to people from Fiji's three plagues (leptospirosis, typhoid and dengue), as well as other diarrheal disease (collectively 'LTDDs'), by improving overall systems health, which provides co-benefits for downstream ecosystems. We define systems health as the emergent result of interactions and feedbacks between the environment and people, nested across different scales.

Improved systems health is accomplished by:

1. identifying disease risks across nested scales (landscape, community, household, individual) through data gathering and participatory planning;
 2. prioritizing investments in interventions that maximize risk reduction potential for human health and downstream ecosystem health; and
 3. measuring impact.
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General Introduction



The WISH Fiji team at the 2022 Impacts and Interventions Workshop, held at the Holiday Inn, Suva.

The Watershed Interventions for Systems Health in Fiji (WISH Fiji) project is a collaborative research-to-action approach that has worked within watershed units to reduce the risk of water-related disease and improve downstream ecosystem health. Between 2018 and 2022, WISH Fiji was implemented in 29 Fijian communities across 5 watersheds in Fiji, located with Central and Eastern and Northern divisions.

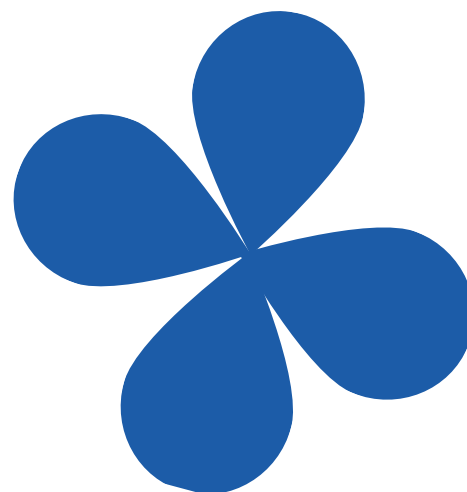
The WISH Fiji project is funded by the Australian Government Indo-Pacific Centre for Health Security and Bloomberg Philanthropies' Vibrant Oceans Initiative. WISH Fiji has additionally been supported with complementary funding from two Grand Challenges Exploration grants from the Bill & Melinda Gates Foundation.

Team members operate from Fiji National University and Wildlife Conservation Society, and implement the project in association with University of Sydney and Edith Cowan University. Throughout the project's duration, stakeholders in at national, divisional and community levels have been engaged. Nearing the end of their first phase of operation, and as next

phase plans are being established, team members presented a detailed up-to-date statement of progress to a broad stakeholder invitation in a two-day event at the Holiday Inn, Suva, 12-13 October 2022.

The overall purpose of the two day event was to provide a summary of the reasoning, approach, methods, activities and outcomes of the WISH Fiji project to-date to stakeholders, to give them opportunities to have an open dialogue with team members in a semi-formal setting.

This report is a summary of the two-day event.



Day 1 Introduction, Methods and Approach

The first day started with a formal welcome and a keynote address, followed by the WISH Fiji team who gave descriptions of the reasons why the project was necessary, the project design and approach, planning and interventions applied and the results to hand. Key results and reports, lessons learned and experiences, and stakeholder reflections, were included, and comments about the future (next phase(s)) were outlined. After individual sessions, questions and discussion from the floor followed.

This day was attended by 70 stakeholder and agency representatives.

The welcome and keynote Address were delivered by the chief guest, Hon. Dr. Ifereimi Waqainabete, Minister for Health and Medical Services. Welcoming attendees, Dr. Waqainabete affirmed the imperative for Fiji to pay careful attention to climate sensitive, water-related diseases, and highlighted the onset of the new cyclone season as a time to be vigilant.

Dr. Waqainabete used the opportunity to formally announce the Cabinet approval of the National Drinking Water Quality Committee, as a high level Fiji Government initiative to ensure all relevant sectors of government were actively involved in a water agenda for environment and health outcomes and benefits for all Fijian citizens.

An Introduction to WISH Fiji and planetary health approaches was delivered by Dr. Stacy Jupiter and Dr. Aaron Jenkins, representatives of the Chief Investigator group. They noted that WISH Fiji is designed to reduce risks to people from Fiji's three plagues (leptospirosis, typhoid and dengue), as well as other diarrheal disease (collectively 'LTDDs'), by improving overall systems health, which provides co-benefits for downstream ecosystems.

WISH has regarded 'systems health' as the emergent result of interactions and feedbacks between the environment and people, nested across different scales. Improved systems health is accomplished by: (1) identifying disease risks across nested scales (landscape, community, household, individual)

through data gathering and participatory planning; (2) prioritizing investments in interventions that maximize risk reduction potential for human health and downstream ecosystem health; and (3) measuring impact.

Dr. Jenkins remarked that implementation of WISH Fiji is an exemplar of a planetary health approach, where natural and cultural diversity, and functioning natural ecosystems, provide the settings for public health, and where decision making comes from coordinated activity across the sectors, and where co-benefits are shared equitably. He pointed to WISH's contributions to national objectives to achieve sustainable development goals (SDGs).

Dr. Jupiter emphasized that the WISH approach had taken over a decade to materialise, and was based on an increasing recognition of the multiple pathways that lead to water-related diseases. Contaminated water, crowded housing, livestock in residential areas, land-use that results in increased nutrients and sediments running off the land and into water ways, out-dated and challenged infrastructure, and a lack of awareness and appropriate behaviours all contributed to disease risks that WISH sought to address.

Dr. Jenkins and Dr. Jupiter both emphasised WISH Fiji's place-based approach, and 'nestedness' – for example that places (communities) occurred within watersheds, within divisions, within a country, in a global region of Oceania. Dr. Jupiter described the five aims of WISH Fiji (Box 1).

Box 1: The five aims of WISH Fiji

1. Empower communities to access and maintain their fundamental right to clean water.
2. Develop a coordinated mechanism for systems health governance between communities and government, and across sectors.
3. Strengthen connections to place to enhance environmental stewardship and to maintain cultural practice.
4. Reduce the incidence of water-related diseases in people and downstream systems, including coral in 5 watersheds in Fiji.
5. Facilitate approaches to sustainably finance and scale interventions nationally.

Day 1 Introduction, Methods and Approach

Mr. Timoci Naivalulevu and Dr. Andrew Tukana, co-Project Managers based at FNU and WCS respectively, then outlined the processes and methods used by WISH Fiji, and used a diagram to show the stages of the project (Figure 1). They described the criteria used to select sub-catchments and communities (including disease incidence data) and the ethical approach. This included the trialling and successful implementation of a free prior informed consent process co-designed with the Ministry of iTaukei Affairs. Following consent, the team designed a series of survey and observation instruments, which served to establish a baseline for the study, and to identify the risk factors for disease which could be targeted for interventions.

The next stages involved reporting baseline risks back to communities, combined with a series of communication tools designed to highlight the links between risk factors and disease incidence. WISH Fiji project staff convened meetings of water committees in each community as a forum for action, and facilitated development of Water and Sanitation Safety Plans (WSSPs), through which interventions could be considered, prioritised and co-designed.

Mr. Naivalulevu and Dr. Tukana outlined the way WSSPs were structured, and then how, through a brokering process used by WISH, they became included in Integrated Village Development Plans, recognised by Sub-divisional Health Officers and in Provincial Council offices. Finally, they outlined when updates had been given to stakeholders, including at a mid-point of this phase ('midline'), and during WSSP cyclic reviews.

Three Catchment Coordinators for the team, Ms. Vilisi Naivalulevu, Mr. Ponipate Baleinamau, and Mr. Sikeli Naucunivanua, then proceeded to provide details on the overall project from their perspectives. Ms. Naivalulevu started by providing some descriptive statistics for the project, which includes 311 participating households across 29 communities in 5 sub-catchments. A total of 339 possible interventions were highlighted during WSSPs, of which 154 have been implemented as of October 2022, and

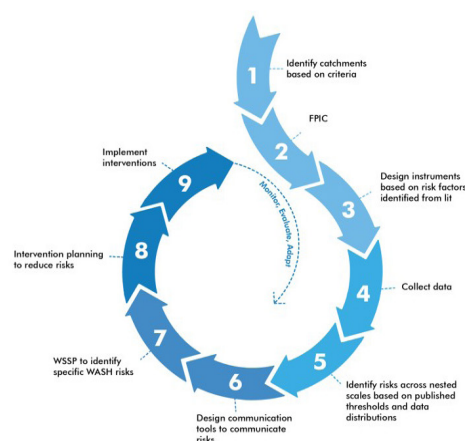


Figure 1: The adaptive management cycle used by WISH Fiji, from identification of communities and catchments to implementing interventions. FPIC = Free Informed Prior Consent; WSSP = Water and Sanitation Safety Planning; lit = Literature.

more interventions are in preparation (in particular, the sanitation interventions).

Ms. Naivalulevu, Mr. Baleinamau, and Mr. Naucunivanua gave illustrative examples of these interventions. At the household level the biggest risks identified from baseline assessments were the condition of the sanitation infrastructure. Awareness raising was an important intervention for risky behaviours.

Community level interventions were identified through WSSP processes and baseline surveys. Where there was a perceived need for an improvement in adequacy of primary water supply, construction of new dams (or repair existing ones) and clearing of sediment, repairing of leaking pipes, installation of water tanks were instigated. Waste management interventions also include awareness raising, relocation of solid waste facilities, construction of recycling points and incinerators, all designed to address the presence of rodents, mosquito breeding places.

Animal waste reduction through re-use and manure collection, livestock management through fencing and other means were interventions applied with the assistance of the Ministry of Agriculture. At the landscape level, land-use was the focus to reduce

exposed and erodible soil through reforestation and riparian plantings, reduction of tree clearing and logging. Use of chemicals was also identified as a source of water contamination.

A productive and vibrant question and answer session followed. Comments and questions from the

floor were directed at a panel comprising the Catchment Coordinators who provided their thoughts in response.

As stated by Mr. Naivalulevu, who chaired the session, these are valuable records for the WISH Fiji team. They are presented in Table 2.

Table 1: Broad categories of interventions applied in each sub-catchment as of October 2022.

Catchment	Animal management	Drainage	Health systems surveillance	Hygiene	Integrated planning	Land use management	Sanitation systems	Waste management	Water systems	Total
Bureta	1	-	7	8	7	14	-	3	16	56
Dama	5	-	3	6	4	4	-	-	11	33
Dawasamu	1	-	-	-	6	3	-	5	14	29
Upper Navua	-	-	-	1	6	-	-	5	5	17
Waibula	1	-	1	1	7	1	-	5	3	19
Total	8	-	11	16	30	22	-	18	49	154

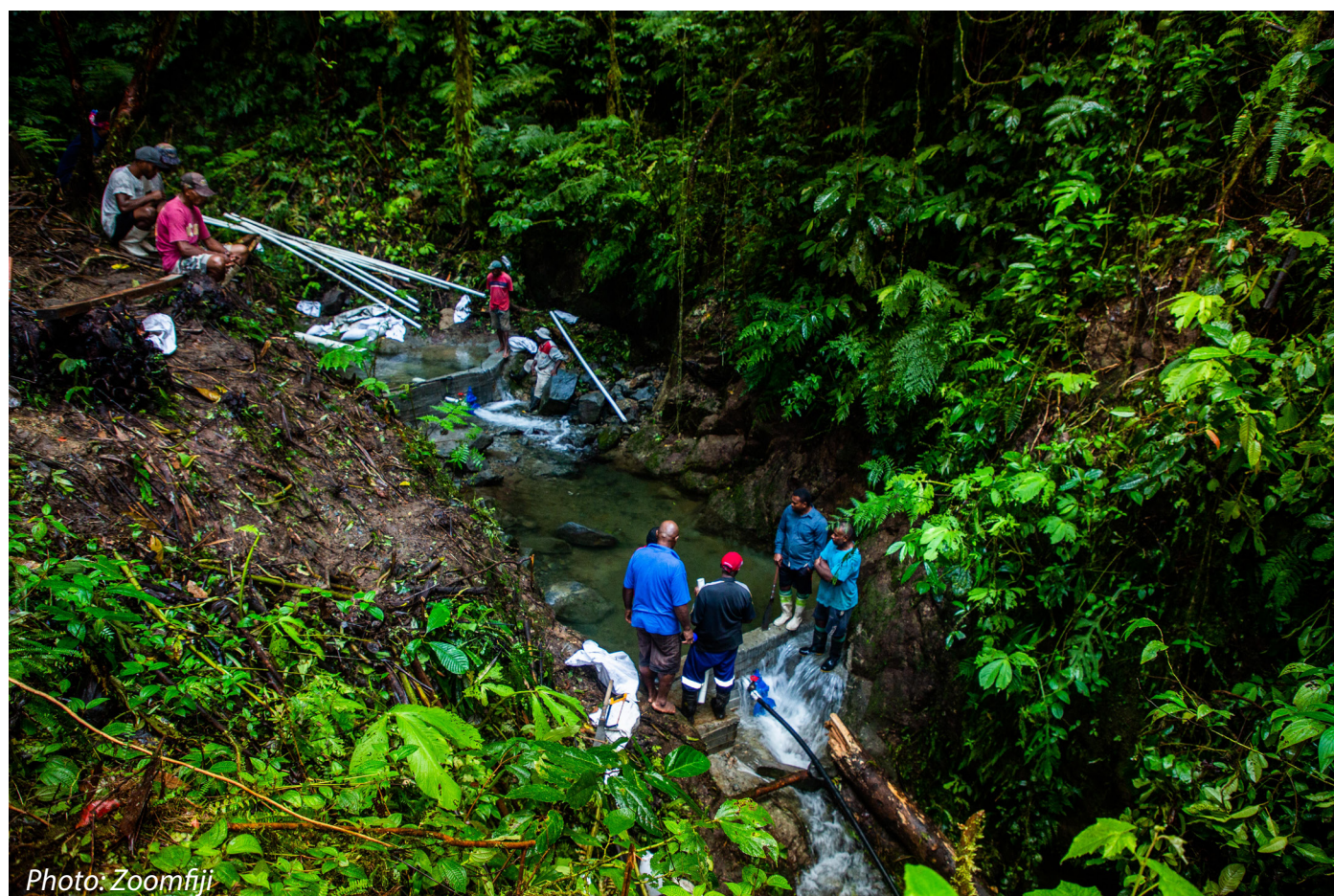


Photo: Zoomfiji

Table 2: Questions and comments from the floor to the Catchment Coordinator panel, with their paraphrased responses.

Question/Comment	Response
What has the project and team put in place to ensure the sustainability of the initiatives, and so that the communities can continue the work?	<p>It has been important to identify community champions. Also to engage with government partners and offer training in monitoring – in our case water quality monitoring, and use of Wagtech kits for measurements. We engage the community health workers as an instrumental connection in each village because they know the community profiles.</p> <p>Our role has been to broker links between these people – we always look for opportunities to connect people and agencies. Through the WSSPs and their [water] committees – which will be a lasting contribution, we have made sure that specified tasks have been assigned to responsible people.</p>
What mechanisms did you put in place post-intervention to make sure monitoring is sustained?	At the village level, each community has a water committee which was entrusted with intervention activities. Having a mechanism for reporting back is critical in order to make sure that results are shared within a community, preferably before they are shared elsewhere.
How did you manage the coordination of the partners, bringing them together?	<p>WSSPs were integrated with Integrated Village Development Plans where possible; Provincial partners were present at village meetings – this ensured integration of activities. Coordination activities have been important for us to make sure we keep our local government and district partners informed (brokering as we mentioned).</p> <p>The National Drinking Water Quality Committee mandates sharing information across the sectors – there is now a legal directive for this, which will be an on-going legacy of the project. We think that persistence and being present is essential – and offering assistance to key government departments.</p>

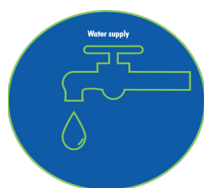
How did you identify sites where you worked? And how can this valuable work of WISH be expanded to other areas in Eastern Division?	<p>The site selection process is described as per the presentation:</p> <p>Primary Criteria for the selection of communities:</p> <ul style="list-style-type: none"> • At least two of the three diseases recurring • At least six identifiable communities within its watershed boundary • Areas of concern with respect to drinking water quality, health-related climate vulnerability, natural disasters and/or water and sanitation infrastructure • Sub-catchment is coastal <p>Secondary Criteria:</p> <ul style="list-style-type: none"> • Accessible all year round • Communities are rural or peri-urban • No significant existing funding or support • Existing community organization structure <p>Regarding the spread of this work – our hope is that other communities see the work we are doing as valuable and they reach out to see if they can adopt the same processes as we have been using (i.e. WSSPs, interventions and monitoring).</p>
Some villages we know have outbreaks of disease in the past – and quality water from catchments but not from pipes. What can be done?	<p>Existing mechanisms (i.e. through infrastructure improvements led by WAF) have set out to extend the reticulation network to such areas.</p> <p>From the WISH perspective, we argue that untreated water systems mean that we have to be even more diligent with protection of catchments as the water source.</p> <p>Because this was our first phase of operation, we had to limit the number of communities we could work with. However, a business plan for the next phase(s) is being developed which will enable some of this lateral spread of our activities.</p>
What have been some of the responses to the data you have gathered and the WSSPs that have been done?	<p>Communities have invariably shown their appreciation for our work and involvement. We have been able to identify risks, undertake water sampling, and get technical guidance from WAF. Important for us was to include women on water committees, and the committee process empowered the communities.</p>
Communities have invariably shown their appreciation for our work and involvement. We have been able to identify risks, undertake water sampling, and get technical guidance from WAF. Important for us was to include women on water committees, and the committee process empowered the communities.	<p>We did not explicitly seek traditional ecological knowledge, but in reality it was embedded in much of how and why the community engaged with us. This was particularly the case for landscape level interventions, where local knowledge was essential. We have indeed noticed a shift of current practices away from TEK, and this is to the detriment of water quality – plantings in the wrong places, chemicals being used. Our interventions are leaning towards moving back to the practices of our forefathers. WSSP is a mechanism to enable this.</p>

Day 1 Results and Reports

Dr. Jacqueline Thomas and Dr. Aaron Jenkins gave a joint presentation on key results of the project. Their presentation focused on 18 key factors that together covered the risks likely to result in higher incidence of the LTDDs, as well as circumstances that might lead to altered ecosystem health downstream.

In general, a large percentage of communities reported improvement for these risk factors over the course of WISH Fiji first phase.

Key risk factor: Drinking water systems



Nearly all communities have a spring fed dam, from which piped water is drawn to a reservoir tank and then delivered to households. The springs are not protected and there is a distance between the spring and the dam where faecal contamination can easily occur from animals and any human activity upstream.

Increased vulnerability occurs due to the age of the drinking water infrastructure – on average it is 30 years old. Twelve communities (43%) use rivers or creeks as their main alternate drinking water system. Five communities had no reservoir connected. The highest risk for drinking water sources was where there was no water treatment and the intake was unfenced, and where the piped system is exposed or damaged.

While it is early days in assessing indications of impact of interventions, when considering pre- vs post interventions across all 29 communities there has been an overall improvement in:

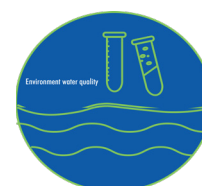
- the adequacy of supply from communities' primary drinking water source;
- the drinking water quality change for primary sources (as judged by E. coli measures, which indicate faecal contamination);
- the piped drinking water quality for primary sources (as judged by E. coli measures).

Key risk factor: Sanitation systems



Nearly 89% of communities do not have safely managed sanitation; this is in part, because over half of these communities (52%) have damaged or overflowing sanitation infrastructure.

Key risk factor: Environmental water quality



Rivers and creeks for bathing and as alternative water sources: water quality monitoring continues across all 29 communities to determine whether there has been an overall improvement in water quality.

Key risk factor: Food preparation and hand washing



There has been a substantial overall improvement in the frequency which householders reported washing their hands.

Dengue risk factors:



Additional key risk factors specifically for dengue that are linked to case incidence include: proximity of swamps (high risk in 41% of communities), uncovered household water containers (25%) and poorly maintained community drainage (17%), each one particularly relevant for vector-borne diseases.

A bespoke dengue model based on our data collected in the 29 communities and the disease data collected primarily by health inspectors. The most important variable influencing the model was an environmental and landscape factor (swamps proximal to the community), then socioeconomic and

demographic factors such as relative wealth and mobility, followed by a mix of environmental (factors related to erosion and runoff) and behaviour measures, such as removing standing water around the house.

The important note is that interventions need to be made from the landscape (or watershed) to the individual level simultaneously in order to reduce dengue incidence. This can only be done through cross-sectoral surveillance and community action.

Metagenomic data:



An important part of our work continues to try and find pathogens of interest wherever they are, and metagenomics is a technique to help us do that; it can also help us to understand the communities of microbes that live in association with pathogens.

By doing this work we have created the largest (and deepest) repository of metagenomic data in existence on freshwater systems of the Pacific Islands region; of interest is that 74-98% of taxa within each sample still remains unidentifiable.

We have also been able to detect *Salmonella typhi* and Leptospirosis in our samples.

Climate change and disease:



Relationships between syndromes, rainfall and seasonality show that it is possible to predict when outbreaks will likely occur by following seasonality and rainfall patterns.

Prepositioning of diagnostic and treatment resources can then be aligned with spatially explicit seasonality and rainfall peaks to plan and address water-related disease outbreaks.

A productive and vibrant question and answer session followed. Comments and questions from the floor were directed at Dr. Thomas and Dr. Jenkins who provided their thoughts in response. They are presented in Table 3.



Photo: Zoomfiji

Table 3: Questions and comments from the floor to Dr. Jenkins and Dr. Thomas, with their paraphrased responses.

Question/Comment	Response
Why are there correlations between rainfall events and syndromes?	<p>Intense rainfall events results in increased erosion in the catchment, and we think the mobility of sediments is associated with mobility of the pathogens.</p> <p>This finding goes against some of the typhoid dogma which states that typhoid is a dry season disease when people congregate around smaller water sources. Work of WISH Fiji is revealing an environmental reservoir sustained by landscape and climate.</p>
With regard to lifespan of infrastructure – what is the operational life of the water treatment system in Waibula?	<p>Answered by WAF representative from the floor: the water treatment system is a packaged plant giving full treatment for metered schemes. It was commissioned in 2020 and is a long-term installation.</p>
How do we explore causation when it comes to the risk factor of proximity to swamps?	<p>Proximity to swamps is indicative of catchment hydrology, where direct causality is difficult to ascertain. One possible way is to link the strain of dengue to the swamp, and vector and household.</p> <p>However, the value of this risk factor is that proximity to a swamp is largely a watershed management issue; it does not mean we drain the swamp – which often have other important environmental values, rather it directs us to land use in the catchment, and making sure that villages themselves do not have standing water.</p>
Do you intend to get these results back to the communities?	<p>Yes. We have very recently completed our first post-intervention monitoring and our intention is to do exactly that, and feed our results back into the WSSP cyclic review process.</p>

How can we be proactive and re-position our actions in preparation for rainfall events?	Yes, this is an important issue for health systems governance. Ideally our information will firstly be shared, and then feed into the LTD preparedness plan.
Why do some communities show negative trends for risk factors post-intervention?	Our overall trends at this stage are a more reliable indicator of our activities. When we have local anomalies like these we have to go back to the village and explore whether there is an obvious explanation, and address it that way.
What were the effects of interventions on downstream sites like coral reefs?	<p>Response from Dr. Jupiter: WCS has sampled coral reefs downstream from the project watersheds and adjacent watersheds. All of these reef systems are showing evidence of coral disease.</p> <p>We don't expect to see immediate reduction of coral disease – once improvements start to take effect in villages and catchments should become more evident.</p> <p>However, reefs downstream from our project watersheds are also influenced from runoff from adjacent watersheds where no project interventions occurred, thus it may be difficult to detect any improvements unless we can scale interventions to adjacent watersheds.</p>
What do these interventions take to be successful and how cost effective are the interventions and actions? Are data being collected about cost effectiveness?	<p>The requirement for cost effectiveness is important, indeed. They should include the investments in the interventions.</p> <p>They must also include what are the costs averted due to this work, and how are watershed actions saving on health costs. Having said that, we recognise that in some ways it would be both unnecessary and cost prohibitive to replicate what we have done.</p> <p>An example is the information sharing platform we are developing in Tupaia with Beyond Essentials. We are also investigating how a watershed fund might result in more widespread actions across broader communities. This is part of the next phase of WISH.</p>

Day 1 Lessons Learned and Experiences

Professor Joel Negin directed the audience's attention towards a 2-page colour printed WISH Fiji Impact Briefing Note, copies of which had been provided to each attendee. This Note is attached to this workshop report as Annex 1.

Key reflections:

Watersheds for place-based research & action

A key transformative approach of the WISH Fiji project is to use watersheds – where water flows - as a unit of analysis when dealing with water-related diseases. The Free, Prior and Informed Consent (FPIC) process and the participatory WSSP processes affirmed Community Engagement as a central plank in the WISH Project.

COVID and other challenges:

Project implementation was complicated by restriction of movements as a result of COVID lockdowns, as well as disruptions from natural disasters, including two cyclones during the project period. These shocks create uncertainty and demand adaptability and flexibility. We are proud that we were able to keep going during such challenges. And more, we met needs beyond the project brief, which included providing additional support to our government partners, including through: distribution of WASH kits; laboratory training and capacity building; and loan and training of our water quality testing kits, particularly to respond to concerns about ashfall from the Tongan volcano eruption.

Fijian ownership and leadership

Professor Negin reflected that the WISH Fiji Project was led by an accomplished and dedicated Fijian team, and supported by a strong partnership with Fiji National University. He added that because of COVID, the project management team had to rely on communities and partners and networks; this demonstrates the resilience of the country and Fijian teams.

Managing data and information

The very large amounts of data and information have meant that the WISH Fiji team needs sophisticated data management processes, particularly since health facilities and services are arranged according different boundaries than watersheds. Support from Beyond Essentials and Fiji government ministries have been, and will continue to be, important for WISH. Accurate, geolocated information on disease incidence is also required, and has been the subject of policy advice and advocacy for WISH.

Stakeholder engagement

Participatory engagement processes included the way project communities were identified - through direct consultation with provincial offices and the Ministry of Health and Medical Services - and the comprehensive process for obtaining FPIC, in collaboration with the Ministry of iTaukei Affairs. In going through the Note, Professor Negin emphasized the support that WISH Fiji had received from a wide range of ministries and other agencies. He made the point that such broad cross-sectoral engagement is essential for complex project like WISH Fiji.



Photo: Zoomfiji

Day 1 Key Stakeholder Reflections



Stakeholders were asked four questions about their interactions with WISH Fiji, and their general responses are recorded here.

The workshop then heard from stakeholders who were asked to comment on WISH Fiji activities. Stakeholders included panel members from specific Ministries (shown in Box 2), and other stakeholders from these or other ministries who offered comments from the floor.

Box 2: Stakeholder representation on Panel for the reflections session

- iTaukei Affairs Board
- Water Authority of Fiji
- Ministry of Agriculture
- Ministry of Forestry
- Ministry of Health and Medical Services

Stakeholders were asked four questions about their interactions with WISH Fiji, and their general responses are recorded here.

As we did not request permission to record the dialogue, only general responses and unattributed quotes are provided in this summary.

What has been your experience in engaging with WISH Fiji?

Stakeholders expressed appreciation to the WISH team for bringing agencies together, and for WISH's cooperative approach, particularly since agencies 'can't do it alone'. Stakeholders recognised that there was no standard way of doing FPIC at first, and that WISH forged 'a way of doing' that enabled communities to take ownership of processes that involved them. Stakeholders also mentioned that WISH 'opens another door of approach' beyond the standard operations of agencies. For some agencies there was no clear alignment with WISH objectives and their strategic planning. For other agencies it was clear that where WISH was operating, their agencies were able to tap into these established networks to get tasks that involved community consultation done more easily.

For one stakeholder, there was a positive and shared understanding of the project at the provincial level: "from the Village Council forum response we realise that we will be able to take control of this project and ensure the sustainability of this work". For an-

Day 1 Key Stakeholder Reflections

other, awareness raising was an important part of their work and needed to be done constantly to remind residents in communities; the activities of WISH were beneficial in keeping these awareness levels up. And finally there was some agreement that communities needed to take ownership and operate interventions themselves.

What challenges do you recognise working across sectors? Did you work together before WISH or did WISH bring you together?

There was a recognition by several stakeholders that non-government organisations (NGOs) had a crucial role to help sectors come together to overcome siloed approaches. NGOs can operate as brokers and knowledge translators. From natural resource managers, attention was drawn to the Land and Water Resource Management Bill – and the significant opportunities it presented for sectors to work together, highlighting national targets for planting native trees, existing legislation that supports the protection of riparian buffers, and so on.

For rural water and sanitation policy the ‘approach taken by WISH has brought is together in a better way – the policy has been there before, WISH made it clear’. Natural resource management stakeholders reflected that they didn’t previously work with Ministry of Health and Medical Services; ‘the first time they did so was during COVID, and the next time was with WISH’.

What can WISH Fiji do better, do more, or do differently?

For some agriculture stakeholders, changing the mindset of the community with respect to food security was important, and WISH could play a role in trying to repair the link between the condition of the land/soil and the people. For the health sector, stakeholders thought that keeping hygiene and sanitation issues uppermost was important. From the water sector there was an imperative to look for opportunities to build on what has been started already – developing skills in survey and water sampling, and look for opportunities to explain sanitation as an influential factor in water-borne diseases.

Forestry stakeholders thought that planting as an intervention was most likely to be successful if the expertise in the Ministry were involved by taking over plantations to make sure outcomes materialise after 40 years.

From natural resource managers, attention was drawn to the Land and Water Resource Management Bill – and the significant opportunities it presented for sectors to work together, highlighting national targets for planting native trees, existing legislation that supports the protection of riparian buffers, and so on.



Day 1 participants' group photo with the chief guest, Hon. Dr. Ifereia

“We are proposing a 10-year vision proof of concept phase and are seeking ment, co-design, and collabora

Day 1 Closing: The Way Forward

Dr Donald Wilson, Associate Professor and Director of the Fiji Institute for Public Health Research at Fiji National University, and a Chief Investigator for the WISH Project, outlined a vision that might embrace WISH Fiji and other similar projects.

He said, “We are proposing a 10-year vision with an initial five-year growth and proof of concept phase and are seeking relevant partners for co-investment, co-design, and collaboration on this timely initiative”.



mi Waqainabete, the then Minister for Health and Medical Services.

with an initial five-year growth and seeking relevant partners for co-investment on this timely initiative”.

The vision, called ‘Tadra Vanua’, would be an institutional home and nexus for the various One Health and Planetary Health initiatives being implemented in Fiji and the region. This will create greater coherence and economies of scale for technical and administrative purposes. Key objectives of the initiative would include:

- Building Pacific capacity in ecological approaches to health including public health, veterinary science, molecular research, bioinformatics and pathogen surveillance, through courses, training programs and short courses.
- Building on the existing investments (e.g. WISH and RISE¹) to reach more communities in Fiji and across the region with proven interventions and monitor medium to long-term impacts;
- Establishing and serving as a donor co-ordination hub for Pacific Planetary and One Health research and action;
- Laying foundations for sustainable and innovative financing mechanisms, through impact investment and private sector engagement and business case studies to provide the resources required to sustain the hub and implement phased interventions across nested scales;
- Developing local capacities on grant management, financial literacy and research grant administration;
- Developing local laboratory capacity to remove need for export samples to Australia or elsewhere and to support governments during surge needs (e.g., during COVID);
- To have Pacific led regional and national research priority setting across multiple regional bodies and ministries;
- Developing partnerships to co-mentor and supervise post-graduate students;
- Hosting and taking stewardship of biannual Oceania Planetary Health Forum; and
- Coaxing back Pacific leaders to reverse the Pacific “brain drain”.

The Day closed at 4pm.

¹ RISE = Revitalising Informal Settlements and their Environments is trialling a new water sensitive approach to water and sanitation management in informal settlements across Makassar, Indonesia and Suva, Fiji. See <https://www.rise-program.org/>.

Day 2 High Level Summary of WISH Fiji

Day 2 was intended to be a high level summary of the WISH Fiji project, and was accordingly attended by a new audience, most of whom were not present during Day 1.

Associate Professor Donald Wilson from FNU provided a welcome & introduced the WISH Fiji.

The WISH Fiji Story

Dr. Aaron Jenkins provided an overview of Planetary Health and its relevance to the Blue Continent and Oceania. He emphasized that the Pacific region was at forefront of Planetary Health action, where health matters were able to be dealt with by engaging with complexity, working across disciplines and sectors, forming likely and unlikely allies, focusing on interspecies, intergenerational health equity, and using place-based approaches.

He drew attention to nested sub-systems, where action was required from global region, to national, provincial, district, community to household – with opportunities to act at each level. Nested within this scale was the watershed, where natural boundaries provided an opportunity to adjust management according to environmental determinants themselves; he used the ahupua'a – the Hawaiian model of ecological governance in watersheds as an example.

Dr. Jenkins demonstrated the linkages between cyclones and floods and water-related disease, and the three plagues – Leptospirosis, Typhoid and Dengue – and from there introduced the WISH Fiji project, providing an overview of processes, catchments, surveys, interventions and results².

Project Impact

Professor Pierre Horwitz from Edith Cowan University spoke to the project impacts, on behalf of the large WISH Fiji team, and thanking stakeholders, ministries, funders, and the communities who have

participated. He drew the audience's attention to the two-page project brief (attached to this document as Annex 1).

Professor Horwitz re-iterated that WISH Fiji Project Impacts are accomplished by:

1. identifying disease risks across nested scales (landscape, community, household, individual) through data gathering and participatory planning;
2. prioritizing investments in interventions that maximize risk reduction potential for human health and downstream ecosystem health; and
3. measuring impact.

He outlined the Project Impact in the following way:

National Policy Contribution - With project support, a cross-sectoral **National Drinking Water Quality Committee** has been legally established. It is tasked with providing evidence of safe drinking water, even in rural areas, "through sanitary surveys, water safety plans, and drinking water quality monitoring and surveillance programs and integrating it with water-related disease surveillance." Five ministries provided support letters to cabinet papers: Ministry of Health and Medical Services, Ministry of Infrastructure, Ministry of Mineral Resources, Ministry of Waterways, and Water Authority of Fiji.

National Policy Implementation – two contributions have been made by WISH Fiji. A comprehensive process for obtaining **free, prior and informed consent (FPIC)** was carried out, piloting a new approach in collaboration with the Ministry of iTaukei Affairs. And Water and Sanitation Safety Plans (WS-SPs) were designed, expanding methodology from WHO and UNICEF to also include broader systems health risks, and produced and implemented for 29 communities in 2020/21 (when the nationwide target in 2020 was for 20 communities).

Prof Horwitz then summarised the impact through project processes:

- Nested participatory engagement processes have been emphasized
- Evidence-based decision-making for systems

²Since these structural components have been summarised for Day 1, they will not be detailed again here, for Day 2

Day 2 Leveraged Impacts

- health - data collected and managed
- Evidence-based decision-making for systems health - risk factors identified
- Evidence-based decision-making for systems health – interventions for risk factors

Important impacts included **Village efficacy in WSSP processes** – for example:

- 20 out of 29 village water committees with increased female membership;
- 24 out of 29 villages where village health workers are represented on the water committee; and
- 27 out of 29 villages where committee members are implementing interventions themselves.

Impact has occurred by supporting **Capacity building for systems health**. Village water committees were strengthened through training on WSSP processes and linking them to government development planning; 546 community members participated in WSSP planning.

Twelve staff from Fiji National University and the National Centre for Communicable Disease Control were trained to monitor water quality and pathogens, and upskilled on new DNA extraction methods from water and soil; 15 sub-divisional health inspectors were trained in water quality monitoring using Wagtech kits; and 32 volunteers were engaged to assist with data collection.

Project Impact continues through **Knowledge dissemination and sharing**. Journal articles have been published, others are in review or in preparation, and policy contributions have been made. Authorship substantially includes Fijian and international researchers (including postgraduate students, early-, mid- and senior-career researchers, with good gender balance).

Prof. Horwitz concluded that impacts were substantially based on the team's processes, "the way we operate is central to who we are and what we are trying to do". He said the project emphasizes equity, diversity, and inclusion/participation, and an adap-

tive approach that enabled the team to be flexible. He said that project outcomes are in their early days.

Leveraged Impacts

Mr. Timoci Naivalulevu and Dr. Andrew Tukana, co-Project Managers based at FNU and WCS, then outlined the impacts that the project has leveraged during the course of the past four years.

Mr. Naivalulevu outlined the contributions to WSSP design, saying that Provincial Council Offices accompanying the team during the WSSP meetings so that they could also conduct their Integrated Village Development Plans (IVDPs) in each of the communities. The project sourced technical expertise from WAF and Department of Water and Sewerage (DWS) to ensure that our WSSPs were aligned to the Rural Water and Sanitation Policy (RWSP).

The water infrastructure assessments and design were led by WAF while the approvals were sought from DWS. In order to ensure that the actions identified by the communities in improvement plans from the WSSPs were better monitored and sustainable, the project enabled the communities to link their WSSPs to their respective IVDPs and reporting mechanisms.

A few district joint stakeholder meetings were co-facilitated with local government partners to help them meet their targets and our own involving more communities outside. The co-facilitation with local government partners promoted the involvement of multiple government partners. This created the platform to encourage the strengthening of IVDPs and the integration of the WSSPs into them. Furthermore, there were:

- Encouraged sharing across ministries and across government sectors
- Training and capacity building for community representatives
- Support for communities to prioritise health, ecology
- Promote water committees activeness and contribution to increase focus on both access and

Day 2 Leveraged Impacts

quality of water for effective use

- Promote greater gender representation to strengthen water quality and usage

Dr. Andrew Tukana said leveraged impacts could be based on stakeholder feedback provided during Day 1, where leverage is the WISH Fiji process and methods employed in the communities and with our partners, and demonstrable for individual ministries:

- Ministry of Agriculture (action plans/models for sustainable farming);
- Health Inspectors (areas to target awareness and capacity building);
- Water Authority of Fiji (Inclusion of sanitation planning);
- Ministry of Forestry (Contribute to 30mil trees in 15 years);
- itaukei Affairs/PO (Improvement of governance and reporting).

The project included in its scope measures to support communities in terms of COVID-19 as extensions of MoHMS and iTAB (via the respective Provincial Council Offices). There were provisions of rain jackets, WASH kits and masks to ensure well being of the WISH Fiji communities. Our partners delivered these items to the communities. Our team also provided capacity building to Health Inspectors on water testing in the North in the aftermath of TC Yasa. We also provided much needed COVID-19 Support to Fiji Center for Disease Control for 3 weeks from sorting, analysis, and data entry for COVID-19 tests.

The following were some response actions taken after natural disasters:

1. After flooding and cyclones, WISH Fiji field trips were organized to assess the intervention priorities
2. Some communities outside the WISH Fiji projects benefitted through scoping visits with WISH/WAF and assisted.
3. These field trips were also used to provide dry vegetable seeds to affected communities in the province of Bua, to address food security and livelihoods sources.
4. The distribution of pamphlets to raise awareness



was also done to ensure community well-being.

5. Provide capacity building to Health Inspectors on water testing in the North.

A specific Portalab training for MHMS staff was done who were undertaking water testing on the maritime islands affected by the volcano ash fall from the volcanic eruption in Tonga.

There were communities outside of WISH areas of focus who wanted to learn more and engage in the learnings. The team provided support to non-WISH communities such as health promotion after disasters, providing information materials, etc.



Photo: Zoomfiji

Day 2 Questions and Comments



Photo: Zoomfiji

Questions and comments were received from the audience, and several community members gave complimentary feedback about WISH Fiji's efforts and approach, to provide a voice from the communities themselves. Dr. Tukana responded to say that the team was appreciative, acknowledging the efforts of the communities in engaging in manual work, including improvements around water infrastructure. Dr. Tukana said that WAF provide good supervision and community followed with the labour for their own community. Together this was a way to ensure strong engagement and ownership. Mr. Naivalulevu said that the communities had responded to evidence about water and its quality, and that it prompts them to work towards changing behaviour, to see the link between health and ecology. He acknowledged that some communities mobilise quicker, others slower – but nevertheless, it was the evidence that drives this change/action.

A question from Fiji Support Facility: **which ministry is the lead ministry; who is shaping to take this forward and own this?**

Dr. Aaron Jenkins offered that there was not one "lead" ministry – it is fundamentally about cross-sectoral issues, requiring a collective effort, and that it

wasn't just MHMS or just WAF, or Forestry and Agriculture on nature-based solutions. All are critical in these ventures. Rather, he said, this is whole of government initiative, and while it makes it complex and risky, multiple ministries meant multiple co-benefits.

A question was received from the Ministry of Agriculture – Livestock division representative. **Biogas digesters portable equipment is cheap and usable and might be a future opportunity together?** He raised a question about waste management: he had been encouraging communities to move animals away from waterways, to move pig pens away from mangrove areas and riverbanks, and that WISH has assisted in doing that. He has always wanted to put forward a suggestion on waste management and use of compost as fertilizer. He said that the Ministry provided biogas digesters that are portable which reduces a need to cut mangroves and also provides electricity and light, providing a win-win. Dr. Tukana responded to say that the team had engaged with MoA on this, and that we can certainly look at this as a possible intervention for the future – for free gas and so that waste is broken down and to use slurry for fertilizer for crops.

A comment was also received from the Commissioner from Central Division. He noted that Day 2 is World Disaster Risk Reduction Day. He wanted to comment on coordination, acknowledging WISH contributions. He said we need to ensure it is coordinated. **Can we use the approaches that are already used within government machinery for integrated approaches?** Divisional platforms existed for integrated initiatives working with a number of agencies, and we could use the same processes we used with Ridge to Reef program. He said that using existing platforms and governmental machinery at the divisional level leads to greater sustainability, and an opportunity to learn together and improve integration mechanisms. Dr. Jenkins and Mr. Naivalulevu agreed and thanked the Commissioner. Many of these integrated mechanisms work particularly well during disasters, for example the WASH cluster does well after events with cross-sectoral engagement and joint responses. But need this to happen all the time, not just in response to disaster.

Day 2 WISH+ and the KIWA Initiative



L-R: Mr. Michael Krejza, the Head of the Cooperation Section, EU Delegation, Ms. Virginia Dawson, Development Counsellor, Ambassador of France to Fiji, Dr Stacy Jupiter Regional Director WCS Melanesia Program, Dr Amelia Wenger, Research Fellow in Planetary Health, University of Sydney and the Edith Cowan University. Photo: Paris

Mr. Paul van Nimwegen, WCS Fiji Country Program Director, chaired the following session to introduce the next phase of WISH under the Kiwa Initiative.. The Chair introduced the Ambassador of France to Fiji, H.E François-Xavier Léger, inviting him to speak. H.E Léger spoke about the broad scope of the Kiwa initiative, and Kiwa in Fiji, emphasizing work towards nature-based solutions, addressing climate change, and human wellbeing. He acknowledged the Wildlife Conservation Society's lead in WISH+, and welcomed their efforts to extend the program of work from Fiji to also include Solomon Islands and Papua New Guinea in the next phase, using the 4.8m Euro contribution from the Kiwa funds.

H.E Léger described the Kiwa Initiative's efforts for oceanic and maritime work, concerns for ecosystem resilience, and work towards greening financial systems and facilitating energy transitions. M. Léger added that France will always be a global partner and here for Pacific friends.

Subsequently, Mr. Michael Krejza, Head of Cooperation Section, European Union (EU) Delegation, said that the Kiwa Initiative is one of the largest EU-funded projects in the Pacific. He underlined the innovative initiative to support nature-based solutions for climate resilience, in the fight against global warming. He highlighted its geographic scope – across the Pacific – involving all countries and territories,



for New Zealand High Commission, H.E. François-Xavier Léger, Fellow, University of Queensland and Dr Aaron Jenkins, Senior Data Gurdayal © Kiwa Initiative – 131022

and bringing together a strong coalition of funders – EU, Canada, Australia, New Zealand, and France – to produce a 57m Euro initiative and growing.

Ms. Virginia Dawson, Development Counsellor with the New Zealand High Commission, then highlighted a need for better coordination of the climate change work we do – particularly around biodiversity. She applauded collaborations that make finance easier to get coordinated projects up and running, and thanked France for their leadership in this regard. Ms. Dawson noted New Zealand's climate finance strategy, with its focus on biodiversity, and alignment with the Blue Pacific 2025 strategy. Together these initiatives provide guardianship of

the Blue Continent. Ms. Dawson said that observers would be not just interested in what WISH+ is doing, but how it was being done, and they could not help but be impressed by the scale of the work.

Dr. Stacy Jupiter and the French Ambassador then officially launched the Kiwa WISH+ project in Fiji. To formalise the occasion, a large cake was cut and shared.

Dr. Jupiter then spoke to the next phase, building on four years of implementation of WISH Fiji. The next phase of WISH, called WISH+, will extend from August 2022 until June 2026. The goal of this next phase will be to see successful implementation of integrated watershed management for biodiversity, climate resilience and human health. Its aim is to mainstream the practice of managing watersheds for systems health and seed these practices across the Pacific.

Under its first component, WISH+ will continue place-based integrated watershed management work across nested scales – landscape, community, residential scale (sanitation, village gardens), plus individual behaviour change, recognising that no one set of interventions alone at any one scale will provide the required co-benefits. Dr. Jupiter emphasized the need to work collectively in the portfolio, to continue with monitoring to assess impacts to ensure we are delivering co-benefits for nature, climate and people, while promoting gender equity. The second component of WISH+ will focus on scaling and mainstreaming the WISH+ approach, initially through the development of tools to aid in assessing where to invest – the high risk watersheds – and the most appropriate portfolio of interventions to deliver. Coupled with this will be making the business case to develop sustainable financing mechanisms in order to enable long-term delivery of needed watershed interventions.

The third WISH+ component relates to knowledge dissemination, in order to share knowledge across the Pacific, and to manifest Planetary Health in the global region. As part of this, the 2nd Oceania Planetary Health Forum will take place during the second year of the project to advance collaboration in the One Health and Planetary Health space across the region.

Day 2 Tadra Vanua Vision & Closing



Day 2 Group photo of the WISH Fiji team with distinguished guests, including Hon. Dr. Mahendra Reddy
Photo: Parijata Gurdal

The closing address was followed by Prof. Donald Wilson's overview of the Tadra Vanua vision³.

Closing Address

The Hon. Dr. Mahendra Reddy, Minister for Agriculture, Waterways and Environment, gave the closing address. He described WISH Fiji as a unique project, and the only one that works across safe drinking water by looking at upstream and downstream impacts and causes.

Dr. Reddy noted the pressure increasing population is putting on land use and people engaging in unsustainable practices with regard to extraction

(such as timber). Given that watersheds are critical for flood mitigation, he was concerned about non-timber products being removed from watersheds, and the loss of good quality topsoil – being lost downstream – and threat to downstream communities.

He said that these losses were a function of not only climate change and increased rainfall – but also the activities that are occurring upstream – leading to more runoff water – taken all the way to the sea. He said extraction from aquifers was another threat.

Dr. Reddy noted that the issue of safe water is complex and needs to be understood in the context of happening with groundwater.



Dr. Reddy, the then Minister for Agriculture, Waterways and Environment, and participants of the workshop.
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Dr. Reddy said there was a need for continuity and sustainability and ownership by local communities and that this was an aspect that was not done well by many projects.

Dr. Reddy advocated that the needs of communities and nature – food security and protecting environmental sources - need to be balanced, and that sustainable resource management and climate-smart agriculture practices, promoting organic farming and support communities was a way forward.

Overall these things needed to occur before there are irreversible environmental changes.

He drew attention strategies within the Ministry of Agriculture, Waterways and Environment's 5 year strategic plan for advancing watershed management.

He finished emphasizing that rural communities understand protection of natural resources well, and that work with local communities and need to support them with existing governance systems, was essential.



Annex 1 WISH Fiji Key Outcomes

Participatory engagement processes emphasized

5 project watersheds were identified around the Upper Navua, Waibula, Dawasamu, Bureta and Dama rivers through collective decision-making with government staff based on key selection criteria, including history of LTDDs, vulnerabilities, size and connections to the coast.

29 project communities were identified through direct consultation with provincial offices and the Ministry of Health and Medical Services.

A comprehensive process for obtaining **free, prior and informed consent** was carried out, piloting a new approach in collaboration with the Ministry of iTaukei Affairs.

Evidence-based decision-making for systems health supported

9 types of data-gathering instruments were designed based on known risks for LTDDs and downstream ecosystem health.

311 households were enrolled to collect information on individual, household and community risks.

>18,000 measurements of water quality and **> 1,000** DNA samples taken across the 5 subcatchments.

A data storage system was produced in **Tupaia** by Beyond Essentials to collect and assess information on risks, and a visualization system is being designed.

29 water and sanitation safety plans (WSSPs) were produced, expanding methodology from WHO and UNICEF to also include broader systems health risks.

Nearly **80% (23 out of 29)** of communities do not have safely managed sanitation, because they do not have safely contained latrine backends, which may be a contributing factor to higher risk environmental water quality in **12 out of 27 (44%)** of communities.

Salmonella Typhi was detected by **DNA analysis** from the backend leach zones of two community latrines (despite only 40% of samples being analyzed), indicating a possible transmission pathway for Typhoid Fever.

8 out of 29 (28%) communities had highly contaminated piped primary drinking water (*E. coli* > 100 cfu/100mL).

Incidence of the **60** reported cases of **dengue** from project watersheds over three years was related to: low effort to control standing water (including from containers) and bushes around houses; presence of mosquito larvae within households; number of people in households and relative wealth; swamps in close proximity; flooding frequency and the amount of flood risk area in the watershed; and the amount of highly erodible soil and pathways for its entry into creeks through road crossings.

339 priority watershed interventions were identified across categories related to: water systems; animal management; land use management (including Nature-based Solutions); waste management; drainage; sanitation systems; hygiene; integrated planning; and health systems surveillance.





Risk reduction measures achieved

154 watershed interventions were implemented, principally related to improvements in water systems, integrated planning, land use management and waste management.

Comparisons between initial and follow-up monitoring are demonstrating changes to risk levels resulting from project interventions.

Over **5,000** residents of project watersheds now have access to cleaner water, supporting national development targets.

More than **11** hectares have been targeted for reforestation, in partnership with the Ministry of Forestry, that will produce lagged risk reduction through sediment control and flood risk mitigation.

Capacity building for systems health supported

Village water committees were strengthened through training on WSSP processes and linking them to government development planning. **546** community members participated in WSSP planning. Actions from the plans have been integrated into Integrated Village Development Plans.

With project support, a cross-sectoral **National Drinking Water Quality Committee** has been legally established. It is tasked with providing evidence of safe drinking water, even in rural areas, "through sanitary surveys, water safety plans, and drinking water quality monitoring and surveillance programs and integrating it with water-related disease surveillance."

More than **10** staff from Fiji National University and the National Centre for Communicable Disease Control were trained to monitor water quality and pathogens, and upskilled on new DNA extraction methods from water and soil.

15 sub-divisional health inspectors were trained in water quality monitoring using Wagtech kits.

29 volunteers were engaged to assist with data collection.

4 WISH Fiji project staff are presently enrolled in complementary Masters degrees through Fiji National University.

Knowledge disseminated and shared

5 journal articles have been published to date on WISH Fiji findings, with an additional **5** in review or in preparation.

4 white papers have been disseminated on the WISH approach, including to Pacific Island Forum Leaders.

A planetary health case study, "**Typhoid and torrents**", was produced on the WISH Fiji approach, complete with teaching resources.

16 presentations have been given to a diverse range of audiences.

Annex 2 Pictorial







Villagers from the Bureta District get together to build a new dam and collection box, supported by WISH Fiji, which has improved the quality and supply of water for at least 350 people.



Connect with us:
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