

Technical Disaster Risk Reduction Program in PNG

Evaluation Report

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Acronyms and abbreviations

Acronym	Definition
ABG	Autonomous Bougainville Government
ADRA	Adventist Development and Relief Agency
AHC	Australian High Commission
AHP	Australian Humanitarian Partnership
AHPSU	Australian Humanitarian Partnership Support Unit
ARoB	Autonomous Region of Bougainville
BIS	Bialla International School
CBSN	Community Based Seismic Network
DFAT	Australian Department of Foreign Affairs and Trade
DMPGM	Department of Mineral Policy and Geohazard Management
DRCC	Disaster READY Country Committee
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DWI	Department of Works and Implementation
EGB	Engineering and Geology Branch
ENBP	East New Britain Province
ENBPA	East New Britain Provincial Authority
GA	Geoscience Australia
GEDSI	Gender Equality, Disability and Social Inclusion
GoA	Government of Australia
GoPNG	Government of Papua New Guinea
KEQ	Key Evaluation Questions
KIS	Kimbe International School
NDC	National Disaster Centre

Acronym	Definition
NGO	Non-Government Organisation
NISIT	National Institute of Standards and Industrial Technology
PACI	PNG Australia Climate Initiative
PMGO	Port Moresby Geophysical Observatory
PNG	Papua New Guinea
PNG ADP	Papua New Guinea Assembly of Disabled Persons
PNG BU	Papua New Guinea Baptist Union
PWD	Person With a Disability
RDK	Rapid Deployment Kit
ROU	Record of Understanding
RVO	Rabaul Volcanological Observatory
RVOP	Rabaul Volcanological Observatory Program
TSSP	Transport Sector Support Program
UNDP	United Nations Development Program
UPNG	University of Papua New Guinea
UPS	Uninterrupted Power Source
USGS	United States Geological Survey

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Executive Summary

This report is an evaluation of the Geoscience Australia's Australian Government funded Technical Disaster Risk Reduction in PNG Program. The evaluation was conducted by a member of the Expert Monitoring Evaluation and Learning Panel of the Australia Pacific Climate Partnership Support Unit.

Since 2010, Geoscience Australia has been working with PNG to strengthen the capacity to monitor and build resilience to natural hazards, in partnership with the Government of Papua New Guinea technical agencies, including the Department of Mineral Policy and Geohazards Management, Rabaul Volcanological Observatory, Port Moresby Geophysical Observatory and Engineering Geology Branch. The support provided by Geoscience Australia has evolved over the period.

The objective of the evaluation is to provide an overview of the program's performance against standard evaluation criteria of relevance, coherence, effectiveness, efficiency, impact, and sustainability and provide recommendations to inform future investment decisions regarding the partnership with Geoscience Australia, and the broader architecture of the Disaster Risk Reduction portfolio in PNG.

The evaluation makes the following findings:

RELEVANCE: Geoscience Australia's flexible and needs-based approach to assisting PNG technical agencies in building their capacity to manage hazards remains a relevant approach in the PNG context.

COHERENCE: The program is coherent within the narrow framework of geohazards but is not well integrated within the broader Disaster Risk Management framework in PNG. This is not the fault of Geoscience Australia but reflective of the broader Disaster Risk Management framework sector in PNG. The original intention of a multi-hazard approach was narrowed to a focus on geohazards through force of circumstance. This multi-hazard approach should be revisited in the design of the next phase as well as potential linkages with the PNG Australia Climate Initiative and Australian Humanitarian Partnership NGOs in PNG.

EFFECTIVENESS: The program is delivering its outputs effectively and these outputs are regularly adjusted to suit the evolving context. A good example is the low cost seismic monitoring equipment for the Community-based Seismic Monitoring Network. The major focus of getting geohazard information to communities has become a dedicated geohazards website in PNG, rather than a more comprehensive community outreach approach which would require a strengthened national disaster coordination capability. A national earthquake hazard map based on updated science was carried out early in the program and this map continues to provide the basis for substantial outputs, most recently the interim amendment to earthquake design in the PNG building code.

EFFICIENCY: The program operates efficiently and achieves outcomes from a relatively modest budget. The delivery model of a wide range of Geoscience Australia technical staff allows for efficient targeted inputs of particular skill sets as required to deliver evolving program outputs.

IMPACT: The program is achieving impact both in terms of improved earthquake monitoring and updated earthquake hazard mapping that has informed the amendment of earthquake design standards and an improved building code.

SUSTANABILITY: The program is building improved capability and capacity on PNG technical agencies in difficult circumstances. It is, however, evident that sustaining that capacity requires continued Geoscience Australia support unless and until PNG technical agencies are better resourced by their own government.

This evaluation makes the following recommendations:

Recommendation 1: Geoscience Australia to continue its flexible and needs-based approach to assisting PNG technical agencies in building their capacity to manage hazards.

Recommendation 2: Geoscience Australia to coordinate with United States Geological Survey to ensure potential future United States Geological Survey inputs are complementary with Geoscience Australia future inputs.

Recommendation 3: Geoscience Australia to revisit the issue of a multi-hazard approach in the design of a new phase of the program (from July 2023). This could also include linkages with the PNG Australia Climate Initiative Australian Humanitarian Partnership NGOs in PNG.

Recommendation 4: Geoscience Australia to meet with the Disaster READY Country Committee to explore possibilities for piloting community based hazard awareness on seismic risk, most likely in Bougainville.

Recommendation 5: DFAT to consider a different approach to strengthening DRM in PNG. One model to consider could be the Australia-Indonesia Partnership in Disaster Risk Management with its focus on institutional capacity and organisational systems strengthening to improve leadership in Disaster Risk Management.

Recommendation 6: Geoscience Australia's annual reporting should consistently include gender-disaggregated data for participation in program related training and workshops.

Recommendation 7: Geoscience Australia to continue the current model of program delivery using a range of technical staff to deliver inputs consistent with the evolving program outputs.

Recommendation 8: DFAT to consider supporting University of PNG in offering the Graduate Diploma in Geohazards and Risk Management through support from Australia Awards PNG, including targeted scholarships for women.

Introduction

This report is an evaluation of the Geoscience Australia's Australian Government funded Technical Disaster Risk Reduction in PNG Program. The evaluation was conducted by a member of the Expert MEL Panel of the Australia Pacific Climate Partnership (APCP). The Partnership is funded by DFAT and aims to increase the effectiveness of Australia's support for climate change action and disaster resilience in the Pacific.

The APCP has a staff of technical experts based in Canberra and Suva who deliver climate change and disaster risk reduction (DRR) advice across DFAT investments in the Pacific, broker knowledge between Partnership components and other actors, manage an Expert Panel and undertake Partnership-wide monitoring, evaluation and learning (MEL).

1.1 Project Background

Located in the active Pacific Ring of Fire, Papua New Guinea (PNG) is ranked among the most disaster-prone countries due to the geophysical conditions. The World Risk Report 2021 identifies PNG among the top 10 countries with the highest disaster risk worldwide¹. Natural hazards, including earthquakes, tsunamis, volcanic activity, cyclones, flooding, landslides, and droughts are contributing to the risks; PNG ranks highest in terms of the population exposed to severe volcanic risk, and is among the top six countries with the highest percentage of population exposed to earthquakes². National disaster risk management coordination is challenged by limited resources and capacity, and disparate governance structures, and challenging geography. The PNG National Disaster Centre is officially slated to be elevated to an executive agency and may benefit from increased budgetary resources to support its mandate.

Since 2010, Geoscience Australia (GA) has been working with PNG to strengthen the capacity to monitor and build resilience to natural hazards, in partnership with the Government of Papua New Guinea (GoPNG) technical agencies, including the Department of Mineral Policy and Geohazards Management (DMPGM), Rabaul Volcanological Observatory (RVO), Port Moresby Geophysical Observatory (PMGO) and Engineering Geology Branch (EGB). The support provided by Geoscience Australia has evolved over the period. Under the current activity schedule (July 2020 - June 2023), the intended outcomes of the investment are:

Outcome A – The Government of PNG technical agencies are better positioned to deliver timely and accurate advice on natural hazards to the community and decision makers.

¹ https://weltrisikobericht.de/wp-content/uploads/2021/09/WorldRiskReport_2021_Online.pdf

² UNDRR (2019). Disaster Risk Reduction in Papua New Guinea: Status Report 2019. Bangkok, Thailand, United Nations Office for Disaster Risk Reduction (UNDRR), Regional Office for Asia and the Pacific. https://www.preventionweb.net/files/68266_682309pngdrmstatusreport.pdf

Outcome B – The PNG communities have a better awareness and understanding of natural hazards and can access relevant information online

As per the activity workplan, a range of activities are currently delivered aligned with these overarching outcomes. Activities supported through the investment have included, but are not limited to –

- Probabilistic Tsunami Hazard Assessment for PNG
- Enhancing earthquake monitoring by upgrading seismic stations across PNG
- Monitoring volcanic activity
- Strengthening building design through updating the PNG Earthquake Building Standard
- Automatic reports for an emergency response to earthquakes
- Improving access to early warnings and alerts by establishing a Geohazards website for PNG

The support delivered by GA is one component of a larger program disaster risk portfolio managed by the Australian development program in PNG.

1.1.1 A brief history of the program and its evolution

As noted in the terms of reference, Geoscience Australia has been working “with PNG to strengthen the capacity to monitor and build resilience to natural hazards, in partnership with the Government of Papua New Guinea (GoPNG) technical agencies” since 2010. The program has not previously been independently evaluated so in order to understand how and why the program has evolved to its current focus this section will first provide some background before going on to look at findings. The program since 2010 has had two broad phases, one Activity going from 2010 to 2016 and a second Activity (with the current title) commencing in October 2016 and ending in June 2020 but extended from July 2020 to June 2023.

2010 to 2016: Strengthening Natural Hazard Risk Assessment Capacity in Papua New Guinea

This Activity was initially scheduled to run from September 2010 until August 2013 but continued to run in similar form until 2016 when a new Activity was developed. Total expenditure over this period was just under \$2.6 million or around \$400,000 per year.

When the program commenced in 2010 it was implemented alongside an existing program, the ‘Rabaul Volcanological Observatory Program’ (RVOP) which had been in operation since 1994. Both activities were “directed towards increasing the capacity of technical agencies for Disaster Risk Reduction” (GA first annual report, July 2011). With an original project period of three years, the Activity aimed to reduce the natural disaster risk of vulnerable communities in a pilot province by increasing capacity of PNG technical agencies to assess the risk and the potential impact from natural hazards. The pilot province was **East New Britain Province** (ENBP) (The same province where Rabaul is located and hence the focus of the pre-existing

Rabaul Volcanological Observatory Program). The Activity had the following expected outcomes:

- (a) Technical agencies in PNG will have developed partnerships and networks that facilitate transfer of knowledge, skills and data;
- (b) Scientists within PNG technical agencies are able to better assess the risk and impact from natural hazards;
- (c) East New Britain Province in PNG is better informed about its risk from natural hazards;
- (d) The relationship between GA and PNG technical agencies is enhanced so that technical agencies have increased capacity to access and use risk assessment knowledge and skills; and
- (e) GoPNG, AusAID and GA are aware of options for strategic support to PNG agencies that further develop their natural hazard risk assessment capacity.

There was a clear focus on building on the work that RVOP had done in ENBP but also to broaden the focus to PNG technical agencies in PNG more broadly. A significant focus of the early period was on capacity building of PNG technical agency staff. For instance in FY 2011-2012 capacity building accounts for around 75% of total expenditure. But soon the focus shifted to what were more tangible outputs such as in FY 2013-2014 where the production of national seismic hazard map for PNG and an assessment of landslide hazard and risk for the Highlands Highway made up nearly 70% of expenditure (mostly GA staff costs).

The production of the national seismic hazard map was targeted to be achieved by the third year of the Activity and this target was met. This seismic hazard map was based on a probabilistic methodology that provides for more granular and accurate risk analysis than what was contained in the previous seismic risk map. The old map was based on a far less accurate approach based on seismic history that divided the country in to four zones based on low to high risk.

The updated map was produced in collaboration between GA and PMGO and published in a peer reviewed journal in January 2016 - "Probabilistic Seismic Hazard Map of Papua New Guinea." This was a ground-breaking piece of work and provides the foundation for broad application of more accurate seismic risk in planning and development in PNG. Soon after its completion in 2014, the Dept of Works expressed interest in forming a national building earthquake loading committee and using the seismic hazard information to update the building code.

There are a number of challenges identified in the reporting from this first phase. Two significant ones are 1) a lack of engagement from the National Disaster Committee (the Director of which was expected to be the Chair of the Project Coordinating Committee (PCC)) and 2) insufficient engagement between technical agencies and end-user agencies (to enable

seismic information to reach at risk communities in an understandable format). These challenges remain current.

What is also notable in the first annual report from this Activity is that a multi-hazard approach (both geophysical and meteorological) is anticipated to be developed in the future, however, limited engagement from the National Weather Service (NWS) makes this difficult:

NWS is also an important stakeholder in any provincial multi-hazard risk assessment in PNG. In the current Activity in ENBP, the risk assessments are based around risks to the province from geohazards, and not meteorological hazards. The impacts from meteorological hazards, such as landslides and flooding, are not being considered at this stage due to resource constraints and limited engagement from NWS.

(GA first annual report, July 2011)

From this first period we can see GA is engaging effectively and achieving solid technical outcomes but the scope is narrowed to a more technical seismological focus from what had been initially anticipated (i.e. something broader and more ambitious in scope), but perhaps a bit unrealistic for a relatively small program such as this.

2016 to 2023: Technical Disaster Risk Reduction Program in Papua New Guinea

This second broad phase begins in October 2016 with an Agreement until June 2020: “Activity Schedule 41 to the Record of Understanding No.51172”. This Agreement is renewed in 2020 and continues as the same formal ROU and with the same program title.

In the original 2016 ROU, the program has the following three desired outcomes:

- a. Targeted PNG Communities have an increased level of understanding of the risk from volcanic hazard, enabling them to be in a position to make informed decisions to take action.
- b. Government of PNG technical agencies are better positioned to deliver timely and accurate advice on natural hazards to the community and decisionmakers.
- c. Governance for disaster risk reduction is enhanced through partnerships at the strategic level.

The first annual report (November 2017) reports against these three outcomes but under the third outcome it notes “In discussion with DFAT in the lead up to the inception meeting in May, it was decided to wait until the PNG parliamentary elections were completed before determining how best to progress the outcome. Considerable challenges exist in determining which personnel within DMPGM are suitable for this type of investment...” In subsequent reporting (2018 onwards) this third outcome disappears and presumably the challenges around broader DRR/DRM governance persist.

Around the same time as this governance outcome was being dropped, an independent review (October 2018) of the DFAT funded “Strengthening Disaster Risk Management in Papua New Guinea” project implemented by UNDP, found that although one of the objectives

of the project had been strengthening NDC capacity, “progress in some areas have been slow. Poor levels of staffing, resourcing and general support for the role of the NDC by the Government of PNG must be addressed”. Governance for broader DRR/DRM in PNG is challenging and Geoscience Australia seems to have unsuccessfully tried to engage at this level at the beginning of both of these phases before focusing on its strength – technical capacity building with PNG partner agencies. By the beginning of the current agreement (2020) the program has just two outcomes and these are:

Outcome A – The Government of PNG technical agencies are better positioned to deliver timely and accurate advice on natural hazards to the community and decision makers.

Outcome B – The PNG communities have a better awareness and understanding of natural hazards and can access relevant information online.

1.2 Objective of the Review

The objective of the evaluation is to provide an overview of the program's performance against OECD DAC evaluation criteria of relevance, coherence, effectiveness, efficiency, impact, and sustainability. In doing so the evaluation will summarise evidence of performance and outcomes, and through strategic analysis and expert judgment provide recommendations to inform future investment decisions regarding the partnership with Geoscience Australia, and the broader architecture of the DRR portfolio in PNG.

2. Methodology and Approach

The approach used in this evaluation utilised document review, semi-structured interviews with individual stakeholders and small groups. Primary data collection for the interview mainly took place in Port Moresby during the week of October 24-28, 2022 (a list of stakeholder organisations interviewed is in Appendix 2). The evaluator was also in Port Moresby the previous week facilitating the design process of phase two of the Disaster READY program implemented by Australian Humanitarian Partnership NGOs in PNG. A session on community-based seismic risk was incorporated into the design workshop to take advantage of having this group of PNG community-based DRR practitioners in one room to gain their views of the issues around working on seismic risk at the community level. A list of stakeholder organisations is contained in Appendix 2).

Semi-structured interviews with key individuals were based around the questions contained in Table 1 below:

Table 1: Evaluation Criteria, KEQ and Sub-questions

Criteria	Key Questions	Sub-questions
Relevance	1. Is the investment doing the right things?	1.1 To what extent is the program aligned with PNG needs and priorities? 1.2 Does the program fill a niche requirement in PNG
Coherence	2. How well does the investment fit?	2.1 Is the program compatible with other investments in PNG and within the DRM sector?
Effectiveness	3. To what extent is the investment achieving it's intended outcomes?	3.1 Are the program activities being delivered as planned? 3.2 How is activity delivery being monitored?
Efficiency	4. How well are program resources being used?	4.1 Is the program delivery model suitable and does it add value? 4.2 Are there potentially more efficient delivery models?
Impact	5. What difference has the investment made?	5.1 What are the benefits and impacts of the program (intended and unintended)?
Sustainability	6. Is the investment building lasting capability and capacity?	6.1 What improved capacities and capabilities indicate or point to sustainability?

2.1 Limitations

Field work for the evaluation was conducted in Port Moresby and face to face interviews were held with key stakeholders in Port Moresby. The evaluator did not travel to Rabaul, the location of Rabaul Volcanological Observatory, and only held one phone interview with RVO (the Director). It was initially expected that the evaluator would be in PNG at the same time as a team from Geoscience Australia and would be able to have extensive face to face discussions. Due to schedule changes this was not the case and all interviews with Geoscience Australia staff were conducted remotely.

3. Findings

The following findings are organised against the six OECD DAC evaluation criteria (relevance, coherence, effectiveness, efficiency, impact and sustainability) and answer the Key Evaluation Questions (KEQ) and sub-questions against those criteria.

3.1 Relevance

Key findings

GA's flexible and needs-based approach to assisting PNG technical agencies in building their capacity to manage hazards remains a relevant approach in the PNG context.

The Key Evaluation Question (KEQ) for relevance is: "Is the investment doing the right things?"

Under this KEQ, there are two sub questions. The first is: "To what extent is the program aligned with PNG needs and priorities?" The program has consistently taken a flexible and needs based approach to assisting PNG technical agencies in building capacity to manage hazards. This approach is captured well in the objective stated in the ROU (2016):

The objective of this program is to support the Government of Papua New Guinea (GoPNG) in developing fundamental information and practices for the effective response and management of natural hazards. The program places a focus on the 'down-stream' users of this technical information within Papua New Guinea (PNG), with an emphasis on establishing which products are needed by decision-makers to best support their activities and then determining the most appropriate technical outputs to use as the evidence-base and the most appropriate pathways to their use.

A good example of this focus on 'down-stream' users is the development of the probabilistic seismic hazard map that began in the first phase of the program, with the application of the map by 'down-stream' users continuing to the present through integrating the map into the national building standards. The original impetus for developing the seismic map was the fact that the existing seismic hazard map was based on a less scientific historical approach that gave PNG a seismic hazard map that was based on four zones that did not give a particularly accurate representation of the actual seismic risk in a specific location. There have been a number of stages flowing through both phases of GA's program where this output has evolved to align with PNG's needs and priorities:

- The first stage of developing the map was to strengthen the skills of PMGO seismologists in the modelling of earthquake hazard scenarios using computational tools (2013-15);
- The second stage was developing the national earthquake hazard map itself (2014-15);

- Map published in peer reviewed journal³ to ensure that the national earthquake hazard map will be reviewed by the international science community (2016);
- Workshops with key stakeholders to begin the process of integrating the updated hazard map into the Earthquake Loading Standard for the PNG Building Codes (2017-18);
- Interim guidance document earthquake loading design developed and provided to Department of Works for endorsement (2019);
- Interim Amendment to PNG's 1001-1982: Part 4 Earthquake Design Actions published and licenced for unlimited copies to be shared with PNG stakeholders (2021);
- Training seminars to be delivered to practitioners in the use of the Interim Amendment (2022-23).

The updated earthquake hazard map and its incorporation into the PNG Building Code is seen by the PNG Department of Works as a very significant contribution to PNG. One that will allow for the avoidance of both under-engineering that increases risk, and over-engineering that unnecessarily increases cost. The example of the updated earthquake hazard map illustrates not just how the program is aligned with PNG needs and priorities but also the very long timeframe required for these kind of interventions to achieve embedded results, in this case over a decade of effort.

The second sub-question under the relevance criteria is: "Does the program fill a niche requirement in PNG?" The niche requirement in this case is the provision of highly technical capacity building in relation to seismic hazard disaster risk reduction. The program is a very technical one that could only be filled by a highly specialised technical agency such as GA, in that regard it is very much filling a niche requirement in PNG, one that is strongly illustrated by the earthquake hazard map example given previously.

Recommendations

Recommendation 1: GA to continue its flexible and needs-based approach to assisting PNG technical agencies in building their capacity to manage hazards.

³ Ghasemi, McKee, Leonard, Cummins, Moihoi, Spiro, Taranu, Buri. Probabilistic seismic hazard map of Papua New Guinea, Natural Hazards (2016) 81:1003-1025 doi 10.1007/s11069-015-2117-8).

3.2 Coherence

Key findings

The program is coherent within the narrow framework of geohazards but is not well integrated within the broader DRM framework in PNG. This is not the fault of GA but reflective of the broader DRM sector in PNG. The original intention of a multi-hazard approach was narrowed to a focus on geohazards through force of circumstance. This multi-hazard approach should be revisited in the design of the next phase as well as potential linkages with PACI and Australian Humanitarian Partnership NGOs in PNG.

In relation to coherence, the KEQ is: “How well does the investment fit?” with the single sub question being: “Is the program compatible with other investments in PNG and within the DRM sector?” As noted in the relevance section, the investment is a highly technical and niche program delivered by GA and mostly engaging with similarly highly technical PNG agencies. There are a very small number of agencies that are able to deliver this kind of technical assistance that also have development assistance programs in PNG.

One of these is the United States Geological Survey (USGS) which has had an ongoing engagement with the RVO and also coordinates with GA to ensure that inputs do not duplicate. USGS have provided some of the more sophisticated volcanological monitoring equipment in the past and noted that over the next few years some of this equipment will be coming up for renewal. This issue would need to be coordinated with RVO and GA to ensure planned technical upgrades of equipment are not incompatible with what RVO and GA have collaborated on in recent years.

The link between the GA technical DRR program and the broader DRM sector in PNG is not well developed and could potentially have much greater impact. As noted in the section on the brief history of the program, the original design anticipated a much broader engagement with the DRM sector in PNG. This assumed that the NDC would take a leadership role as head of the steering committee. There was also an attempt to engage with the NWS to ensure the technical DRR program took a multi-hazard approach to DRR. If these links had been established earlier the program may have looked quite different but GA did attempt to make these links early on and the engagement from NDC and NWS did not appear to be forthcoming.

In the very first annual report in 2011, there is a section on ‘Identified Issues’. One of these identified issues is NWS engagement (or lack thereof). It is worth quoting that section of the report in full as it gives a good overview of why NWS should be in the program:

NWS is also an important stakeholder in any provincial multi-hazard risk assessment in PNG. In the current Activity in ENBP, the risk assessments are based around risks to the province from geohazards, and not meteorological hazards. The impacts from meteorological hazards, such as landslides and flooding, are not being considered at this stage due to resource constraints and limited engagement from NWS. This omission creates difficulty for future engagement of NWS although NWS has demonstrated interest so far.

By remaining in the Activity NWS will be exposed to natural disaster risk assessment techniques, stakeholders and the value of the DRR outcomes at least.

They may wish to develop their role over several years if they see value for NWS and its stakeholders. For example, NWS could provide hazard information such as statistical information on localised extreme precipitation in relation to landslide activity in at-risk provinces in future. They may need support for extra instrumentation to achieve this role as they have already indicated for the current Activity in ENBP.

(GA first annual report, July 2011)

In subsequent reporting there is no further mention of NWS, including in the identified issues section. The main concern identified by the third year of the Activity (2013) is “limited staffing depth” in PMGO, RVO and ENBPA as well as staff turnover in GA. The concern was that due to the small numbers of staff at PNG technical agencies there would be insufficient engagement with the Activity to ensure effective capacity strengthening. This would be compounded by the lack of relationship building due to GA staff turnover. To address this, GA created a position dedicated to managing the relationship with PNG stakeholders (PNG Activity Leader). From around this point the program both becomes more effective and focused but also more narrow in scope.

The original multi-hazard focus narrows to a seismological hazard focus and the engagement with PNG technical agencies narrows to focus predominantly on the three DMPGM agencies – PMGO, RVO and EGB. This approach allows for more effective engagement to achieve impact – the long process of seismic hazard mapping leading to the Interim Amendment to the Building Code being a good example. The approach is also a pragmatic adjustment to the challenging circumstances of the PNG DRM sector and the limited resources of the GA DRR program in PNG. If there had been stronger engagement from the NDC through the PCC, there may have been a better chance of driving a multi-hazard approach but without NDC leading this GA could not be expected to take the lead in driving it. This is a lost opportunity that should be revisited in the design of the next phase. Having a multi-hazard focus including hydro-meteorological hazards could also allow for a link with the impacts of climate change in PNG. There may be opportunities to work on this with the PNG Australia Climate Initiative which is currently in the design stage.

Another element of the broader DRM sector in PNG is that of NGOs, particularly in relation to community-based DRR. There were numerous attempts by GA to engage with the NGO sector but these do not appear to have led to any substantive ongoing collaboration. For instance, in 2015-16 GA Officers met with World Vision, Red Cross, Oxfam and CARE regarding their needs for technical information and maps to support hazard awareness and response activities. Engagement with NGOs seems to have not been consistent across the GA program with occasions only appearing sporadically in the reporting.

The main DFAT supported NGO based DRR program is the Disaster READY program which has just begun its second 5 year phase (2022-2027). Disaster READY is part of the Australian Humanitarian Partnership which includes 6 Australian NGOs, four of which are part of Disaster

READY in PNG (Caritas (together with other Church based agencies), CARE, Plan (together with ChildFund) and Save the Children). These four lead agencies have activities in various locations with Bougainville the one area they are all operating.

GA has previously attempted to conduct community awareness activities of seismic hazards alongside GoPNG technical agencies but a consistent approach does not seem to have been developed. The current focus of the GA program on reaching the community is via the support to establishing the PNG Geohazards website online. This presupposes access to online information as well as a capacity to interpret and act on the information. The program could possibly reach communities more effectively through having a more systematic engagement with NGOs to jointly develop seismic awareness materials that communities can easily understand and act upon to reduce risk. As all Disaster READY agencies have activities in Bougainville, which is also a high seismic risk area, a pilot activity could be trailed there. This could have both community and school-based components. Disaster READY also has a strong focus on disability inclusion and women's empowerment so a pilot activity could also include these elements.

Recommendations

Recommendation 2: GA to coordinate with USGS to ensure potential future USGS inputs are complementary with GA future inputs.

Recommendation 3: GA to revisit the issue of a multi-hazard approach in the design of a new phase of the program (from July 2023). This could also include linkages with PACI and the Australian Humanitarian Partnership (Disaster READY).

Recommendation 4: GA to meet with the Disaster READY Country Committee (DRCC) to explore possibilities for piloting community-based hazard awareness on seismic risk , most likely in Bougainville.

3.3 Effectiveness

Key findings

The program is delivering its outputs effectively and these outputs are regularly adjusted to suit the evolving context. A good example is the low cost seismic monitoring equipment for the Community-based Seismic Monitoring Network. The major focus of getting geohazard information to communities has become a dedicated geohazards website in PNG rather than a more comprehensive community outreach approach which would require a strengthened national disaster coordination capability which remains lacking. A national earthquake hazard map based on updated science was carried out early in the program and this map continues to provide the basis for substantial outputs, most recently the interim amendment to earthquake design in the PNG building code.

The KEQ for effectiveness is: To what extent is the investment achieving it's intended outcomes? Under this KEQ there are two sub-questions the first of which is: Are the program activities being delivered as planned?

The current program has two outcomes with a number of outputs under each outcome. The first outcome is *The Government of PNG technical agencies are better positioned to deliver timely and accurate advice on natural hazards to the community and decision makers*. Under this outcome there are currently four outputs which are broadly focused on the technical skills and equipment to operate a seismic monitoring network.

The main focus of the technical equipment to deliver this outcome is a low-cost seismic monitoring equipment with the brand name "Raspberry Shake". These were initially expected to be used as rapid deployment kits for under-monitored volcanoes that were showing signs of unrest. Trials of the new generation Raspberry Shake 4D sensors in 2018 found them to be effective units and they were then rolled out more widely as part of a Community-Based Seismic Network (CBSN). These are currently installed in international schools in New Britain and at UPNG and future installations will include government buildings in Bougainville.



Figure 1. The Raspberry Shake 4D device currently deployed at RVO. Each unit costs approximately \$2000 (compared to \$60,000 for traditional seismic sensors – from 2018 GA report).

CBSN using Raspberry Shakes is in some ways a decline in capacity compared to the old system (based on more complex and expensive equipment) but also a recognition that an effective

seismic monitoring system needs to be one that is consistent with the financial and technical capacity of the PNG agencies.

“We were sceptical about the Raspberry Shake but in the process of piloting have learned a lot. There are other instruments that are better but much more expensive. Raspberry Shakes are good value and I think we can accept them”

DMPGM staff member

Training activities were disrupted during COVID when GA staff could not travel to PNG and DMPGM staff could not travel to Australia. Despite this, DMPGM staff have managed to expand the CBSN using Raspberry Shakes with remote support from GA (see sustainability section). Further training in associated seismic monitoring software was delayed by COVID travel restrictions but these are expected to be held soon now that GA staff are travelling to PNG again.

Outcome Two of the current program is focused on getting geohazard information to the community. A key output under this outcome is the interim amendment to the PNG Building Code. As outlined in the relevance section, this is a major achievement that builds on over a decade of activities across all phases of the GA program in PNG. The interim amendment is the first stage of a two-stage process as summarized in the executive summary of the interim amendment:

The first stage would be aimed at making the new hazard science available as quickly as possible in a form that could be used with the current regulations.

The second stage would deliver a fully revised design standard aligned with those used in New Zealand and Australia. Collectively these stages represent two levels of amendment to the current building regulations and structural design standards of PNG with an initial focus on seismic design.

This report delivers the first stage, or Level 1 methodology, referred to as the “Interim Amendment”.

Edwards et al. (2020)

The program continues to evolve new focus areas that build on this foundational earthquake hazard mapping that led to the interim amendment. In addition to progressing the second stage of a fully revised design standard, another activity that builds on the updated earthquake hazard map is a detailed earthquake risk assessment for Lae. This is a good example of how GA’s adaptive process of program implementation opportunistically develops based on evolving identified needs and interests.

A major focus of outcome two has been the enhancement of the PNG Geohazards website so that community members can access geohazard information online. The website is in the final phase of going live and at the time of this evaluation was only waiting for the Minister’s approval to launch the website:

“We have been trying to do this for a long time so this is a milestone development for us. Well on the way to launching – next month should go live.”

DMPGM staff member interview

The GA annual report from 2019 gives an idea of how slow and difficult it was to get the website established, as well as providing an insight as to why the website became the main focus of making geohazard information available to the community:

After over 2 years of lobbying, the program was finally able to obtain permission from the Secretary of the Department of Mineral Policy and Geohazards Management to develop and deploy a dedicated Geohazards website for PNG. Based on that approval the program has engaged a local software development company (Datec PNG Limited) to develop the website. In the absence of a functional national disaster coordination capability, the website will serve to communicate earthquake alerts and volcanic hazard advice and warnings to both the GoPNG and the PNG community.

Annual Report November 2019

The reference to the “absence of a functional national disaster coordination capability” in the 2019 report echoes frustrations that GA has reported going back to the beginning of the program (and continues to the most recent annual report – 2021/22). This has been a major constraint that has contributed to a narrowing of the focus of the program from an early ambition of a multi-hazard approach with effective information flows down to the community level. The frustration is not confined to GA but is shared by PNG technical agency partners:

Reaching community is difficult as there is minimal to no support from Government. NDC has a new structure but there is no positive change that we can see. We have been unable to meet with them.

DMPGM staff member interview

This is the broader challenge to effectiveness (as well as sustainability and impact), the lack of capacity in the main national DRM structure - the NDC. This makes it difficult for programs like GA's to sustainably integrate technical DRR into the broader DRM architecture in PNG. There have been many years of support to building national and provincial DRM capacity in PNG but the results have been limited as shown in the independent review of the UNDP implemented “Strengthening Disaster Risk Management Capacity in PNG” in 2018. It may be time for DFAT to look at a different approach to strengthening DRM in PNG. One model to consider could be the Australia-Indonesia Partnership in Disaster Risk Management with its focus on institutional capacity and organisational systems strengthening to improve leadership in DRM.

The other sub-question under effectiveness is: How is activity delivery being monitored? The program does not have a formal monitoring and evaluation framework and the annual reporting is the main monitoring method. The current structure of the report provides enough information for an external reader to gain a clear picture of the evolving program and includes:

- program highlights;

- analysis of the changing operating context, program risks and responses to maintain program relevance (including lessons learned)
- Description of program logic and main activities (including a table with progress and deliverables against each output)
- Efficiency of program management (budget expenditure and evidence of value for money)
- Cross-cutting policy issues
- Lessons learned and possible good practice for sharing.

Reports often also include trip reports from GA staff visits to PNG which provide additional detail. The most recent reports (2022 and 2021) do not contain any information under the heading cross cutting policy issues but the 2019 report has some useful tables including gender disaggregated data on participation in training and workshops as well as staff in partner organisations. There is also similar summary information in the 2018 report. No doubt this is not included in 2021 and 2022 as there was no travel due to COVID but this information should be included in future reports as it provides a useful data source for measuring women's participation over time. This would also provide a useful baseline if there were efforts to increase women's participation in geohazard management in future programs.

Recommendations

Recommendation 5: DFAT to consider a different approach to strengthening DRM in PNG. One model to consider could be the Australia-Indonesia Partnership in Disaster Risk Management with its focus on institutional capacity and organisational systems strengthening to improve leadership in DRM.

Recommendation 6: Annual reporting should consistently include gender-disaggregated data for participation in program related training and workshops.

3.4 Efficiency

Key findings

The program operates efficiently and achieves outcomes from a relatively modest budget. The delivery model of a wide range of GA technical staff allows for efficient targeted inputs of particular skill sets as required to deliver evolving program outputs.

The KEQ under efficiency is “How well are program resources being used?” There are two sub-questions under this KEQ, the first being “Is the program delivery model suitable and does it add value?”

The program has been operating for 12 years with a total expenditure of approximately \$5.7 million. This equates to an average of less than half a million dollars per year over that period. The largest single component of program costs is that of GA staff which varied between 50% to 80% of total expenditure. The program has operated over that period without any long term deployment of GA staff in PNG. All staffing inputs have been targeted inputs of staff with particular skill sets relevant to the output they are working on. This allows the activity to draw on a broad range of positions to be deployed for short periods. For this type of program this would be both practical and efficient. For instance, in the agreement for the period 2016 to 2020 (the period of highest expenditure, around \$800,000 per year) the FTE allocation was 6.15 but this included the following range of highly specialised positions:

1.2 x Seismologist

0.45 x Engineer

0.15 x Tsunami Specialist

2.1 x Volcanologist/technical support

0.60 x Remote Sensing I Geodesy

0.90 x Spatial Analyst

0.60 x Activity Leader

0.15 x Senior Management (SES band 2).

In country support for transport, logistics, procurement, security etc. is provided through the Deployee Support Program currently managed in PNG by Abt Associates. This is an efficient arrangement that allows a small program like GA's to focus on what is a very targeted technical assistance and capacity building program.

A consistent theme of the reporting over the period of the program has been the under-resourcing of GoPNG technical agencies. These agencies have small numbers of staff and also have challenges in retaining staff. They also have very limited budgets to purchase, operate and maintain seismological equipment which can be very expensive. Some of the seismic monitoring equipment that RVO and PMGO use cost around \$60,000. GA has introduced low cost seismic monitoring equipment “raspberry shakes” which can be purchased for around \$2,000. These do not have the full range of functionality that the more expensive hardware

has but their low cost allows for a wider geographic range of coverage than if more expensive equipment is used. The introduction of this equipment by GA, and acceptance of their utility by GoPNG technical agencies, will allow for more efficient use of financial resources by GA and GoPNG.

The second sub-question under efficiency is “are there potentially more efficient delivery models?” For a program of this scale and budget, the current model of a mix of GA technical staff being allocated to the program, mostly on a part time basis, would appear to be the most efficient. GoPNG staff are also brought to Australia for training depending on the nature of the training. The flexibility of the current delivery model is efficient. An alternative model of full time GA technical staff based in PNG would be more expensive. The current delivery model is also more efficient in that it can be more easily calibrated to suit the level of engagements:

Systemic and chronic lack of capacity with the technical agencies that we are engaging with, largely a result of the absence of operational funds and inability to attract, recruit and retain technical and scientific staff, is limiting the effectiveness of the program. We have had to scale back and in some case re-direct our efforts, in order achieve at program objectives.

Annual Report November 2019

The above analysis from the 2019 annual report is reflected in expenditure where there is a significant decline from the approximately \$800,000 annual expenditure in the 2017-2020 period to the current phase (2020-2023) where budgeted expenditure dropped to approximately \$400,000 per year.

Recommendations

Recommendation 7: GA to continue the current model of program delivery using a range of technical staff to deliver inputs consistent with the evolving program outputs.
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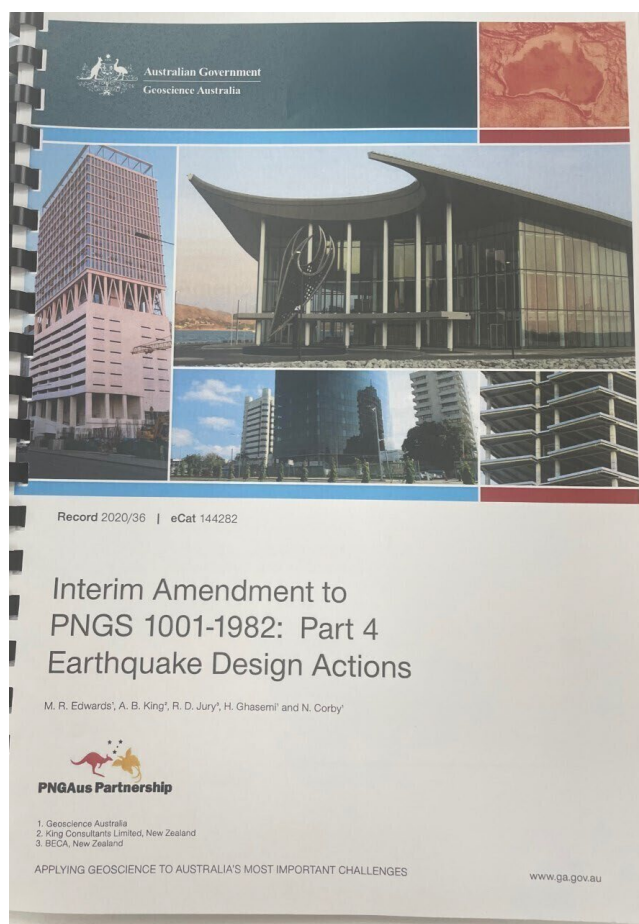
3.5 Impact

Key findings

The program is achieving impact both in terms of improved earthquake monitoring and updated earthquake hazard mapping that has informed the amendment of earthquake design standards and an improved building code.

The KEQ for impact is: What difference has the investment made? With the sub-question being: What are the benefits and impacts of the program (intended and unintended)?

The program has implemented a diverse range of activities and the direct impact of the overall program would be hard to measure. A number of the activities can be assessed as having impact. One activity that has had a clear and very substantial impact is the national earthquake hazard assessment that has informed the PNG Interim Amendment document.



This document is already being utilised to inform various infrastructure developments in PNG. Those reported in the GA annual reports for 2020-21 and 2021-22 include:

- Design of five new ports
- Kimbe Hospital
- Metoreia Health Centre
- Various infrastructure projects in Bougainville

It was reported to the evaluator that engineers from the Total led Papua LNG Project had asked the Dept of Works for the draft to inform the construction standards of their new LNG plant Papua LNG which is scheduled to commence development by the end of 2023. This is a multi-billion dollar project.

From the Department of Works perspective, a major benefit of the amended building code is the avoidance of both under-engineering and over-engineering.

The national earthquake hazard assessment has also provided an evidence base for why further work is needed to better quantify the seismic risk in Lae, PNG's second largest city and industrial centre. The recent earthquake near Lae has accentuated the importance of this work. A GA team was travelling to Lae to begin this work at the time of writing this report.

Another impact of the program has been the improvement of earthquake monitoring through the CBSN. In the recent (September 2022) Lae earthquake, it was only the three installed CBSN stations that successfully recorded the earthquake. The older and more expensive earthquake monitoring equipment were not fully operational during the event and failed to pick it up. The same Raspberry Shake technology is being used by GA (in modified form) to trail as Rapid Deployment Kits (RDK). The initial RDK were planned to be presented to PMGO and RVO in November for their feedback on their functionality. These low cost seismic monitoring units are now used by both PMGO and RVO for monitoring both earthquake and volcanic activity and are a more affordable option for these financially constrained GoPNG agencies.

To a certain extent, the impact is the fact that PMGO and RVO continue to have functioning earthquake monitoring capacity. The Lae earthquake example indicates that without the low cost CBSN stations PNG would have had no functioning in-country capacity at all.

Technical inputs from GA have also supported the DFAT funded Transport Sector Support Program (TSSP), specifically in the development of port infrastructure in Vanimo where GA was able to complete a site-specific tsunami hazard assessment to inform design leading to more resilient infrastructure.

3.6 Sustainability

Key findings

The program is building improved capability and capacity on PNG technical agencies in difficult circumstances. It is, however, evident that sustaining that capacity requires continued GA support unless and until PNG technical agencies are better resourced by GoPNG.

In relation to sustainability, the KEQ is: "Is the investment building lasting capability and capacity?" with the sub-question being: "What improved capacities and capabilities indicate or point to sustainability?"

From the beginning of the program in 2010 there has been a strong focus on building the capacity of technical GoPNG partner agencies, particularly DMPGM. There are a number of challenges here with the main one being the small number of staff in these agencies and the limited financial resources made available to these agencies by GoPNG. Without the ongoing

support of GA there would likely be a deterioration in the technical capacity of these agencies, both in terms of equipment and human resources. GA does not directly support the cost of staff in these agencies but it has provided substantial opportunities for professional development (both in PNG and Australia) and it is unlikely these opportunities would be available without GA support. DMPGM have a number of long term technical staff, some who have been with the department since before the GA program began in 2010. This has allowed for continuity but it is very difficult for DMPGM to attract and retain new staff given the required skillset is similar to that required by the mining industry in PNG which is able to provide much better salaries and conditions.

Despite these constraints, there is evidence of sustainable improvements in capacity within DMPGM. An example was provided during the long COVID imposed travel restrictions. GA has relied on regular face to face exchanges to build capacity in PNG since the beginning of the program. This was not possible during COVID and GA could only provide remote support (virtual meetings and email exchanges). In the 2020-21 annual report, GA identified a number of indicators for the success of capacity building efforts specifically around the capability of PMGO and RVO to fully set up, maintain and use the Raspberry Shake earthquake/volcanic monitoring stations. These indicators are listed below with the results in green or amber (no red):

- RVO is able to bring the existing CBSN stations at Bialla and Kimbe back into operation and keep them operational – RVO got Bialla back in operation but there are issues with the Kimbe site beyond the capability of RVO to address.
- RVO/PMGO has successfully negotiated access to new sites for further CBSN stations: RVO was in the process of planning installation on Bougainville (in collaboration with the ABG) and PMGO confirmed a location in Wewak with plans to install in November 2022
- RVO/PMGO is able to install at least one new CBSN station: PMGO installed one at Rainbow Estate in Port Moresby
- RVO install Raspberry Shake at their existing Matupit Island site and telemeter data back to base, thus proving their ability to embrace the new low-cost sensors in their existing network system: RVO is directly sending to their server using telemetry.

These results indicate that there is improved capacity that point to sustainability but it is likely that without ongoing inputs from GA there would be some degrading of capacity, due to the fact that PNG technical agencies continue to be underfunded and under-resourced. Without improvement to that underlying situation (which is beyond GA's role) it is likely that sustainability of the current level of technical capacity requires continued GA support.

Another key activity in the program that is meant to improve sustainability is the enhancement of the PNG Geohazards website. This is the key output under the second outcome of the current program: *The PNG community have a better awareness and*

understanding of natural hazards and can access relevant information online. The website has gone through four phases of operationalisation and finalisation and is waiting for final approval from the Secretary of the Geohazard Management Division before final launch. DMPGM also need to be able to assign 24/7 duty officers to ensure materials are published online and in real time. The website is hosted by a PNG company (Datec) and once operational would be a significant milestone towards sustainability.

Another area not directly related to the GA program but one that could contribute to sustainability of geohazard management capacity in PNG is that of the Centre for Disaster Risk Reduction at the University of PNG. The Centre hosts a Raspberry Shake as part of the CBSN and was visited as part of this evaluation. The Centre received funding from the EU (under EDF 11) to design a Graduate Diploma in Geohazards and Risk Management which they have done. The Graduate Diploma builds on the broadening unit (Geology and Disaster Reduction) that is offered within the Bachelor of Science (Major in Earth Sciences) program. There is strong demand for the broadening course with 50-100 students per year (PNG and Pacific regional students) taking the course. This would indicate that there would likely be demand for a graduate diploma if it was made available.

The Graduate Diploma in Geohazards and Risk Management curriculum is fully developed but has not yet been rolled out and needs additional funding to do so. Having a regular cohort of graduates in geohazard risk management (not just in PNG but the Pacific more broadly would be a significant asset in terms of human resources. Employment pathways would include the resource sector (multiple large gas and mining projects in PNG) as well as public and private sector infrastructure development, to name just two major areas. This is potentially something that DFAT could support through Australia Awards PNG (AAPNG currently funds scholarships in UPNG's Graduate Diploma in Economic and Public Policy. Geohazard management in PNG is a male dominated field and providing targeted scholarships for women could contribute to breaking down this male domination.

Recommendations

Recommendation 8: DFAT to consider supporting UPNG in offering the Graduate Diploma in Geohazards and Risk Management through support from Australia Awards PNG, including targeted scholarships for women.

4. Conclusion

The Geoscience Australia Technical DRR in PNG Program is an effective program that has evolved extensively to adapt to the needs and circumstances of its principal PNG stakeholders – the three technical agencies that sit within the Department of Minerals Policy and Geohazard Management. This evolution has taken it from a more ambitious multi-hazard approach (involving a broad range of national and provincial stakeholders and reaching down to community level to mitigate risks posed by natural hazards) to a more focused program looking at geohazards with limited outreach to community. This is an understandable evolution given the context of the broader DRM architecture in PNG and its challenges.

The program has achieved notable impacts including an updated national earthquake hazard map that is informing substantial improvements to earthquake design and building codes. Another notable achievement is the beginning of the establishment of a seismic monitoring network based on low cost seismic monitoring equipment as well as an upgraded PNG Geohazards website and associated capacity strengthening of DMPGM staff.

There is potential to broaden the impact of the program through strengthening linkages at the community level via the Australian Humanitarian Partnership. Broader impacts at the national level would require greater capacity and leadership from the national DRM coordination structures.

5. Recommendations

This evaluation makes the following recommendations:

5.1 Recommendations for Geoscience Australia

Recommendation 1: GA to continue its flexible and needs-based approach to assisting PNG technical agencies in building their capacity to manage hazards.

Recommendation 2: GA to coordinate with USGS to ensure potential future USGS inputs are complementary with GA future inputs.

Recommendation 3: GA to revisit the issue of a multi-hazard approach in the design of a new phase of the program (from July 2023). This could also include linkages with PACI and Australian Humanitarian Partnership NGOs (Disaster READY) in PNG.

Recommendation 4: GA to meet with the Disaster READY Country Committee (DRCC) to explore possibilities for piloting community-based hazard awareness on seismic risk, most likely in Bougainville.

Recommendation 6: Annual reporting should consistently include gender disaggregated data for participation in program related training and workshops.

Recommendation 7: GA to continue the current model of program delivery using a range of technical staff to deliver inputs consistent with the evolving program outputs.

5.2 Recommendations for DFAT

Recommendation 5: DFAT to consider at a different approach to strengthening DRM in PNG. One model to consider could be the Australia-Indonesia Partnership in Disaster Risk Management with its focus on institutional capacity and organisational systems strengthening to improve leadership in DRM.

Recommendation 8: DFAT to consider supporting UPNG in offering the Graduate Diploma in Geohazards and Risk Management through support from Australia Awards PNG, including targeted scholarships for women.

Appendix 1: Terms of Reference

TERMS OF REFERENCE

Evaluation of the Technical Disaster Risk Reduction Program in Papua New Guinea under Activity Schedule 41 to the Record of Understanding No. 51172

Background

Located in the active Pacific Ring of Fire, Papua New Guinea (PNG) is ranked among the most disaster-prone countries due to the geophysical conditions. The World Risk Report 2021 identifies PNG among the top 10 countries with the highest disaster risk worldwide⁴. Natural hazards, including earthquakes, tsunamis, volcanic activity, cyclones, flooding, landslides, and droughts are contributing to the risks; PNG ranks highest in terms of the population exposed to severe volcanic risk, and is among the top six countries with the highest percentage of population exposed to earthquakes⁵. National disaster risk management coordination is challenged by limited resources and capacity, and disparate governance structures, and challenging geography. The PNG National Disaster Centre is officially slated to be elevated to an executive agency and may benefit from increased budgetary resources to support its mandate.

Since 2010, Geoscience Australia (GA) has been working with PNG to strengthen the capacity to monitor and build resilience to natural hazards, in partnership with the Government of Papua New Guinea (GoPNG) technical agencies, including the Department of Mineral Policy and Geohazards Management (DMPGM), Rabaul Volcano Observatory (RVO), Port Moresby Geophysical Observatory (PMGO) and Engineering Geology Branch (EGB). The support provided by Geoscience Australia has evolved over the period. Under the current activity schedule, the outcomes of the investment are:

Outcome A – The Government of PNG technical agencies are better positioned to deliver timely and accurate advice on natural hazards to the community and decision makers.

Outcome B – The PNG communities have a better awareness and understanding of natural hazards and can access relevant information online

As per the activity workplan, a range of activities are currently delivered aligned with these overarching outcomes. Activities supported through the investment have included, but are not limited to –

- Probabilistic Tsunami Hazard Assessment for PNG
- Enhancing earthquake monitoring by upgrading seismic stations across PNG
- Monitoring volcanic activity
- Strengthening building design through updating the PNG Earthquake Building Standard
- Automatic reports for an emergency response to earthquakes
- Improving access to early warnings and alerts by establishing a Geohazards website for PNG.
- Building local knowledge

The support delivered by GA is one component of larger program disaster risk portfolio managed by the Australian aid program in PNG.

⁴ https://weltrisikobericht.de/wp-content/uploads/2021/09/WorldRiskReport_2021_Online.pdf

⁵ UNDRR (2019). Disaster Risk Reduction in Papua New Guinea: Status Report 2019. Bangkok, Thailand, United Nations Office for Disaster Risk Reduction (UNDRR), Regional Office for Asia and the Pacific. https://www.preventionweb.net/files/68266_682309pngdrmsstatusreport.pdf

Activity Description

As the Technical Disaster Risk Reduction Program is coming to an end in June 2023, DFAT Port Moresby Post wishes to commission an evaluation of the Geoscience to understand the relevance, effectiveness, efficiency, and impact of the program in the last 10 years. The findings of the evaluation will inform future investment decisions and considerations around the broader portfolio of DRR support via the aid program.

Post is working with the Australia Pacific Climate Partnership (the Climate Partnership) to undertake the evaluation. The Climate Partnership is an Australian development program in the Pacific that aims to integrate climate and disaster resilience into Australia's aid investments in the region and promotes a multi-hazard approach. It manages an Expert Panel, a cohort of sector specialists in many development sector areas, including disaster risk reduction (DRR) and monitoring, evaluation, and learning (MEL).

Under the overall guidance of the DFAT Port Moresby Post (Program Strategy and Gender team) and in close contact with GA (Natural Hazards and Impacts, Community Safety Branch), the Climate Partnership seeks to engage an appropriately qualified and experienced Expert Panel member to undertake the evaluation.

Objectives

The objective of the evaluation is to provide an overview of the program's relevance, coherence, effectiveness, efficiency, impact, and sustainability as per the evaluation questions described further below. In doing so the evaluation will summarise evidence of performance and outcomes, and through strategic analysis and expert judgment provide recommendations to inform future investment decisions regarding the partnership with Geoscience Australia, and the broader architecture of the DRR portfolio in PNG.

Scope and Method

The evaluation will be framed by the following evaluation questions, to be confirmed through the work planning process:

- Relevance – is the investment doing the right things?
 - Evidence that investment design and activities are aligned with PNG needs and priorities
 - Evidence that the investment fills a niche requirement in PNG
- Coherence – how well does the investment fit?
 - Evidence of the investment compatibility with other investments in PNG and within the DRM sector
- Effectiveness – is the intervention delivering what is intended?
 - Evidence that activities are being delivered as planned
- Efficiency – how well are resources being used?
 - Evidence that the delivery model is suitable and adds value
 - Evidence that compared to possible alternatives the delivery has been efficient.
- Impact – what difference does the intervention make?
 - Evidence of intended and unintended benefits and impacts as result of the investment
- Sustainability – is the investment building lasting capability and capacity?
 - Evidence that the investment is resulting in lasting capacities and capabilities of relevant PNG partners.

The evaluation is expected to be undertaken as a desk-based evaluation, with a selection of targeted consultation with relevant program stakeholders, including DFAT, GA, GoPNG agencies and other development partners (including NGOs and donors). Relevant interviews will be confirmed through the initial work planning process. The evaluation will draw on the following types of documentation and literature:

- Project funding agreements
- Annual Plans and Reports
- Program communication materials
- Investment outputs (web-based tools, reports etc)
- Other documentation

The evaluation will focus on the current phase of the investment 2020-2023, though it will give consideration to the long-term nature of the partnership investment, including with respect to notable capacity, capabilities, collaborations and partnerships, and other assets build up over the long-term investment. With this in mind, the evaluation may draw on documentation that predates the current 2020-2023 phase in order to glean and verify evidence as required to address the evaluation questions

The evaluation of the Program will commence on 12 September and be completed by 21 November 2022. The Climate Partnership's Climate Change Advisor and DRR Advisor will work alongside the MEL specialist to provide technical advice, as required, and the DFAT Program Team will be consulted regularly through the process.

The evaluator will commence with a kick-off meeting with DFAT Program Team and APCP and develop an evaluation plan, which will include a methodology; confirmation of the evaluation questions; documentation register; and a tentative schedule for online and (or face-to-face) consultations with relevant stakeholders in Australia and PNG. The evaluator will deliver an aide-memoire presentation in October (approx.) and submit the draft evaluation report by 31 October 2022. The final report is expected in the three weeks after the draft report submission and incorporates feedback from relevant stakeholders

If deemed necessary, the evaluator may be required to travel to Port Moresby and/or Canberra to undertake the evaluation. Any travel requirement will be agreed with the evaluator and additional costs covered by APCP.

Deliverables

Deliverable	Due Date
Evaluation Plan and Schedule	19 September 2022
Aid Memoir	24 October 2022
Draft Report	31 October 2022
Final Report	21 November 2022

Budget

It is estimated that the evaluation will require 25 days expert input.

Appendix 2: List of stakeholder organisations

Organisation

DFAT (AHC, Port Moresby)
Port Moresby Geophysical Observatory (DMPGM)
Geohazard Management (DMPGM)
Engineering Geology (DMPGM)
Rabaul Volcanological Observatory (DMPGM)
National Institute of Standards and Industrial Technology
Department of Works and Highways
Geoscience Australia
USAID/Bureau for Humanitarian Assistance
USGS Volcano Disaster Assistance Program
University of Papua New Guinea

Participant List: Community-based Seismic Risk session of AHP Disaster READY 2.0 design workshop (19/10/22)

Organisation

CARE International in PNG
CARE International in PNG
Caritas Australia
ADRA
PNG ADP
PNG BU
Plan International in PNG

Appendix 3: List of documents reviewed

Chamberlain, Peter (October, 2018) Independent Review of the “Strengthening Disaster Risk Management in Papua New Guinea” Project.

DFAT (2016) Activity Schedule 41 to the Record of Understanding No. 51172

Edwards, M. R., A.B. King, R.D. Jury. H. Ghasemi and N. Corby (2020) Interim Amendment to PNGS 1001-1982: Part 4 Earthquake Design Actions, Geoscience Australia

Geoscience Australia Progress Reports - Technical Disaster Risk Reduction in Papua New Guinea

Annual Report FY2021/2022

Annual Report FY2020/2021

Annual Report FY2018/2019

Annual Report FY2017/2018

Geoscience Australia Progress Reports - Strengthening Natural Hazard Risk Assessment Capacity in Papua New Guinea

Six month report 2016

Six month report 2015

Annual Report FY2013/2014

Annual Report FY2012/2013

Annual Report FY2011/2012

Annual Report FY2010/2011

Geoscience Australia - Extension Proposal Overview - Technical Disaster Risk Reduction in Papua New Guinea 2020-2023