



Food and Agriculture
Organization of the
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MTF/SOI/003/STF
STDF/PG/521
Terminal Report

FAO/MULTILATERAL TRUST FUND

STRENGTHENING THE CAPACITY OF THE NATIONAL PUBLIC HEALTH LABORATORY TO PROVIDE SERVICES IN SUPPORT OF MARKET ACCESS FOR SOLOMON ISLANDS FISH EXPORTERS

SOLOMON ISLANDS

PROJECT FINDINGS AND RECOMMENDATIONS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

ROME, 2023

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Report prepared for
the Standards and Trade Development Facility
by
the Food and Agriculture Organization of the United Nations

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2023

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The Food and Agriculture Organization is greatly indebted to all those who assisted in the implementation of the project by providing information, advice and facilities.

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LIST OF ABBREVIATIONS

CPF	-	Country Programming Framework
EOD	-	Entry on duty
EU	-	European Union
FAO	-	Food and Agriculture Organization of the United Nations
IANZ	-	International Accreditation New Zealand
ILCP	-	Interlaboratory comparison programme
ISO	-	International Organization for Standardization
MHMS	-	Ministry of Health and Medical Services
NPHL	-	National Public Health Laboratory
NTE	-	Not-to-exceed date
SDG	-	Sustainable Development Goal
SOPs	-	Standard operating procedures
STDF	-	Standards and Trade Development Facility
QCM	-	Quality control material
QMS	-	Quality management systems

A. OVERVIEW

A.1 PROJECT PROFILE

Country	Solomon Islands	
Project Symbol	MTF/SOI/003/STF	
Project Title	Strengthening the capacity of the National Public Health Laboratory to provide services in support of market access for Solomon Islands fish exporters	
Resource Partner	Standards and Trade Development Facility	
Actual EOD	1 June 2017	
Actual NTE	30 June 2022	
Participating Organizations	National Public Health Laboratory, Ministry of Health and Medical Services	
Implementing Partners:		
Name	Type (non-governmental organization/community-based organization/government, etc.)	Total funds transferred (USD)
Cawthron Institute (New Zealand)	Independent science organization	
Contribution to Programmatic Framework		
<i>Indicate the title of each higher-level result to which the project contributes</i>		
Sustainable Development Goals (SDGs)	<p><u>SDG 1</u>: End poverty in all its forms everywhere.</p> <p><u>SDG 2</u>: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.</p> <p><u>Target 2.1</u>: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.</p> <p><u>SDG 9</u>: Build resilient infrastructure, promote sustainable industrialization and foster innovation.</p> <p><u>SDG 14</u>: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.</p> <p><u>Target 14.2</u>: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.</p> <p><u>SDG 17</u>: Revitalize the global partnership for sustainable development.</p>	
Organizational Outcome(s)	<p><u>FAO Programme Priority Area</u>: Better nutrition.</p> <p><u>BN2</u>: Nutrition for the most vulnerable.</p> <p><u>BN3</u>: Safe food for everyone.</p>	

Regional Priorities	Fisheries, Nutrition and food safety, Inclusive value chain development.
Country Programming Framework (CPF) Outcome(s)	<u>CPF Outcome</u> : Sustainable increase in production and marketing of domestic agriculture products and healthy consumption of safe and nutritious food. <u>Output 3</u> : Food control and business practices identified and promoted to facilitate efficient agrifood value chains which provide safe, nutritious and affordable food.

A.2 FINANCIAL DATA in USD¹

Latest approved budget	USD 355 408 ²
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A.3 EXECUTIVE SUMMARY

Processed fish ranks among the top three export earners for Solomon Islands and the industry is also an important provider of employment. While tuna products represent a significant source of trade with the European Union (EU), Solomon Islands is at risk of losing the EU market for fishery products due to the lack of an accredited national laboratory for microbiological testing, which would be able to guarantee the safety of exports. In order to maintain their market access, the tuna industry of Solomon Islands must be able to provide microbiological testing results using internationally accredited methods. Under an interim agreement, Solomon Islands have access to the EU market utilizing the non-accredited National Public Health Laboratory (NHPL) for a grace period. However, the country needs to demonstrate that significant efforts are being made to use an accredited laboratory for microbiological testing.

The FAO project “Strengthening the capacity of the National Public Health Laboratory to provide services in support of market access for Solomon Islands fish exporters” (MTF/SOI/003/STF) – co-funded by the Standards and Trade Development Facility (STDF), the Government of Solomon Islands and FAO – aimed to develop the capacity of the NPHL to conduct microbiological testing on water and food products in compliance with international standards, particularly the International Organization for Standardization (ISO) 17025. The project also sought to address gaps in technical knowledge

¹ Data source: FPMIS/Data Warehouse.

² In addition to this sum contributed by the Standards and Trade Development Facility, the project also received contributions of USD 112 800 in kind from the Government of Solomon Islands and USD 20 128 from FAO.

among NPHL staff and provide improvements to the facility's systems and procedures to ensure compliance with sanitary and food safety requirements of the European Union and other trade partners, to gain and, importantly, maintain access to those markets. The target beneficiaries of the project included NPHL facility and staff, government agencies, especially the Ministry of Health and Medical Services (MHMS), fish processors and exporters, tuna fishing companies, tuna fishers, consumers of exports and local consumers.

The initial project objective to achieve ISO 17025 accreditation was not possible, however, due to delays the project experienced because of the global COVID-19 pandemic and staff turnover. The COVID-19 pandemic prevented in-person overseas laboratory training and other direct onsite project interventions, consequently rendering the original objective of attaining ISO 17025 accreditation by the project's end unachievable. FAO subsequently agreed in 2020, with the donor and project partners, to focus assistance on enhancing the capacity of the NPHL and placing it on a strong path to ISO 17025 accreditation. The activities were adjusted accordingly to achieve concrete and optimal results in the remaining time frame.

The project subsequently achieved the enhancement of the scientific capabilities of staff at the NPHL for specific microbiological tests, and established systems and methods in line with the ISO 17025 standard. The achievements included the production of a laboratory quality manual, an essential document that governs how the laboratory operates, calibration documents, microbiology methods for the analysis of water and food, and a variety of accompanying quality control worksheets. The NPHL is now well positioned to achieve ISO 17025 accreditation, if the quality systems and operations achieved to date are maintained.

B. RELEVANCE

The problem

Processed fish is one of the top three export earners for Solomon Islands, an important source of income and employment. Tuna products represent the largest portion of trade between Solomon Islands and the European Union, which requires the competent authorities in exporting countries to provide an official guarantee regarding compliance and conformity with all the conditions of EU legislation, including sanitary and food safety measures.

Yet Solomon Islands is at risk of losing access to the EU market for fishery products due to the lack of an accredited national laboratory for microbiological testing that would be able to guarantee the safety of fish exports. The country's NHPL facility is currently non-accredited and access to the EU market for their fish exports, utilizing non-accredited testing methods, was granted for a grace period under an interim agreement. Solomon Islands needs to demonstrate that significant efforts are being made to use an accredited laboratory for microbiological testing. Failure to achieve accreditation may pose a risk to continued market access, with potential consequences for the domestic economy, employment earnings and government revenue.

The response

In response, this project aimed to build the capacity of the NPHL to comply with the required international standard, ISO 17025, in order to support the productive sector and facilitate trade. It planned to address technical knowledge gaps of NPHL staff and support improvements to the quality management systems (QMS) and procedures of the facility. This was intended to ensure compliance with import requirements of the European Union and other trade partners, and to help gain and maintain access to those markets.

The strategy to achieve accreditation targeted the following outputs over the project time frame:

- NPHL facility is equipped and organized according to international standards.
- NPHL staff are trained to ISO 17025 standard for certification.
- Essential NPHL systems are developed and or amended to comply with international standards and promote efficient workflow in the laboratory.

Once the support provided through this project had assisted the NPHL to obtain the capacity required, it was envisaged that FAO would support a formal application to International Accreditation New Zealand (IANZ) for accreditation.

The primary beneficiaries of the project were expected to be the NPHL facility and its staff, who would be the recipients of capacity development and technical inputs to support a more effective workflow, improved skills and professional development. Government agencies, especially the MHMS as the supervisory body of the laboratory, would also benefit from a facility certified to carry out certain microbiological tests on water and food products to ISO 17025, as well as a better functioning microbiological testing facility and more competent staff. The increased capacity of the facility stands to serve the government as a reliable resource for food contamination testing, water monitoring and quality assurance, and interdisciplinary environmental/public health studies relating to microbiology water

contamination. Other expected beneficiaries included fish processors and exporters, who would benefit from having ready access to an ISO 17025-certified testing facility and minimized time delays associated with the use of overseas test facilities, and tuna fishing companies such as the SolTuna canning company, which would benefit from uninterrupted trade and compliance with EU trade regulations. Further, consumers both in Solomon Islands and overseas would benefit from the consumption of safe products, avoiding illness from contaminants and spoilage.

The COVID-19 pandemic, which could not have been foreseen while planning this project, extended through 2020 and continued in 2021. This prevented planned in-person overseas laboratory training and other direct onsite project interventions, consequently rendering the original objective of attaining ISO 17025 accreditation by the project's end unachievable. FAO subsequently agreed in 2020, with the STDF and project partners, to focus assistance on building the microbiological testing capability and quality management systems of the NPHL and putting it on a strong path to ISO 17025 accreditation. The activities were adjusted accordingly to achieve concrete and optimal results in the remaining time frame.

The project goal of enhancing the capacity of NPHL fit well with other interventions in the country aimed at assisting Solomon Islands to maintain access to key export markets and improve capacity to support public health work. These interventions include an initial assessment of the testing capacity of the NPHL and training of laboratory personnel on microbiological testing methods and QMS carried out by the Pacific Horticultural and Agricultural Market Access Program, backed by Australia and New Zealand, in 2012 and 2014. The STDF project built on the recommendations and activities of these projects. FAO also supported a Technical Cooperation Programme Facility project from 2015 to 2017 on "Strengthening National Capacity for Food Control in the Solomon Islands" (TCP/SOI/3501 Baby 1). The specific focus of the project was assisting the MHMS, and related ministries and departments that have responsibility for imported food control, to increase their capacity and effectiveness to control the safety and quality of imported foods. In 2017, the Food Fortification Initiative secured funds from the Australian Department of Foreign Affairs and Trade to build on work started under the TCP/SOI/3501 Baby 1 project in respect to imported food control. The activities included continued support for amendments to the Solomon Islands Food Safety Act and Pure Food Act to enable effective implementation of imported food control by MHMS, provision of staff resource support to MHMS for a dedicated imported food control inspector for a limited term, completion of the Imported Food Control Guidelines/Standard Operation Procedures, and further training of inspectors. Solomon Islands joined the Enhanced Integrated Framework to support least-developed

countries in 2006 and has since benefited from the programme's Enhancing Capacity for Agriculture Trade project. Under this project, the NPHL received USD 140 000 of laboratory equipment and chemicals in 2018 to enhance the facility's capacity to conduct proper testing and analysis of agricultural products.

C. ACHIEVEMENT OF RESULTS

Significant achievements were made in relation to the expected outputs of the project, despite delays caused by the COVID-19 pandemic and staffing issues. Notably, the National Project Coordinator left in the middle of the project to study abroad. This stalled progress significantly until his return. According to NPHL staff and Cawthron Institute experts, it was difficult to meet project deadlines, organize meetings or make appointments with project partners, beneficiaries and stakeholders in his absence. Additionally, the COVID-19 pandemic prevented crucial in-person training and guidance for NPHL staff and relevant stakeholders. The project was able to adapt to the challenge by delivering practical online training from experts from the Cawthron Institute. This innovative approach was found to be even more impactful, as it afforded a longer training period where the abilities of the trainees could be better assessed for consistency compared to shorter-term in-person training.

The results achieved during the project time frame are indicated in the table below.

Table 1: Status of project output and activities

Output/Activity	Indicator/Target	Actual performance (percentage complete)	Comments (results and challenges faced)
Output 1: NPHL facility is equipped and organized according to ISO 17025 standards			
<u>Activity 1.1:</u> Perform baseline and needs assessment of the NPHL, including facility and staff resources, at start and mid-term of project.	Target: Baseline and needs established.	100%	A baseline assessment identified many areas that required addressing, with the most notable being the staffing and procurement system. The facility was found to be of a good standard, though fluctuation in the power supply needed to be addressed.
<u>Activity 1.2:</u> Perform equipment maintenance, calibration and registration.	Target: 50% of equipment is registered/calibrated in accordance with international standards. 50% of equipment in need of repair is in working order.	50%	An equipment list was generated, and some maintenance performed in the fourth quarter of the first year of the project. Calibration of some equipment was marked for

Output/Activity	Indicator/Target	Actual performance (percentage complete)	Comments (results and challenges faced)
			outsourcing to the Water Authority of Fiji. All equipment was registered and the laboratory now has an equipment logbook that includes maintenance.
Output 2: NPHL staff are trained according to ISO 17025 standards			
<u>Activity 2.1:</u> Perform capacity assessment of the NPHL staff.	Target: Baseline of staff training needs established. Target: Mid-term capacity assessment is completed.	100%	The capacity assessment was completed, and it highlighted that staffing was an issue that needed to be addressed before Activities 2.2 and 2.3 could be completed.
<u>Activity 2.2:</u> Train laboratory aides in support responsibilities.	Target: Both laboratory aides are able to independently facilitate testing set-up and breakdown of 50% of microbiological tests.	100%	Two laboratory technicians were employed, resolving the staffing issues identified in Activity 2.1. The laboratory is operational with a full staff capacity. Specifically, a technician who went to study abroad has returned to Solomon Islands with a graduate degree in chemistry and resumed work.
<u>Activity 2.3:</u> Provide overseas training to NPHL microbiology technician and trainee staff.	Target: All staff graduate from training course to the level required by international standards for ISO 17025 certification.	This activity was cancelled due to travel restrictions resulting from the COVID-19 pandemic.	Overseas training could not be undertaken within the project timeframe. However, online training was conducted, which although effective was not sufficient to replace in-person training. New staff should receive training in NPHL microbiological procedures to become familiar with their role.
<u>Activity 2.4:</u> Provide training for NPHL staff and management on QMS, standard operating procedures (SOPs), environmental monitoring and new procurement system.	Target: All staff have improved testing capacity by 50% compared to baseline. Indicator: All staff have improved laboratory management capacity by 50% compared to baseline.	50%	Remote learning on a biweekly basis helped deliver training on quality systems, SOPs and environmental monitoring. In-person staff training could not be achieved due to global travel restrictions in response to the COVID-19 pandemic.

Output/Activity	Indicator/Target	Actual performance (percentage complete)	Comments (results and challenges faced)
<u>Activity 2.5:</u> Assess the progress towards developing staff capacity.	Target: Laboratory aides are able to independently facilitate testing set-up and breakdown of 50% of microbiological tests by the third quarter of year two	100%	Two new staff were recruited and a national project coordinator nominated. The recruitments effectively meet staffing requirements for the relevant microbial testing methods.
Output 3: Essential NPHL systems are developed and or amended to comply with ISO 17025 standards and promote efficient workflow in the laboratory			
<u>Activity 3.1:</u> Review laboratory manuals and systems.	Target: Initial review completed.	100%	The review was completed and several areas requiring attention were identified.
<u>Activity 3.2:</u> Develop laboratory SOPs manual in line with ISO 17025.	Target: Draft manual submitted.	100%	SOPs have been developed and are in NPHL format, in compliance with ISO 17025.
<u>Activity 3.3:</u> Amend NPHL procurement system to ensure the efficient provision of goods and services and develop concept note to present to government; follow up.	Indicator: Procurement concept note drafted.	25%	<p>The Cawthron Institute spoke to a key supplier which agreed to supply directly to NPHL.</p> <p>Procurement systems were discussed at a technical workshop on 17 April 2018 and the Project Steering Committee meeting on 18 April 2018. The undersecretary of the Ministry of Health and Medical Services presented the recommendations to the Ministry of Finance and Treasury. The recommendation is for NPHL to have a ready-access laboratory account for income received (“fee for service”) for expenditure on consumables and general laboratory requirements. This does not include the budget allocated from the Solomon Islands government for public health testing. There has been no feedback received on the outcome of this recommendation.</p>

Output/Activity	Indicator/Target	Actual performance (percentage complete)	Comments (results and challenges faced)
			<p>Preferred suppliers for microbiological/specialized consumables have been identified, although in some cases there is only one option available. These suppliers have been assessed in accordance with ISO 17025 and their ability to supply the highly specific consumables.</p> <p>The procurement system is still being discussed and developed by the MHMS.</p>
<p><u>Activity 3.4:</u> Engage with government to facilitate the adoption of the amended procurement system and other areas uncovered in needs assessments, such as staffing.</p>	<p>Indicator: Specialist in microbiological laboratory capacity development engages with government to facilitate the adoption of new procurement system.</p>	<p>20%</p>	<p>Key government officials were present at the technical workshop held in April 2018 and the undersecretary of the MHMS will present the procedure proposed as part of Activity 3.3 to the permanent secretary of the MHMS. At the technical workshop, there was significant support from industry for the procurement system to be amended to enable the NPHL to respond to increasing testing demand on time. This includes responding to public health outbreaks and routine sample analysis.</p> <p>It is noted that other government departments have access to readily available funds for essential consumables. These could be used as examples to help develop the proposed procurement structure.</p> <p>Progress on adopting the new procurement system is pending the outcome of acceptance of the recommendation in Activity 3.3 for NPHL to have a ready-access</p>

Output/Activity	Indicator/Target	Actual performance (percentage complete)	Comments (results and challenges faced)
			laboratory account for income received for expenditure on consumables and general laboratory requirements.
<u>Activity 3.5:</u> Develop and document QMS in line with ISO 17025.	Target: QMS drafted to the level required by international standards for ISO 17025 certification.	100%	A quality control consultant from the Cawthron Institute was engaged to write the quality manual for NPHL. The quality manual was successfully completed.
<u>Activity 3.6:</u> Establish and put into place necessary record keeping systems to demonstrate a history of ISO compliance.	Target: Draft of manual for record keeping system completed.	90%	The required systems have been put in place in accordance with ISO 17025. These include: <ul style="list-style-type: none"> – Media preparation records – pH calibration records – Non-conforming work – Autoclave logbook – Staff training records – Equipment registration folder, including maintenance – Laboratory cleaning records – Diluent volume checks – Reagent preparation – Hot air oven sterilization – Glassware residue check – Report templates Time is required to demonstrate the history of compliance. In their final report, the Cawthron Institute confirmed that: “Over the course of the project all documentation required by NPHL to operate and comply with the ISO 17025 standard has been developed”.
<u>Activity 3.7:</u> Develop and put into place environmental monitoring systems and procedures.	Target: Environmental monitoring procedural manual draft submitted.	100%	This has been completed and the laboratory staff are monitoring the environment.

Output/Activity	Indicator/Target	Actual performance (percentage complete)	Comments (results and challenges faced)
<p><u>Accreditation process</u></p> <p>(Note that the independent assessment was not part of this project. FAO was expected to liaise with IANZ to facilitate the assessment activities and report to NPHL and STDF with the final assessment results.)</p>	<p>The NPHL was unable to prepare sufficiently for IANZ assessment for accreditation due to the project delays brought about the COVID-19 pandemic and staff turnover.</p> <p>FAO and project partners subsequently agreed in 2020 to focus assistance on enhancing the capacity of the NPHL and placing it on a strong path to ISO 17025 accreditation. The activities were adjusted accordingly.</p>		
Output 4: A documented case story is produced			
<p><u>Activity 4.1:</u> Document the efforts made, experiences, lessons and recommendations in a case story targeted at stakeholders in other least-developed countries interested in working towards international laboratory accreditation.</p>	<p>Indicators/targets not identified. The workplan schedules case study documentation at the end of the years one and two, and the final documented case story to be completed by project end.</p>	100%	<p>Representatives from two institutions in Ghana were interviewed by phone and given questionnaires to help gain insight into lessons learned as they worked to achieve accreditation. The two institutions – the Food Research Institute of the Council for Scientific and Industrial Research, and the Ghana Food and Drugs Authority – were selected based on the fact that they had achieved and sustained ISO 17025 accreditation in a low-income region.</p>
Output 5: An independent end-of-project assessment is conducted			
<p><u>Activity 5.1:</u> Independent end-of-project evaluation organized by FAO and carried out by an external evaluator.</p>	<p>Indicators/targets not identified. The workplan schedules the assessment by project end and STDF provided its guidelines for evaluating STDF-funded projects to guide the external evaluation process.</p>	100%	<p>An external evaluator was recruited by FAO on 7 June 2022. The independent end-of-project assessment has been completed and submitted.</p>
Output 6: Participation in and facilitation of workshops and associated activities			
<p><u>Activity 6.1:</u> Facilitate technical workshop and review of progress made to date towards ISO 17025, share learnings from Pacific Island countries and provide</p>		100%	<p>A technical workshop held on 17 April 2018 was attended by government officials, industry stakeholders, laboratory personnel, FAO representatives and specialists from the Cawthron Institute.</p>

Output/Activity	Indicator/Target	Actual performance (percentage complete)	Comments (results and challenges faced)
technical advice.			<p>Progress made was reviewed and major challenges were identified and discussed.</p> <p>A Project Steering Committee meeting was held on 18 April 2018. Sharing of learnings from Pacific Island countries and provision of technical advice was moved to a later workshop.</p>

By placing the NPHL on the path to accreditation, the project contributed to ensuring the right to safe, sufficient and nutritious food in Solomon Islands.

D. IMPLEMENTATION OF WORKPLAN AND BUDGET

Workplan and budget

Project activities were implemented within the budget provisions, despite delays due to the COVID-19 pandemic and staff turnover. A minor budget revision was approved in June 2018, reallocating funds without changing the total amount.

In July 2018 there were multiple staff changes at NPHL and project progress was hindered as a result. A one-year extension to the original project agreement was granted in November 2019, setting a new end date of May 2021. During this time, the global COVID-19 pandemic occurred, and staffing issues were not resolved. In June 2020, after two years of inactivity, the steering committee decided to revise the project's objective and adjust the workplan accordingly.

New staff members were subsequently employed at NPHL and, while international travel was still not possible due to COVID-19 restrictions, a new workplan was developed for online training. This was captured in a new letter of agreement signed in September 2021, which covered activities through to the end of December 2021 (four months).

A third and final extension was granted by STDF in December 2021 to complete the online training of the new NPHL staff members between February and June 2022 (five months), with a new workplan and letter of agreement developed and the inclusion of a senior Pacific consultant from the Cawthron Institute. In total, the project thus ran from 1 June 2017 to 30 June 2022.

Resource partner contribution

The STDF provided funding of USD 355 408 for this project, while the Government of Solomon Islands provided in-kind contributions worth USD 112 800. FAO contributed USD 40 128.

Coordination

The MHMS of Solomon Islands is recognized by the European Union as the competent authority charged with enforcing food safety policy for exports. MHMS created the NPHL to serve as the facility to perform the necessary microbiological tests for exported goods. Funding for the NPHL was provided by the STDF and implemented in partnership with FAO. The Cawthron Institute was then commissioned by FAO to deliver the scientific components of the project.

Risk management

The original project application included a risk matrix, yet not all the risks faced were adequately identified or ranked. A significant risk encountered during project implementation was the issue of staff shortages. The project anticipated staff turnover and the inability to hire additional staff, but ranked the probability of their occurrence as “little likelihood” and “somewhat likely” respectively. Staffing issues ultimately stalled the project’s progress for two years. The subsequent recruitment of two government-salaried laboratory technicians and the return of the National Project Coordinator from postgraduate study overseas effectively restored the project to achieving its goals, based on modified objectives that sought to place the NPHL on a strong path to accreditation.

Even though the project plan identified adverse climatic events such as cyclones as “somewhat likely”, it was impossible to anticipate the COVID-19 pandemic. This unprecedented emergency prevented the achievement of one of the main project goals of conducting in-person training of NPHL technicians at accredited facilities at the Cawthron Institute. The project was able to adapt to the challenge by instead delivering practical online training led by the institute’s experts. This approach afforded a longer training period where the abilities of the trainees could be better assessed for consistency compared to shorter-term in-person training. Although the benefits of online training cannot effectively replace in-person training, the experiences and lessons achieved through remote learning are very relevant for future laboratory capacity development projects.

Visibility

A project initiation workshop was hosted at the MHMS in September 2017 and attended by personnel from various government divisions and representatives from commercial and private sectors. A second technical workshop was held in April 2018 and hosted at the MHMS. It was again attended by government, private and commercial sector representatives.

To help inform Solomon Islanders of the project and its importance, two news articles were published in The Island Sun daily newspaper following the workshops, the first on 25 April 2018 and the second on 2 May 2018.

A virtual project exit meeting was held in August 2022 and attended by all NPHL staff and Cawthron Institute experts, where next steps were discussed in detail and a path forward identified for the microbiology technical staff.

E. SUSTAINABILITY

a. Capacity development

The project made significant strides in building laboratory capacity and placing NPHL on a strong path to accreditation. Specific microbiological tests and quality systems and methods in line with the ISO 17025 standard have been achieved. This includes, but is not limited to, writing the quality manual – an essential document that governs how the laboratory operates – calibration documents, microbiology methods for the analysis of water and food, and a variety of accompanying quality control worksheets.

The project activities were also effective in raising government awareness on sanitary and phytosanitary challenges and contributed to support for enhancing laboratory capacity to meet food testing and water quality monitoring needs.

b. Gender equality

Gender balance in laboratory staff recruitments was achieved under the project. This will encourage equal participation of women and men in food and water control activities at national level.

c. *Environmental sustainability*

Enhancing the capacity of the NPHL to conduct microbiological testing of food and water in compliance with international standards helps to address environmental contaminants of public health concern. It also supports the reduction in environmental pollutants and promotion of sustainable agriculture and safe food.

d. *Human Rights-based Approach – in particular Right to Food and Decent Work*

By placing the NPHL on the path to accreditation, the project contributed to ensuring the right to safe, sufficient and nutritious food in the Solomon Islands, as well as the right to decent work. The project's ultimate goal of supporting Solomon Islands to maintain or gain access to export markets for its fish products will help sustain the ability of fishery companies in the private sector to continue create jobs and retain employees, thus contributing to national employment rates and poverty reduction.

e. *Technological sustainability*

Improved capacity to test water for monitoring purposes is crucial to maintaining good water governance in Solomon Islands. As the NPHL is the only laboratory in country with the existing experience and infrastructure needed to accommodate these tests, it was well situated to participate in the project's interventions to develop capacity and improve the quality of service. Through the project, NPHL staff have been trained to a high level of competency in compliance with the standards of ISO 17025. The facility is well positioned to achieve ISO 17025 accreditation if it stays on the same trajectory of competence and compliance with the established quality standards.

f. *Economic sustainability*

While progress has been made from a technical standpoint, NPHL still faces the hurdles of low sample volume and the absence of an effective procurement system, which is essential for efficient laboratory operations. Sustainability of the results achieved under the project will effectively require a renewed effort at resource mobilization for funds to support in-person training for laboratory staff, as well as a procurement system that facilitates the easy and fast access to reagents and consumables for testing. Funding support will also be required to continue the proficiency testing initiated during the project, and to promote activities that will achieve a higher laboratory sample throughput in order to attain a sufficient history of testing compliance to demonstrate competency for ISO 17025 accreditation.

F. LESSONS LEARNED

LESSONS LEARNED – elements of success

A key learning from this project was the importance of having someone in country who can support the project and ensure project activities are completed when working remotely. The appointment of a National Project Coordinator, who was also the Quality Assurance Manager, ensured rapid response to emails, providing scanned copies of quality control documents and collation of training results, and helped to make sure that meetings were attended by NPHL staff. These actions were critical to the success of this project.

LESSONS LEARNED – impediments and constraints

While the role of the National Project Coordinator was found to be a critical factor for the successful implementation of the project, the person in this role left in the middle of the project to study abroad. This stalled the progress of the project significantly until his return. The risk of turnover of laboratory staff had been identified at the design stage of the project but was ranked as a low probability. It is important that such staff changes be properly anticipated and prepared for.

The COVID-19 pandemic was impossible to anticipate and prevented crucial in-person training and guidance for NPHL staff and relevant stakeholders. The project was able to adapt to the challenge by delivering practical online training, which afforded the advantage of a longer training period. Although the benefits of online training cannot effectively replace in-person training, the experiences and lessons provided are very relevant for future laboratory capacity development projects. The experiences and methods used should be documented and disseminated to other STDF projects, as the lessons learned from successful remote activities that help to prevent the non-achievement of in-person project outputs can provide useful mitigation solutions to address risks during the design stage of other projects.

According to the project service providers, experts from the Cawthron Institute, the biggest issue faced by NPHL is that the laboratory's budget cannot fund the remaining activities required to gain ISO 17025 accreditation, nor maintain it going forward.³ Three potential funding models were proposed:

- A government-funded model where the NPHL budget, currently funded by the MHMS, is expanded to include the funding required to undertake the ongoing quality requirements for ISO 17025 accreditation.

³ Murray, J.S. and Oakly, J. 2022. "Strengthening the scientific capabilities of the National Public Health Laboratory of the Solomon Islands" – Project Conclusion Report. Cawthron Report No. 3823.

- A combined model involving government funding and commercial testing services. This model would generate two revenue streams: first, from the MHMS to support the analysis of water- and food-borne illnesses that pose a risk to Solomon Islanders domestically; and second, from fee-for-service testing for businesses in both the private and commercial sectors.
- An independent commercial testing service where NPHL would be recognized as an independent laboratory offering fee-for-service testing for both the Government of the Solomon Islands and the private and commercial sectors. This would enable NPHL to have its own business model and be in control of the revenue generated and the expenses incurred, both for ISO 17025 accreditation and purchasing of laboratory equipment and consumables.
- The funding models involving commercialization would require a review of fee pricing to ensure affordability for potential clients.

G. FOLLOW-UP ACTIONS

The next steps for the NPHL to move towards ISO 17025 accreditation are focused on complying with the quality conditions specified in the standard. These include:

- Laboratory equipment calibration by an external provider.
- Ongoing testing of interlaboratory comparison programme (ILCP) and quality control material (QCM) samples, and purchase of control cultures.
- Securing an efficient procurement system.
- Achieving a higher laboratory sample throughput in order to attain the history of testing compliance necessary to demonstrate competency.

Further funding will be required to support the remaining activities required to gain ISO 17025 accreditation, and to maintain accreditation – if obtained – going forward. These activities involve audit assessments to be performed by an accredited service provider. The IANZ is one such provider selected under this project. A useful online resource to help understand the pre-requisites of ISO 17025 accreditation is provided on the IANZ website (<https://www.ianz.govt.nz/get-accredited#advice-and-asistance>).

H. GOVERNMENT ATTENTION

Securing an efficient procurement system will require NPHL to have a separate, self-managed budget allocated by the MHMS.

The NPHL has a small throughput of samples for analysis, resulting in inadequate revenues for laboratory operations compliant with ISO 17025. A national policy-backed requirement for producers, processors, health inspectors and environmentalists to use the facility would greatly enhance its sustainability as an accredited microbiological laboratory.

I. HUMAN INTEREST STORY

The NPHL and its staff have benefited significantly as the recipients of capacity development and technical inputs. The facility benefited from expert technical support from the Cawthron Institute through the development of systems and training to support an efficient and effective workflow. The staff – 50 percent of whom are women – received high-quality technical training, which has promoted their professional development and increased the quality of their work in the area of microbiological testing and quality management systems. Of particular note was the development of a strong team spirit among the staff members.

Interviews with laboratory staff indicated that they experienced a real difference in the following areas:

- improved team spirit;
- improved reporting of results;
- improved expertise in laboratory techniques;
- improved compliance and focus on international standards for testing;
- increased staff capacity;
- improved laboratory management; and
- improved approaches to problem solving.



Photo 1: Online interview with staff of the NPHL of Solomon Islands. (Credit: ©FAO/Nana Annan).

Appendix 1

LOGFRAME MATRIX – ACHIEVEMENT OF INDICATORS

Results chain	Indicators			If not achieved, explain why	If applicable, follow-up action to be taken	
	Indicators	Baseline	End target (<i>expected value at project completion</i>)			Achieved
Impact	Sustainable increase in production and marketing of domestic agriculture products and healthy consumption of safe and nutritious food.					
Outcome: Capacity of NPHL strengthened to attain international accreditation for microbiology (for water analysis).		NPHL has not received accreditation by an internationally recognized certifying body.	Necessary microbiological analysis for market access is accepted by trading partner (European Union). NPHL achieves ISO 17025 certification for microbiology required for access to the EU market for fish exports.	The initial objective of achieving ISO 17025 accreditation was not reached. FAO subsequently agreed to focus assistance on enhancing the capacity of the NPHL and placing it on a strong path to ISO 17025 accreditation. The project subsequently achieved significant enhancement of the scientific capabilities of staff at the NPHL for specific microbiological tests and established systems and methods in line with the ISO 17025 standard.	The COVID-19 pandemic prevented crucial in-person overseas laboratory training and other onsite interventions. The project also experienced delays because of the COVID-19 pandemic and staff turnover.	Certain critical steps are still required before NPHL can apply for the initial ISO 17025 accreditation assessment: <ul style="list-style-type: none"> – Calibration of laboratory equipment by an external service provider. – Ongoing proficiency testing – ILCPs and QCM. – Purchase of control cultures. This will require financial resource mobilization.

Results chain	Indicators				If not achieved, explain why	If applicable, follow-up action to be taken
	Indicators	Baseline	End target (<i>expected value at project completion</i>)	Achieved		
Output 1: NPHL facility is equipped and organized according to ISO 17025 standards.	Number of facility violations of international standards for microbiological testing facilities.		Baseline of staff training needs established; mid-term capacity assessment completed.	<p>An initial baseline audit was performed in September 2017 at NPHL and identified many key areas that needed addressing. These included staff training, procurement, methods, laboratory equipment and no quality control documentation. These became the focus of the project, with staff trained, methods and a QMS developed, and laboratory equipment properly used, repaired, or replaced.</p> <p>All equipment has been registered and the laboratory now has an equipment logbook that includes maintenance.</p>		

Results chain	Indicators				If not achieved, explain why	If applicable, follow-up action to be taken
	Indicators	Baseline	End target (<i>expected value at project completion</i>)	Achieved		
Output 2: NPHL staff are trained according to ISO 17025 standards.	Number of facility violations of international standards for microbiological testing facilities.		Baseline of staff training needs established; mid-term capacity assessment completed; both laboratory aides are able to independently facilitate testing set-up and breakdown of 50% of microbiological tests.	<p>Two new staff were recruited, and a National Project Coordinator was appointed. This was sufficient to meet NPHL staffing needs.</p> <p>All microbiology staff improved their technical competency and generated “Good” results for the ILCP and QCM samples. This also demonstrated that the systems and methods introduced over the course of this project were implemented successfully.</p> <p>An audit conducted in 2022 determined that significant improvements have been made at NPHL and by the staff since the baseline audit in September 2017.</p>		The next steps for NPHL towards ISO 17025 accreditation involve complying with the quality conditions as specified in the standard.

Results chain	Indicators				If not achieved, explain why	If applicable, follow-up action to be taken
	Indicators	Baseline	End target (<i>expected value at project completion</i>)	Achieved		
<p>Output 3: Essential NPHL systems are developed and or amended to comply with ISO 17025 standards and promote efficient workflow in the laboratory.</p>	<p>Utilization of systems to support efficient laboratory management.</p> <p>Number of facility violations of international standards for microbiological testing facilities.</p>	<p>The NPHL had an inefficient procurement system where an annual budget and inventory list required approval by the government via the MHMS, resulting in late arrival and/or incorrect laboratory supplies.</p> <p>Quality control documentation was lacking and there were no documented SOPs in compliance with ISO 17025.</p>	<p>Draft manual submitted; draft of QMS to the level required by international standards for ISO 17025 certification submitted; record-keeping system draft manual submitted; environmental monitoring procedural draft manual submitted.</p>	<p>A review of NPHL manuals and systems was conducted as part of a preassessment mission to confirm readiness of NPHL to apply for accreditation.</p> <p>SOPs have been developed and are in NPHL format, in compliance with ISO 17025.</p> <p>The required systems have been put in place in accordance with ISO 17025. Time is required to demonstrate a history of compliance.</p>	<p>Progress on adopting a new procurement system is pending government acceptance of the project's recommendations.</p>	<p>Government officials, including the undersecretary of the MHMS, will continue to advocate for the required improvements.</p>

Appendix 2**DOCUMENTS PRODUCED DURING THE PROJECT**

- FAO.** 2017. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 1, June-November 2017.*
- FAO.** 2018. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 2, December 2017–May 2018.*
- FAO.** 2018. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 3, June-November 2018.*
- FAO.** 2019. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 4, December 2018–May 2019.*
- FAO.** 2019. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 5, June-November 2019.*
- FAO.** 2020. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 6, December 2019–May 2020.*
- FAO.** 2020. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 7, June-November 2020.*
- FAO.** 2021. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 8, December 2020–May 2021.*
- FAO.** 2021. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 9, June-November 2021.*
- FAO.** 2022. *MTF/SOI/003/STF – STDF/PG/521 Project Progress Report No. 10, December 2021–June 2022.*
- Annan, N.T.** 2022. *MTF/SOI/003/STF – STDF/PG/521 Project Evaluation Report.*
- Murray, J.S. and Oakly, J.** 2022. *“Strengthening the scientific capabilities of the National Public Health Laboratory of the Solomon Islands” – Project Conclusion Report. Cawthron Report No. 3823.*

Appendix 3**TRAINING AND STUDY TOURS**

Number of Participants	Title of Training	Place	Date
2	Staff training on quality systems, SOPs and environmental monitoring	Honiara, Solomon Islands	1 April-4 May 2018
4	Online training in scientific capacity building	Honiara, Solomon Islands; online	September 2021-June 2022