



Climate Resilient Honiara

Engineering actions validation report
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Abbreviations and acronyms

Term	Definition
CAUSE project	Community Access and Urban Services Enhancement project, implemented by World Bank and HCC
CDC	Community Development Committee
CRCDP	Climate Resilient Community Development Plan
CRH	Climate Resilient Honiara
DRR/M	Disaster Risk Reduction/Management
HCC	Honiara City Council
HVA	Honiara Vulnerability Assessment
GHA	Greater Honiara Area
HURCAP	Honiara Urban Resilience and Climate Action Plan
MECCDM	Ministry for the Environment, Climate Change, Disaster Management and Meteorology
MLHS	Ministry of Lands, Housing and Survey
MHMS	Ministry of Health and Medical Services
RMIT	Royal Melbourne Institute of Technology
UNFCCC	United Nations Framework Convention on Climate Change
UN-Habitat	United Nations Human Settlement Programme
WP3	Work Package 3: Community engineering actions



Executive summary

Honiara is being adversely affected by the consequences of rapid urbanisation and the growth of informal settlements. Climate change will act to amplify many of these human stresses into the future. In response, the 'Climate Resilient Honiara' (CRH) project, funded by the UNFCCC Adaptation Fund and administered by UN-Habitat, has been set up to address many of these critical issues.

This report relates to Work Package 3 of the CRH project: Community engineering actions. The report summarises the participatory process for understanding vulnerabilities and designing appropriate actions for communities in Honiara. This process included the publication of climate resilient community development plans (CRPDPs) for each of the five hotspot communities:

1. Ontong Java settlement;
2. Fishing Village;
3. Jabros (Gilbert Camp);
4. Wind Valley (White River); and
5. Aekafo-Feraladoa area.

These CRPDPs proposed a number of actions for the communities, including flood protection and drainage, sanitation and water supply, and waste management. To confirm the communities agreed that these were priority actions, five validation workshops were held in the communities in January and February 2021.

During the workshops, each community stated their general agreement to the proposed actions. This report notes additional feedback from the communities, the approval of the actions by the Project Management Committee in March 2021, and the next steps for the implementation phase of WP3 of the project.

It is intended that these community engineering actions will contribute to a strengthened local resilience to climate-related impacts and address some effects of urbanisation within the five hotspot communities.



1. Introduction

The 'Climate Resilient Honiara' Project (CRH) is a four-year project funded by the UNFCCC Adaptation Fund and administered by UN-Habitat. RMIT University provides scientific support to a range of different urban climate resilience activities (actions and capacity building). Professor Darryn McEvoy leads the project and a large multi-disciplinary team of lecturers and researchers from six different schools at RMIT.

The project also engages with multiple local partners, non-government organisations (NGOs) and consultants. The project is implemented locally by the Solomon Islands Ministry for the Environment, Climate Change and Disaster Management (MECCDM), the Ministry of Lands, Housing and Survey (MLHS), and Honiara City Council (HCC).

The aim of CRH is to reduce the vulnerability of those living in informal settlements in the fast-growing capital city of the Solomon Islands, Honiara. RMIT commenced work on the project in 2019 and provide scientific support to 15 different components.

This report details Work Package 3 '**Community engineering actions**'. Background information is outlined in this report, as well as the proposed engineering actions to be implemented in the 'hotspot' settlements identified in Honiara.

The report details the five validation workshops conducted in January and February 2021, to confirm with members of the community that there is general agreement around the actions proposed. The findings of these workshops were reported back to the Project Management Committee during its meeting on 25 March 2021.

The report has been authored by John Clemo, and has been reviewed by Steve Likaveke and Professor Darryn McEvoy.

2. Project aims

2.1. Aims of the Climate Resilience Honiara project

The aim of the CRH project is to:

1. Enhance the resilience of Honiara for current and future climate impacts and natural disasters; and
2. Focus on the most vulnerable communities in Honiara.

2.2. Aims of Work Package 3: Community engineering actions

Work Package 3 (WP3): Community engineering actions forms a key part of the community-level climate change interventions within the CRH project. The actions in WP3 sit alongside ward- and city-level actions.

WP3 is centred around a range of engineering interventions which have been developed through a participatory process with the five hotspot communities in Honiara. These actions are aimed at reducing the vulnerability of these communities, through better sanitation, water supply, flood

protection, drainage and waste management. The participatory process is described in Section 5.1 below, but in summary involved a range of meetings and workshops to understand key vulnerabilities in the communities, and then ongoing engagement to ensure appropriate solutions were supported by the communities.

3. Research approach

A participatory action-based research approach was adopted for this work programme, for each of the five ‘hotspot’ communities. The research included:

- 1. Community meetings and site visits:** A number of community meetings and workshops have been conducted from 2015-2021 in relation to the project. RMIT engineers conducted a site visit in 2019 to understand vulnerabilities and guide the design of engineering actions. Additional geospatial mapping and analysis was carried out by RMIT University in support of these actions.
- 2. Preparation of Climate Resilient Community Development Plans (CRCDPs):** Five CRCDPs were published in August 2020, to guide future development to strengthen the resilience of each settlement (refer Figure 1). These CRCDPs note climate vulnerabilities, community issues, sources of adaptive capacity, and a number of resilience-building actions for each community.

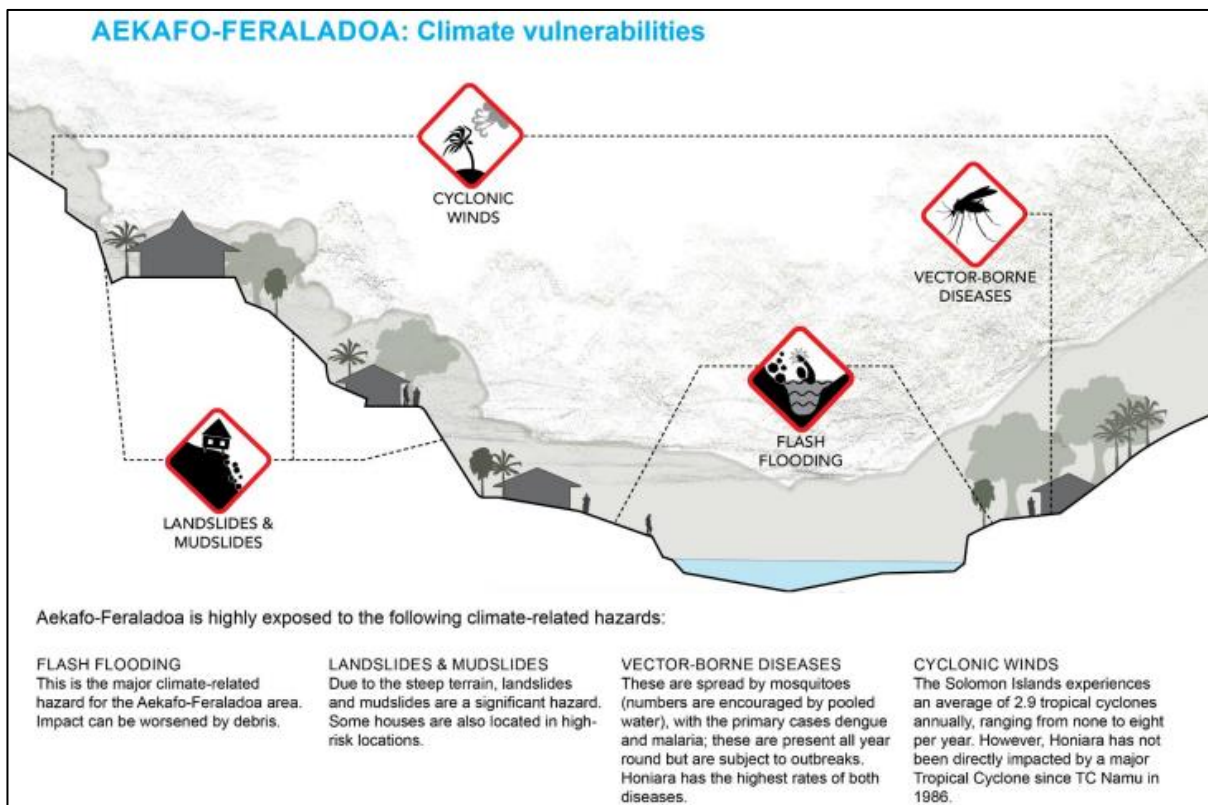


Figure 1: Example schematic of climate vulnerabilities from Aekafo-Feraladoa Climate Resilient Community Development Plan

3. Community validation workshops: Five validation workshops were conducted by Steve Likaveke, Lorraine Livia, and John Clemo between 24 January 2021 and 21 February 2021. This report centres around the findings from these validation workshops.

The engineering actions directly correspond to specific vulnerabilities or community needs in each community. Many community needs were consistent across settlements, meaning some similarities in the actions proposed (and there may be some benefits of scale from implementing actions across a number of communities).

4. The Honiara context

4.1. Climate hotspot communities

Five community vulnerability hotspots were identified in the HURCAP (Figure 2; Trundle & McEvoy, 2016).¹ These hotspots are the focus of the community-level actions for the CRH project, and were confirmed as high priority areas during consultation with Honiara City Council in September 2019. The hotspots are: Ontong Java Settlement; Kukum Fishing Village; Jabros (Gilbert Camp); Wind Valley (White River); and Aekafo Planning Area (7 zones).

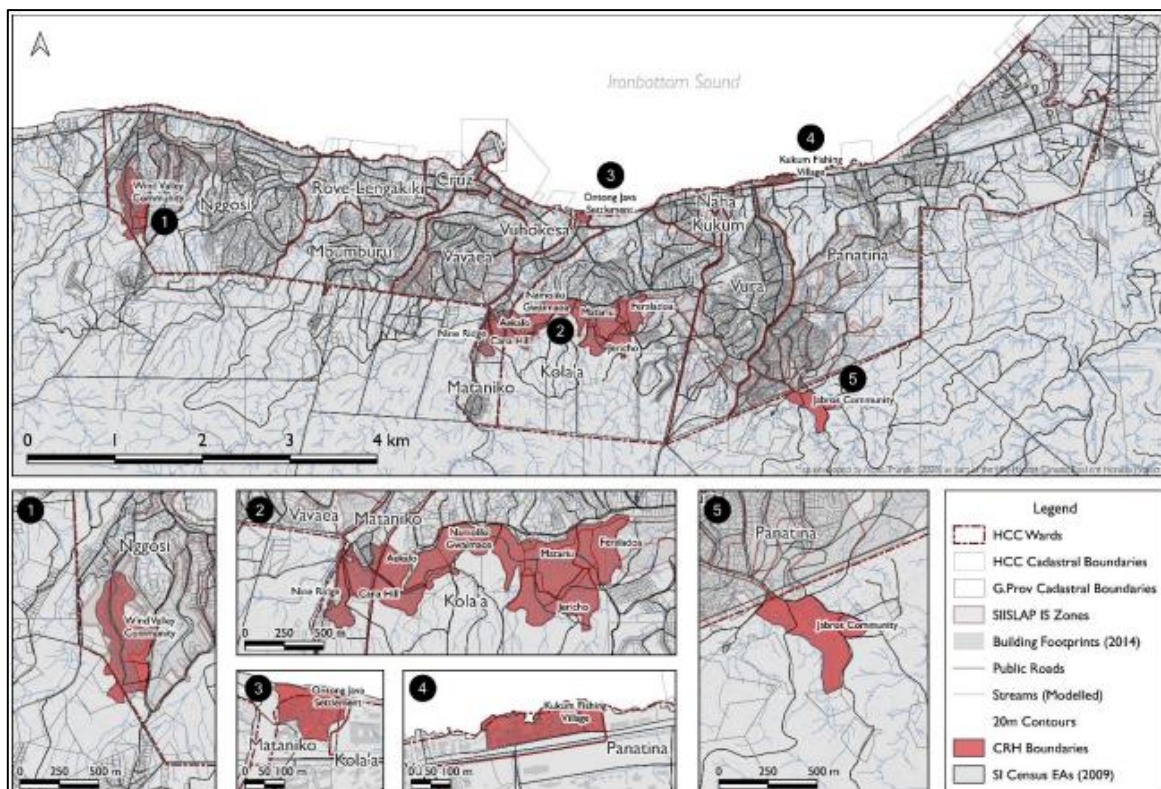


Figure 2: Climate hotspot communities in Honiara (Trundle & McEvoy, 2016)

¹ Note: Six hotspots had been identified in the Honiara Vulnerability Assessment (UN-Habitat, 2014), but April Floods' destruction of Koa Hill floodplain meant it was no longer a hotspot community.

4.2. Issues faced by Honiara communities

Honiara residents experience a range of issues which may be exacerbated by climate change and rapid urbanisation. Figure 3, taken from the HURCAP, shows the range of challenges and their frequency.

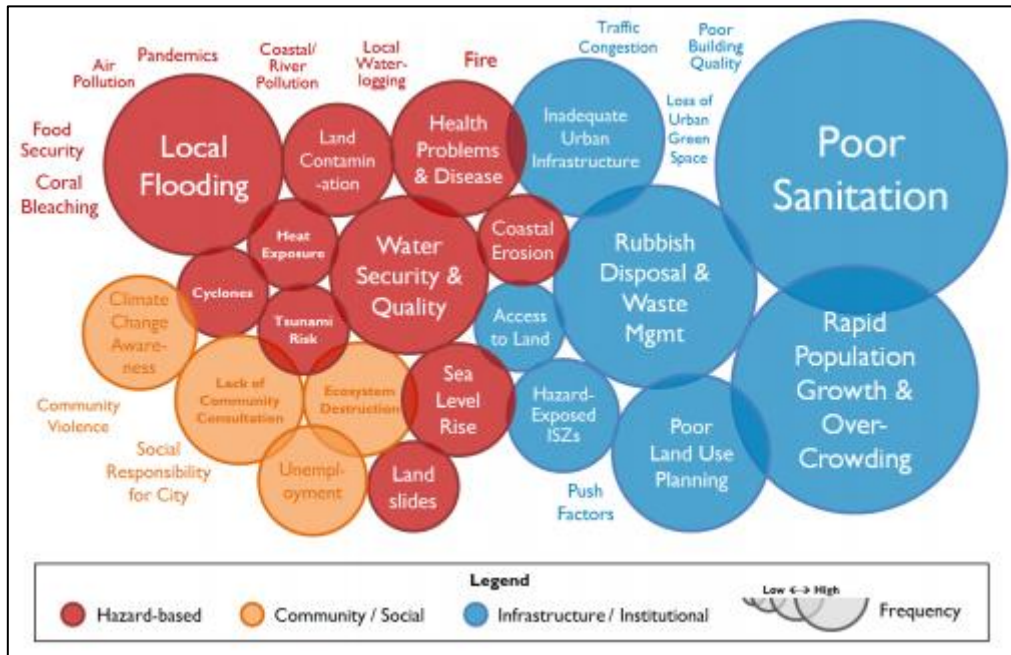


Figure 3: Key issues identified by Honiara stakeholders (Trundle & McEvoy, 2016)

The key challenges relevant to WP3 include:

- Lack of, or poor, services including water, sanitation and waste management;
- Inadequate infrastructure such as road networks;
- Water quality (e.g. waste being burned or dumped in waterways, saltwater inundation);
- Local flooding (coastal, low-lying areas, flood plains, riverbanks); and
- Sea level rise and coastal erosion.

These challenges affect each of the different hotspot communities in varying ways (e.g. the three inland communities are not directly affected by sea level rise and coastal erosion).

5. Summary of climate resilient community development plans

5.1. Information gathering process

To understand vulnerabilities and design engineering actions, community meetings and workshops have been carried out in Honiara throughout the project. These have included:

- Regular meetings between community leaders and UN-Habitat staff from 2015-2021. Community leaders are focal points for the project, who can pass information to and from other members in their communities.
- Meetings and workshops during RMIT University missions to Honiara. These missions enabled RMIT engineers to carry out site visits, community meetings and stakeholder workshops. Field missions have not been possible since February 2020 due to the COVID-19 pandemic.
- Further engagements, workshops and trainings have been conducted with community members, including on disaster risk reduction (supported by ICLEI), non-written communication of climate risks (with Vois Blong Mere and Honiara Youth Council), gender and food security (supported by Vois Blong Mere), nature based solutions (SINU), evacuation centres (Ward Councillors) and GIS basic and advanced training (Ministries and HCC).

5.2. Household survey in Wind Valley

Initially, household surveys were planned across each of the five communities. However funding constraints, followed by the threat of COVID-19 spreading, meant that household surveys were only collected in Wind Valley. The group of enumerators, supported by Lorraine Livia (UN-Habitat), collected surveys in Wind Valley in October-November 2019.

The results from the Wind Valley surveys are set out in the Wind Valley Community Profile report (December 2019). Some of the community issues relevant to this workstream included:

- **Limited access to water:** including 59% of households reporting their water quality as being average or poor.
- **Natural hazards:** community members noted landslides, flooding and storms/cyclones were the three most problematic hazards. Most reported that they thought flooding and extreme events were getting worse.
- **Tenure security:** with 23% of households reporting they did not feel secure on their land, and some land disputes noted between community members.
- **Waste management:** with 64% of households reporting they burn their rubbish, and 30% disposing it into the river.

5.3. Summary of issues identified in climate resilient community development plans

The climate resilient community development plans noted a number of key community needs identified through meetings and site visits, including:

- Lack of evacuation centres or appropriate community facilities which could be used in times of disaster or emergency.
- Challenges accessing clean water, especially during periods of rainy weather (when water sources were often polluted or switched off). These challenges include the high cost of accessing water.
- Lack of appropriate sanitation facilities, resulting in a higher risk of health effects on the community. Some facilities (e.g. in coastal settlements) were particularly difficult to access during stormy periods or cyclones.
- Issues with drainage in communities, including floodwaters entering settlements (especially in Ontong Java settlement) and high water table preventing water from draining properly.
- Limited waste management services, leading some households (within and in adjacent communities) to dispose of rubbish on land or in the streams, exacerbating flooding. Honiara City Council's waste management trucks are unable to access many settlements due to poor roading infrastructure.
- Challenges in accessing bush gardens, which are important elements of food security;
- Concerns around development in catchments, particularly on steep slopes where vegetation was removed, heightening the risk of slope failure; and
- Land tenure concerns, including anxiety around lack of tenure and issues understanding land registration processes.

6. Proposed engineering actions

The climate resilient community development plans set out community resilience actions, which encompass 'soft' interventions (such as climate hazard awareness raising) and 'hard interventions' (such as the engineering actions relevant to this work package).

6.1. Ontong Java settlement engineering actions

Three priority actions were identified for Ontong Java settlement in the Climate Resilient Community Development Plan (UN-Habitat, 2020a):

1. **Riverine flood levee (high cost):** Requiring detailed hydraulic/civil engineering modelling, so scheduled to take 18 months, including construction. Data would need to be collected locally and then processed by engineers at RMIT to inform levee design. Some of the land lost to erosion might be able to be reclaimed, but not all of it (due to river dynamics issues).



Figure 4: Riverside Ontong Java during February 2019 field mission (Credit: Darryn McEvoy)

2. **Drainage and footpaths (medium cost):** This would reduce regular inundation and being exposed to grey and black water pollution. Data would need to be collected locally and then processed by engineers at RMIT to inform footpath design.
3. **Water tanks (low cost):** Appropriate water tanks would be selected based on modelling and roof sizes.

6.2. Jabros engineering actions

Four priority actions were identified for Jabros in the Climate Resilient Community Development Plan (UN-Habitat, 2020b):

1. **Evacuation centre (high cost)** – A new community building to act as an evacuation centre during times of emergency. The centre is needed for the community to address a lack of community facilities in the settlement. The centre will be designed by RMIT experts, and will draw on community labour, locally sourced materials, and construction expertise. The selected site is in the open space area adjacent to the Jabros church.

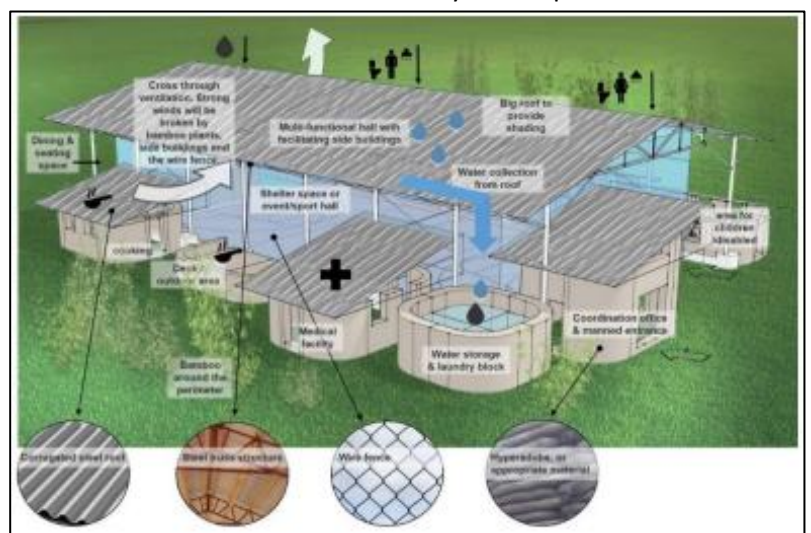


Figure 5: Conceptual design for evacuation centre (from Jabros CRCDP)

2. **Low-flow pour flush toilet (medium cost)** - Pour flush toilets are simple and will improve sanitation conditions. There are an increasing number of low flow toilets, such as the SaTo pan, that could be used.
3. **Water tanks (medium cost)** - Pilot households to have access to affordable rainwater harvesting technology that is easy to maintain and provides extra water to supplement household demand. Requires community input to map out a suitable implementation plan.
4. **Water quality testing and filters (low cost)** - Existing sources of water will be tested for quality. This will be supported by filters to provide clean drinking water at a household level.

6.3. Kukum Fishing Village engineering actions

Three priority actions were identified for Kukum Fishing Village in the Climate Resilient Community Development Plan (UN-Habitat, 2020c):

1. **Communal sanitation block (medium cost):** Design and building of a communal toilet block, separated between male and female. Solid waste from the communal block will be treated to safe standards before being released into the sea.
2. **Footpaths and drainage (medium cost):** This would reduce regular inundation and being exposed to grey and black water pollution. Data would need to be collected locally and then processed by engineers at RMIT to inform footpath design.
3. **Biodigester (medium cost):** for organic food wastes (reduction of waste, but also generation of bioenergy, and production of liquid fertiliser for farming application). Community input needed to identify location, be involved in maintenance training, and collect data for evaluation purposes to ensure maximum efficiency.



Figure 6: Example of a biodigester in Burns Creek, Honiara (Credit: John Clemo)

6.4. Wind Valley engineering actions

Four priority actions were identified for Wind Valley in the Climate Resilient Community Development Plan (UN-Habitat, 2020d):

1. **Water tanks (medium cost)** - Pilot households to have access to affordable rainwater harvesting technology that is easy to maintain and provides extra water to supplement household demand. Requires community input to map out a suitable implementation plan.
2. **Low-flow pour flush toilets (medium cost)** - Pour flush toilets are simple and will improve sanitation conditions. There are an increasing number of low flow toilets, such as the SaTo pan (Figure 7), that could be used.
3. **Drainage upgrades (medium cost):** The drainage system is unsuitable in its present condition and capacity of the system needs to be upgraded. It is proposed to upgrade the drainage system alongside the main road by constructing parallel lined channels on both sides on the main road. These channels will collect and discharge storm water and grey water (if possible).
4. **Water quality testing and filters for clean drinking water (low cost):** Existing sources of water will be tested for quality. This will be supported by filters to provide clean drinking water at a household level.



Figure 7: SaTo pan toilet (Credit: Contractor Mag website, 2015)

6.5. Aekafo-Feraladoa engineering actions

Four priority actions were identified for Aekafo-Feraladoa in the Climate Resilient Community Development Plan (UN-Habitat, 2020e):

1. **Water tanks (medium cost)** - Pilot households to have access to affordable rainwater harvesting technology that is easy to maintain and provides extra water to supplement household demand. Requires community input to map out a suitable implementation plan.
2. **Low-flow pour flush toilet (medium cost)** - Pour flush toilets are simple and will improve sanitation conditions. There are an increasing number of low flow toilets, such as the SaTo pan, that could be used.
3. **Biodigesters (medium cost):** A network of biodigesters for organic food and pig wastes (reduction of waste, but also generation of bioenergy and production of liquid fertiliser for farming application). Each digester can serve a cluster of nested set of houses. These will be sited in consultation with community leaders, but could be used to generate power for churches, community buildings, etc., as well as producing fertiliser for gardens. Community input needed to identify locations for pilots, be involved in maintenance training, and collect data for evaluation purposes to ensure maximum efficiency.



4. **Water quality testing and filters for clean drinking water (low cost):** Existing sources of water will be tested for quality. This will be supported by filters to provide clean drinking water at a household level.

7. Summary of validation workshops

An example brief for the validation workshops is included in Appendix A. The basic format for the workshops was as follows:

1. Introduction
2. Purpose of the workshop
3. Community profile, vulnerabilities, community issues
4. Proposed engineering actions
5. Discussion to validate proposed engineering actions
 - (a) Seeking general agreement that the actions are priority needs
 - (b) Asking whether any other local actions should be considered
 - (c) Asking the community to rank each engineering action, and provide feedback on each action
6. Asking how the community members would like to be involved in the implementation phase
7. Confirming makeup and contact details of the Community Development Committee
8. Asking about any other partnerships in the community (e.g. church or NGOs) which the project team should be aware of
9. Thanks and next steps

Steve Likaveke facilitated the workshops, with John Clemo recording notes and Lorraine Livia supporting (including helping with attendance sheets and taking photos). An example of the briefs for the workshops is attached in Appendix A.

7.1. Ontong Java settlement

The Ontong Java community validation workshop took place on Sunday 24 January 2021 at the 'leaf hut' which serves as the community meeting place. 24 participants attended, including:

- 10 women;
- 14 men;
- One person with a disability;
- Five young people (below 35 years old); and
- Seven elderly people (above 50 years old).



Figure 8: Photos from Ontong Java settlement validation workshop (Credit: John Clemo)

7.1.1. Key points discussed

Following the introduction, Steve talked through the background to the project and the purpose of the workshop. Aside from the issues in the CRCDP and the brief prepared by Professor Darryn McEvoy, other points discussed and feedback from the community included:

- There was general agreement that the proposed engineering actions were the priority needs in the community. A number of community members emphasised that flooding is a major issue for the community, especially during the rainy season. Many mentioned recent rainfall events which had led to flooding in the community.
- Some attendees thought it was better to start with ‘low hanging fruit’ in terms of the actions – if possible, install water tanks, and then move to the other two.
- One person noted the connection between flooding and people getting sick – polluted water flows through the settlement, and then when it dries the mud and dust is polluted and remains in the community (Figure 9).
- One community member said that Honiara City Council needs to step up – demolish the illegally constructed wharf on the Mataniko River (Figure 10), and improve waste management, which makes flooding worse.



Figure 9: Aerial view of Ontong Java settlement during April 2014 floods (Credit: RAMSI)



Figure 10: Illegally constructed wharf (left hand side of photo). Ontong Java settlement abuts the river in the top right hand side of the photo. (Credit: John Clemo)

7.1.2. Ranking of actions and discussion

The ranking system from Ontong Java differed slightly from the other four communities. Steve facilitated an ‘eyes closed, first priority’ system, whereas for later communities we decided to seek more feedback through a ‘first, second, third’ ranking system (which provides more validation data).

The results from the ranking of actions were as follows:

No.	Action	First priority
1	Flood levee	31
2=	Drainage improvements	2
2=	Water tanks	2

Further discussion:

- One attendee noted the need for better toilet facilities (noting the high water table).
- The community noted that the coastal reclamation has resolved erosion/storm surge issues at the moment.
- One woman said while the flood protection is important, it needs to be done in concert with drainage improvements, as flood water from other areas also flows through (Figure 11).
- Another community member asked about WASH facilities. Steve noted that while there is no proposed sanitation project for Ontong Java, the provision of water tanks is relevant as it would provide clean water to community members.
- The community asked that Steve shares a soft copy of the CRCDP with Stanley, Chairman of the Community Development Committee.



Figure 11: Stormwater drain through Ontong Java (Credit: Usha Iyer-Raniga)

Community contributions offered:

- Some members of the community noted they would be happy to provide some labour as a contribution of the community, but also would want some paid work. Plus the community could provide food for labourers.
- Skills in the community included building, digging and plumbing – including some qualified labourers e.g. welders.
- The Community Development Committee can send through an inventory of skilled people.

Focal point within CDC and contact list:

- There may have been some changes to the CDC contact list, so Stanley will send through an updated list (noting a focal point for the implementation stages of the contract).

Existing partnerships to be considered for implementation:

- There were no current partnerships with NGOs, but previous support had been provided by Save the Children (Figure 12) and Red Cross. A Memorandum of Understanding may exist with NDMO around the early warning system in the community.



Figure 12: Save the Children sign, in Ontong Java meeting space (Credit: Usha Iyer-Raniga)

7.1.3. Key feedback and actions from the Ontong Java workshop

Key feedback from the Ontong Java workshop included:

1. General agreement that the engineering actions proposed were priority actions for the community.
2. An overwhelming agreement among attendees that the flooding (and associated pollution, and damage to households) is the most serious issue facing the community.
3. Some comments were made throughout about the need for Honiara City Council to execute its duties better – in terms of waste management (both for the community, and in the Mataniko catchment) and infrastructure.

Actions from the Ontong Java settlement validation workshop included:

1. Steve to send through a soft copy of the CRCDP.
2. CDC to send through inventory of skilled people in the community.
3. Stanley to send through updated CDC contact list.
4. Steve to keep the CDC informed of outcomes from PMC meeting and next steps for implementation phase.

7.2. Jabros validation workshop

The Jabros community validation workshop took place on Thursday 28 January 2021 in the hall next to the SSEC church in the community. 21 participants attended, including:

- 12 men;
- 9 women;
- Two people with disabilities;
- Six young people (below 35 years old); and
- Nine elderly people (above 50 years old).



Figure 13: Photos from Jabros community validation workshop (Credit: John Clemo)

7.2.1. Initial discussion

Following the introduction, Steve talked through the background to the project and the purpose of the workshop. Aside from the issues in the CRCDP and the brief prepared by Professor Darryn McEvoy, other points discussed and feedback from the community included:

- There was general agreement that the proposed engineering actions were the priority needs in the community.
- Steve emphasised that the actions being ranked today do not include the proposed community hall/evacuation centre. That would be funded from a different budget.
- For the evacuation centre, there would need to be land available for this, which the community needs to be able to contribute for the project. One youth noted that the open space area in front of the church (Figure 14) is used for recreation, and for Christmas events every year. So locating a building there would be a “slap on the face of these people”. So another location needs to be found for the evacuation centre that doesn’t use up the open space.



Figure 14: Aerial view of Jabros church, hall and open space area
(Credit: Google, 2021)

- For proposed water tanks, community input would be required as to location and governance/maintenance arrangements. Steve explained they would be communal tanks located strategically – e.g. a number of houses connected to a tank. Steve explained the tanks would be not necessarily for full time supply, would provide contingency e.g. for emergencies.
- One of the young members of the community raised the issue of land tenure. Steve noted that the project is not securing land tenure; that the community will have to work through the process with the Commissioner of Lands. This has been explained to the CDC and community members a number of times.
- John noted that as part of the gender and disaster work package, he and Lorraine would like to come back to the community with Vois Blong Mere to carry out workshops and a walkabout to bush gardens, to be videoed to capture some stories. This would be followed by another workshop at Rock Haven for the Jabros women to come together with women from Wind Valley and local organisations. John talked to Grace (gardening woman about this) after the workshop.

7.2.2. Ranking of actions and discussion

For Jabros and the next three communities, voting slips to rank engineering actions were prepared. These required people to put a ‘first, second and third’ (plus fourth, where a fourth action was proposed) on the slip to be counted after the workshop.

The results from the ranking of actions were as follows:

No.	Action	First priority	Second priority	Third priority
1	Water quality testing and filters for clean drinking water	8 votes	0 votes	8 votes
2	Low-flow pour flush toilet (pilots)	5 votes	9 votes	1 vote
3	Water tanks	3 votes	6 votes	6 votes

Key points from discussion:

- A woman raised the need for a stronger women’s group, which could connect with others across Honiara. Steve said the women’s representative in the CDC could help drive this. John mentioned the upcoming gender work package, which would give an opportunity to connect with Wind Valley women and representatives from other organisations.
- Another woman raised the idea of solar electricity (either at the church hall, or the evacuation centre) which could enable community development activities such as sewing machines.
- One woman asked how water filters would work. Steve responded that they would be linked with SIWA supply, so could still be subject to outages when SIWA switched supply off. So water tank supply could supplement those filters.
- Community members emphasised that formalising the land tenure remains a high priority (noting that it would be outside scope of the project).

Community contributions offered:

- Some members of the community noted they would be happy to provide some labour as a contribution of the community, and can help to locate projects.
- The CDC will send through a list of some of the skills and qualifications within the community to aid this process.
- A woman said they could help to maintain the facilities after construction.

Focal point within CDC and contact list:

- There may have been some changes to the CDC contact list, so Timothy will send through an updated list (noting a focal point for the implementation stages of the contract).

Existing partnerships to be considered for implementation:

- The community has a close relationship with the broader SSEC church network.



- Save the Children constructed the church hall (where the workshop was located), but this relationship was not active now.

7.2.3. Key feedback and actions from Jabros workshop

Key feedback from the Jabros validation workshop included:

1. General agreement that the engineering actions proposed were priority actions for the community.
2. Strong sentiments expressed about developing an evacuation centre in the open space area near the church. These perspectives need to be considered for the design and location selection process.
3. There remains some resentment about the project not supporting any land tenure formalisation process. This will have to be managed through continued communications with Jabros emphasising the need to proceed through the process at MLHS.
4. Access to water was a key discussion point, and previous meetings have highlighted the disproportionate effect on women (given their responsibilities for collecting water and for household responsibilities).

Actions from the Jabros workshop:

1. CDC to send through inventory of skilled people in the community.
2. Timothy to send through updated CDC contact list.
3. Steve to keep the CDC informed of outcomes from PMC meeting and next steps for implementation phase.

7.3. Fishing Village validation workshop

The Fishing Village community validation workshop took place on Thursday 4 February 2021 at the Ministry of Agriculture and Livestock Conference Room. The workshop was scheduled to run in the community but this was not possible due to heavy rain and no covered meeting place being available. 19 participants attended, including:

- 14 women;
- Five men;
- One person with disabilities;
- Eight young people (below 35 years old); and
- One elderly person (above 50 years old).

Note that a number of participants did not write their ages down on the participation sheet. It appears from photos that there were more like 6-7 elderly people in the workshop.



Figure 15: Photos from Fishing Village community validation workshop (Credit: John Clemo)

7.3.1. Initial discussion

Following the introduction, Steve talked through the background to the project and the purpose of the workshop. Aside from the issues in the CRCDP and the brief prepared by Professor Darryn McEvoy, other points discussed and feedback from the community included:

- There was general agreement that the actions proposed are priority needs for the community.
- A woman noted that there is fear among women when cyclones hit. She said people build up coral rock walls during calm weather, but they often wash away during stormy weather.
- Fishing is becoming more difficult: quantity and size of fish has decreased, and it is more expensive to travel further to catch fish.
- The seawall option was raised again, as discussed with the community in the past. However the community acknowledged the high cost, so it was not feasible as part of this project.

7.3.2. Ranking of actions and discussion

For Fishing Village, we prepared and printed voting slips to rank engineering actions. These required people to put a 'first, second and third' (on the slip to be counted after the workshop).

The results from the ranking of actions were as follows:

No.	Action	First priority	Second priority	Third priority
1	Communal sanitation block	19 votes	0 votes	0 votes
2	Drainage upgrades	0 votes	19 votes	0 votes
3	Biodigester	0 votes	0 votes	19 votes

Note that these results indicate that people may have simply ticked ‘first, second and third’ in the order that they appeared on the page (this did not happen in other communities using this system). As such, the discussion points below provide some further guidance on the community needs.

Key points from discussion:

- A younger community member noted the current communal toilet is relatively easier for young people than older people to access and use. So disproportionately affects older people especially during storms.
- Community members said the current toilet facilities were inadequate for the community, particularly during periods of high waves (the main communal toilet is located out on the coast). The waves either damage the toilet or make it unsafe to access and use. There was a strong feeling that a sanitation block is needed.
- One man pointed out the current waves from Cyclone Lucas – affecting the coast, making it hard to fish, and heavy rainfall. A young man said that younger people tended to stay closer to the coast, so were affected more by bigger waves.

Community contributions offered:

- People noted there are good (and trained) builders in the community, could be involved in implementation actions. Labour contributions could include digging holes and drains, sourcing stone, mixing cement, transporting materials and providing refreshments for workers.
- The CDC will send through a list of some of the skills and qualifications within the community to aid this process.

Focal point within CDC and contact list:

- Eddie (Chairman of CDC) is usually focal point, but Steve said it could be good to have someone else – share the load.
- Eddie will send through an updated list (noting a focal point for the implementation stages of the contract).

Existing partnerships to be considered for implementation:

- The community has a strong links within the SDA church.
- World Vision has been supporting the community, particularly with some post-COVID actions such as providing seeds and a small tank for washing hands.

7.3.3. Key feedback and actions from Fishing Village workshop

Key feedback from the Fishing Village validation workshop included:

1. General agreement that the engineering actions proposed were priority actions for the community.
2. While it was ranked second, there was a lot of discussion about the need for toilet facilities, given the current issues accessing and using communal toilets on the coast.
3. There is still a strong desire to manage the effects of coastal erosion and storm surge. However the community acknowledges that this will need to be pursued outside the project.

Actions from the Fishing Village workshop:

1. CDC to send through inventory of skilled people in the community.
2. Eddie to send through updated CDC contact list, with a focal point for the project.
3. Steve to keep the CDC informed of outcomes from PMC meeting and next steps for implementation phase.

7.4. Wind Valley validation workshop

The Wind Valley community validation workshop took place on Wednesday 10 February 2021 at the Ministry of Agriculture and Livestock Conference Room. The workshop was scheduled to run in the community, but this was not possible due to heavy rain and no covered meeting place being available.

21 participants attended the Wind Valley workshop, including:

- 10 men;
- 5 women;
- One person with disabilities;
- Five young people (below 35 years old); and
- Three elderly people (above 50 years old).



Figure 16: Photos from the Wind Valley validation workshop (Credit: John Clemo)

7.4.1. Initial discussion

Following the introduction, Steve talked through the background to the project and the purpose of the workshop. Aside from the issues in the CRCDP and the brief prepared by Professor Darryn McEvoy, other points discussed and feedback from the community included:

- There was general agreement that the proposed engineering actions were the priority needs in the community.
- Lack of access to appropriate toilets was a big issue for many in the community. Community members were concerned about health effects of poor sanitation.

- Water supply was a big issue facing the community, especially during rainy periods when SIWA's supply could be switched off. The well at the southern end of the community (Figure 17) is not suitable for drinking water – people wash there, and wash their clothes. However heavy rain could spoil that water as well.



Figure 17: Water source in Wind Valley (Photo from CRCDP)

- Waste management was problematic, with no HCC services meaning rubbish is often disposed of on land or in the stream. This can lead to the stream getting blocked and making flooding worse. Organic waste was a problem as well, with much of it being thrown away.

7.4.2. Ranking of actions and discussion

For Wind Valley, we prepared and printed voting slips to rank engineering actions. These required people to put a 'first, second and third' (plus fourth, where a fourth action was proposed) on the slip to be counted after the workshop.

The results from the ranking of actions were as follows:

No.	Action	First priority	Second priority	Third priority	Fourth priority
1	Water tanks (\$\$);	1	4	10	0
2	Water quality testing and filters (\$\$);	0	4	1	10
3	Low-flow pour flush toilets (\$\$);	6	5	2	2
4	Drainage upgrades (\$\$).	8	2	2	3

Key points from discussion:

- One attendee noted the challenges with steep slopes in the community, including landslips and difficulties accessing houses (Figure 18). But during disasters there is still a need for a safe evacuation route – perhaps a Jacob’s ladder up one of the hill slopes. Steve noted that there needs to be more coordination with government about plans during disaster events.
- One older man noted all the debris which washes down due to logging in the catchment. This can further block the stream, causing more flooding.
- In terms of waste management, community members said the HCC rubbish truck currently cannot access the community, so the road needs to be improved for this service. The community would be happy to provide bins if there was assurance of a regular pickup.



Figure 18: Houses on steep Wind Valley slopes (Photo from CRCDP)

Community contributions offered:

- One attendee suggested establishing groups for different parts of the community, based on the locations of their houses. Some members of the community noted they would be happy to provide some labour as a contribution of the community, and can help to locate projects.
- There are some trained builders who live in the community, could support the implementation.
- One young man said that youth sometimes feel neglected, so want to be involved in the implementation phase.
- The CDC will send through a list of some of the skills and qualifications within the community to aid this process.



Focal point within CDC and contact list:

- There may have been some changes to the CDC contact list, so Timothy will send through an updated list (noting a focal point for the implementation stages of the contract).

Existing partnerships to be considered for implementation:

- The SSEC played a role in a previous drainage project, and can help with organisation and coordinating.
- World Vision provided water tanks previously, but relationship finished in 2016.

7.4.3. Key feedback and actions from Wind Valley workshop

Key feedback from the Wind Valley validation workshop included:

1. General agreement that the engineering actions proposed were priority actions for the community.
2. Drainage (and interaction with waste management and catchment deforestation) was strongly emphasised by the community during the workshop.
3. The effects of poor sanitation on the community was a concern. Improved toilet facilities were supported by a number of attendees.

Actions from the Wind Valley workshop:

1. CDC to send through inventory of skilled people in the community.
2. Teiba to send through updated CDC contact list, including focal point for implementation.
3. Steve to keep the CDC informed of outcomes from PMC meeting and next steps for implementation phase.

7.5. Aekafo-Feraladoa validation meeting

The Aekafo-Feraladoa community validation meeting took place on Sunday 21 February 2021 at the Gwaimaoa church hall. The meeting was scheduled to run in the community, but this was not possible due to heavy rain and no covered meeting place being available.

42 participants attended the Wind Valley meeting, including:

- 20 women;
- 22 men;
- Three people with disabilities;
- Nine young people (below 35 years old); and
- Twelve elderly people (above 50 years old).

While Jericho community is one of the communities within the project area, there were no representatives from Jericho present at the workshop. The leadership group had a clashing engagement, and no other community members came to Gwaimaoa for the workshop.



Figure 19: Photos from the Aekafo validation workshop (Credit: John Clemo)

7.5.1. Initial discussion

Following the introduction, Steve talked through the background to the project and the purpose of the workshop. Aside from the issues in the CRCDP and the brief prepared by Professor Darryn McEvoy, other points discussed and feedback from the community included:

- There was general agreement that the proposed engineering actions were the priority needs in the community.
- One woman noted the population continues to grow at a rapid rate, and they are seeing more houses being built. Another man said he had noticed flood waters rising higher, and attributed it to more houses with copper roofs.
- Landslips are still a big concern of the community, especially with more development on steep slopes (Figure 20). One man mentioned the rockfall which struck a house and killed a child at night.



Figure 20: Steep slopes in Aekafo-Feraladoa (Photo from CRCDP)

- One man asked to hear the basics of climate change. What is causing it? How is it likely to affect Solomon Islands? Steve asked John to summarise for the workshop attendees, to provide some context for the ranking and further discussions.

7.5.2. Ranking of actions and discussion

For Wind Valley, we prepared and printed voting slips to rank engineering actions. These required people to put a ‘first, second and third’ (plus fourth, where a fourth action was proposed) on the slip to be counted after the workshop.

The results from the ranking of actions were as follows:

Number	Action	First priority	Second priority	Third priority	Fourth priority
1	Water testing and filters (\$\$)	9	10	12	3
2	Water tanks (\$\$)	6	11	10	7
3	Pour flush toilets (\$\$)	9	10	4	11
4	A system of biodigesters (\$\$)	10	3	8	13

Key points from discussion:

- One attendee asked about the costs of running/maintaining the biodigester. Steve said it was likely to be relatively simple, but it would be up to the community to maintain and run the biodigesters if they were provided.



- Some attendees agreed that sanitation was an issue – appropriate toilets, especially because of drinking water sources located within the community.
- There was some concern expressed about governance of the communities, for example around the election of members. Steve agreed it was important for all community members to understand this process, and encouraged CDCs to be transparent about their processes.
- One older man noted that there needs to be stronger enforcement of planning rules, as they are concerned about increasing risk from new houses being built on steep slopes.

Community contributions offered:

- There was recognition from the community that the project needs to be supported.
- The community has experience supporting the World Bank and HCC's Community Access and Urban Services Enhancement (CAUSE) project – is happy to offer labour, carrying material, water during implementation.
- There are youth and others with skills and experience, and they want to be involved and have ownership of any projects.

Focal point within CDC and contact list:

- There may have been some changes to the CDC contact list, so each CDC will send through an updated list (noting a focal point for the implementation stages of the contract).

Existing partnerships to be considered for implementation:

- The main one is the relationship with the CAUSE project. Two bridges and connected Jacob's ladders and pathways have been completed, and one more Jacob's ladder will be constructed leading up to West Kola'a.
- No other active partnerships at the moment, apart from with faith-based organisations.

7.5.3. Key feedback and actions from Aekafo-Feraladoa workshop

Key feedback from the Aekafo-Feraladoa validation workshop included:

1. General agreement that the engineering actions proposed were priority actions for the community.
2. There was interest in the system of biodigesters but also some concerns around who would maintain them, along with broader governance issues raised by the community.

Actions from the Aekafo-Feraladoa workshop:

1. CDC to send through inventory of skilled people in the community.
2. Teiba to send through updated CDC contact list, including focal point for the implementation of the project.
3. Steve to keep the CDC informed of outcomes from PMC meeting and next steps for implementation phase.

8. Project Management Committee meeting

The Climate Resilient Honiara Project Management Committee (PMC) meeting took place on 25 March 2021, at the Ministry of Environment, Climate Change, Disaster and Meteorology (MECCDM) conference room. The PMC meeting was chaired by the Undersecretary of Ministry of Housing, Lands and Survey (MLHS) Mr Buddley Ronnie. Other attendees included representatives from UN-Habitat, RMIT University, and MECCDM.

The PMC meeting noted the completion of the validation meetings, and the Committee approved the following community level priority actions (these were captured in the draft minutes dated 9 April 2021). Note that the actions in bold were approved as the number one priority action for each community.

Ontong Java	Jabros	KFV	Wind Valley	Aekafo
Flood levee along riverbank	Pour-flush toilets	Communal sanitation block	Pour-flush toilets	Pour-flush toilets
Footpath / stormwater drainage	Water tanks	Footpath / stormwater drainage	Drainage network	Water tanks
Water tanks	Water quality testing / filters for clean water	Biodigester	Water tanks	Water quality testing / filters for clean water
			Water quality testing	Biodigesters

The minutes from the meeting also noted the action for UN-Habitat to “prepare detailed proposals on implementation modalities for PMC and share via email”.

Steve also noted that initial discussions had taken place with Ministry of Infrastructure Development (MID) regarding options and approaches for local contracting for implementation. Steve will continue to liaise with MID and the CAUSE project regarding appropriate and experienced contractors and partnership options.

9. Key findings of validation workshops and next steps

9.1. Key findings of validation workshops

The validation workshops sought feedback on the proposed engineering actions, and asked the five communities whether there was general agreement that these were priority actions. All five communities agreed that the actions proposed were priority actions. This was reported to the PMC meeting in March 2021.

Each of the communities has a responsibility to consider how to support the implementation process, including:

- providing community views about location and design of some actions (such as water tanks);
- sending through inventories of key community members' skills to support implementation, such as building or plumbing expertise; and
- ensuring they have a focal point within their CDC for the implementation stage of the project.

Some communities noted their desires for certain actions which are outside the scope of the project. These queries, and the project team's responses, can be summarised as follows:

Community	Query/issue	Response from project team
Fishing Village	Construction of seawall to manage coastal effects of climate change and natural disasters	Steve emphasised that the cost for a seawall was too high to be provided as part of the project. Steve noted that the community can seek external support for this if they want to pursue the seawall construction. This was understood by the community.
Jabros	Formalising land tenure through subdivision process	This issue has been raised during many community meetings and again at the validation workshop. Steve noted this was outside scope of the project, and said the community must work with the Ministry of Lands, Housing and Survey to complete this process. Steve was happy to direct community leaders to the right staff at MLHS for this purpose.
Wind Valley	Evacuation centre / Jacob's ladder	Wind Valley community has raised their lack of evacuation centre and appropriate evacuation pathway during a number of meetings. Currently the community evacuates down through the valley entrance (which can be flooded) during disasters. They are aware an evacuation centre or Jacob's ladder is outside scope of the project. Steve noted that the CAUSE project may be able to support the construction of a Jacob's ladder.

9.2. Next steps

As noted in the minutes from the PMC meeting, UN-Habitat will prepare detailed proposals for implementation modalities based on the priority actions confirmed in the meeting. RMIT will continue to provide scientific support. All actions are subject to funding, and budgets will be confirmed and finalised prior to tender processes being commenced for the actions.

Steve will continue to follow up with communities regarding action points from the meetings, including around locations of the Jabros evacuation centre, water tanks (where selected for communities), sanitation blocks (where selected) and details of CDC members.



Steve will also continue to liaise with MID and CAUSE project regarding appropriate contractors, to inform the tender process for the implementation actions.

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UN-Habitat (2020c). *Fishing Village Climate Resilient Community Development Plan*. Published August 2020.

UN-Habitat (2020d). *Wind Valley Climate Resilient Community Development Plan*. Published August 2020.

UN-Habitat (2020e). *Aekafo-Feraladoa Climate Resilient Community Development Plan*. Published August 2020.

Appendix A: Example workshop brief

Verification of climate resilient community development plan (Aekafo-Feraladoa)

1) Print outs

- Several copies of Community Development Plan to be shared (B&W).
- Household change over time (from Development Plan).
- Climate hazards (large colour print out, p7, 8 & 9).
- Engineering map (large colour print out, p12).

2) Purpose of the workshop

- Introduction and briefly summarising UN-Habitat CRH project.
- Pass out copies of Climate Resilient Community Development Plan.
- Explain that the community development plan is based on consultations with community members, site visits by engineers, and analysis of geospatial data by RMIT University (maps to be shown as a large print out). This provides the necessary scientific evidence for actions to be proposed.
- Today's workshop is to verify actions listed in the plan and an opportunity for everyone to provide feedback before actions are sent to the Project Management Committee (PMC) for final approval.
- There is a fixed budget for the implementation of actions in each community, therefore it will also be useful to get community feedback on the ranking of priority local actions as it may not be possible to fund all actions that have been identified.
- Depending on who is present, demographics, etc, it is very important that we highlight the importance of hearing from everyone in the community (e.g. women and youth) and to allow all members to communicate their perspectives on the proposed implementations. [Delay start of workshop to allow more people to come if needed].

3) Profile

- Refer to 'change over time' tables. Highlight large increases in zones 20 - 22.
- Ask for additional feedback about how recent changes has impacted vulnerability (is there any male v female narrative etc?).

4) Climate-related vulnerabilities

- Refer to flood and landslide risk maps (large colour print out).
- Refer to climate vulnerabilities map (large colour print out).
- Talk everyone through the vulnerabilities, using text next to icons.
- Highlight the steep landscape of the community and risk of flash flooding on valley floors.
- Group discussion: does everyone agree with the vulnerabilities identified?



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5) Community issues

- Briefly summarise the issues that have been identified: lack of basic infrastructure, access to health and educational facilities, rainwater storage, lack of road access and housing quality, lack of community spaces, access to bush gardens, and limited sanitation.

6) Proposed engineering actions

- Four priority engineering actions have been identified:
 - 1) water testing and filters (\$\$);
 - 2) water tanks (\$\$);
 - 3) pour flush toilets (\$\$);
 - 4) a system of biodigesters (\$\$).
- [Explain \$\$\$ - high cost; \$\$ - medium cost; \$ - low cost]. Two city-wide actions will also directly benefit A-F: retention basins (\$\$\$) and climate resilient buildings (\$).
- **Water quality testing and filters for clean drinking water:** Existing sources of water will be tested for quality. This will be supported by filters to provide clean drinking water at a household level. Proposed implementation partner is a local NGO (to be confirmed), though potentially it could also set up as a community social enterprise scheme (12 month project). Exact set-up to be discussed with community members.
- **Water tanks:** Pilot households have access to affordable rainwater harvesting technology that is easy to maintain and provides sufficient water to supplement household demand. Requires community input to map out a suitable local implementation plan. Intended implementation partner is a local NGO.
- **Low-flow pour flush toilet (pilots):** Pour flush toilets are a simple, improved sanitation set-up which use water to dispose of human waste. Existing toilets require relatively large quantities of water for flushing. However, there are an increasing number of low capacity pour flush toilets, such as the SaTo pan, that could be used. Intended implementation partner is the World Bank CAUSE project.
- **Biodigesters:** Biodigester for organic food and pig wastes (reduction of waste, but also generation of bioenergy and production of liquid fertiliser for farming application). Each digester can serve a cluster of nested set of houses. These will be sited in consultation with community leaders, but could be used to generate power for churches, community buildings, etc., as well as producing fertiliser for gardens. Community input needed to identify locations for pilots, be involved in maintenance training, and collect data for evaluation purposes to ensure maximum efficiency. Intended implementation partner is a local NGO.
- Explain that these local engineering actions are only one component of the CRH project, specific to the settlement. Other components that target city-wide improvements have



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actions that will also benefit the community including disaster planning (as well as the greater role of women), training for upgrading houses to be more resilient to extreme events, retention basins, and training in urban organic farming best practice. The design of a linear park for the Mataniko catchment area is also proposed.

7) Group discussion (though could also be done as break out groups depending on numbers)

- Q1: is there general agreement that these are priority needs for the community?
- Q2: with an understanding that there is limited funding available for each case study settlement, are there other local actions that should be considered?
- Q3: what is the ranking of each engineering action, and why (ask for any community feedback on each proposed action)?
- Q4: how would community members like to be involved in the implementation phase (Good to note capacities, skills & resources - e.g. trained labour, materials, etc. - that could be co-contributed here)?
- Q5: moving forward into the implementation phase, can we have up to date details of members of the CDC, and which of them are the best points of contact for follow up activities in the community next year (telephone numbers and also hopefully email addresses)?
- Q6: are there strong existing partnerships with civil & faith-based societies/orgs that the project needs to consider in the implementation phase?

8) Thanks and next steps

- RMIT will take on board any feedback received from the workshop and will update the community development plan as necessary.
- The development plans, and proposed list of engineering actions, will be submitted to the Project Management Committee (MLHS, MECCDM and HCC) for approval in late November. Actions will be subject to available budget as determined by UN-Habitat and will start in early 2021.
- Results of the approval process to be conveyed back to the community before the end of the year.
- RMIT will sign a new agreement of cooperation with UN-Habitat to develop detailed engineering designs. The RMIT engineers will collaborate with local implementation partners who will need to visit the settlement to collect the necessary scientific data to inform the designs (so will need access to the community to collect data – hence the need for a best contact point), and will also provide remote support for the implementation phase.