TERMINAL EVALUATION –

MANAGING RISKS ASSOCIATED WITH GOLD RIDGE MINES TAILINGS STORAGE FACILITY PROJECT

UNDP SOLOMON ISLANDS

FINAL REPORT

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My deepest gratitude to all.

Abhijit Bhattacharjee, 27 November 2018

Summary Table	
Agency Name	United Nations Development Programme (UNDP), Solomon Islands
Partners	Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), Ministry of Mines, Energy and Rural Electrification (MMERE) and Ministry of Health and Medical Services (MHMS) of the Solomon Islands Government
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Evaluation Commissioner	Azusa Kubota, Head of Country Office, UNDP Solomon Islands
Evaluation Manager	Jiye Suh, Project Manager for the TSF Risk Management Project, UNDP
Evaluation Type	Country level project evaluation
Evaluation Dates	November-December 2018

Abbreviations used

DFAT	Department of Foreign Affairs and Trade, Government of Australia
GCIL	Guadalcanal Community Investment Limited
GRM	Gold Ridge Mine
GRCP	Gold Ridge Contingency Plan
KII	Key Informant Interview
KTDA	Kolobisi Tailings Dam Association
M&E	Monitoring and Evaluation
MDA	Matapono Downstream Association
MDPAC	Ministry of Development Planning and Aid Coordination
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MHMS	Ministry of Health and Medical Services
MMERE	Ministry of Mines Energy and Rural Electrification
NDC	National Disaster Council
NDMO	National Disaster Management Office
NDMP	National Disaster Management Plan
NPHL	National Public Health Laboratory
OCHA	Office for Coordination of Humanitarian Affairs
PDC	Provincial Disaster Committee
ToR	Terms of Reference
TSF	Tailings Storage Facility
WHO	World Health Organization

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EXECUTIVE SUMMARY

Introduction

The Gold Ridge Mine Tailings Storage Facility (TSF) on the main island of Guadalcanal in Solomon Islands is part of a bigger tailings storage system which poses risks to the surrounding communities. The Solomon Islands Government (SIG), in partnership with UNDP Solomon Islands, developed a project (*Managing Risks Associated With Gold Ridge Mines Tailings Storage Facility Project*) in 2016 to assess and manage the risks associated with the TSF, as well as build general capacity of the Government to manage disaster risks facing communities in the country. The project, funded by the Department of Foreign Affairs and Trade (DFAT) of the Australian Government, was implemented jointly by the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) and Ministry of Mines, Energy and Rural Electrification (MMERE) during the period June 2016 to December 2018. The project intended to deliver three main outcomes, namely:

i. Contingency plans to respond to natural disaster events related to the TSF;
ii. Strengthen the existing capacity of MECDM, MMERE, Ministry of Health and Medical services (MHMS) and other key stakeholders to effectively monitor the situation for risk management, early warning and response; and
iii. Conduct an environmental and socio-economic assessment of potential areas which will be affected in the event of a disaster arising from the TSF.

An independent evaluation of this project was conducted during November-December 2018 to assess progress; this report presents the methodology, findings, conclusions and recommendations of the evaluation. The evaluation followed a mixed-method approach involving document research, purposively selected key informant interviews with stakeholders and field visits to a small sample of communities in the vicinity of the TSF.

Key findings

Outcome 1: Contingency planning

The project led to production of a contingency plan (CP) focusing on early warning and life-saving interventions in the event of flooding caused by rains and overflow or breach from the tailings dam. The contingency plan defined the minimum preparedness actions, sectoral response and preparedness plans, early warning procedures and coordination and management arrangements for various scenarios, including the priority scenario of spillovers, as well as dam collapse. The NDMO currently continues to spearhead the CP, though in the long run, the main custodian of the institutional CP will be the Guadalcanal Provincial Administration (GPA) once the latter has acquired the necessary human and financial resources to support it.

Besides the above national level CP, the project identified 31 at-risk downstream communities and drafted CPs for each community. Community members from each of the identified areas were trained in basics of early warning, disaster preparedness and response, including evacuation plans, in the event of any flood or disaster associated with the TSF. Though communities are familiar with flood risks and have developed coping mechanisms to deal with frequent floods and cyclones, the risk posed by the TSF, particularly the threat of arsenic and cyanide contamination from spill overs and sediment overflow from the dam, appears to be the biggest concern now. The project helped undertake three technical studies to understand the hydrological and geotechnical influence on TSF

safety and possible impact on physical environment in an event of a major contamination. The assessment reports have provided vital data for the SIG to manage the risks associated with the TSF/RWD. The MECDM has taken the lead in ensuring that the new mine operator takes into account the findings and recommendations from these studies in developing their plans for future redevelopment of the Gold Ridge Mine.

Outcome 2: The capacity of SIG on early warning, detection and response

The project's main contribution has been in delineating the roles and responsibilities of key institutions /ministries (namely, the MECDM, MMERE and MHMS) with regard to monitoring of key risk parameters, early warning and response to any threat arising from the TSF. Monitoring of the TSF is being undertaken by various agencies of the SIG. However, there is no effective coordination in place to see that data collected are analyzed and shared with the interested stakeholders. The village level disaster risk plans created space for the NDMO to engage with communities in identifying local hazards and plan measures to manage the risks. More will need to be done in terms of regular and transparent communication with communities, with the engagement of senior leaders of the government and mining authorities.

Outcome 3: Project management

The implementation of the project has been delayed, requiring two extensions. Part of the reason is that the complex technical nature of the project required preparatory time for UNDP to get going during the later half of 2016. For community contingency planning, UNDP had to bolster the capacity of NDMO with additional support provided through national consultants during 2017 and 2018. The project's progress was reviewed every quarter and where necessary, the logframe as revised to take into account any changes felt to be necessary.

Conclusions

Relevance

The project strategies are well aligned with the United Nations Development Assistance Framework (UNDAF) focus on knowledge management and capacity development. The central outcome of the project, contingency planning, is directly in line with key priority focus areas of the National Development Strategy (NDS) of the SIG. The project design was based on an in-depth analysis of the context arising from closure of the mine operations and built on the ongoing monitoring and assessment work that various ministries /agencies of the SIG had been carrying out during 2013-2016. The project's results chain (logframe) and strategy are clearly aligned with the overall goal of the project to strengthen institutional capacity of key institutions to effectively monitor risks associated with the TSF and RWD.

Effectiveness

The project achieved all its intended outputs under the outcome 1 area. All vital data required for managing the TSF-related risks are now available and risk mitigation measures can be planned by responsible agencies. Community risk management plans have been developed and a general level of awareness among the downstream communities exist. The experience gained from its work with Guadalcanal communities which was the focus of this project has enabled the NDMO to begin to roll out community contingency planning process throughout the country. Regarding outcome 2, capacity enhancement of key government agencies has been achieved to a limited extent through provision of equipment to three key ministries involved in the project. Provincial level capacity to take forward disaster management agenda still remains limited. Coordination among agencies remains a gap, especially with regard to sharing of data and developing a unified approach to assessing risks.

The project benefitted from UNDP's handling of the complex technical nature of project management, particularly with regard to drawing up the ToR for the technical studies and procuring of services of specialist experts, besides the former's ability to bring on board key government departments and UN agencies (OCHA and WHO) together to work on the project. One lesson emerging from this project is that for projects requiring such technically complex multi-disciplinary interventions, coordination mechanism among different agencies/ministries needs to be built in the project design. In this instance, coordination has been slow in the absence of an inter-ministerial governing mechanism within the SIG, compromising the effectiveness of the project as sharing of data and collaboration between agencies remains problematic. Another important lesson is that adequate time and resources needed to be in place for dissemination and internalization of complex technical reports written by specialists.

Efficiency

The project implementation was slow in the initial stages. Considering the complex technical nature of the project for which expertise within the country was very limited, on the one hand, and getting three different ministries to work together, on the other, perhaps the 18-months' duration initially envisaged was over-ambitious. The project management (outcome 3) appears to have been slightly expensive, with nearly 20 per cent of projected expenditure going into it when compared with the originally budgeted allocation which was slightly above 12 per cent of the project cost. This was necessitated by the need to hire specialised international technical expertise to support the project.

Sustainability

The project's key results namely, contingency plans and assessment of the TSF risks, are now with the GIS to act on and monitor on a regular basis. The contingency plans, led by the NDMO, are now being put into action through community disaster prepared interventions, and are likely to be extended to other provinces for which alternative funding for NDMO is now in the pipeline. Moving forward, the SIG now has all necessary tools and information to ensure evidence-based risk management, moderated by effective coordination among agencies.

Lessons

- As coordination within the Government institutions in Solomon Islands is weak, UNDP, donors and all agencies supporting the government need to continually advocate through various projects for streamlining coordination among agencies, especially for disaster management.
- Another important lesson is that adequate time and resources needed to be in place for dissemination and internalization of complex technical reports written by specialists.

Recommendations

No	Recommendations
R1	Working with other Ministries and the mine operator, NDMO needs to strengthen and develop a consistent communication strategy to keep communities well informed of risk management measures being undertaken with regard to the TSF/RWD.
R2	The SIG needs to strengthen the system for sharing of relevant data between the MHMS, MECDM and MMERE with regard to various safety and environmental parameters of the Gold Ridge mine.
R3	The SIG needs to clearly identify the capacity needs and develop MMERE's capacity for monitoring the structural issues related to the dam on an ongoing basis.

1. INTRODUCTION, SCOPE AND METHODOLGY OF THE EVALUATION

Introduction and background

1.1 Introduction to the evaluation

1. The Gold Ridge Mine Tailings Storage Facility (TSF) on the main island of Guadalcanal in Solomon Islands is part of a bigger tailings storage system which has been operating since 1998 on a 25 years' lease. The tailings storage system comprises the main TSF embankment covering a water treatment plant with separate (now combined) sedimentation and discharge ponds and a Return Water dam (RWD) upstream for storing treated water to be reused in the gold processing plant. During 2014, following heavy rainfalls, there were severe floods which exposed vulnerability of the structure. Since then, the TSF and RWD have been constant threats to the surrounding communities, particularly as the mine is not operating following a change in ownership of the mining company. The closure of the Gold Ridge Mine (GRM) in 2014 meant that maintenance of the water balance in the tailings storage system could not be sustained.

2. The Solomon Islands Government (SIG), in partnership with UNDP Solomon Islands, developed a project (Managing Risks Associated With Gold Ridge Mines Tailings Storage Facility Project) in 2016 to assess and manage the risks associated with the TSF/RWD, as well as build general capacity of the Government to manage disaster risks facing communities in the country. The project was implemented jointly by the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) and Ministry of Mines, Energy and Rural Electrification (MMERE) during the period June 2016 to December 2018. In order to take stock of progress made and draw lessons from various activities carried out within the project, an independent evaluation was conducted during November-December 2018, and this report presents the methodology, findings, conclusions and recommendations of the evaluation.

1.2 The project context and objectives

3. The context within which this project has been implemented is described in detail in the project document (ProDoc)[1] and Annual Reports. Solomon Islands face a high exposure to natural disasters and likelihood of extreme events. The last mine operator, Santa Barbara Mining Company,[2] ceased the mining activity in April 2014 and left the TSF and RWD unattended, posing a threat to the communities in its vicinity. Given that the mine is located in a seismically active region with high average annual rainfall of 3000mm-4000mm per annum, the threat of the dam collapsing or overflowing remains a risk that needed to be verified through an

[1] Solomon Islands Government/UNDP. Managing risks associated with the Gold Ridge Mine Tailings Storage Facility, Project Document (June 2016 – Dec 2017)

[2] The Gold Ridge Mine has changed ownership a few times since it was commissioned in 1998. Initially owned by Ross Mining (1997) which was purchased by Delta Mines in 1998. In 2010, Allied Gold acquired the company which was in turn bought by Santa Barbara in 2012. The latter sold the company to Gold Ridge Community Investment Limited (GCIL) in 2015. Currently, three companies jointly own the mine – Wangou International Mining Group hold controlling share (Hong Kong, 70%), with AXF Resources (Aus, 20%) and GCIL (10%) holding the remaining shares.

appropriate physical investigation. In addition, the TSF no longer has the capacity to hold runoff from a 100mm rainfall in 24 hours. From the years of operations there has been increase in the amount of sediments/tailings in the TSF, raising concern that the sediments contained high concentrations of arsenic and cyanide, and therefore needs to be properly assessed at different depths to ascertain the level of contaminants.[3]

4. Following the floods in early 2014, UNDP sought assistance of the United Nations Disasters Assessment and Coordination (UNDAC) to provide technical guidance on identifying the risks and future actions. The report submitted by UNDAC[4] experts formed the basis of this comprehensive project. The project seeks to enhance mechanisms and institutional capacity to effectively monitor and reduce the risks associated with the Gold Ridge TSF and RWD in the event of any breach or disaster affecting it. The project intended to achieve this by delivering three main outcomes, namely:
   i. Contingency plans to respond to natural disaster events related to the TSF;
   ii. Strengthen the existing capacity of MECDM, MMERE, Ministry of Health and Medical Services (MHMS) and other key stakeholders to effectively monitor the situation for risk management, early warning and response; and
   iii. Conduct an environmental and socio-economic assessment of potential areas which will be affected in the event of any disaster arising from the TSF.

5. The project also complemented and catalyzed ongoing initiatives by the Solomon Islands Government towards implementation of its National Disaster Risk Management Plan, 2010. Previous initiatives were hamstrung by weak technical capacity for hazard and risk assessment, community level disaster risk preparedness and early warning capability. This project aimed at addressing some of the gaps under the preparedness planning activities, particularly pertaining to downstream communities, while at the same time focusing on the specific risks emanating from the TSF/RWD.

6. The project activities were directly implemented under national implementation modality, with support from UNDP, by the MECDM and MMERE. UNDP's support to the project is delivered through a Project Management Unit (PMU), headed by a Disaster Risk Reduction and Management Specialist/Project Manager. The project aims at developing capacities across the three-tiers i.e. enabling environment, organizational/institutional and community levels. It includes sustaining support to institutionalization, capacity building, knowledge building and advocacy through a participatory process with key stakeholders.

7. **Project outputs and results**: The project comprises 3 components with respective outcomes to achieve the project goals. The first component is to develop contingency plans at institutional and community levels. Second is to strengthen government's capacity for monitoring the TSF, and the last component is to establish management system for successful project implementation. The project document (ProDoc) outlines the following specific outputs and results intended by the project (Table 1):

[3] UNDP (2016). Concept Note - Risk management and mitigation of the Tailings Dam and Return water dam at Gold Ridge mine.

[4] Joint UNEP/OCHA Environment Unit (2014). Gold Ridge Tailings Storage Facility Assessment, Solomon Islands. United Nations Disaster Assessment and Coordination, April / May 2014

Table 1: Outcomes and key outputs of the project

Project goal: **To strengthen institutional capacities to effectively monitor risks associated with the Gold Ridge Mining TSF & RWD.**	
Outcomes	**Outputs**
Outcome 1: Contingency Planning exercise conducted and completed in an inclusive and participatory manner	Output 1.1: A comprehensive contingency plan to reduce and manage all risks associated with the TSF and the RWD in place.
	Output 1.2: Villages which may be potentially affected by any disaster emanating from the TSF will have village or community disaster preparedness and response plans with clearly identified early warning and evacuation procedures and leadership and coordination structures as well as available resources at the community level.
	Output 1.3: TSF and RWD modeling conducted to inform contingency planning.
	Output 1.4: Catastrophic dam-break scenario modeling undertaken.
	Output 1.5: Key impact from spillovers identified and incorporated into contingency planning.
	Output 1.6: Assessment of TSF Tailings sediments-depth, volume, contaminant levels, density, chemical interaction with surface waters.
Outcome 2: The capacity of SIG on early warning, detection and effective response enhanced	Output 2.1: The National Disaster Management Office (NDMO) capacitated to undertake regular monitoring of Tailings dam water level, rainfall, arsenic and turbidity and make these available to relevant agencies for enhanced early warning and detection capacity.
	Output 2.2: Capacity of the National Public Health Laboratory of MHMS and Geochemistry Laboratory of MMERE for regular testing and monitoring assessed and gaps reduced.
	Output 2.3: Members of downstream and affected communities fully made aware of possible risks and mitigating measures through the design and roll out of awareness programmes.
	Output 2.4: Capacity of SIG staff enhanced to monitor tailings dam and downstream areas independently.
Outcome 3: Project Management systems and mechanisms for sound project execution and results delivery	Output 3.1: Coordination mechanisms and effective project management ensured.
	Output 3.2: Effective Monitoring and Evaluation (M&E) mechanism in place.

(Source: Project logframe, Terms of Reference, Annex 1[5])

[5] UNDP Solomon Islands (2018). Terms of Reference for Terminal Evaluation - Managing Risks Associated With Gold Ridge Mine TSF Project

Table 2: TSF Risk Management Project - financial status, 2016-2018

	Expenditure		Projected Expenditure[6]	Total (US$)
	2016 (US$)	2017 (US$)	2018 (US$)	
Outcome 1	46,064.35	162,933.03	282,300.10	491,297.48
Outcome 2	5718.17	37,326.01	66,887.16	109,931.34
Outcome 3	6,490.75	45,124.13	107,156.30[7]	158,771.18
TOTAL	**58,273.27**	**245,383.17**	**456,343.56**	**760,000.00**
	Donors	**US$**		
	DFAT	725,748.39		
	UNDP	34,251.61		
	Total	**760,000.00**		

(Source: UNDP Solomon Islands, 21 November 2018)

1.3 Scope and objectives of the evaluation

8. The scope of the evaluation covers various activities undertaken since June 2016 up to the time of the evaluation. As described in the inception report (Annex 2),[8] the terminal evaluation examined results, achievements and challenges faced in the course of implementation of the project, with emphasis on learning and accountability. The evaluation used the following criteria based on UNDP evaluation guidelines to draw conclusions and make recommendations: *relevance, efficiency, effectiveness and sustainability*. The evaluation criteria, methods and questions addressed in the evaluation are provided in the inception report.

1.4 Key stakeholders

9. The primary stakeholders of the evaluation are UNDP country office, OCHA, MECDM (NDMO), MMERE, Ministry of Health and Medical Services (MHMS) and National Disasters Council (NDC) of the SIG. Secondary (indirect) stakeholders are communities in disaster-prone areas of Solomon Islands who are potentially directly affected by the course of action that is taken to address the risks associated with the TSF/RWD.

1.5 Organisation of the evaluation and declaration of conflict of interest, if any

10. The evaluation was commissioned by UNDP country office (CO) and managed by its Project Manager for this project. Through an international recruitment process, an independent consultant was contracted to conduct the evaluation. The consultant had never worked for UNDP Solomon Islands or any of its partner agencies in the past, nor was the consultant being

[6] These figures may change when final expenditure statement is produced by UNDP at the end of December 2018.

[7] This includes an amount of US$ 4,214.08 for hiring a national consultant to support NDMO in contingency planning (Outcome 1). So the net amount spent on outcome 3 during 2018 is projected to be US$ 102,942.22, bringing the total amount over 2016-2018 to US$ 154,557.10

[8] Inception report, UNDP Solomon Islands – Terminal Evaluation of Managing Risks Associated With Gold Ridge Mine Tailings Storage Facility (TSF) Project

considered for any other engagement as staff or consultant for UNDP CO at the time of the evaluation.

Methodology

1.6 Methods and data sources

11. The evaluation followed a mixed-methods approach involving document research, purposively selected key informant interviews (KIIs) with stakeholders and field visits to a small sample of disaster-prone communities who are also potentially affected by risks arising from the TSF/RWD. Detailed methodology is provided in the inception report. The evaluation matrix (Annex 3) developed during the inception stage and agreed with UNDP formed the basis for the evaluator to address the evaluation questions using different sources and methods of data collection and analysis. As is customary with mixed-method evaluations, triangulation with multiple sources of data comprising interviews and desk reviews was crucial for developing the evidence-base for this evaluation. Where discrepancies occurred that could not be resolved, the evaluator has not used such data for drawing conclusions or lessons and recommendations.

12. The evaluation interviewed a total of 20 key informants – a breakdown of the key informants is provided in Table 3 below. Generic lead questions the evaluator used during interviews is provided in Annex 4 and a full list of key informants provided in Annex 5. Besides key informant interviews, the evaluator undertook substantial desk-based research, drawing on progress reports, studies and related documents provided by UNDP (a list of documents attached as Annex 6).

Table 3: Breakdown of key informants, Terminal Evaluation, TSF Risk Management Project

Stakeholder group	No of key informants
UNDP & OCHA	4
Solomon Islands government staff (MECDM, NDMO, MMERE, MHMS)	8
Provincial authority	1
Community members (communities visited: St. Mary and Babani)	4
Others (mining company, donor)	3
Total	**20**

(Source: Compiled by the evaluator, Terminal Evaluation 2018)

1.7 Evaluation ethics

13. The evaluation process ensured that the evaluator adhered to the following protocols in interactions with all stakeholders:

- *Informed consent* - the purpose of the evaluation and how data was to be used was explained to all participants who voluntarily gave their consent to participate in the evaluation;
- *Respect of rights* of those involved in evaluation process - participants had the option of not answering any or all of the questions asked;
- *Anonymity* – all information and/or views provided by the participants were on anonymous basis and the evaluator has not attributed any of the observations, findings and conclusions to any individual or organisation, unless explicitly authorised by interviewees in writing, nor

was information provided by individual interviewees shared with third-parties, either orally or in writing, or transmitted electronically;
- *Respect dignity* - interviews and data-gathering were conducted in a way that respects individual's dignity;
- *Ensuring inclusivity* – all voices were heard without any judgement made by the evaluator, ensuring respect to privacy and confidentiality.

2. FINDINGS OF THE EVALUATION

2.1 Outcome 1: Contingency planning

14. The project's emphasis has been on contingency planning for managing risks associated with the TSF/RWD structures, based on scientific assessment of risks on the one hand, and community contingency planning for downstream communities to ensure disaster preparedness in cases of possible disasters associated with the TSF and RWD, on the other.[9] The contingency planning included undertaking several in-depth studies on geo-technical, hydrological and environmental aspects to assess the level of risks that informed the contingency plan (CP).

TSF contingency plan

15. When the mining company ceased its operations (2014), risk management associated with the TSF/RWD became a central concern at the time, as a non-operating mine increased risks from the TSF which needed regular water pumping / recycling and dewatering, besides monitoring of its sedimentation and structure. In the absence of the mine operator, there was no agency within the SIG responsible for undertaking these maintenance tasks, thus amplifying the risks for the local communities, though the SIG was pursuing options to get the mining operations restarted for its vital importance to the national economy. The SIG had already established a National Disaster Management Office (NDMO) within the MECDM under the National Disaster Management Plan (NDMP). However, there was no CP in the country[10] that could enable different agencies of the SIG or provincial government to launch a coordinated response in the event of any of the risks posed by the TSF materializing. The lack of a CP or a coordinated institutional mechanism was brought to the fore after spill-overs from the tailings dam in 2014 and April 2016.

16. The project brought several agencies of the MECDM (NDMO, Environmental Conservation Division), MMERE and MHMS together to develop a common and evidence-based understanding of the risks posed by the Gold Ridge Mine TSF for surrounding and downstream communities. With NDMO in the lead, the project facilitated in the first part of the CP process the development of a disaster response and preparedness plan, focusing on early warning and life-saving interventions in the event of flooding caused by rains and overflow or breach from the tailings dam. This was a significant contribution of the project as one of the gaps and challenges identified in the inception phase of the project was the lack of inter-ministry

[9] Solomon Islands Government/UNDP (2016). Managing risks associated with the Gold Ridge Mine Tailings Storage Facility Project Document (June 2016 – Dec 2017)

[10] Solomon Islands Government. Gold Ridge Mine Tailings Storage Facility - Contingency Plan, Version 2.1 (15/02/2017)

communication and coordination to manage, monitor and respond to any disaster events caused by natural hazards to the TSF.[11] Key informant interviews (KII) with SIG officials confirmed that traditionally they were not used to working in a collaborative approach going beyond their line Ministries, and this project provided a platform for this. A Technical Working Group (TWG) was set up in early 2017 to help identify data and knowledge gaps by the relevant government divisions that collected data from the Gold Ridge TSF, and agree on a coordination mechanism for monitoring and reporting process in respect of the Gold Ridge TSF. The contingency plan which was developed by February 2017 clearly defined the minimum preparedness actions, sectoral response and early warning procedures, coordination and management arrangements for various scenarios, including the priority scenario of spillovers, as well as, dam collapse.[12] As part of the process, a simulation exercise was also carried out to test the operability of the CP that was developed.

17. The main custodian/owner of the institutional CP is the Guadalcanal Provincial Administration (GPA). Once developed, the project office in collaboration with NDMO focal point conducted a contingency plan familiarization workshop for the provincial staff.[13] Key informant interviews indicated that ownership of the CP by the GPA is weak as the capacity of the provincial office in relation to manpower and finance to manage and implement the plan is limited. Until this happens, the NDMO currently continues to spearhead the CP. This provides an added advantage in that the NDMO, being a national institution under the aegis of the MECDM, is in a better position to leverage national institutions, which is crucial for a coordinated approach.

Community contingency planning

18. The project identified 31 at-risk downstream communities who might be potentially affected by any disaster associated with the TSF, and draft CPs for each community has been prepared during 2018. Key informant interviews with community members in 2 communities visited by the evaluator indicated that community members from each of the identified areas were trained in basics of early warning, disaster preparedness and response, including evacuation plans, in the event of any flood or disaster associated with the TSF. The preparedness training covered multiple hazards, namely floods, tropical cyclones and dam break scenario. Community leaders interviewed asserted that they were now better aware of the risks. In this regard, it is worth noting that NDMO has been working with several communities to test the Community-Based Disaster Risk Management (CBDRM) tools for some years now, with assistance from several other agencies (International Federation of Red Cross and Oxfam support was mentioned). This project enabled it to refine these tools, map local risks and set up community groups. The village leaders have been trained in risk assessments and preparedness planning through simulation exercises. NDMO now has eight (8) trainers to train communities in CBDRM, according to one key SIG informant. All the 31 communities now have a village disaster risk committee and a disaster risk plan for their respective communities. The Village Disaster Risk

[11] UNDP (2017). Managing Risks Associated with Gold Ridge TSF Consultation Workshop for Technical Working Group Report, June 01 2017

[12] UNDP (2017). Managing risks associated with the Gold Ridge Mine Tailings Storage Facility Project, Progress Report, Quarter 1, 2017.

[13] UNDP (2017). Managing risks associated with the Gold Ridge Mine Tailings Storage Facility Project, Progress Report, Quarter 2, 2017.

Plans follow a standard format covering all critical areas (Box 1) that villagers need to prepare for and be aware of.

Box 1: Core contents of a Village Disaster Risk Plan

1. Response Mechanisms - Village Disaster Risk Committee role and composition
2. Warning System
3. Village Profile
4. Hazard Assessment
5. Vulnerability and Risk Assessment
6. Community Disaster Risk Plan
7. Response Arrangements
8. Warning Alert System for multiple Hazards -
   - Cyclone and Wave Surge
   - Tsunami
9. Flooding - Flood warning through the Solomon Island Broadcasting Corporation (SIBC); Local level early warning for flooding Community Hazard Map
10. Village Disaster Risk Committee Contact Directory
11. Village Disaster Risk Plan Review

19. At the heart of the community contingency planning process has been direct and regular engagement between NDMO and other SIG ministries (water resources, for instance) with communities. Working with communities, NDMO and the Ministry of Water Resources are now identifying local risks and vulnerable points that pose enhanced risks. Local level early warning and alert mechanisms (sounding sirens, church bells etc.) to warn people of impending dangers are being put in place.

20. Interviews with communities indicated that, with the exception of the 2014 floods caused by heavy rains brought by tropical cyclone *Ita* which was one of the "worst flooding ever seen,"[14] people are used to dealing with the risks of regular floods in the area. Communities often welcome floods as these bring fine fertile silt which enhances fertility of their land. However, now their biggest concern appears to be the risk posed by the TSF, particularly the threat of arsenic and cyanide contamination from spill overs and sediment overflow from the dam. Though hydrological studies and regular monitoring data obtained by the National Public Health Laboratory (NPHL) of the MHMS show that the contamination, if any, have been very low and within WHO's permissible limits, the fear factor is strong. The perceived risk from the TSF gets amplified by the fact that the mine remains non-operational. The TSF is designed to store sediments and solid discharge from the mines, and any water that comes with sediments is meant to be recirculated, but with the plant not operating and rain and run-of water getting into the structure, the threat increases. Periodic dewatering was also done by the mine operator during flood season.

21. KIIs with community members, provincial administration and NDMO officials revealed that, as has been the experience with early warning systems in many developing countries, last-mile warning remains a key challenge. Villagers do not use radio as extensively as they used to in the past; mobile technology and social media which are used extensively are also fraught with challenges in that many of the villages do not have electricity and recharging handsets, though

[14] OCHA (2014). Solomon Islands – Worst flooding in history (https://www.unocha.org/story/solomon-islands-worst-flooding-history)

the SIG is trying to promote solar panels. This is an area that requires continuous research into understanding community practices in order to maximize a multi-pronged approach to dissemination of early warning.

Risk assessment studies

22. Three technical studies were commissioned under the project to understand the hydrological and geotechnical influence on TSF safety and possible impact on physical environment in the event of a major contamination. The geotechnical study[15] which examined the stability of the dam structure identified several weaknesses and made recommendations, including the need for further technical tests and steps to improve the structure of the embankment. The key findings and recommendations were:
    i. There remains some uncertainty over the initial data at the design stage, particularly with respect to soil quality and strength, which has a crucial bearing on quality of construction and stability of the structure. The current stability of the tailings dam was found to be lower than the design standard.
    ii. Water seepage was observed downstream which, in the event of high phreatic level, could lead to slide in slope in toe areas.
    iii. The upstream slope needs to be stabilized with gravels and vegetation cover to reduce erosion.
    iv. There is need for thorough geotechnical testing of the materials to perform more rigorous analysis (static, under rainfall infiltration and seismic stability) and to propose solutions to improve the reliability of the embankment.

23. In brief, the geotechnical study points to a situation where not much can be said with certainty about the stability of the dam in the long term, due to missing data from the design phase. In any case, these structures are not meant to be permanent. The hydrological study[16] noted weaknesses in the spillway structure which increases risk of flooding and erosion downstream, especially during heavy rainfall as was seen during the 2014 floods. The study highlighted the need for systematic hydrometric data for monitoring and recommended installation of meteorological stations in the upper basin and hydrometric stations at low and middle elevation segments of the river network.[17] The study also recommended further modeling due to potential outburst of floods (debris or mudflow simulations addressing the high concentrations of sediment the dams might release) and dam-break scenario.

24. The third study assessed the water and sediments-depth, volume, contaminant levels, density, chemical interaction with surface waters (fluxes),[18] in order to enable contingency planning to mange the risk to downstream communities from uncontrolled discharges over the spillway, or failure of the TSF embankment. While the study found no cyanide contamination in river

[15] Dr. Jianfeng Xue. Geotechnical Risk Assessment of the Gold Ridge Tailing Storage Facility Report 3-Final Report, 05 April 2018

[16] Denny Rivas (2018). Hydrological assessment of the Gold Ridge Tailing Storage Facility (TSF) Catchment Areas on Guadalcanal - Report 2: Hydrologic simulations

[17] Denny Rivas (2018). Hydrological assessment of the Gold Ridge Tailing Storage Facility (TSF) Catchment Areas on Guadalcanal - Report 4: Findings and recommendations

[18] University of Queensland (2018). Assessment of water and sediment quality within the Gold Ridge Tailings Storage Facility and riverine sites downstream of Gold Ridge Mine, Solomon Islands, Final Report-March 12 2018

sediments downstream of the mine, arsenic concentrations in tailing water near the spillway pose a risk when the water overflows during flooding or uncontrolled discharge downstream, though the MHMS monitoring data showed that such contamination was within the WHO permissible levels. The sediments within the TSF, however, contain high concentration of both arsenic and cyanide beyond WHO threshold. The structural integrity (of the dam) study which was in the original plan was not carried out.

25. The assessment reports have been shared with all the key ministries, though key informant interviews indicate that 'socialization' of these reports within different institutions has been uneven. Given the highly technical nature of these dense reports, a communication and dissemination strategy to engage policy makers and senior directors of relevant government institutions would have been helpful for people to internalize the findings and recommendations. It is understood that UNDP[19] did raise the possibility of developing a communication strategy and a summary document extracting key findings and recommendations from all the studies with the SIG counterparts, but the idea did not attract much traction and was given up.

26. While the reports' findings may not have yet found their way into a revised version of the contingency plan, a few key findings and recommendations of these reports are certainly being acted upon, for example: (a) monitoring of water level and quality in the TSF; (b) regular monitoring of water quality for contamination level in rivers downstream; (c) upgrading of meteorological stations – automated weather stations are being installed by MECDM (under a different project); and (d) engaging the new Gold Ridge Mine operator right from the feasibility study phase that is currently being undertaken (see paragraph 27 below). The MECDM has taken the lead in ensuring that the new mine operator takes into account the findings and recommendations from these studies in developing their plans for future redevelopment of the Gold Ridge Mine.

27. All KIIs confirmed that the studies undertaken under this project have provided vital data for the SIG to manage the risks associated with the TSF/RWD. These have also given urgency to the task of scientific risk management. The SIG key informants confirmed that they are taking the technical assessment reports as reference point for all clearance requests for the mining operation. The new mine operator appears to be taking the findings emerging from the studies in outlining various options for reopening of the mine, for which a feasibility study is tentatively due to be submitted to the SIG at the end of 2018. The feasibility study will include risk assessment of the safety, environmental and social risks of the TSF.[20] In the meantime, when necessary during rains, dewatering options have also been considered, with approval from the MECDM.[21] During the past several months, regular meetings have been conducted between the new mine operator and key ministries of the SIG where discussions have been held on key parameters for risk management, and weekly TSF monitoring reports have been submitted to government stakeholders.[22] The new mine operator has undertaken further independent studies of its own, based on findings from the above studies, and claims to have developed an in-depth of understanding of the risks associated with TSF now. Trial operations

[19] A key informant in personal communication with the evaluator.

[20] Fiona Martin, GRML. Ppt presentation - Gold Ridge Mine Recommissioning update, September 2018

[21] Gold Ridge Gazette, Issue 01, December 2017

[22] Fiona Martin, GRML. Ppt presentation - Gold Ridge Mine Recommissioning update, September 2018

of the mine are tentatively scheduled to start around March 2019.[23] The operator has specifically identified the following priority actions in relation to managing the risks associated with TSF, subject to approval by the SIG:

- Increasing freeboard[24] level of the TSF to 2.5 metres
- Reducing runoff into the TSF by constructing diversion channels (likely to be completed before the rains)
- Rebuilding the spillway, with sediment control structures
- Production method to be used in future will have less arsenic content in the discharge and will have no cyanide.

2.2 The capacity of SIG on early warning, detection and response

28. The project's main contribution has been in delineating the roles and responsibilities of key institutions /ministries (namely, the MECDM, MMERE and MHMS) with regard to monitoring of key risk parameters, early warning and response to any threat arising from the TSF. As mentioned previously, by bringing together different ministries and technical departments, the project has attempted to facilitate dialogue among different institutions. KIIs indicate that though the studies produced valuable data which can now guide the MMERE and MECDM, in particular, in fulfilling their regulatory and developmental role vis-à-vis the GRM, technical capacities of the Ministries to deal with complex geo-hydrological and structural issues remain limited. In this regard, ongoing engagement with the consultants who undertook the studies would have been beneficial. However, as different consultants were hired for different studies, their engagement with the ministries/technical departments was of very limited, short-term nature. Key informants felt that if UNDP had commissioned one specialist agency/technical institution to undertake all these studies, the engagement might have been of a continuing nature which could have fostered technical exchanges with experts. This may have been an option UNDP considered, but was not found to be realistic for budgetary limitations, and hence individual consultants on short-term contracts were hired for different studies.

29. Monitoring of the TSF is being undertaken by various agencies of the SIG. In the past, water samples were sent mainly to Australia for testing which increased costs and delayed real time monitoring.[25] Now the National Public Health Laboratory (NPHL) of the MHMS conducts independent water quality sampling for arsenic and cyanide within the TSF and downstream areas. Since the departure of Santa Barbara in 2014, MECDM has initiated a monitoring programme of TSF water levels on a weekly basis with more frequent monitoring whilst the TSF is at critically high water levels. MECDM has improved its monitoring programme through the utilization of rotating lasers for water level and turbidity for water quality. MMERE (Geochemistry Laboratory) have also maintained regular monitoring of the TSF with assessments of rainfall, water level, river flow rates and treatment plant discharge rates.[26] KIIs

[23] A mining company official in a personal communication with the evaluator.

[24] A technical term in hydrology, which means the vertical distance between the top of the dam and the full supply level on the reservoir.

[25] UNDP (2017). Project Logical Framework, updated 2017, Annex A to the Annual Progress Report 2017

[26] Solomon Island Government/UNDP. Managing risks associated with the Gold Ridge Mine Tailings Storage Facility Project Document (June 2016 – Dec 2017)

however revealed that sharing of data among different agencies remain limited, with all agencies interviewed for this evaluation stating that they have no idea of the data gathered by other agencies as data are not shared across agencies. There is no effective coordination in place to see that data collected are analyzed and shared with the interested stakeholders.[27]

30. Under the project, equipment like arsenometer, spectrphotometer [28] and meteorological equipment are being provided/upgraded to all the 3 Ministries. The delay in procurement of the equipment was caused partly by delay in agreeing the specifications with different ministries, and partly due to UNDP's procurement delays. Once these equipment are delivered and staff trained in their use, it is expected that more rigorous and systematic monitoring data will be generated for managing the TSF risks. Besides these, the NDMO has been provided 6 drones for conducting aerial surveys to identify potential geophysical hazards. Using these drones, currently NDMO is mapping disaster risks across the country. A number of pilots (8) have been trained to operate these drones, and they are also assisting other Ministries (Water Resources, Agriculture) in using drones for conducting surveys, according to key informants.

Community awareness and community-based risk reduction measures

31. As discussed previously, the village level disaster risk plans created space for the NDMO to engage with communities in identifying local hazards and plan measures to manage the risks. Through use of several tools, communities have been made aware of various risks, including risk of flooding and spill-overs from the TSF. The communities have a high perception of risks, particularly with regard to the dam breaking and causing flash floods, besides high arsenic and cyanide contamination taking their toll. Part of this arises from mixed and conflicting awareness messaging to downstream communities from various agencies. More will need to be done in terms of regular and transparent communication with communities, with the engagement of senior leaders of the government and mining authorities.

2.3 Project management

32. Given the multi-agency nature of the project, while this project has been implemented by MECDM and MMERE, UNDP provided full NIM support. The implementation of the project has been delayed, requiring two extensions - designed to end in December 2017, the project is now coming to an end in December 2018. Part of the reason is that the complex technical nature of the project required preparatory time for UNDP to get going during the later half of 2016. One of the first tasks the project undertook was to facilitate preparation of the TSF contingency plan based on the available data in early 2017. The first project board meeting took place in February 2017. UNDP recruited a staff (Project Manager) with a generalist background to get the project off the ground, but this did not quite work as the person had difficulty in engaging on technical issues of the project. The project effectively got moving in the first half of 2017 after a new PM, who is a UN Volunteer, replaced the previous incumbent. In its second meeting in August 2017,[29] the project board noted delay in implementation,

[27] UNDP (2017). Managing risks associated with the Gold Ridge Mine Tailings Storage Facility Project, Progress Report, Quarter 2, 2017.

[28] A specialized instrument to detect heavy metals in water

particularly with regard to commissioning the technical studies as the technical ministries were unable to provide timely feedback on the ToRs. The technical studies were finally started in late 2017 and completed by April 2018. Some delays are also attributed to moving timelines in ongoing negotiations with the new buyer of the company regarding reopening of the mines.

33. For community contingency planning, UNDP had to bolster the capacity of NDMO with additional support provided through a national consultant during 2018 to validate the information and data in the plans. The project's progress was reviewed every quarter and where necessary, the logframe was revised to take into account any changes felt to be necessary. Output 2.7 (geotechnical assessment training and use of equipment) in the original logframe was dropped as this was found to be unrealistic within the timeframe, besides the fact that technical capacity within the agencies on geotechnical issues was limited.

3. CONCLUSIONS, LESSONS AND RECOMMENDATIONS

3.1 Relevance[30]

34. The project is in line with the National Development Strategy[31] of the SIG which stresses the critical importance of effectively managing the risks of natural disasters, requiring greater emphasis on disaster preparedness and mitigation to reduce the impact of a disaster. Disaster management arrangements in the country are governed by the National Disaster Council Act (1989), supported by the National Disaster Risk Management Plan (2010). The National Disaster Risk Management Plan[32] provides for institutional arrangements for the Solomon Islands Government to address disaster risk management, and has been endorsed by the National Disaster Council (NDC) established under Section 3 of the National Disaster Council Act and approved by the Cabinet of the Solomon Islands Government. The Act establishes the NDC with the National Disaster Management Office (NDMO) as its secretariat. The NDC Act also established the Provincial Disaster Committees (PDC). However, these have not been active due mainly to capacity and resource constraints and have largely been left unsupported over the years. Nonetheless, the need to strengthen Provincial Disaster Risk Management arrangements has been recognised and support activities are increasing.

35. The project strategies are well aligned with the United Nations Development Assistance Framework (UNDAF) focus on knowledge management and capacity development. As can be seen from Table 4 below, the central outcome of the project, contingency planning, is directly

[29] UNDP (2017). Minutes of the Project Board Meeting, 24 August 2017

[30] *Questions addressed*: To what extent is the project in line with National Development Strategy and National Disaster Management Plan? To what extent are/do the objectives, design and allocation of resources realistic, integrate available knowledge and experience and adhere to recognised national or international standards? Is there a clear rationale in the project logic in terms of linkage between activities, outputs and outcomes? Has the project been able to adapt its programming to any contextual changes during the period of its implementation?

[31] Ministry of Development Planning and Aid Coordination, SIG (2016). The National Development Strategy, 2016-2035. April 2016

[32] Solomon Islands Government. National Disaster Risk Management Plan, October 2009

in line with the following priority focus areas of the National Development Strategy (NDS) of the SIG.[33]

Table 4: NDS priority focus areas, disaster risk management, awareness and preparedness

Priority focus areas	Policies and programmes
Increase risk awareness and knowledge at all levels	Increase awareness of disaster and climate risks at the community level by promoting risk awareness raising as part of ongoing development planning.
	Raise awareness of key development actors on disaster and climate risks, their causes and impacts.
	Promote risk identification and assessment including assessments of vulnerability and hazards as part of the community development planning process and ongoing identification of development needs.
	Strengthen management, communication and use of risk information including widespread use of GIS and community "risk maps" to identify high- risk areas and support risk informed development planning.
Support community disaster and climate preparedness, protection and adaptation	Support the development of community risk management plans in all high risk communities in the country and where appropriate, safe community evacuation centres catering for the needs of all vulnerable groups.
	Train and organise leaders and key community members including representatives of vulnerable groups on community response and preparedness such as regular exercises and drills.

(Source: The National Development Strategy, 2016-2035. Pp 43-44)

36. The project design was based on an in-depth analysis of the context arising from closure of the mine operations and built on the ongoing monitoring and assessment work that various ministries /agencies of the SIG had been carrying out during 2013-2016. The UNDAC study referred to in section 1.2 also helped distill the issues the project needed to focus on. The project design took into account key gaps that were identified by various assessments analysis, for instance, weak inter-ministerial coordination, lack of capacity to undertake routine monitoring and analysis of environmental pollutants in water and sediments.[34] Towards this, besides addressing the need for scientific risk analysis, the project aimed to bring about better coordination amongst key national institutions responsible for regular monitoring as well as disaster risk reduction and mitigation.

37. The project's results chain (logframe) and strategy are clearly aligned with the overall goal of the project to strengthen institutional capacity of key institutions to effectively monitor risks associated with the TSF and RWD. Additionally, the outputs sought for improved coordination of data collection and information sharing, and having preparedness plans in place were highly relevant. With a small budget, the project had a limited set of highly relevant objectives of facilitating risk-informed contingency planning and monitoring capacity development, and

[33] Ministry of Development Planning and Aid Coordination, SIG (2016). The National Development Strategy, 2016-2035. Pp 43-44, April 2016

[34] Solomon Islands Government/UNDP. Managing risks associated with the Gold Ridge Mine Tailings Storage Facility Project Document (June 2016 – Dec 2017), pp 7.

rightly did not get side-tracked into issues to do with reinforcement or redesign of the existing dam or TSF structure which are decisions the SIG and the mining companies may need to take. As can be seen from Table 2 presented earlier, the project allocated nearly 63 per cent of its resources to outcome 1 (contingency planning and technical assessments) which was appropriate, given that this was the central purpose of the project.

3.2 Effectiveness[35]

38. Findings presented in section 2 show that the project achieved all its intended outputs under the outcome 1 area, while its achievements on outcome 2 have been mixed. All vital data required for managing the TSF-related risks are now available and risk mitigation measures can be planned by responsible agencies. Community risk management plans have been developed and a general level of awareness among the downstream communities exist, though this needs to be constantly reinforced with consistent messages from all agencies involved in dealing with disaster prevention, preparedness and response in the TSF catchment area. The project has enabled the NDMO to systematize its approach to rolling out village risk management plans, backed by awareness and training of village leaders and representatives. The experience gained from its work with Guadalcanal communities which was the focus of this project has enabled the NDMO to begin to roll out community contingency planning process throughout the country, with resources made available through other projects.

39. Capacity enhancement of key government agencies has been achieved to a limited extent through provision of equipment to the three key ministries involved in the project. Provincial level capacity to take forward disaster management agenda still remains limited. Coordination among agencies, though attempted, remains a gap, especially with regard to sharing of data and developing a unified approach to assessing risks. Furthermore, in the absence of adequate technical capacity in the MMERE, it is unclear as to which agency will take the lead for managing the risks associated with structural breach or dam-collapse of the TSF. This is an area that will require attention from the SIG authorities, as disaster management demands a whole-of-government approach and cannot be handled by individual agencies working in isolation. A short-term project with limited resources could not probably have achieved anymore than what has been realized under this project.

40. The project has enabled NDMO to work with 31 communities in developing community disaster risk plans and training community members, including women. During selection of trainees, special attention was paid to including as many women and youths as possible in each village. Apart from this component of the project, direct interaction with communities was not central to the delivery of this project.

41. The project benefitted from UNDP's handling of the complex technical nature of project management, particularly with regard to drawing up the ToRs for the technical studies and

[35] *Questions addressed*: What were the intended and unintended results (positive or negative) and the key explanatory factors behind the results? To what degree UNDP contributed to the observed results? To what extent interventions have succeeded in reaching vulnerable people (for example, women) in downstream communities? What were the risks involved and to what extent were they managed? What lessons have been learned from the project regarding achievement of outcomes? What changes could have been made (if any) to the design of the project in order to improve achievement of the project's results? Are there any synergies with other UNDP and other programmes and projects implemented by other agencies on emergency preparedness & response in the same areas?

procuring of services of specialist experts, besides the former's ability to bring on board key government departments and UN agencies (OCHA and WHO) together to work on the project. Besides UNDP's contribution, WHO's ongoing work with the MHMS (NHPL) on monitoring and analyzing the water and sediment quality, and NDMO's ongoing engagement on CBDRM through support provided by several NGOs and Red Cross, provided synergy to this project.

42. One lesson emerging from this project is that for projects requiring such technically complex multi-disciplinary interventions, coordination mechanism among different agencies/ministries needs to be built in the project design. In this instance, coordination has been slow in the absence of an inter-ministerial governing mechanism within the SIG, compromising the effectiveness of the project, as sharing of data and collaboration between agencies remains problematic. Another important lesson is that adequate time and resources needed to be in place for dissemination and internalization of complex technical reports written by specialists.

3.3 Efficiency[36]

43. As discussed earlier, project implementation was slow in the initial stages for reasons to do with not having a technically competent project manager for the first year of the project and the time taken to identify the niche expertise required for the technical studies. One of the main challenges was that the project office and the respective government ministries did not have the necessary expertise to provide quality technical inputs to the terms of references that required for engagement of external consultants to undertake technical studies. This contributed to the delay in procurement process.[37] Considering the complex technical nature of the project for which expertise within the country was very limited, on the one hand, and getting three different ministries to work together, perhaps the 18-months' duration initially envisaged was slightly over-ambitious. At the end, the project took nearly two and half years to complete.

44. Due to the highly technical nature of the project, a technical advisory service provider, Norwegian Geotechnical Institute (NGI), was hired to provide technical oversight, the cost of which (US$ 118,500) was not budgeted project proposal. The project management (outcome 3) which includes monitoring and evaluation absorbed slightly over 20 per cent (US$ 154,557) of projected expenditure, while the originally budgeted allocation (US$ 92,000) as per the concept note was about 12 per cent of the project cost, including the standard General Management Support (GMS) charged by UNDP. It is understood that this higher management support cost was necessitated by the fact that UNDP staff had to undertake substantial backstopping support for NDMO and MECDM in tasks like developing the ToR for the studies, follow up and coordination. Additionally, the extended duration of the project also added to management costs. Overall, given the special nature of the project which needed extra technical support (NGI), the project management was efficient in financial terms.

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[36] *Questions addressed:* Was the project implemented within the timeframe and the budget earmarked for it? Were issues that negatively affected performance identified and dealt with in a timely and effective manner? Has the M&E been adequately designed and used to inform decision-making?

[37] UNDP (2017). Managing risks associated with the Gold Ridge Mine Tailings Storage Facility Project, Progress Report, Quarter 2, 2017.

3.4 Sustainability[38]

45. The project's key results namely, contingency plans and assessment of the TSF risks, are now with the GIS to act on and monitor on a regular basis. The contingency plans, led by the NDMO, are now being put into action through community disaster prepared interventions, and are likely to be extended to other provinces for which alternative funding to NDMO is now in the pipeline. The technical assessment data is already being utilised by the SIG in its discussions with the mine operator which has begun to incorporate these data in its planning. The SIG should now be in a position to move forward in managing the risks associated with the TSF/RWD on its own, without external assistance. The equipment being provided should help in regular monitoring by different agencies. In brief, moving forward, the SIG now has all necessary tools and information to ensure evidence-based risk management, moderated by effective coordination among agencies.

Lessons

- As coordination with the Government institutions in Solomon Islands is weak, UNDP, donors and all agencies supporting the government need to continually advocate through various projects for streamlining coordination among agencies, especially for disaster management.
- Adequate time and resources needed to be in place for dissemination and internalization of complex technical reports written by specialists.

Recommendations

No	Recommendations
R1	Working with other Ministries and the mines operator, NDMO needs to strengthen and develop a consistent communication strategy to keep communities well informed of risk management measures being undertaken with regard to the TSF/RWD.
R2	The SIG needs to strengthen the system for sharing of relevant data between the MHMS, MECDM and MMERE with regard to various safety and environmental parameters of the Gold Ridge mine.
R3	The SIG needs to clearly identify the capacity needs and develop MMERE's capacity for monitoring the structural issues related to the dam on an ongoing basis.

[38] *Questions addressed*: Were exit strategies devised considering crucial factors such as political will and support, budgetary allocations for operational costs, existing technical skills, environmental preservation? What lessons can be drawn regarding sustainability of the project results? What changes could have been made (if any) to the design of the project in order to improve the sustainability of the project results?

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END