Republic of Fiji
National Disaster Risk Management Office (NDRMO)

The Project for Mainstreaming Disaster Risk Reduction (Second Period)

Project Completion Report

December 2025

Japan International Cooperation Agency (JICA)

Oriental Consultants Global Co., Ltd.
Pacific Consultants Co., Ltd.
Yachiyo Engineering Co., Ltd.

GE
JR
25-105

Republic of Fiji
National Disaster Risk Management Office (NDRMO)

The Project for Mainstreaming Disaster Risk Reduction (Second Period)

Project Completion Report

December 2025

Japan International Cooperation Agency (JICA)

Oriental Consultants Global Co., Ltd.
Pacific Consultants Co., Ltd.
Yachiyo Engineering Co., Ltd.

Table of Contents

List of Figures

Page

List of Tables

Page

Abbreviations

ADB	Asian Development Bank
C/P	Counterpart
CCA	Climate Change Adaption
CCICD	Climate Change and International Cooperation Division
DBGA	Department of Buildings and Government Architects
DDM	Director for Disaster Management
DDS	Director for Development Services
DEM	Digital Elevation Model
DoE	Department of Energy
DoLS	Department of Lands and Survey
DoW	Department of Waterways
DRR	Disaster Risk Reduction
DWS	Department of Water and Sewerage
EPC	Emergency Planning and Coordination
FAL	Fiji Airports Limited
FMS	Fiji Meteorological Service
FNBC	Fiji National Building Code
FRA	Fiji Road Authority
FRDP	Framework for Resilient Development in the Pacific: An Integrated Approach to Address Climate Change and Disaster Risk Management
GIS	Geographical Information System
HAT	Highest Astronomical Tide
IFRC	The International Federation of Red Cross and Red Cresent Societies
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
JMA	Japan Meteorological Agency
MoWE	Ministry of Waterways and Environment
M/M	Minutes of Meetings
MFSPNDS	Ministry of Finance, Strategic Planning, National Development and Statistics (former MoE)
MAW	Ministry of Agriculture and Waterways (former MWE)
M&E	Monitoring and Evaluation
MoC	Ministry of Communication
MoE	Ministry of Economy
MoITDM	Ministry of Infrastructure, Transport, Disaster Management and Meteorological Services
MHCD	Ministry of Housing and Community Development
MHLG	Ministry of Housing and Local Government
MLMR	Ministry of Lands and Mineral Resources
MMI	Modified Mercalli Intensity

MPWMST	Ministry of Public Works, Meteorological Services, and Transport (former MoITDM)
MRD	Mineral Resources Department
MRMDDM	Ministry of Rural and Maritime Development and Disaster Management
NAP	National Adaptation Plan
NCCP	National Climate Change Policy
NDMA	National Disaster Management Act
NDRMC	National Disaster Risk Management Councils
NDRMO	National Disaster Risk Management Office (former NDMO)
NDMP	National Disaster Management Plan
NDP	5-Year and 20-Year National Development Plan
NDRRP	National Disaster Risk Reduction Policy
NEOC	National Emergency Operation Centre
NEOP	National Emergency Operation Plan
NOAA	National Oceanic and Atmospheric Administration
OCW	Office of Commissioner Western
OJT	On the Job Training
PDM	Project Design Matrix
PGA	Peak Ground Acceleration
PO	Plan of Operation
PRRP (UNDP)	Pacific Risk Resilience Program
PSIP	Public Sector Investment Program
R/D	Record of Discussions
RESTEC	Remote Sensing Technology Center of Japan
RMR	Risk Management and Research
RRI	Rainfall Runoff Inundation Model
SDGs	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction 2015-2030
SPC	Pacific Community
SOP	Standard Operation Procedure
TAF	Telecommunications Authority of Fiji
TEA	Training Education and Awareness
UNDP	United Nations Development Program
UNDRR	United Nations Office for Disaster Risk Reduction
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN-HABITAT	United Nations Habitat
USGS	United States Geological Survey
USP	University of South Pacific
WG	Working Group
WRI	World Resources Institute

Project Completion Report

I. Basic Information on the Project

I.1 Country

The Republic of Fiji

I.2 Title of the Project

The Project for Mainstreaming Disaster Risk Reduction (Second Period)

I.3 Duration of the Project (Planned and Actual)

First Period

Plan : From February 2020 to October 2023 (44 months)
Actual : From February 2020 to July 2024 (53 months)

Second Period

Plan : From November 2023 to March 2025 (16 months)
Actual : From August 2024 to November 2025 (16 months)

I.4 Background

In the Republic of Fiji, hereinafter referred to as Fiji, flooding occurs almost every year due to cyclones and rain fronts. Tsunamis caused by earthquakes pose risks in the surrounding ocean. The vulnerability of living in small, reclusive, and remote island countries increases the disaster risk in Fiji, the 14th high-risk country among 181 countries in the world based on the World Risk Index 2021 released by the UN University. Therefore, Disaster Risk Reduction (DRR) is required to promote the sustainable development of Fiji.

The National Disaster Risk Management Office (NDRMO) is responsible for developing and monitoring the implementation of DRR plan and coordinating related agencies based on the National Disaster Management Plan (NDMP) of 1995, the National Disaster Management Act (NDMA) of 1998 and the National Disaster Rik Management Act (NDRMC) of 2024.

Fiji has a certain level of capacity for disaster response, based on its experience with past disasters through coordinating related agencies from national to local levels. Furthermore, some efforts were made to mainstream and promote the pre-investment for DRR by developing the “Fiji National Disaster Risk Reduction Policy (NDRRP) 2018-2030” based on international framework such as the Sendai Framework.

However, there are several challenges in the institutional framework for the development of national and local DRR plans and the implementation of DRR projects in the hazard assessment, etc. Given this situation, JICA received the request to implement the “Project for Mainstreaming DRR” which will enhance the

capacity of NDRMO. JICA conducted the detailed planning survey for this project from May to June 2019. The Record of Discussions (R/D), which describes the details of the project, was signed on October 9, 2019, between JICA and NDRMO, Ministry of Infrastructure, Transport, Disaster Management, and Meteorological Services.

I.5 Overall Goal and Project Purpose [from Record of Discussions (R/D)]

The overall goal, project purpose, expected outputs, and respective activities since the beginning of the Project are summarized in Table I-1.

Table I-1 Summary of Overall Goal, Project Purpose, Outputs, and Activities

Overall Goal	DRR activities in the NDRRP roadmap are implemented under the coordination of NDRMO.
Project Purpose	Capacity of NDRMO is strengthened to implement and promote DRR activities in line with the international, regional, and national policies.

Output	**Activities**
Output 1 The capacity to assess hazards scientifically is strengthened in collaboration with technical agencies.	1-1 Conduct a survey on the present status of hazard assessments (including roles and responsibilities among agencies) in Fiji and identify issues. 1-2 Examine methodologies to assess hazards based on the present status in Fiji. 1-3 Conduct hazard assessments of targeted disasters at pilot areas. 1-4 Develop a guideline to assess hazards and a plan to expand the assessments nationwide.
Output 2 The implementation system is established to develop practical local DRR plans nationwide.	2-1 Examine the optimal way to implement local DRR planning and expand them nationwide based on the present conditions in Fiji. 2-2 Develop local DRR plans of pilot areas in accordance with a practical development process. 2-3 Conduct technical supports to implement prioritized DRR measures in the plans. 2-4 Prepare a guideline to develop and implement local DRR plans based on the results and the lessons learned from pilot activities. 2-5 Develop an implementation plan to expand Local DRR plans, and its monitoring and evaluation procedures.
Output 3 The functions to promote DRR investment are enhanced at a national level in consideration with CCA.	3-1 Conduct a survey on the system and capacity to plan, implement, monitor and review DRR activities at a national level, and identify issues. 3-2 Develop a practical road map to invest in DRR activities based on related national DRR/CCA plans and policies. 3-3 Establish a system to plan, implement, monitor, and review DRR activities implemented by related agencies. 3-4 Conduct meetings under NDRMC structure among related organizations to implement the above activities. 3-5 Support mainstreaming DRR into activities implemented by related organizations. 3-6 Organize a system to issue a National Annual Report on DRR.

Source: JICA Project Team

I.6 Implementing Agency

I.6.1 Overall Structure of the Project

The main counterpart (C/P) of this project is the National Disaster Risk Management Office (NDRMO) so it will be mentioned in the Project purpose. NDRMO collaborates with the C/Ps listed below to achieve the Project objectives.

Table I-2 C/Ps and Related Agencies

Organization Name		Involvement in the Project	Relevant Outputs
C/P	NDRMO	- C/P of the Project. - Coordination with related organizations. - Formulation and facilitation of the Approval/ Authorization of the Project Outputs. - Establishment of internal and inter-agency structures to monitor the formulation and implementation status of the LDRRMPs, conduct training to expand the Pool of Trainers, and maintain the sustainability of the Project. Establishment of procedures to periodically review and renew Project Outputs.	Overall Project (including monitoring of the Project activities, inter-agency arrangements, and others)
Related Organizations	MRMDDM	- Overall adjustment as a governmental ministry of NDRMO. - Formulation of the local DRR Plans in the Divisional Commissioner Office. - Coordination with pilot local governments.	Overall Project
	MFSPNDS	- Feedback on the local DRR plans developed by the project activity. - Feedback on the draft NDRRP roadmap as the ministry of governmental authorities of the national financial.	Mainly Outputs 2 and 3
	MHLG	- Feedback on the local DRR plans developed by the project activity.	Mainly Outputs 2
	MPWMST	- Overall adjustment as a governmental ministry of the Fiji Meteorological Service, FMS. - Feedback on the local DRR plans developed by the project activity. - Feedback on the draft NDRRP roadmap as the ministry of governmental authorities of public infrastructure.	Mainly Outputs 1, 2 and 3
	FMS	- Conduct hazard analysis (flood and storm surge). - Provide observation data.	Mainly Outputs 1
	MLMR	- Conduct hazard analysis (earthquake, tsunami, and landslide /sediment). - Provide observation data. - Provide topography data.	Mainly Outputs 1

Organization Name		Involvement in the Project	Relevant Outputs
	MAW	- Conduct hazard analysis (flood). - Provide observation data. - Feedback on the Local DRR Plans developed by the project activity. - Feedback on the draft NDRRP roadmap as the ministry of governmental authorities implementing flood control projects.	Mainly Outputs 1, 2 and 3
	Pilot Cities and Towns	- Conduct pilot activities. - Approval of the Local DRR plans developed by the activity. - Review and monitoring of the Local DRR plans.	Mainly Outputs 2
	Prevention and Mitigation Committee member agencies	- Feedback on the draft NDRRP Roadmap as the implementing agency for DRR projects.	Mainly Outputs 3

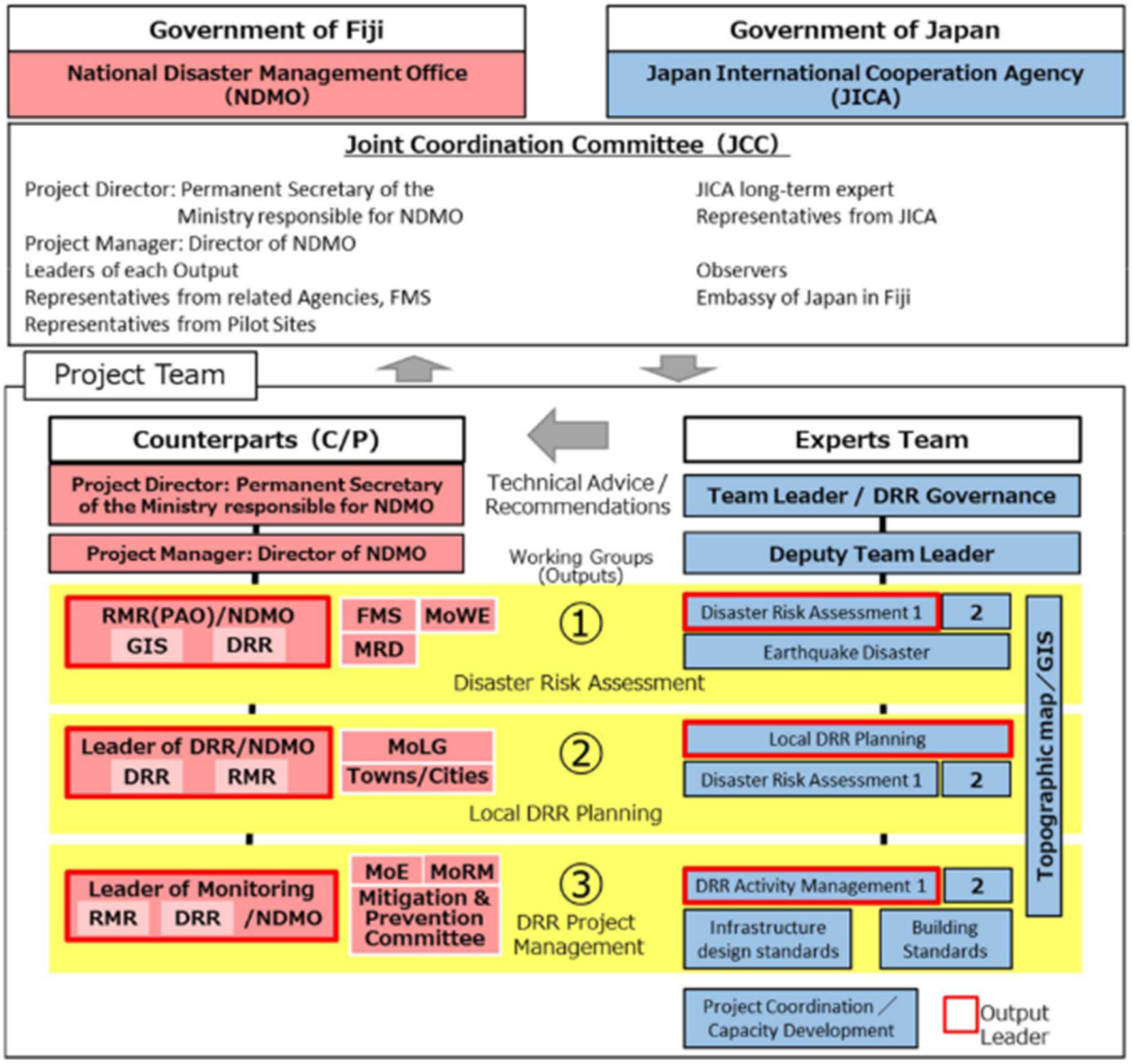
Source: JICA Project Team

I.6.2 Administrative Structure of the Project

Figure I-1 presents the implementation structure of the Project.

The Project members from Fiji and Japan have three WGs based on the Project outputs. The counterpart members from DRR, RMR, and GIS in NDRMO will be assigned as members of each WG so that project members from Fiji would take ownership of the Project and continue the NDRMO capacity enhancement through the WG activities. In addition, at least one person from related organizations should be assigned as a member of each WG to build a good link between NDRMO and other organizations. Identifying the roles and responsibilities of each organization will strengthen the DRR in Fiji.

The Joint Coordination Committee (JCC) meeting members, as described in R/D of the Project, are responsible for decision-making related to the Project implementation. The individual activities of the Project were carried out in close coordination with the JICA experts, forming Working Groups (WGs) for each output.



Source: JICA Project Team

Figure I-1 Administrative Structure of the Project

II. Results of the Project

II.1 Results of the Project

II.1.1 Input by the Japanese Side (Planned and Actual)

(1) Expert Dispatch

The assigned roles of the experts are listed, including the planned and actual dispatch and man-months (Table II-1 and Table II-2).

Table II-1 Dispatch of JICA Experts (First Period)

Roles	Number of Dispatch		Man Month (MM)	
	Planned	Actual	Planned	Actual
Team Leader / DRRM Governance	7	4	6.80	4.50
DRR Activity Management 1	10	10	7.07	7.23
DRR Activity Management 2	0	0	1.05	1.05
Deputy Team Leader / Local DRR Planning	10	12	9.83	11.15
Disaster Risk Assessment 1	10	8	9.93	8.17
Disaster Risk Assessment 2 (Coastal Disaster / Climate Change)	8	6	6.00	4.88
Earthquake Disaster	6	4	4.90	4.97
Building Standards	6	2	5.60	2.82
Infrastructure Design Standards	3	3	2.00	2.00
Topographic Map 1 / GIS 1	3	3	2.00	2.00
Project Coordination / Capacity Development	7	5	0.00	0.00
DRR Activity Management 3	6	5	3.50	3.53
Deputy Team Leader 2 / Local DRR Planning 2	0	0	0.75	0.75
Topographic Map 2 / Hazard Mapping	0	0	0.45	0.45
GIS2 / Terrain Analysis	7	4	6.80	4.50
Total	76	62	59.88	53.50

Source: JICA Project Team

Table II-2 Dispatch of JICA Experts (Second Period)

Roles	Number of Dispatch		Man Month (MM)	
	Planned	Actual	Planned	Actual
Team Leader / DRRM Governance	6	7	2.67	3.87
DRR Activity Management 1	6	6	2.67	3.33
Deputy Team Leader / Local DRR Planning	6	6	2.67	2.97
Disaster Risk Assessment 1	6	5	2.67	4.00
Disaster Risk Assessment 2 (Coastal Disaster / Climate Change)	2	2	0.67	0.80
Disaster Information Management and Inter-Organizational Collaboration Strengthening	0	6	0.00	2.17
Earthquake Disaster	1	1	0.67	0.67
DRR Activity Management 2	5	7	1.33	4.00
Total	32	40	13.35	21.81

Source: JICA Project Team

(2) Invitation to Japan

The Fiji C/P NDRMO, MRMDDM, and officers from the pilot area, Office of Commissioner Western and Office of Commissioner Central came to Japan for an invitation program in October 2024. For further details, please refer to the "Report on the Invitation to Japan for the Project for Mainstreaming of Disaster Risk Reduction in Fiji".

Table II-3 Breakdown of Training Participants

Position	Participants	
MRMDDM	2	Total 5
OCW	1	
OCC	1	
NDRMO	1	

Source: JICA Project Team

(3) Equipment Provision

One note PC was provided for office use in February 2024. Additionally, topographical data for the project target area was purchased for the purpose of detailed hazard analysis in February 2025. Table II-4 shows the details of the equipment.

Table II-4 Details of Equipment

Equipment	Product Specification	No. of Unit
PC	HP NB 155-FQ2733TU i5-1135G7 16 GB 512GB SSD W11 HOME S-MODE 15.6" FHD WIFI-AC + BT5	1
Satellite Topography Data	AW3D High-Definition 3D Topography Data 0.5m DTM Area 100~499km^2, Greater Suva Area	1

Source: JICA Project Team

II.1.2 Inputs by the Fiji Side (Planned and Actual)

(1) Counterpart assignment

NDRMO implemented the project and convened other agencies for meetings and other coordination. The WG has 22 members from the Risk Management and Research (RMR) Unit (responsible), GIS Unit, OCW, and OCC of MRMDDM, FMS, and MRD.

Table II-5 List of WG members

Working Group (WG) / Output	Leader	Members
Overall	[P] Mr. Sunia Ratulevu, RMR, NDMO (retired in Dec. 2021) > - [S] Mr. Napolioni Boseiwaqa, RMR, Mr. Napolioni Boseiwaqa, RMR, NDRMO	
WG1: Hazard / Risk Assessment	[P] Mr. Tevita Soqo, GIS, NDMO (resigned in Aug 2023) > - [S] Ms. Lita Uaniceva, GIS, NDRMO	- [S] Mr. Freddy Uluilakeba, GIS, NDRMO - [S] Mr. Johnthan Varea, GIS, NDRMO - Mr. Viliame Vereivalu, FMS - Mr. Swashica, FMS - Mr. Orisi, FMS - Mr. Sefo, FMS - Mr. Saly, FMS - Mr. Rovil, FMS - Mr. Stephen Meke, FMS - Mr. Sake, FMS - Mr. Amit, FMS - Mr. Laisenia Rawace, MRD - Mr. Saula Mule, MRD - Mr. Mika Seru, MRD - Mr. Samisoni Raiwalui, MRD
WG2: Local DRR Plan	[P] Mr. Mesake Mataitoga, RMR, NDMO (resigned in Aug. 2022) > [P] Mr. Mitieli Seruiratu, RMR, NDMO (resigned in Feb. 2023) > - [S] Mr. Eparama Ruamarau, RMR, NDRMO - [S] Mr. Joji Waqana, RMR, NDRMO	Mr. George Dregaso, RMR, NDMO Mr. Jone Malapo Bacau, OCW, MRMDDM - Mr. Mateo Naiveli,OCW, MRMDDM - Mr. Elimi Rokoduru, OCC, MRMDDM
WG3: DRR Projects Promotion	[P] Mr. Kevin Maitava, RMR, NDMO (resigned in Apr. 2023) > - [S]Ms. Savaira Sigawale, RMR, NDRMO	- Ms. Melenia Tuinasau, RMR, NDRMO

[P]: predecessor, [S]: successor

Source: JICA Project Team

(2) Provision of offices

NDRMO designated an office and room for the project for the smooth progress of the activities. Apart from this, NDRMO provided a conference room and costs at some meetings, such as the Joint Coordination Committee.

II.1.3 Activities (Planned and Actual)

(1) Overview of the Project

[0-1]: Support to hold the JCC Meetings and progress explanation.

The Fijian and Japanese sides held a JCC meeting to share the project progress and discuss activities of particular importance. In addition to the JCC meetings, progress meetings aim to monitor the progress and outcomes of the project. The following table lists the JCC meetings and progress meetings held during the first period of activities.

Table II-6 JCC Meetings and Inter-WG Meetings

Date	Meeting	Main Agenda
2022 May 18	1st JCC Meeting	- Progress of NDRRP Implementation and linkages to the project - Project outline - Project Progress and next activities - Confirmation of revision of Record of Discussion (R/D)
Nov. 17	1st Progress Meeting	- Project progress on overall project and each Output - Discussion - Ways forward
2023 June 2	2nd JCC Meeting	- Project progress on overall project and each Output - Discussion - Ways forward
2024 Jan. 19	2nd Progress Meeting	- Project progress on overall project and each Output - Discussion - Ways forward
June 12	3rd JCC Meeting	- Project progress on overall project and each Output - Discussion - Ways forward
Sep. 23	Kick Off Meeting	- Project progress on overall project and each Output - Discussion - Ways forward
2025 Feb. 20	3rd Progress Meeting	- Project progress on overall project and each Output - Discussion - Ways forward
Sep. 2	4th Progress Meeting	- Project progress on overall project and each Output - Discussion - Ways forward
Oct. 27	JCC Meeting and DRR Seminar	- Project Summary and Future DRR Activities to be Implemented by Fiji

Source: JICA Project Team

[0-2]: Preparation and discussion of the Work Plan (in Japanese).

Based on the common specifications, a work plan was prepared and approved by JICA.

[0-3]: Preparation and discussion of the Work Plan.

A draft Work Plan, including an outline of the project, was shared with the Fijian side at the kick-off meeting in September 2024, and they approved it.

[0-4]: Implementation of endline for measuring project effectiveness.

An end-line survey was carried out from July to August 2025 to measure the project's achievements. We collected data corresponding to the indicators from the initial baseline survey and the PDM, conducted interviews with the C/P, and compiled the survey results in September.

[0-5]: Invitation in Japan.

The purpose of this invitation program in Japan was to enhance the awareness of decision-makers from disaster management organizations in Fiji regarding the planning and implementation of DRR projects in Fiji. This was achieved by having them observe various DRR initiatives of Japan against different types of disasters to understand the concept and potential effectiveness of such projects.

This invitation was extended to five high-ranking government officials from Fiji, including the Minister and the Permanent Secretary of MRMDDM, Office of Commissioner Western and Office of Commissioner Central and the Acting Director of NDRMO and was carried out for approximately one week in October 2024. For further details, please refer to the "Report on the Invitation to Japan for the Project for Mainstreaming of Disaster Risk Reduction in Fiji".

(2) Output 1

[1-2]: Examine methodologies to assess hazards based on the present status in Fiji.

The local DRR plan formulated in Output 2 will reflect the results of the hazard and risk assessments. Details will be described in the section below, but the local DRR plans will be formulated for both the divisional level and Priority Area Plans in pilot areas.

A simplified method was used as a preliminary assessment for a large-scale hazard assessment at the broad division level. Priority areas, assessed to have a higher disaster risk than others, were selected based on the results of preliminary assessments. Enhanced assessment, which is a more detailed evaluation/analysis method than the preliminary assessment, was conducted for the Priority Areas, accounting for the available data and the horizontal deployment of C/P to other areas in the future. There has been no change in the evaluation method since the first period.

The following is an overview of the methodologies of preliminary assessment and enhanced assessment for each type of disaster used in this study. The next section will discuss the results of each method outlined below.

1) Flood

As a preliminary assessment, the "Aqueduct Floods Hazard Maps (Global Flood Map)" developed by the World Resources Institute (WRI), which is available on the online platform, was utilized. In addition,

risk assessments, such as the number of affected households, population, and business establishments within the flood range, were conducted using the national census data of 2017 for population and 2018 for registered establishments.

Developing a detailed model of runoff, hydraulics, and inundation analysis and conducting adequate simulations for considering specific countermeasures against floods is significant to implement the project. Although currently available hydrological data, elevation data, records of actual inundation area and inundation level, which are contributing factors to model verification in Fiji, are very limited, it is possible to evaluate using a more scientific method than the preliminary assessment, utilizing the observed hydrological data. Therefore, the Rainfall Runoff Inundation Model (RRI Model) was used as an enhanced assessment, which is not a detailed inundation analysis model, but can be analyzed even with limited data. Global DEM data (spatial resolution of about 30 m) was used to develop the model. High-resolution 3D map data (AW3D) was purchased and used for specific areas of Rakiraki and parts of Suva in the second period of the Project for detailed evaluation. In particular, observation rainfall data recorded by FMS (Koronivia Research Station, Nasinu, Savura, Wailoku, Tamavua) were used for the external forces of flooding in the Suva area. Regarding the return period of rainfall, the observation data of the Koronivia Research Station was used, as it was the only nearby observation station with long-term (75-year) observed data available. Since no river survey data is available, the calculation formula set in the RRI model was used.

2) Sediment disaster

Sediment disasters have three classification phenomena: debris flows, steep slope collapse, and landslides. From 2022 over the next five years, MRD plans to compile a GIS database of past debris flows, river erosion, slope failures, and landslides throughout Fiji. For this reason, “development of a database of past landslides records" was regarded as a preliminary assessment.

Hazard assessment of sediment disasters can be implemented in several ways, from basic methods of visually identifying from topographic maps based on past disaster history to analytical methods using high-resolution DEM data. Evaluation methods based on DEM data (elevation data), also available in Fiji, were used in this study as enhanced assessments of debris flows and steep slope collapse. Specifically, the basis for the slope calculation of rivers and streams is based on the DEM. The occurrence points and the end points of the debris flow are set depending on the slope (occurrence points will be the place where the slope is ten degrees or more in the mountain or hilly area, and the end points will be the section where the slope is two degrees or less and it is continuously reached to some extent)[1]. The degree of slope and its height were calculated based on the DEM to determine the hazard area of steep slope collapse, referring to the definition of steep slope in Japan, "slope of 30 degrees or more and a height of 5 m or more". The utilization of GIS data from the national census of 2017 for population and major roads is necessary to assess and extract both risk areas of debris flows and steep slope collapses (i.e., steep slopes that are not in the vicinity of households or major roads are not evaluated as

[1] This method refers to the method used in the JICA Project, “Capacity Development Project for Structural Measures against Sediment-related Disaster for Resilient Cities” in Brazil

hazard / risk areas). On the other hand, since assessing the landslides requires specialized surveys, such as reading literature and topography, and various field surveys and determination by specialists, this study focused on debris flow and steep slope collapse. Same as the flood hazard / risk assessments, AW3D was used within the range where it is available.

Since it is possible to evaluate the entire Viti Levu Island uniformly or at once by GIS, the judgment of the steep slope collapse using the above Enhanced Assessment was performed not only in the Priority Area but also on the entire Viti Levu Island.

3) Coastal Disaster

The following roles of the relevant organizations for coastal disaster are assumed.

The table below summarizes the preliminary and enhanced assessment of coastal hazards. The basis of the preliminary assessment is the current method used by the NDRMO and other organizations, which does not use numerical analysis to evaluate the intensity of hazards. On the other hand, the enhanced assessment is a method to improve scientific reliability as much as possible by utilizing the numerical analysis currently operated by FMS and MRD. The adapted method is to conduct numerical analysis assuming various hazards, mainly hazards that have occurred in the past, and to select hazards that have a large impact on the target area from among them.

The same method was employed in the preliminary assessment and enhanced assessment for risk analysis, utilizing the census data and exposure data on population, number of households, commercial facilities, etc.

Table II-7 Outlines of Coastal Disaster Hazard Risk Assessment

Level of Assessment	Hazard Analysis in Sea	Hazard Analysis in Land	Risk Analysis
Preliminary Assessment	- Not considered at all.	- Extract the impact area using ground elevation (10m, 20m) and distance from the coastline (1km, 3km) as indicators.	- Quantitative evaluation of the number of affected populations, households, commercial facilities, etc., using census data.
Enhanced Assessment	- [Storm Surge] Analyzed storm surges caused by significant past cyclones (including parallel shift courses) using the JMA model operated by FMS, identified the cyclones with the greatest impact on the target area, and calculated the coastal storm surge. - Using the ComMIT model operated by MRD for the Tonga-Vanuatu Trench for M9 class tsunamis, identify the tsunami sources with the greatest impact on the target area and estimate tsunami heights for the coastal areas.	- Calculated the maximum inundation area and inundation depth of the land area using the fill level method by adding HAT to the storm surge and tsunami heights at the coast.	- The same as above.

Source: JICA Project Team

1. Preliminary Assessment

Since the study covered a relatively large area, the following simplified assessment method, currently used by the NDRMO and other organizations, was applied as a Preliminary Assessment. Specifically, without conducting hazard analysis, this method identifies the areas used by the following two indices as potential disaster-prone areas and evaluates the population, assets, etc., within these areas.

Evaluation index 1: Ground elevation (MSL+10m or less, MSL+20m or less)
Evaluation index 2: Distance from the shoreline (1 km or less, 3 km or less)

Therefore, while coastal hazards cover storm surges and tsunamis, the Preliminary Assessment does not distinguish between the two, but rather evaluates the areas affected by disasters occurring in the coastal zone and the population affected by such disasters. Of course, the heights of storm surges and tsunamis vary from region to region, so this study is only a Preliminary Assessment of the population and asset concentration in coastal areas, while the Enhanced Assessment should consider the coastal and hazard characteristics of each region.

2. Enhanced Assessment

[Coastal Disaster: Storm Surge]

With respect to storm surges, cyclones that have occurred in the past are sorted out, and prominent cyclones are extracted. The most significant cyclones are identified by setting up a hypothetical course parallel to the east-west and north-south directions and calculating the one with the significant storm surge anomaly at the target location using a numerical simulation model (JMA model) to identify the maximum storm surge deviation in the coastal area. Furthermore, assuming that the storm surge deviation comes at high tide, the maximum storm surge tide level is set to add the Highest Astronomical Tide (HAT), and the inundation area and depth of the land area are calculated using the fill level method.

The cyclones that occurred in the past in Rakiraki and Suva, the target areas of the Enhanced Assessment in the second period of this project, were sorted, and the most prominent cyclones were extracted for each route.

<u>Representative Cyclones for Rakiraki</u>

a. Eastward: Cyclone Oscar 1983 (930 hPa)
b. Southward: Cyclone Evan 2012 (944 hPa)
c. Westward: Cyclone Winston 2016 (898 hPa)

<u>Representative Cyclones for Suva</u>

a. Eastward: Cyclone Oscar 1983 (930 hPa)
b. Southward: Cyclone Ana 2021 (975 hPa)
c. Westward: Cyclone Winston 2016 (898 hPa)

The most significant storm surge deviation for the target site was calculated by a numerical simulation model (JMA model) for these three representative cyclones by setting up a hypothetical shift course parallel to the east-west and north-south directions. As a result, the cyclone that shifted 0.25° north of the original course of Winston had a significant impact on Rakiraki, with a storm surge deviation of 1.74 m. Adding the HAT (MSL+1.142 m, Lautoka Port) to this storm surge deviation, the extent and depth of inundation over land were calculated by the fill level method as approximately MSL+2.9 m.

As the same as above, the cyclone that shifted 0.75° south of the original course of Winston had a significant impact on Suva, with a storm surge deviation of 1.23 m. Adding the HAT (MSL+0.966 m, Suva Port) to this storm surge deviation, the extent and depth of inundation over land were calculated by the fill level method as approximately MSL+2.2 m.

[Coastal Disaster: Tsunami]

With respect to tsunamis, past earthquakes and tsunamis are organized, and target earthquake and tsunami sources are extracted. For the prominent sources, we set up a series of sources shifted along the trench, calculated the one with the largest tsunami height at the target location using a numerical simulation model (ComMIT), and identified the maximum tsunami height in the coastal area. Furthermore, assuming that the tsunami will attack at high tide, the maximum tsunami water level is set to the Highest Astronomical Tide (HAT), and the inundation area and depth of the land area are calculated using the fill level method.

Tsunami analysis was conducted for Rakiraki and Suva in the target area of the Enhanced Assessment in the second period of this project, assuming M8.5 to M9.5 earthquakes for the Tonga Trench and Vanuatu Trench, and a numerical analysis model (ComMIT model) was used to calculate the maximum tsunami height for the target sites. The maximum tsunami height for Rakiraki was 2.03 m for an M9.5 earthquake and tsunami in the Tonga Trench. Adding HAT (MSL+1.142 m, Lautoka Port) to this tsunami height, the inundation area and depth of the land area were calculated by the fill level method as approximately MSL+3.1 m. For Suva, the maximum tsunami height was 5.3 m for a M9.0 earthquake and tsunami in the Tonga Trench. Adding HAT (MSL+0.966 m, Lautoka Port) to this tsunami height, the inundation area and depth of the land area were calculated by the fill level method as approximately MSL+6.3 m.

4) Earthquake Disaster

The fundamental concept of the methods used in earthquake hazard and risk assessment serves as basic reference material for the formulation of regional disaster reduction and mitigation plans in Output 2. An outline of these methods is presented in Table II-8. As shown in the table, the evaluation methods for ground motion indices (peak acceleration) at the engineering bedrock differ between simplified and detailed assessments of earthquake hazards.

In the former method, the ground motion index (peak ground acceleration, PGA) at the engineering bedrock is uniformly determined by adopting publicly available information from probabilistic seismic

hazard data (Global Earthquake Model[2]) as a reference. As shown in the table, the evaluation methods for ground motion index (PGA) at the engineering bedrock differ between preliminary and enhanced assessments of earthquake hazards. In the Preliminary Assessment, the ground motion index (PGA) at the engineering bedrock is uniformly determined by adopting publicly available probabilistic seismic hazard information (Global Earthquake Model) as a reference. This method is based on the case of the Community Earthquake Risk Assessment Study conducted by the Bureau of Urban Development, Tokyo Metropolitan Government. The reasons are: (1) it is an evaluation method that does not depend on a specific earthquake and can be applied to an area the size of a Japanese prefecture, such as Viti Levu Island in Fiji; and (2) it provides a standard reference for ground motion indices in urban planning and infrastructure development plans in the Western and Central Division.

The Enhanced Assessment, on the other hand, is based on the practice commonly adopted by Japanese local governments in estimating earthquake damage, where a scenario earthquake is defined. A scenario earthquake is one in which source parameters are set with reference to past damaging earthquakes that are expected to have significant impacts on the target area. In regions that have experienced damaging earthquakes in the past, those earthquakes and their parameters are used to calculate peak ground acceleration at the surface, based on attenuation relationships and soil amplification factors. The source parameters are determined with reference to the earthquake catalog of the U.S. Geological Survey (USGS). In the Central Division, which is the focus of second period, the Suva Earthquake of 1953, which caused damage in the area, was adopted as the scenario earthquake.

In regions where no damaging earthquakes have occurred, the policy shown in the table below was adopted: to define an earthquake with a shallow source located near land, expected to produce a seismic intensity distribution comparable to that of the Suva Earthquake. However, while this policy was applied in the Western Division during the first period, it was not used in the second period. It should be noted that the establishment of this policy was based on discussions among the project team, the technical adviser of JICA, and counterparts, and was reached through consensus.

As with the Preliminary Assessment, the risk assessment calculated the population exposure to seismic intensity. The specific calculation method and explanation are provided in the supplementary document, “Guideline on Earthquake Hazard / Risk Assessment – Simplified GIS-based Estimation”.

[2] https://maps.openquake.org/map/global-seismic-hazard-map/#8/-17.816/177.946

Table II-8 Outlines of Earthquake Hazard Risk Assessment

Assessment Level	Seismic Motion at the Engineering Bedrock	Soil Amplification Factor	Risk Assessment Details
Preliminary Assessment	- Apply the commonly published probabilistic seismic hazard indicators available on the web (10% exceedance probability over 50 years, maximum ground acceleration on engineering foundations) uniformly. - Use the average for priority areas on Viti Levu Island.	- Calculate using empirical methods based on Vs30 data published by the United States Geological Survey (USGS).	- Evaluate the population exposure to seismic intensity based on census population data. - MMI intensity scale reference: MMI VIII (level causing building damage, equivalent to JMA measured intensity of 5+ in Japan).
Enhanced Assessment	- Refer to the USGS earthquake catalog to set the source parameters for the scenario earthquake. - If a damaging earthquake occurred near the target region, use that earthquake. - For regions without damaging earthquakes, use a relatively nearby earthquake from the catalog with shallow focal depth (<30 km) and relatively large magnitude (M>6) as a reference to set seismic intensity distributions comparable to the Suba earthquake. - Calculate the maximum acceleration using an empirical method (attenuation formula for point sources).	- Calculate using empirical methods based on the Vs30 values published by the USGS.	- Evaluate the population exposure to seismic intensity based on census population data. - Calculate using MMI intensity levels VIII and VII, which cause building damage, as thresholds.

Source: JICA Project Team

In addition, the following role assignments for counterparts are assumed.

Table II-9 Outlines of Earthquake Hazard Risk Assessment

Special field	Organizations Involved	Explanation
Social Sciences, Engineering, and Information and Communication (buildings, population, etc., use of GIS)	NDRMO	- Obtain updated census data at each assessment cycle to update GIS population data. - Perform earthquake hazard and risk assessments using GIS. - Collaborate with MRD to calculate earthquake hazard and risk assessments using GIS for nationwide deployment. - Assume responsibility for estimating building damage by developing a building database (including footprints, structural types, etc.) and appropriately setting damage functions for future use.

Special field	Organizations Involved	Explanation
Natural sciences (fields related to earthquakes and geotechnical engineering)	MRD Seismology Section	- In the nationwide deployment plan, scenario earthquakes will be defined in response to requests from local governments. - Foundational data for ground acceleration (Vs30, borehole data, etc.) will be collected from publicly available sources such as the USGS website and through field surveys, with information updated accordingly. - Looking ahead, since the Vs30 data published by the USGS is based on topographic estimates, it will be necessary to replace it with higher-precision values derived from geophysical surveys and other methods in the future.
No specific expertise	Local Government	- Collaborate with NDRMO and MRD to play a role in nationwide earthquake hazard and risk assessment. - In actual hazard and risk assessments, receive technical guidance from NDRMO and MRD and work collaboratively. - Disseminate hazard information to residents of municipalities.

Source: JICA Project Team

1. Preliminary Assessment of Earthquake

When targeting a relatively wide area such as the Central Division, setting a scenario earthquake presents difficulties: shaking is stronger in areas near the epicenter and weaker in those farther away. Therefore, as a simplified assessment, the earthquake hazard evaluation method adopted was based on the method of the Bureau of Urban Development, Tokyo Metropolitan Government[3]. In this method, a uniform value of Peak Ground Acceleration (PGA) at the engineering bedrock is specified, and regional hazard and risk are evaluated on the same basis according to differences in soil amplification within the division.

- For the Central Division, the peak ground acceleration (PGA) at the engineering bedrock was determined by adopting the probabilistic seismic hazard distribution (10% probability of exceedance in 50 years) publicly available on the website and calculating the average seismic level for the pilot areas on Viti Levu Island. For the evaluation of soil amplification, values based on the average shear-wave velocity up to 30 meters depth (Vs30), published in 30-second latitude/longitude grid units on the U.S. Geological Survey (USGS) website, were adopted, and the soil amplification was calculated using an empirical method[4]. The PGA at the surface ground was calculated by multiplying the PGA at the engineering base by the soil amplification factor at each grid cell.
- Risk assessment employed population exposure to seismic intensity based on Fiji's 2017 national census. The seismic intensity threshold assumed is Modified Mercalli Intensity (MMI) VIII,

[3] https://www.funenka.metro.tokyo.lg.jp/2024/02/kikendo_english.pdf
[4] Midorikawa, S., Matsuoka, M. and Sakugawa, K. (1994): Site Effectson on Strong Motion Records Observed during the 1987 Chiba-ken-toho-oki, Japan Earthquake, Proc. Ninth Japan Earthquake Engineering Symposium, 3, 85-90.

which is typical for the country. This threshold is based on the fact that building damage generally begins to occur above this intensity level.

- The population exposure to seismic intensity will be utilized in DRR plans and other measures within the Priority Area identified in Output 2.

2. Enhanced Assessment for Earthquakes

In the earthquake damage estimates typically conducted by Japanese local governments, damage levels are generally calculated based on scenario earthquakes specific to the region. Therefore, in the detailed assessment, the calculation method employing scenario earthquake assumptions, which references earthquake damage estimates conducted by Japanese local authorities, was adopted as the hazard assessment methodology for formulating DRR plans during the pilot activities. The assessment policy is outlined below.

- Scenario earthquake settings: Point sources were established by reference to historical earthquake catalogues, with PGA on the engineering foundation calculated using the empirical attenuation formula [5]. Parameters from the USGS earthquake catalogue were referenced. For the target region, the scenario earthquake adopted had caused damage in the past, if such an event existed. For the Central Division, the 1953 Suva earthquake (Mw: 6.4, depth 10 km) was used.
- PGA at the ground surface was calculated by multiplying the PGA at the engineering bedrock by the soil amplification factor derived from USGS Vs30 data, as in the simplified assessment. The calculation results estimated an MMI of VIII around Suva, confirming validity with existing material (SOPAC, 2001)[6].
- Risk assessment was evaluated based on the population exposure to seismic intensity, similar to the preliminary assessment.

[1-3]: Conduct hazard assessments of targeted disasters at pilot areas.

Using the method explained in the activity above [1-2], a Preliminary Assessment in the Central Division and an Enhanced Assessment were conducted in the Priority Area. The results of each hazard evaluation are shown below.

1) Flood

The basis of the Preliminary Assessment is the 1-in-50-year inundation area of the "Aqueduct Floods Hazard Maps (Global Flood Map)." As shown in Table II-10, the coastal areas in Suva / Lami and the Rewa River basin have a large inundation area and affected households and population in the Central Division.

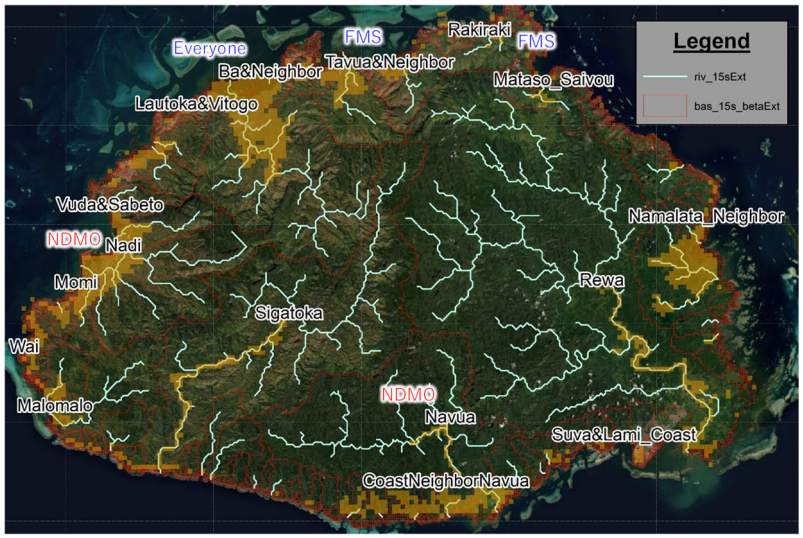
[5] Joyner W. B. and Boore D. M. (1982): Prediction of Earthquake Response Spectra, Open-file Report 82-977, 16pp, U.S.Geological Survey.
[6] SOPAC (2001): Site-Specific Earthquake Hazard Determinations in Capital Cities in the South Pacific, SOPAC Technical Report 300, pp.31.

Table II-10 Preliminary Assessment Results Based on the Global Flood Map (flooded areas are colored on the map)

Basin	Assumed										
				Risky Age Group (Need Assistance for Evacuation) [5]							
	Inundation Area[2] (km^2)	Affected Household[3]	Affected Population[3]	Affected Female	(%)	People required support for evacuation 55year-	(%)	People required support for evacuation 60year-	(%)	Affected Business[3]
Ba & Neighbor	199.9	8,533	35,790	17,426	49%	11,608	32%	9,588	27%	824
Lautoka & Vitogo	39.2	4,787	21,680	10,813	50%	6,521	30%	5,516	25%	127
Nadi	74.2	10,138	43,557	21,678	50%	12,969	30%	11,073	25%	1,214
Sigatoka	65.9	2,403	10,227	5,081	50%	3,305	32%	2,822	28%	103
Navua	44.7	1,484	6,599	3,266	49%	2,108	32%	1,804	27%	122
Coastal Neighbor Navua	92.7	1,420	6,285	3,109	49%	2,110	34%	1,814	29%	56
Rewa	99.3	4,678	21,732	10,794	50%	6,867	32%	5,804	27%	433
Namalata Neighbor	116.5	1,463	6,873	3,111	45%	2,225	32%	1,916	28%	76
Rakiraki	11.4	665	2,809	1,387	49%	886	32%	744	26%	248
Tavua & Neighbor	94.7	3,030	13,232	6,489	49%	4,339	33%	3,679	28%	210
Vuda & Sabeto	34.2	2,235	9,851	4,893	50%	3,015	31%	2,551	26%	182
Momi	51.3	2,176	9,167	4,504	49%	2,805	31%	2,329	25%	63
Suva & Lami Coast	22.0	4,378	18,885	9,128	48%	5,476	29%	4,697	25%	1,350

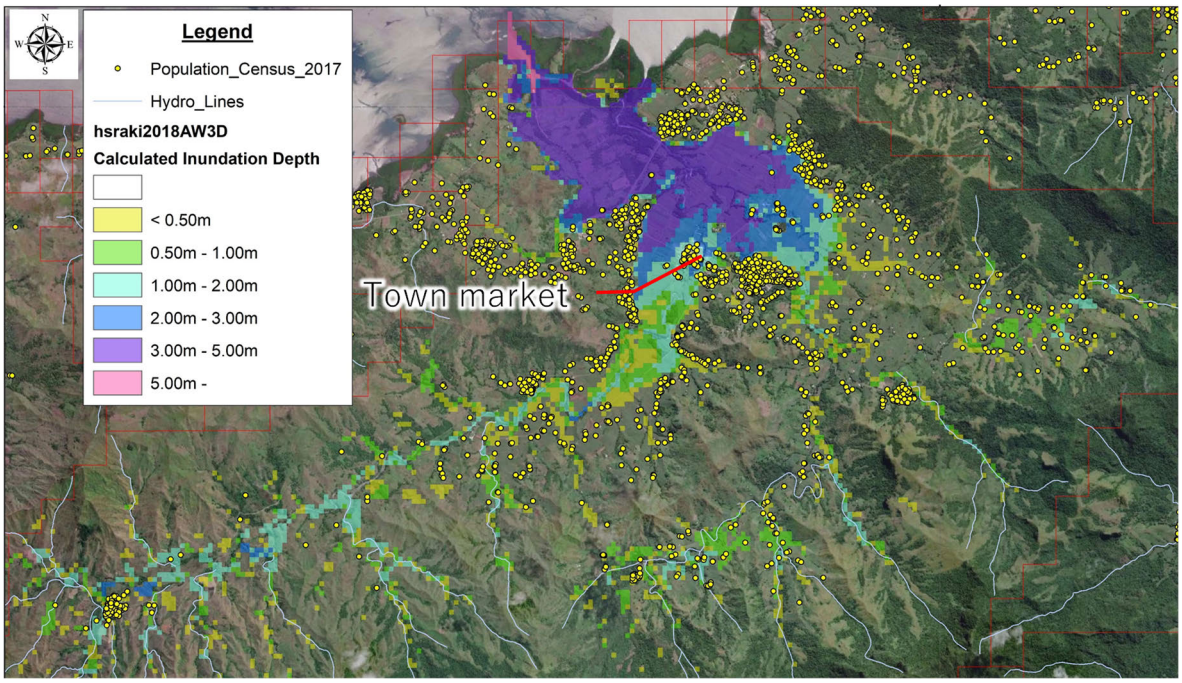
Actual Damage		
Frequency of Flood damage[4]	Year[4]	Damaged infrastructures in GFM inundation area[4]
5	2012Jan&Mar, 2016, 2018, 2019	84
4	2012Jan&Mar, 2016, 2018	31
4	2012Jan&Mar, 2016, 2018	54
4	2012Jan&Mar, 2018, 2019	21
1	2016,	10
1	2012,	6
3	2012Jan&Mar, 2016	10
-	Unknown	4
3	2012Jan&Mar, 2016	17
5	2012Jan&Mar, 2016, 2018, 2019	41
3	2012Jan&Mar, 2018	17
5	2012Jan&Mar, 2016, 2018, 2019	18
-	Unknown	2

1) inunriver_historical_000000000WATCH_1980_rp00050.tif,
(source: https://www.wri.org/data/aqueduct-floods-hazard-maps),
2) Difference of inundation depth is not considered,
3) Based on the 2017 Census (Household & Population)
The 2018 Census, "Fiji_BR_2018.shp" (Business),
4) Based on the "Infrastructures Affected by Flood" prepared by NDMO,
5) Based on the "Fiji 2017 EAs" provided by Bureau of Statistics



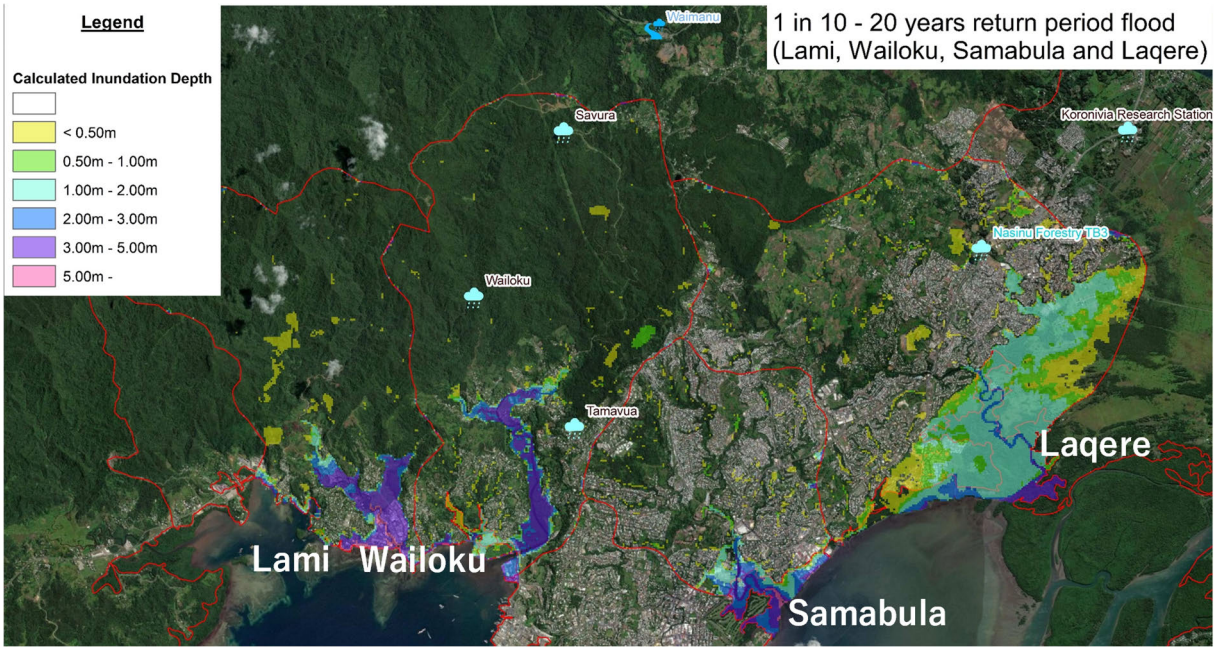
Source: JICA Project Team

As the Rakiraki area in the Western Division and the Suva area, including Lami in the Central Division, were selected as Priority Areas for flood DRR planning, as mentioned later, Enhanced Assessments were conducted using the RRI model. The Suva area has four small to medium rivers, and in consultation with C/P, the four river basins, the Lami River, Wailoku River, Samabula River, and Laqere River, were targets for the assessment. Figure II-1 and Figure II-2 shows the analysis results using the RRI model.



Source: JICA Project Team

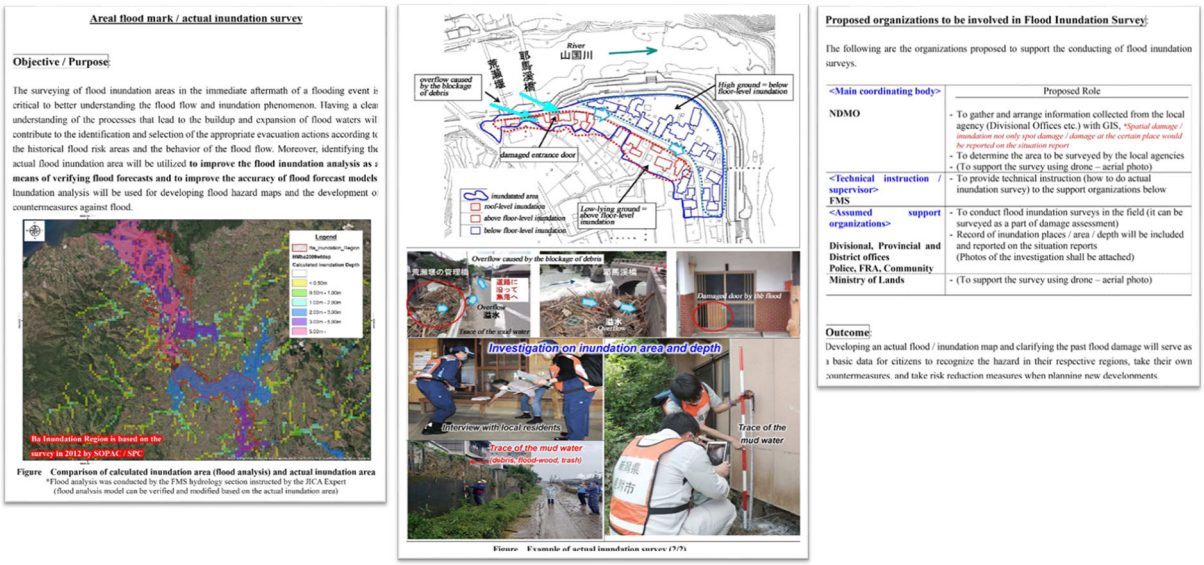
Figure II-1 An Example of Analysis Results by RRI Model in the Rakiraki River Basin



Source: JICA Project Team

Figure II-2 An Example of Analysis Results by RRI Model in the Suva Area

In addition, "the lack of information that contributes to the analytical model validation" was noted as an issue related to hazard assessment during the first period. Therefore, the JICA Project team proposed and discussed the implementation of actual flood surveys or flood trace surveys with NDRMO and FMS regarding that issue. As a result, NDRMO will consider implementing two responses: 1) adding flood depth to the survey items for the Initial Damage Assessment (which is dispatched about three days after a disaster at the request of the Division), and 2) incorporating post-flood investigations as one of the duties of disaster response officials to be deployed in the NDRMO's local offices (at the Division level) in the future.

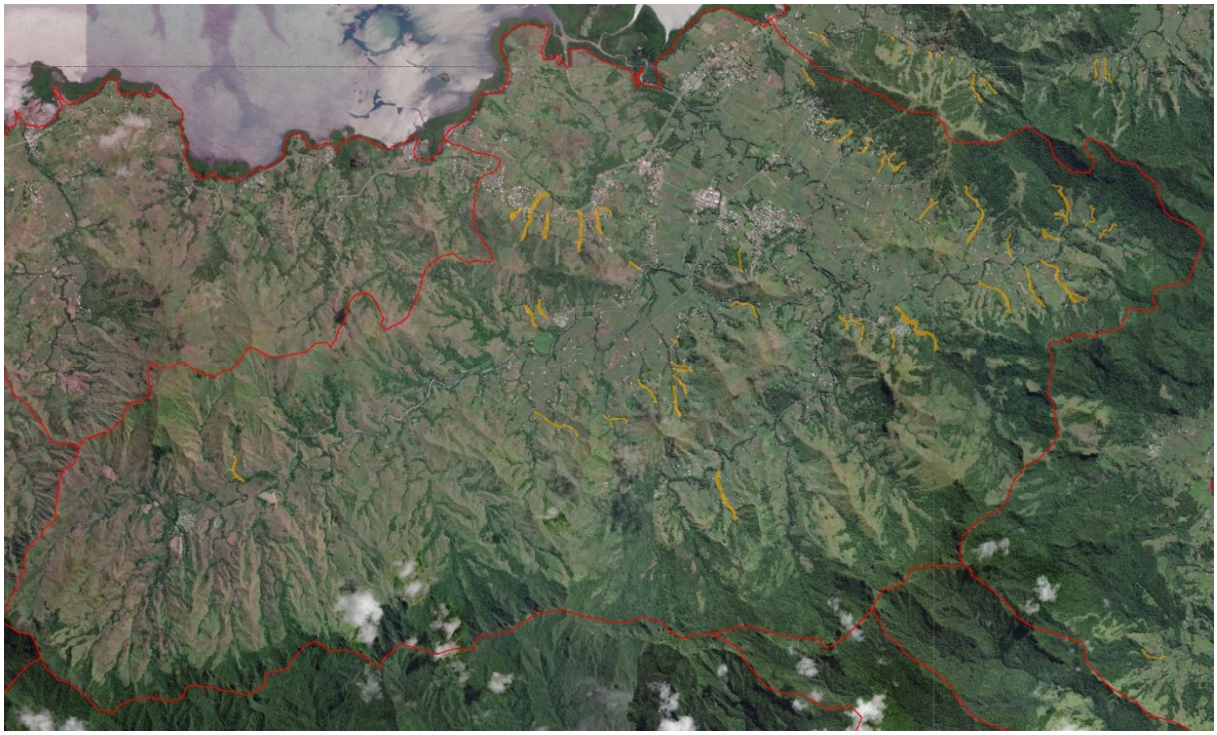


Source: JICA Project Team

Figure II-3 An Example of Analysis Results by RRI Model in the Suva area

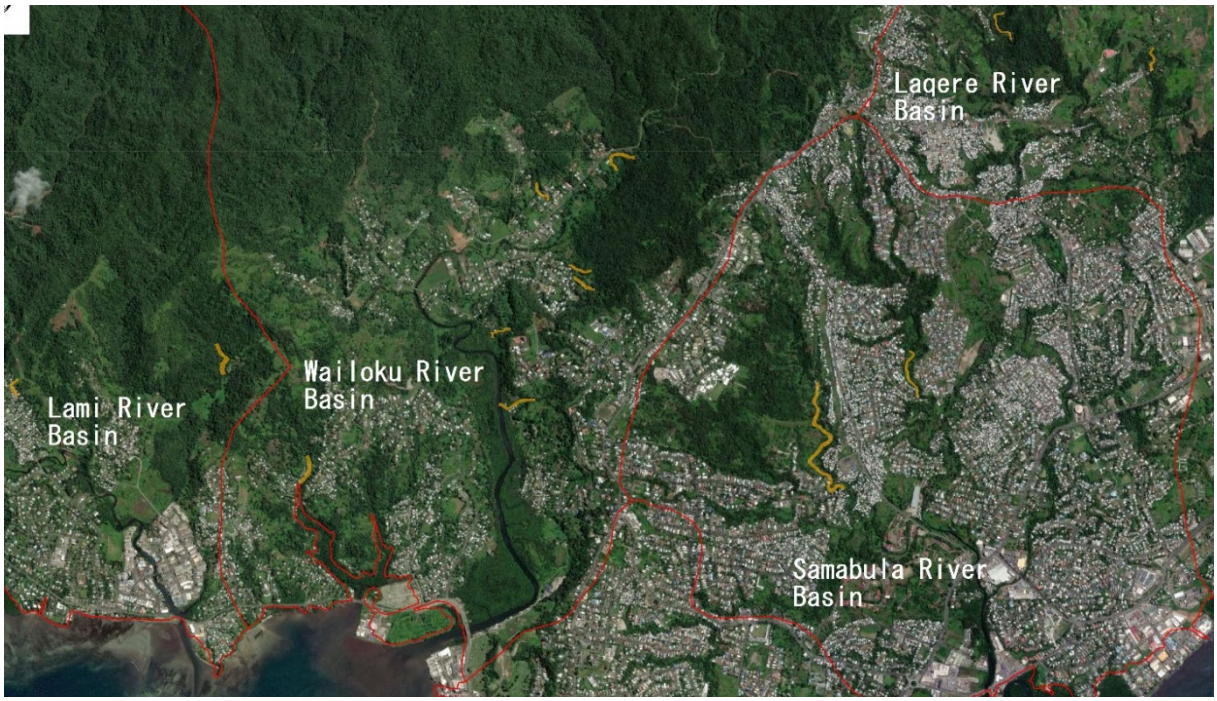
2) Sediment Disaster

C/Ps of MRD and NDRMO conducted a hazard assessment of debris flow in the Rakiraki River basin and Suva area under the guidance and review of JICA experts in the Enhanced Assessment (see Figure II-4 and Figure II-5).



Source: JICA Project Team

Figure II-4 Hazard Assessment of Debris Flow in the Rakiraki River Basin (risk areas are orange-colored areas on the map)



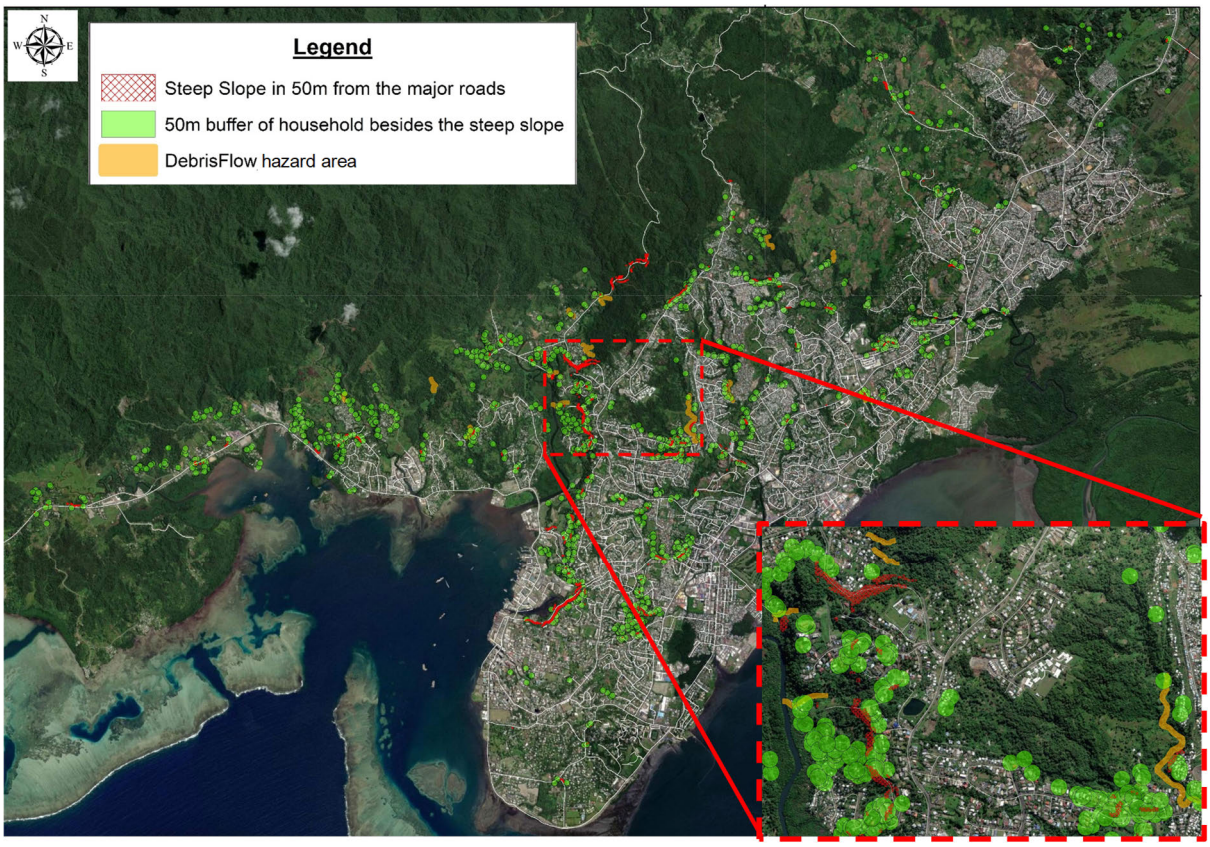
Source: JICA Project Team

Figure II-5 Hazard Assessment of Debris Flow in Suva area (risk areas are orange-colored areas on the map)

As mentioned above, steep slope collapse was assessed throughout Viti Levu Island (see Figure II-6 and Figure II-7). High-resolution 3D map data from AW3D is used in part of the Rakiraki area and the Suva area.

Source: JICA Project Team

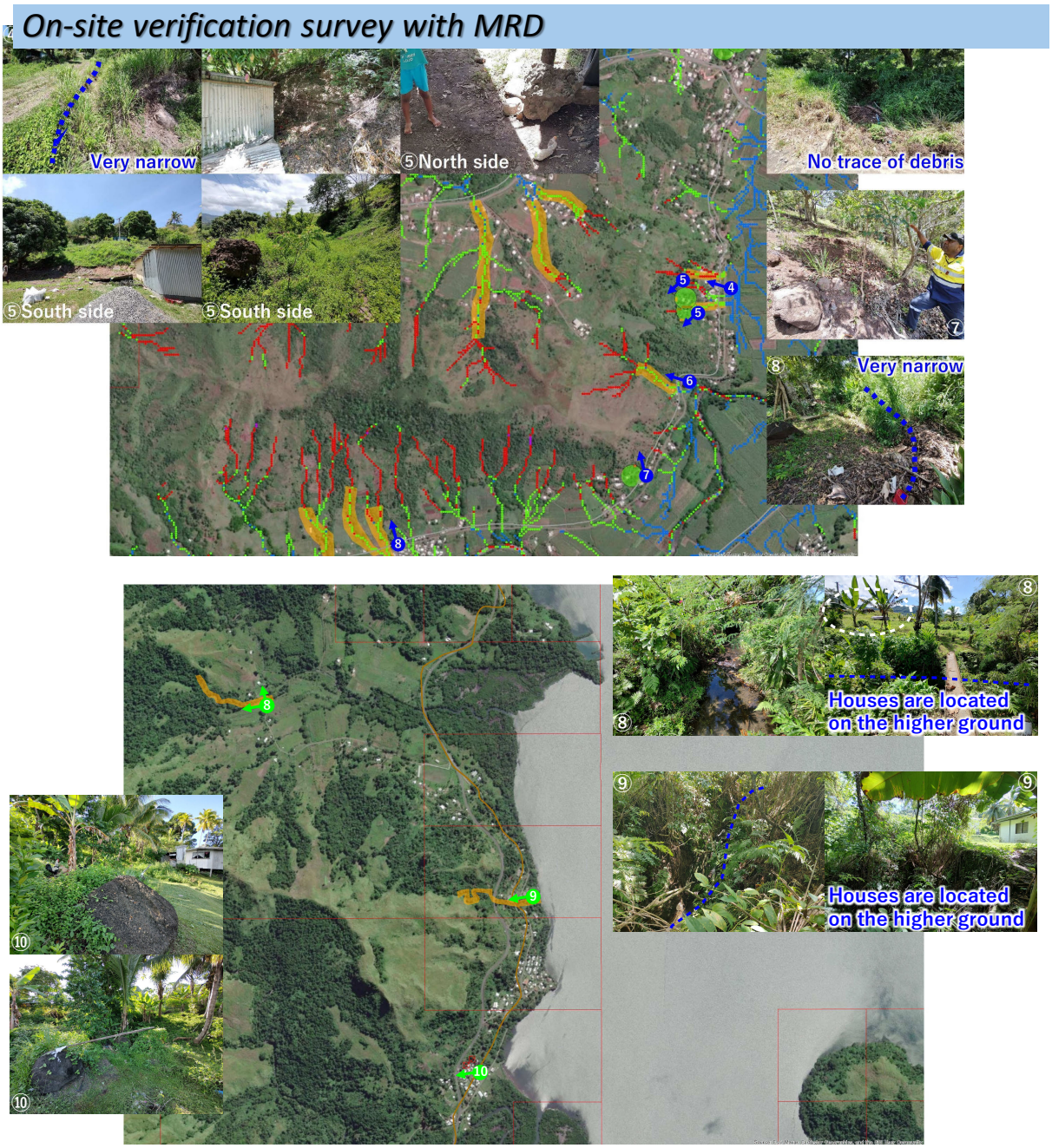
Figure II-6 Hazard Assessment of Steep Slope Collapse in the Rakiraki River Basin



Source: JICA Project Team

Figure II-7 Hazard Assessment of Steep Slope Collapse in Suva Area

Regarding the hazard areas of debris flows and steep slope collapse evaluated through desk research using GIS mentioned above, field surveys were conducted in collaboration with MRD to verify the validity of that evaluation. The validity was assessed through visual confirmation on-site of factors such as "geology", "condition of the ground surface", "thickness of topsoil", "history of past disasters", "presence of spring water", "distance from areas of human activity", "traces of remnants such as rocks, gravel, and driftwood", and "elevation differences" (see Figure II-8).

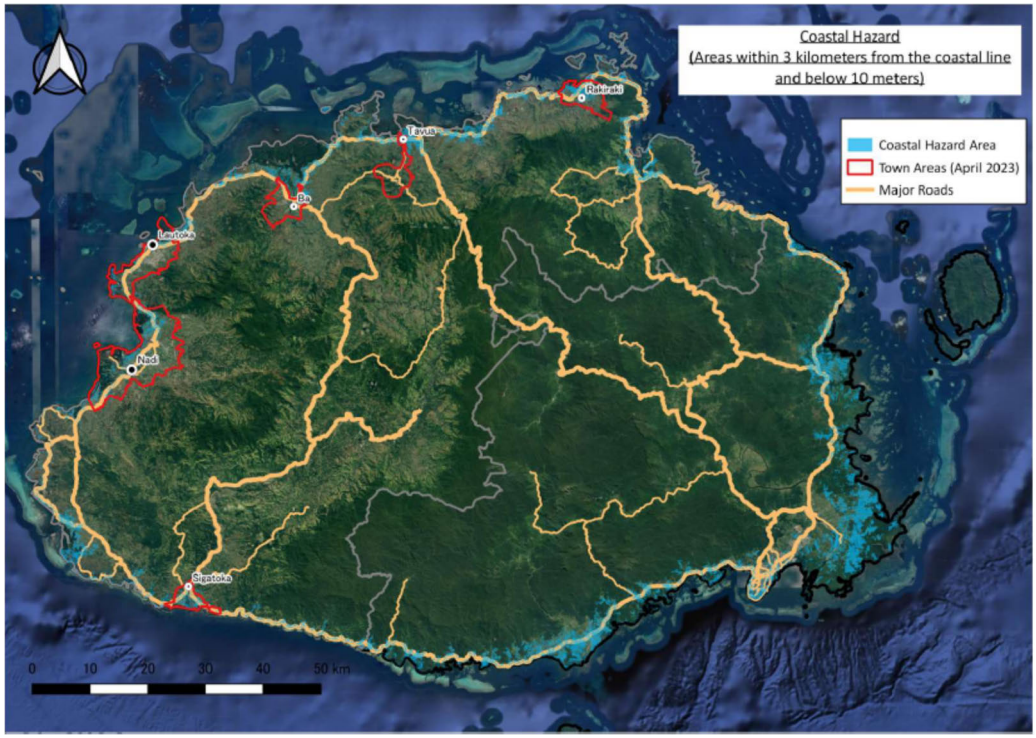


Source: JICA Project Team

Figure II-8 An Example of the Result of a Survey to Confirm the Validity of the Sediment Disaster Hazard Assessment

3) Coastal Hazard

Enhanced assessments for coastal hazards were necessary for areas below 10 m elevation and within 3 km of the coastline. As shown in Figure II-9, the inundated area is vast in Lautoka and Nadi.

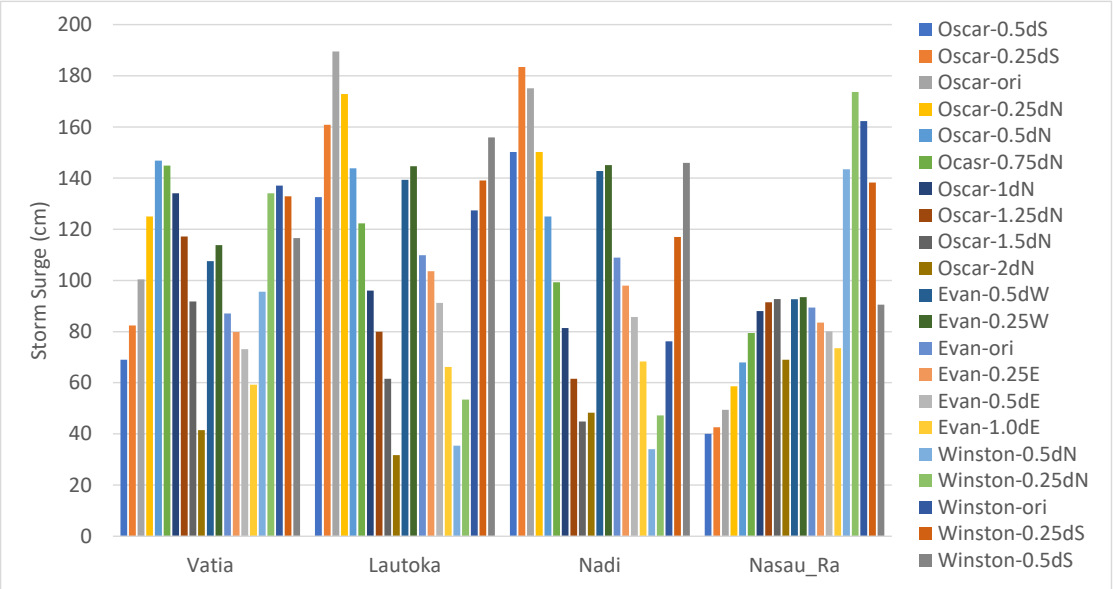


Source: JICA Project Team

Figure II-9 Hazard Assessment of Coastal Hazard on Viti Levu Island

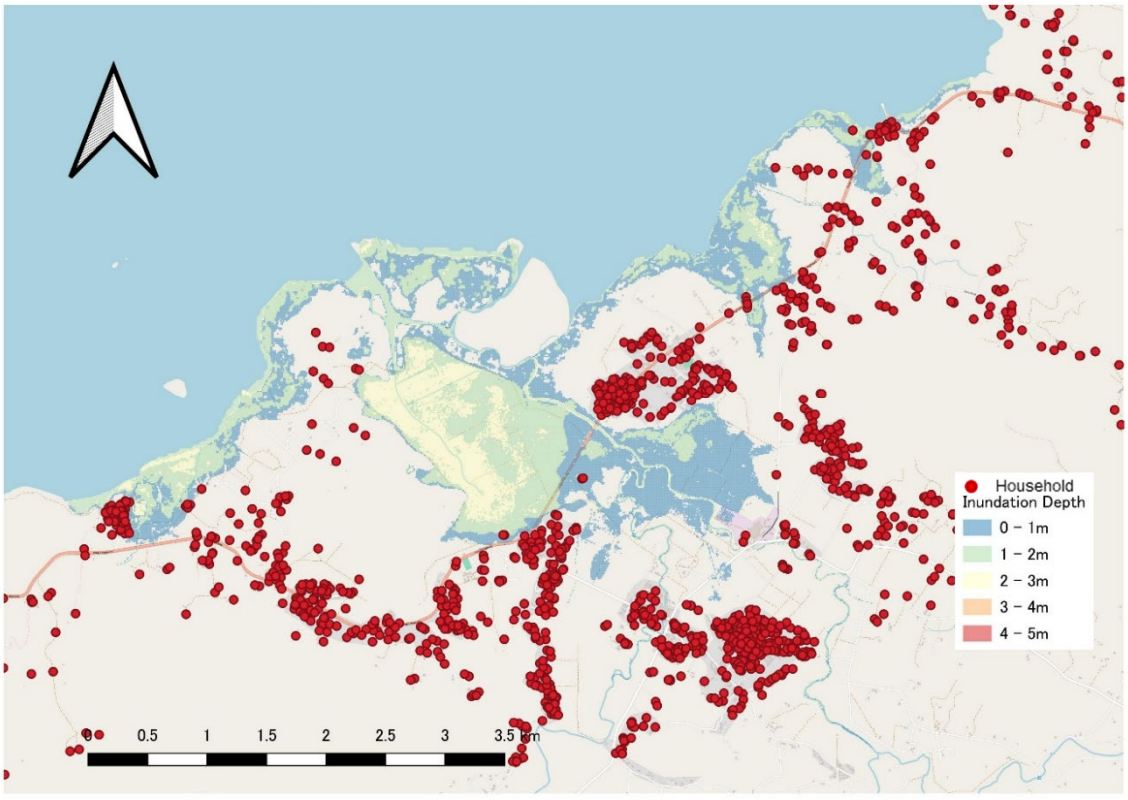
[Storm Surge]

Figure II-10 shows the results of a detailed storm surge assessment conducted under Cyclone Oscar, Evan, and Winston scenarios, with parallel shifted east-west and north-south directions. (For details of the research results, see the attached document Chapter 6, "Guideline on Storm Surge Hazard / Risk Enhanced Assessment -Enhanced Assessment-").



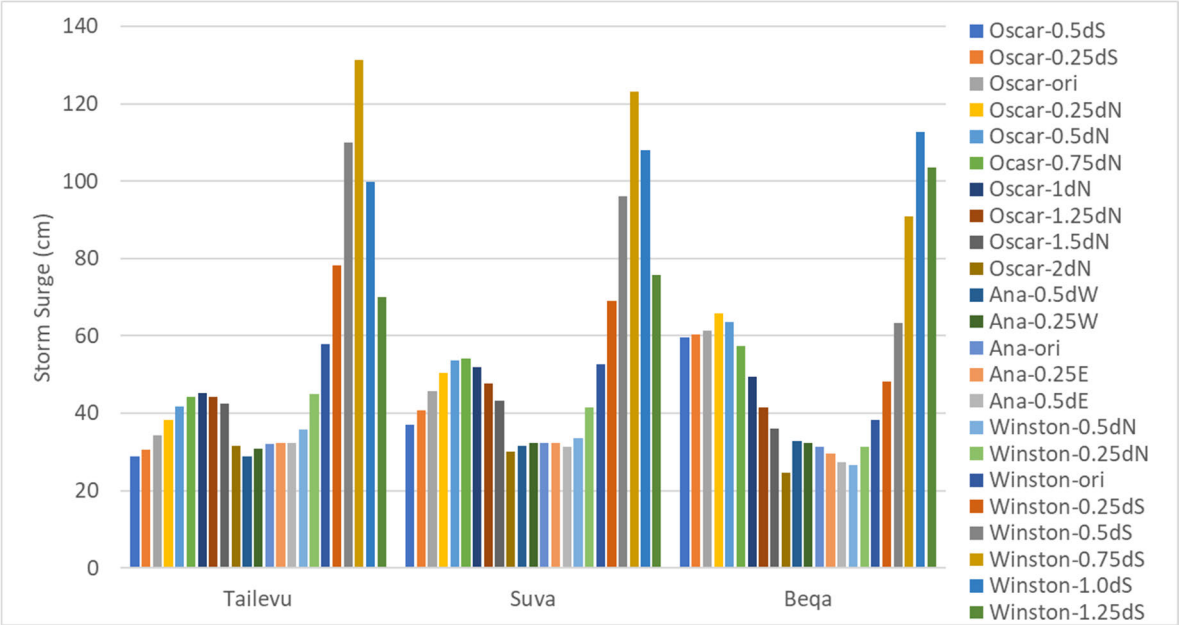
Source: JICA Project Team

Figure II-10 Scenario Hazard Assessment of Batia, Lautoka, Nadi and Nasau against Cyclones Oscar, Evan, and Winston



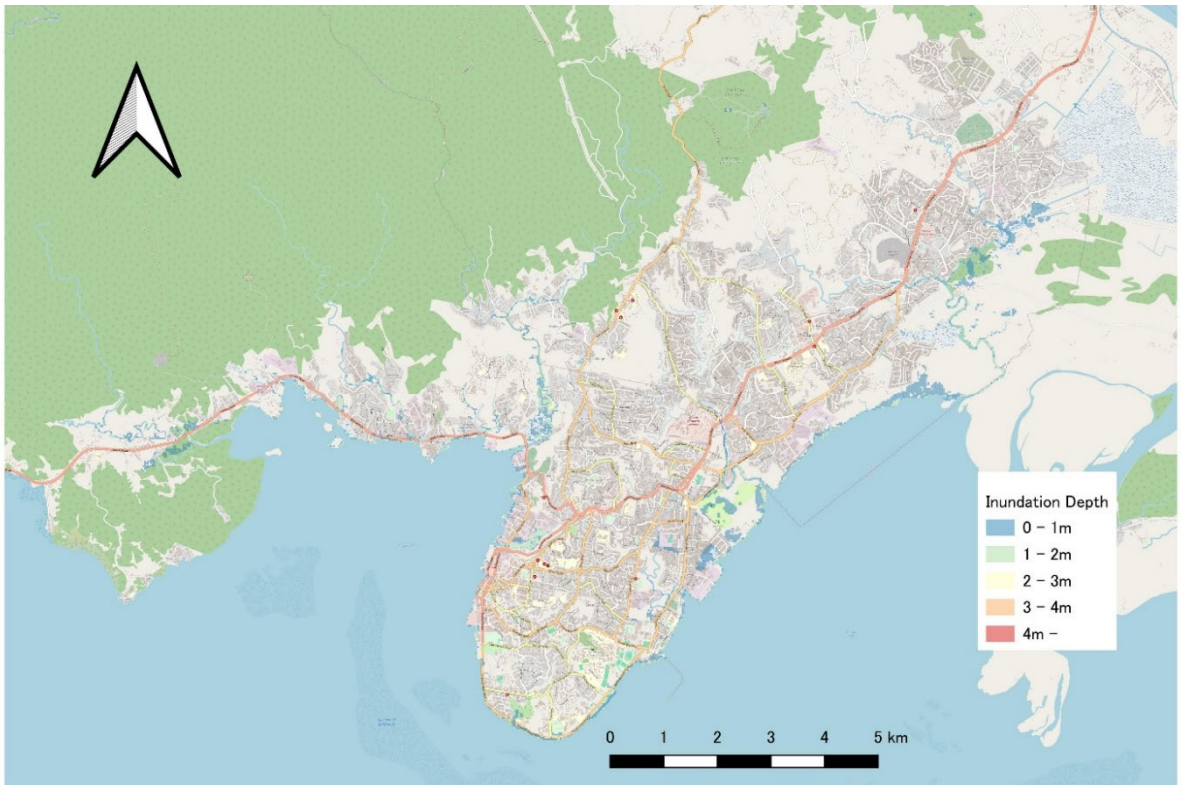
Source: JICA Project Team

Figure II-11 Assumed Inundation Depth in Rakiraki under the Scenario, with the Highest Inundation Depth in Rakiraki



Source: JICA Project Team

Figure II-12 Scenario Hazard Assessment of Tailevu, Suva and Bega against Cyclones Oscar, Ana, and Winston.



Source: JICA Project Team

Figure II-13 Assumed Inundation Depth in Suva under the Scenario, with the Highest Inundation Depth in Suva

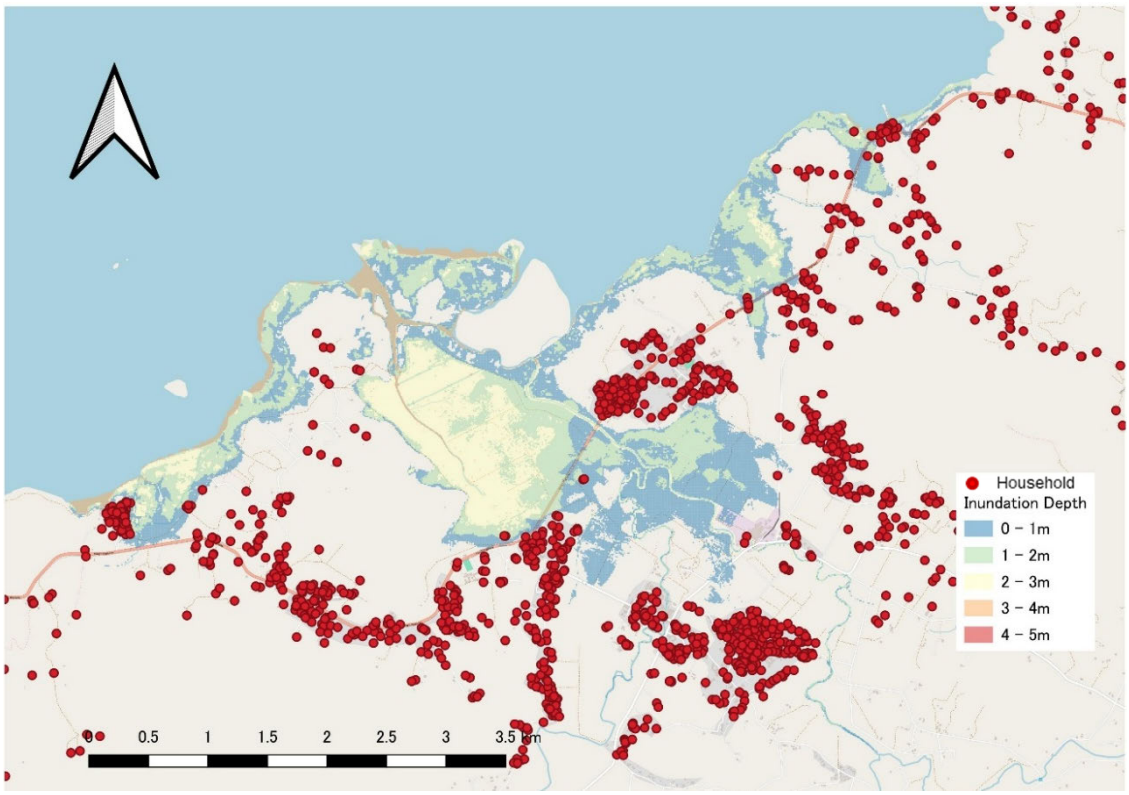
[Tsunami]

The project performed the same detailed evaluation for tsunamis. Table II-11 shows the results of the tsunami analysis assuming M9.0-9.5 earthquakes in the Tonga Trench and Vanuatu Trench. For detailed results, please refer to the attached document, "Guidelines on Tsunami Hazard / Risk Enhanced Assessment"

Table II-11 Results of the Preliminary Assessment of the Assumed Maximum Tsunami Height in Rakiraki

No.	Trench	Magnitude	Maximum Tsunami Height at Rakiraki
1	Tonga	9.0	0.87m
2		9.5	2.03m
3	Vanuatu	9.0	0.68m
4		9.5	1.51m

Source: JICA Project Team



Source: JICA Project Team

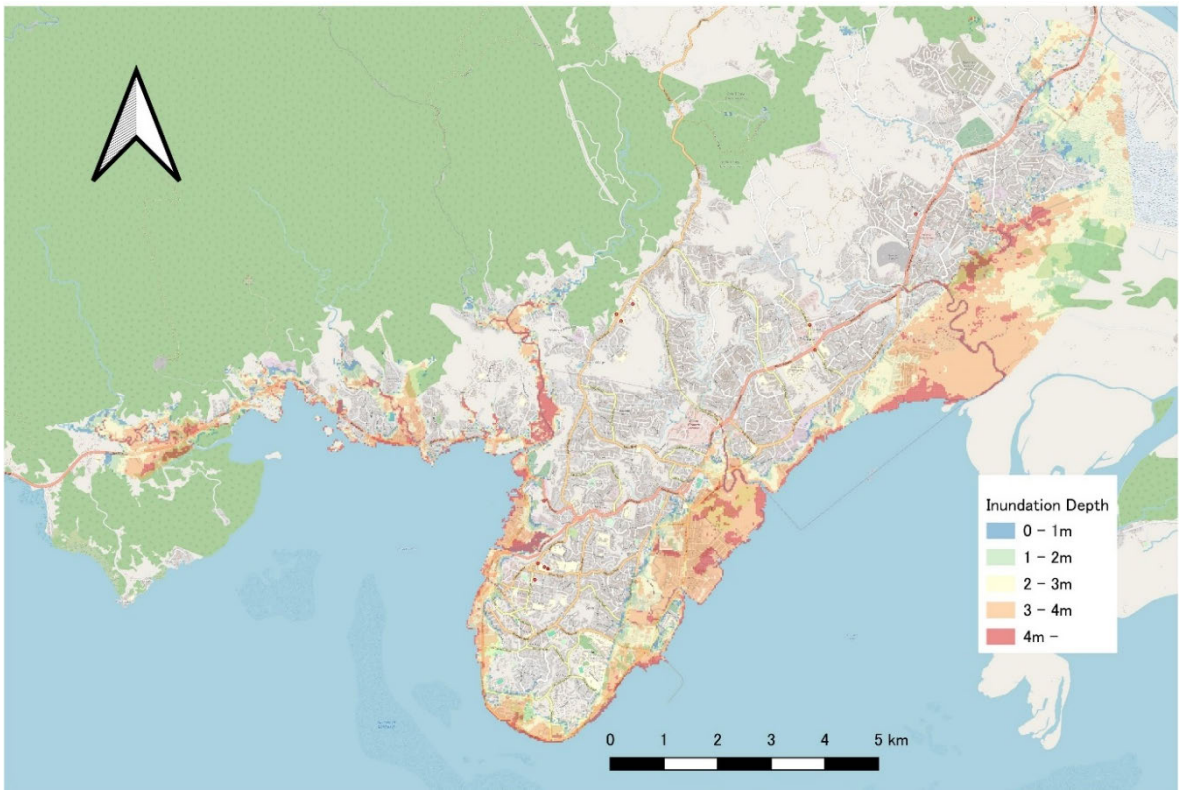
Figure II-14 Assumed Inundation Depth in Rakiraki under the Scenario with the Highest Inundation Depth in Rakiraki

Table II-12 shows the results of the tsunami analysis assuming M9.0-9.5 earthquakes in the Vanuatu Trench.

Table II-12 Results of the Preliminary Assessment of the Assumed Maximum Tsunami Height in Suva

No.	Trench	Magnitude	Maximum Tsunami Height at Suva
1	Tonga	8.5	1.33m
2		9.0	5.30m
3		9.1	5.41m
4		9.2	5.98m
5		9.5	10.14m
6	Vanuatu	8.5	1.03m
7		9.0	4.14m
8		9.1	4.24m
9		9.2	5.01m
10		9.5	9.60m

Source: JICA Project Team



Source: JICA Project Team

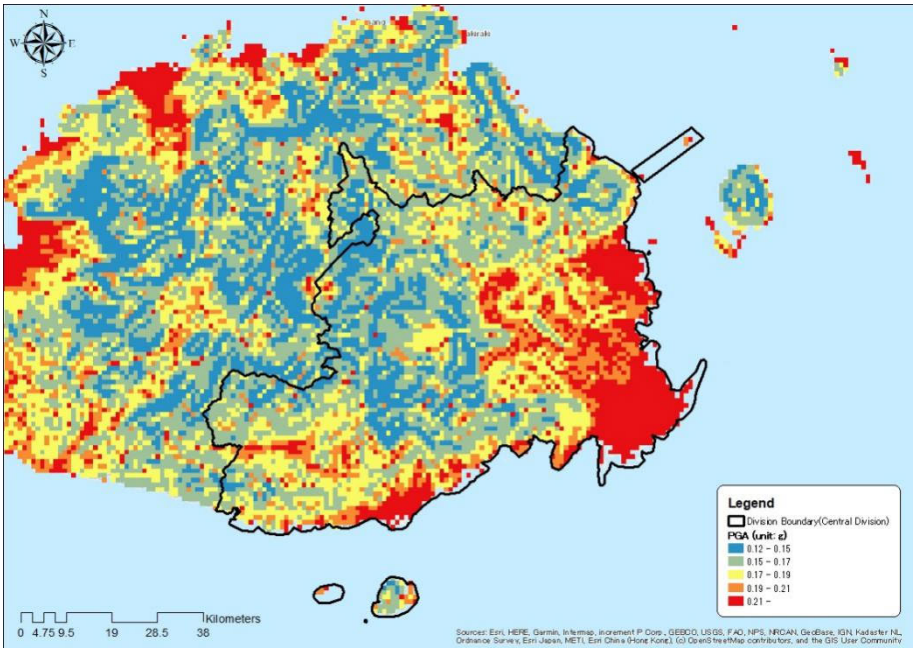
Figure II-15 Assumed Inundation Depth in Suva under the Scenario with the Magnitude 9.0 Earthquake

4) Earthquake Disaster

1. Preliminary Assessment

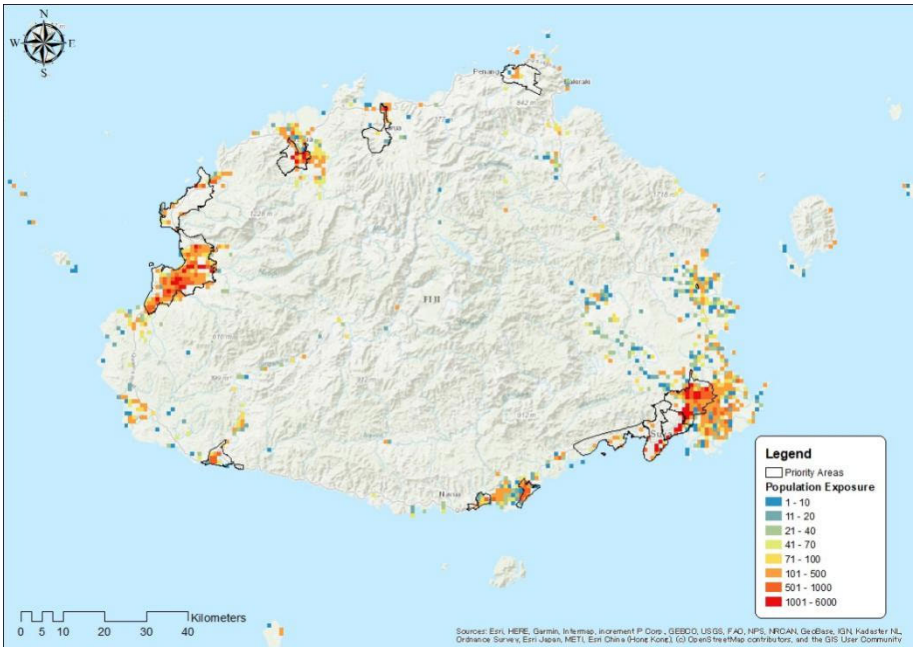
The distribution of peak ground acceleration (PGA) in the Central Division and the distribution of the population exposure to seismic intensity, calculated using a simplified earthquake assessment method,

are shown below. PGA values are high in areas such as alluvial lowlands with weak soil ground and high amplification, reaching values equivalent to MMI intensity VIII. The population exposure to seismic intensity in the Priority Areas identified in Output 2 was approximately 80,000 in the Western Division and approximately 100,000 in the Central Division.



Source: JICA Project Team

Figure II-16 Distribution of Peak Ground Acceleration (PGA) at the Ground Surface Based on Preliminary Assessment



Source: JICA Project Team

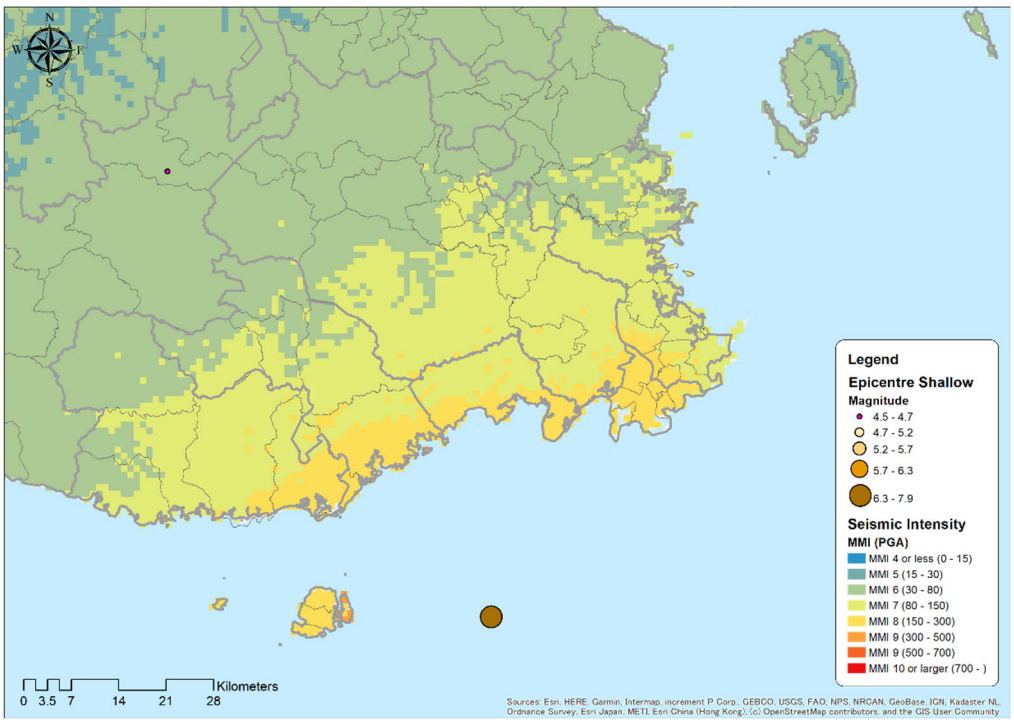
Figure II-17 Distribution of Population Exposure to Seismic Intensity Based on Preliminary Assessment and Priority Areas

Details are provided in Chapter 7 of the attached guideline document, "Guideline on Earthquake Hazard / Risk Assessment -Simplified GIS-based Estimation-".

2. Enhanced Assessment

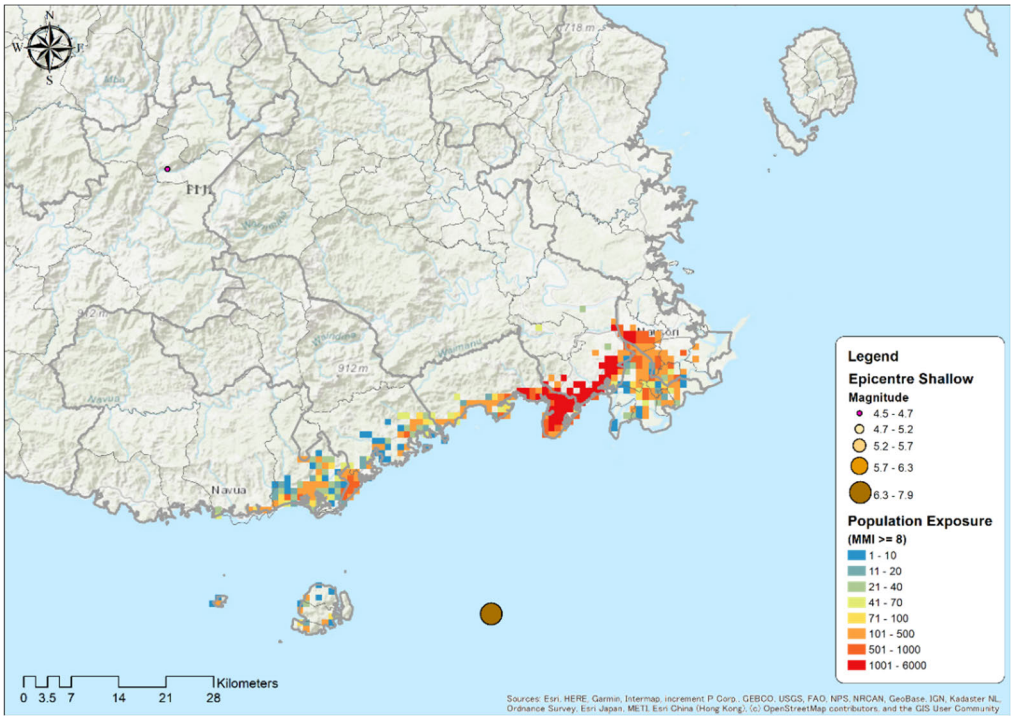
An earthquake hazard assessment was conducted for the Priority Areas in the Central Division, designating the Suva area and setting a scenario earthquake. The basic approach involved selecting earthquakes from the USGS earthquake catalog where the epicenter's latitude and longitude were close to the land area of Viti Levu Island and the magnitude was relatively large. The method then sets the focal depth and magnitude to produce seismic intensity equivalent to the past damaging Suva earthquake. In the Central Division, the 1953 Suva damaging earthquake was selected as the scenario earthquake. Various earthquake parameters (latitude/longitude, focal depth, magnitude) were referenced from the USGS earthquake catalog.

The figure below shows an example of seismic intensity distribution and population exposure to seismic intensity calculated using the 1953 Suva earthquake scenario (point source model). It reaches MMI VIII, consistent with existing data (SOPAC, 2021). Furthermore, the population exposure to seismic intensity is 337,963 people for the MMI ≥ VII case and 233,784 people for the MMI ≥ VIII case.



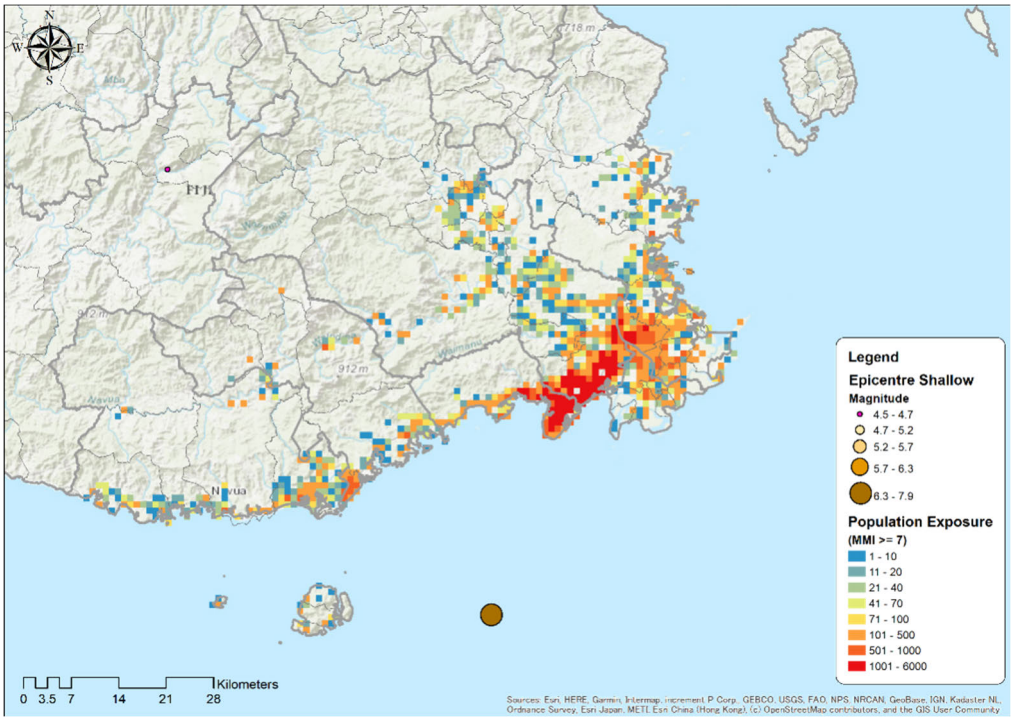
Source: JICA Project Team

Figure II-18 Calculated Seismic Intensity Distribution at the Ground Surface Based on the Point Source Model for the 1953 Suva Earthquake



Source: JICA Project Team

(a) MMI ≧ VIII



Source: JICA Project Team

(b) MMI ≧ VII

Figure II-19　Distribution of Population Exposure to Seismic Intensity Based on the 1953 Suva Earthquake Scenario

Detailed information is provided in Chapter 5 of the attached guideline document, “Guideline on Earthquake Hazard / Risk Assessment -Simplified GIS-based Estimation-”.

[1-4]: Develop a guideline to assess hazards and a plan to expand the assessments nationwide.

The guidelines for hazard assessments are the prepared procedure manual for the C/P organization to implement the Preliminary and Enhanced Assessments in other regions under the leadership of the NDRMO (refer to the Appendix). The guidelines developed in the first period were shared with C/P and were updated based on the activities of technology transfer, improvements to the analytical model, or to deepen the understanding of C/P. For example, “procedures for combining 30m grid DEM data with high-resolution terrain data such as LiDAR data and AW3D”, “a method for rainfall statistical analysis”, and “confirmation method for missing / suspicious observation data” were added and updated in the guideline for flood in the second period.

On the other hand, the contents of the nationwide expansion plan related to Output 1 (refer to the attached document "Nationwide Expansion Plan of Hazard and Risk Assessments") are as shown in Table II-13. The content organized by the JICA Project team was explained to NDRMO, MRD, and FMS, and collected opinions on each content to implement a nationwide expansion, which was reflected in the plan. The outlook for future developments for each disaster type is shown below.

Table II-13 Content of Nationwide Expansion Plan

- Purpose of the Assessments - The Effectiveness and Utilization of the Simplified Hazard / Risk Assessments to be conducted in this Project - Limitations of Simplified Hazard / Risk Assessments, Limitations of Accuracy, and Constraints
* The following items were described by disaster type ✧ Activities / Responsibilities ✧ Expected Areas to Expand and Timeline / Milestones ✧ Limitations of simplified hazard / risk assessments, limitations of accuracy, and constraints ✧ Expected improvements in hazard / risk assessments in the future ✧ Expected budgeting ✧ Other related projects to be collaborated

Source: JICA Project Team

1) Flood

A guideline for the C/P to proactively conduct detailed evaluations (refer to the attached document "Guideline on Flood Hazard / Risk Assessment -Simplified Flood Simulation by RRI Model-") has been created. Furthermore, the overview of the hazard and risk assessments conducted so far in this project and the anticipated future developments related to the nationwide expansion plan have been organized as follows.

Table II-14 Overview of the flood hazard and risk assessments conducted in this project and future developments

Items	Organization	Activities
Nationwide Flood Hazard Assessment	FMS Hydrology Section, NDRMO	- RRI models have been developed for several watersheds in the Western Division, including the Ba River basin and one basin in the Central Division. - Little to no actual inundation information contributes to model verification. Therefore, conducting an actual inundation survey under the leadership of NDRMO was considered. - More detailed flood hazard assessments have been conducted or will be conducted with the support of other donors in some watersheds (e.g., the Western Division's Rakiraki Basin, Nadi River Basin, etc.). Therefore, the task division of hazard assessment should be confirmed, considering other donor support. - As mentioned above, based on the results of the Preliminary Assessment, the relevant C/P organizations will discuss the setting of the Priority Area next to the Priority Area set in the Project, the division of roles, the timeline, etc., and finalize the plan.
Nationwide Flood Risk Assessment	NDRMO	- NDRMO manages asset data, so risk assessments depend on the results of the FMS hazard assessment.

Source: JICA Project Team

2) Sediment Disaster

A guideline for the C/P to proactively conduct detailed evaluations (refer to the attached document "Guideline on Sediment Disaster Hazard / Risk Assessment -Simplified Assessment using GIS-") has been created. “On-site verification survey” and so on were added and updated in the guideline according to the project activities in the second period. Furthermore, the overview of the hazard and risk assessments conducted so far in this project and the anticipated future developments in relation to the nationwide expansion plan have been organized as follows.

Table II-15 Overview of the sediment disaster hazard and risk assessments conducted in this project and future developments

Items	Organization	Activities
Nationwide Sediment Disaster Hazard / Risk Assessment	MRD, NDRMO	- As mentioned above, MRD is developing a GIS database of past landslides. - Enhanced debris flow assessments have been conducted in the Ba, Nadi, and Rakiraki River basins in the Western Division. Additionally, it has already been implemented only in the upper reaches of the Rewa River, as well as in the small basins of the Lami River, Wailoku River, Samabula River, and Laqere River in the Central Division. - In consultation with the MRD and NDRMO, the MRD is considering the development of debris flow hazard assessments in other watersheds of the Western Division. At this stage, we are considering the evaluation in the Sigatoka basin following the above basin. - The MRD is the main organization for conducting hazard assessments for sediment disasters, but both organizations have agreed to provide on-the-job training or lectures to the NDRMO. - Enhanced assessment of steep slope collapse has already been carried out on Viti Levu Island (Western Division, Central Division). Future expansion to Vanua Levu Island might also be possible. - However, since there is room for further improvement in the evaluation results, such as the extraction of dangerous areas accounting for geological information, it is necessary to examine and update by MRD. - In addition to the above, verify the hazard and risk areas evaluated on the desktop through a field investigation.

Source: JICA Project Team

3) Coastal Disaster

The attached guideline document, “Guideline on Storm Surge Hazard / Risk Enhanced Assessment -Enhanced Assessment-” and “Guideline on Tsunami Hazard / Risk Enhanced Assessment -Enhanced Assessment-” for storm surge and tsunami hazard / risk assessment methodology was developed and organized after thorough discussions with counterparts. A national development plan enabling FMS/ MRD/ NDRMO to conduct storm surge and tsunami hazard / risk assessments proactively, was drafted based on this guideline. The plan is shown as below.

Table II-16 Overview of the coastal disaster hazard and risk assessments conducted in this project and future developments

Development level	Related Organization	Activities
Nationwide Storm Surge Hazard Assessment	FMS Forecast	- Storm surge analysis has been conducted for the Western Division. - Storm surge analysis has been conducted for Suva in the Central Division. - For other areas of the Central Division and other divisions, representative cyclones will be selected, parallel east-west and north-south shift courses will be assumed, and storm surge analysis will identify which has the most significant potential impact on each region. - The WMO would develop topographic data for the entirety of Fiji, which will be essential for calculating the extent and depth of inundation. But the project seems to have been canceled. More information is necessary. - The inundation calculations were supposed to start as soon as the data is available, in line with the progress of the WMO project, but other sources are necessary.
Nationwide Tsunami Hazard Assessment	MRD Seismology Section	- Cuvu in the Western Division and Suva in the Central Division were already recipients of the Tsunami Ready project, and Nadi and Suva were the pilot area for the implementation of this project. - The project will be gradually expanded to other areas while sharing the status of the Tsunami Ready project and progress with other projects.
Nationwide Storm Surge and Tsunami Risk Assessment	NDRMO	- Risk assessments will transpire sequentially based on the hazard analysis results for FMS and MRD.

Source: JICA Project Team

The contents of the above plan outline are based on discussions with FMS, MRD, and NDRMO, but they also significantly align with the progress of other projects. Notably, FMS and MRD are not responsible for past hazard analysis; their primary duties are current monitoring and forecasting. Therefore, it is necessary to resolve issues such as personnel and budget shortages and advance nationwide implementation through continuous support activities.

4) Earthquake Disaster

The earthquake hazard / risk assessment methodology was developed and organized after thorough discussions with our counterpart, based on the attached document “Guideline on Earthquake Hazard / Risk Assessment -Simplified GIS-based estimation-”. While this methodology is a relatively simple approach utilizing GIS, it clearly explains the necessary earthquake expertise.

Based on this guideline, the nationwide implementation plan for local governments to proactively conduct earthquake hazard assessments is outlined below.

Table II-17 Nationwide Expand Plan (Earthquake Disaster)

Development Level	Related Organizations	Summary
Implementation of Earthquake Hazard and Risk Assessment (Preliminary, Enhanced)	NDRMO, MRD Seismology Section	- Treat the MRD as the central organization to identify past damaging earthquakes. Based on this, prepare the data necessary for earthquake hazard assessment. - Treat the NDRMO as the central organization to prepare GIS data for earthquake risk assessment.
Implementation and Dissemination of Preliminary Assessment	NDRMO, MRD Seismology Sectio、Local Governments	- Evaluate PGA based on engineering bedrock, focusing on MRD. - Share earthquake hazard and risk assessment results with relevant administrative agencies during events like Fiji National Disaster Awareness Week, focusing on NDRMO. - NDRMO will raise awareness among relevant administrative agencies about the importance of earthquake hazard / risk assessments for pre-disaster investments, such as seismic retrofitting and land use planning.
Implementation and Dissemination of Enhanced Assessment	NDRMO, MRD Seismology Section etc.	- Local government officials, MRDs, and NDRMOs shall collaborate to conduct earthquake hazard / risk assessments for scenario earthquakes based on a thorough understanding of the guidelines. - The NDRMO shall inform local government officials that the purpose of the earthquake hazard and risk assessment at the municipal level is to establish appropriate evacuation sites and secure stockpiled food and materials and shall collaborate in the necessary field. - In areas where earthquake disasters have not frequently occurred in the past, the hazard / risk assessment results based on the scenario earthquake shall, in principle, be shared with relevant administrative agencies, and public notification to residents shall be conducted with caution.

Source: JICA Project Team

The above plan was explained to MRD and NDRMO, finalized after discussion. For details, please refer to the attached document "Nationwide Expansion Plan of Hazard and Risk Assessments."

(3) Output 2

[2-1]: Examine the optimal way to implement local DRR planning and expand them nationwide based on the present conditions in Fiji.

The study in the first period revealed that designating the City and Town Councils as the main entities for local disaster management plan formulation would be difficult, given that they are not obligated to create such plans and the NDRMO is overseen by the MRMDDM. Instead, we adopted a policy to formulate disaster management plans at the Division level. By also developing slightly more detailed plans for Priority Areas, we aim to produce plans that closely approximate those originally envisioned for the disaster management plan for Cities and Towns. Therefore, WG2 defined a local DRR plan as a complex plan, as shown below.

- Divisional DRR Plan: a plan to develop a basic strategy for DRR for the four Divisions.
- Priority Area DRR Plan: a plan to detail DRR measures in the area identified as high priority in the Division DRR Plan.

[2-2]: Develop local DRR plans of pilot areas in accordance with a practical development process.

1) Consultation for Local DRR Plans Formulation in the Central Division

In the second period, a Central Division DRR Plan was formulated, and, through consultations with NDRMO, relevant technical agencies, the Divisional Commissioner's Office, City and Towns, areas for the formulation of Priority Area DRR Plans were selected, which were subsequently prepared. Building on the guidelines developed during the first period and the experiences in the Western Division, the discussions and plan formulation were led by NDRMO, and technology transfer toward nationwide rollout was facilitated.

The consultations related to the formulation and implementation of local DRR plans in the pilot areas were as follows.

Table II-18 Record of Consultations on the Formulation of the Divisional DRR Plan and the Priority Area DRR Plan in Central Division

Date	Agency	Summary
2024 Sep. 23	Central Division Commissioner's Office	Kick-off meeting to confirm the purpose of the plan at the administrative level to launch the divisional DRR planning activity.
Sep. 26	Provincial Administrations of Rewa and Naitasiri	
Nov. 19	Suva City, Nasinu Town, Nausori Town, Lami Town Councils	
Nov. 26	Central Division Commissioner's Office	Agreement on the selection of priority areas.
Nov. 26	MAW (Ministry of Agriculture and Waterways)	Confirmation of project outlines on rivers, drainage, and irrigation in the Central Division.
2025 Jan. 31	Central Division Commissioner's Office	Confirmation of the approach to hearings and information consolidation for sectoral agencies, provincial administrations, and municipalities.
Feb. 3	MRD (Mineral Resources Department), Seismology Section	Confirmation of information development for earthquake observation and tsunami forecasting/alerts.
Feb. 4	FRA (Fiji Roads Authority)	Understanding of future road development plans and road drainage issues in the Greater Suva area.
Feb. 7	Rewa Province Administration	Confirmation of disaster management issues and status of DRR-related measures in Rewa Province.
Feb. 10	MAW, JICA Volunteer Mr. Nakatani	Confirmation of river management issues in the Rewa River and MAW's efforts in the Central Division.
Feb. 11	Naitasiri Province Administration	Confirmation of disaster management issues and status of DRR-related measures in Naitasiri Province.
Feb. 11	MHLG (Ministry of Housing and Local Government)	Confirmation of issues in the housing sector and status of DRR-related measures in the Central Division.
Feb. 11	DTCP (Department of Town and Country Planning)	Confirmation of urban planning system issues and status of DRR-related measures in the Central Division.

Date	Agency	Summary
Feb. 13	Serua Province Administration	Confirmation of disaster management issues and status of DRR-related measures in Serua Province.
Feb. 14	Central Division Commissioner's Office	Confirmation and agreement on the DRR policy for the Central Division DRR Plan based on hearing results.
Feb. 19	MHMS (Ministry of Health & Medical Services)	Confirmation of disaster-related issues in the health sector and the status of countermeasures.
Feb. 20	Progress Meeting	-
Feb. 21	MFSPNDS, Strategic Planning Unit	Confirmation of the status of comprehensive strategy formulation and DRR-related measures.
Feb. 27	MOE (Ministry of Education)	Confirmation of disaster-related issues and the status of measures in the education sector.
Apr. 10	Suva City Council	Confirmation of disaster management issues and required measures for the Priority Area DRR Plan.
Apr. 11	Lami Town Council	
Apr. 15	FPCL (Fiji Ports Corporation Limited)	Confirmation of disaster-related issues and the status of measures at the Port of Suva.
Apr. 16	Nausori Town Council	Confirmation of issues and status of measures in the Nausori town center.
Apr. 17	Joint Meeting at Central Division Commissioner's Office	Confirmation and sharing of the chapter structure and hazard analysis results for the Priority Area DRR Plan.
Jun. 3	Suva City Council	Detailed confirmation of the April hearing results.
Jun. 5	Lami Town Council	
Jun. 5	Nasinu Town Council	
Jun. 6	Nausori Town Council	
Jun. 11	Central Division Commissioner's Office	Confirmation of the approach to finalizing the Central Division DRR Plan.
Aug. 14	Namosi Provincial Office	Confirmation of disaster management issues and status of DRR-related measures in Namosi Province.
Aug. 15	Central Division Commissioner's Office	Sharing and confirmation of the final draft of the Central Division DRR Plan.
Aug. 26	Nasinu Town Council	Briefing on and detailed review of the draft Priority Area DRR Plan.
Aug. 27	Suva City Council	
Aug. 28	Lami Town Council	

Source: JICA Project Team

2) Selection of the Priority Area

In the second period, while the fundamental approach followed the methodology set out in the first period guidelines under the leadership of NDRMO, a different approach in selecting Priority Areas was required in light of the rapid urban expansion unique to the Greater Suva metropolitan area.

In the Western Division, Priority Areas were selected at the city/town level by calculating the exposure situation based on simple hazard analysis results, the distribution of population, industries, and shelters for each municipality. However, in the Central Division, Suva City forms a continuous urbanized area including the area of Nasinu Town, Lami Town, and Nausori Town, where the population is concentrated

across the four municipalities. Therefore, the selection of Priority Areas was based on the population distribution tendencies rather than on the administrative boundaries of individual cities or towns.

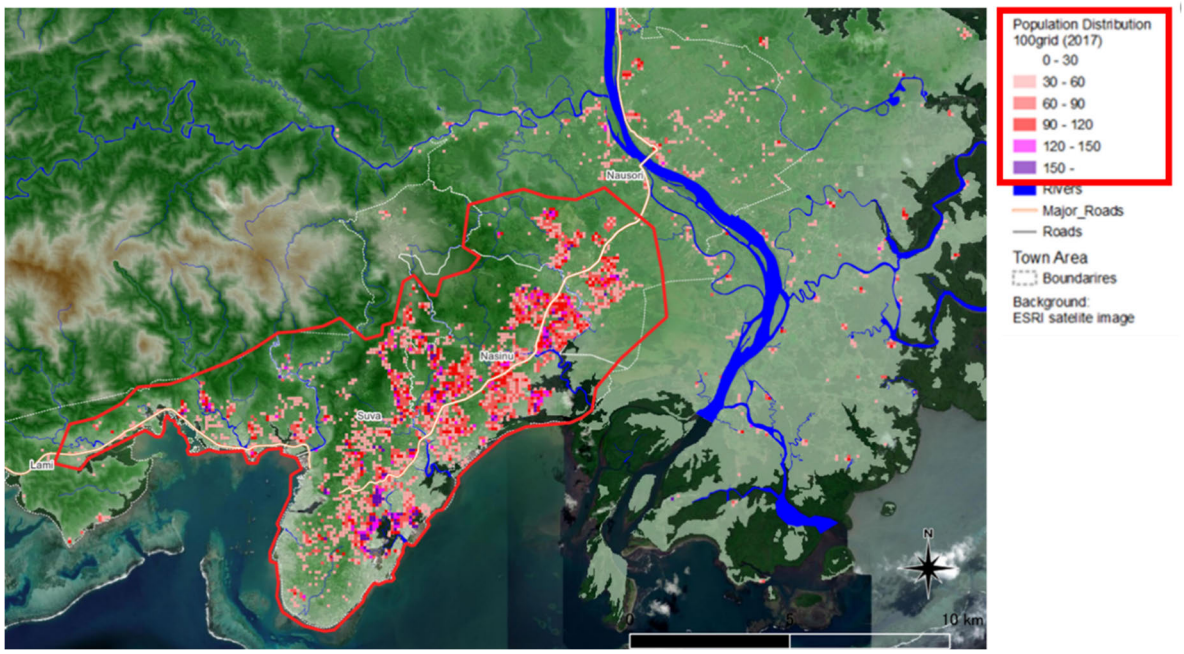
Table II-19 Summary of Preliminary Risk Analysis in the Central Division

Item	Suva	Lami	Nasinu	Nausori	Navua	Deuba	Korovou
Area (km^2)	66.14	45.93	28.66	66.14	12.26	9.69	0.38
Administrative Category	City			Town		Incorporated City	
Population (2017)	93,874*[1]	24,637*[1]	92,046*[1]	57,866*[1]	5,812*[1]	1,963*[1]	329*[1]
Number of Businesses	2,860*[1]	159*[1]	549*[1]	790*[1]	131*[1]	74*[1]	36*[1]
Susceptibility to Flood Population Number of Businesses Number of EC	 12,074 1,318 18	 6,151 26 4	 20 0 0	 12,069 410 17	 4,909 115 8	 1,726 38 2	 388 34 1
Susceptibility to Coastal Hazard Population Number of Businesses Number of EC	 18,677 1,409 70	 3,265 117 24	 8,251 35 61	 2,342 9 10	 3,990 38 8	 819 13 2	 331 33 1
Susceptibility to Earthquake Population highly affected	20,395	1,397	19,385	50,137	5,111		

Source: JICA Project Team

To confirm the population distribution, population density per 100-meter mesh was calculated based on the 2017 Census, and the detailed distribution was verified (Figure II-20). It was identified that the population was continuously distributed from Suva City to Nasinu Town, eastern Lami Town, and southern Nausori Town. Accordingly, the area within the red frame shown in Figure II-20, based on the population distribution, was designated as the Priority Area.

For the Priority Area, detailed elevation data were obtained, and hazard analysis was conducted. The hazards existing in the area were analyzed, including coastal hazards (tsunami and storm surge), flooding, and steep slopes.



Source: JICA Project Team

Figure II-20 Population Distribution in the Area Designated as the Priority Area in the Central Division

The difference of the character and contents of the Divisional DRR Plan and the Priority Area DRR Plan in the Central Division are shown in Table II-20.

Table II-20 Differences Between the Divisional DRR Plan and the Priority Area DRR Plan in the Central Division

Item	Divisional DRR Plan	Priority Area DRR Plan
Objective	To establish basic strategies and directives for DRR.	To examine specific DRR measures.
Target Area	Entire division.	Urban areas, including peri-urban zones.
Project Target Area in Central Division	Central Division.	Greater Suva (covering Suva City, Nasinu Town, eastern Lami Town, and southern Nausori Town).
Relevant Agencies	National headquarters, line ministries, and all town councils.	Target city/town councils, line ministries, and the private sector.
Secretariat	Divisional Commissioner.	Divisional Commissioner.
Hazard Analysis	Review of past disasters and simplified hazard analysis for the entire division. - Flood hazard: Global Flood Map (50-year flood) - Coastal hazard: Areas within 10 m above mean sea level and within 3 km from the coastline - Earthquake hazard: Peak ground acceleration based on scenario earthquakes	Review of past disasters and strengthened hazard analysis using detailed simulation models. - Flood hazard: RRI model - Storm surge hazard: ComMIT model - Tsunami: SSFM-JMA model - Steep slopes: Extraction of steep slope areas around houses and roads using AW3D elevation data

Source: JICA Project Team

3) Formulation of Central Division DRR Plan

In formulating the DRR plan, the items listed below were examined to establish DRR policy directions and indicate the practical guidelines in the Central Division. In the Western Division, reference was made to the Divisional Development Plan to understand the status of activities in relevant sectors. However, a divisional development plan was not prepared in the Central Division, the current situation was identified through hearings with sectoral, provincial, and municipal officers.

- Socio-economic Situation
  - Population concentration in the Greater Suva metropolitan area
  - Issues arising from urban expansion and population growth in the Greater Suva metropolitan area
  - Challenges related to informal settlements
- Development Challenges
  - National Development Plan (confirmation of priority projects under the national-level development plan)
  - National Infrastructure Investment Plan (confirmation of implementation status of nationwide projects)
  - Compilation of other development plans
    - Development plans of Greater Suva metropolitan area, provinces, municipalities, and towns
    - Sectoral development plans (river management, roads, health, education, housing, ports, etc.)
  - Development trends in Greater Suva metropolitan area (such as planned residential developments)
- Disaster risk
  - Characteristics of the natural environment
  - Past disasters in the Central Division
  - Simplified hazard analysis (flood, storm surge/tsunami, earthquake, etc.)
  - Exposure analysis to hazards (population, assets, etc.)
- Identification of Challenges in DRR
  - Determination of Priority Areas
  - Issues by spatial zoning according to hazard characteristics
  - Issues by sector (river management, roads, health, education, housing, ports, etc.)
- DRR Measures
  - DRR policy directions (guidelines for implementing disaster management and DRR in the Central Division)
  - List of measures to be implemented based on the DRR policy directions

In the Central Division plan, four DRR policy directions were established as shown in Figure II-21. These were: (i) DRR considerations associated with urban development, (ii) measures to reduce hazard impacts, (iii) protection of critical infrastructure, and (iv) strengthening of project implementation capacity. Policy (i) is particularly distinctive in the Greater Suva metropolitan area and is to be considered in all DRR measures. Accordingly, the classification of DRR measures was aligned with Policies (ii) to (iv), while the considerations under Policy (i) were incorporated into the consideration of all DRR measures.

Source: JICA Project Team

Figure II-21 DRR Direction Identified in the Central Division

To comprehensively consider the DRR aspects associated with urban development under Policy (i), the analytical matrix shown in Figure II-22 was examined. On the horizontal axis, development trends from urban to rural areas were expressed, classified into issues in central urban areas, issues of informal settlements, new and planned development areas in peri-urban zones, and mountain areas, as well as areas linking districts, areas linking provinces, and access to rural villages. On the vertical axis, hazards were classified by type. In addition, given the importance of ensuring connectivity between regions, an item on road resilience was included to account for impacts on road networks.

Urbanization / Development Situation

Hazard / Impacts

	Urban		Sub-urban		Hilly Terrain		
	Central Area	Informal	Already Developed	Future Develop-ment Area	Divisional Connection	Provincial Connection	Village
Drainage	Urban Flooding	Insufficient Drainage	Impact to Downstream	Sufficient Drainage to be planned	Coordination among roads, drainage channels	Road drainage to secure connection	Community Drainage to be managed
River Flooding							
Steep Slope Measures							
Coastal Hazard Measures							
Strong Wind Measures							
Earthquake/Tsunami Measures							
Road Resilience							

Source: JICA Project Team

Figure II-22 Analytical Matrix on Urbanization Trends and Impacts of Hazards in the Central Division

Table II-21 List of DRR Measures Identified in the Central Division

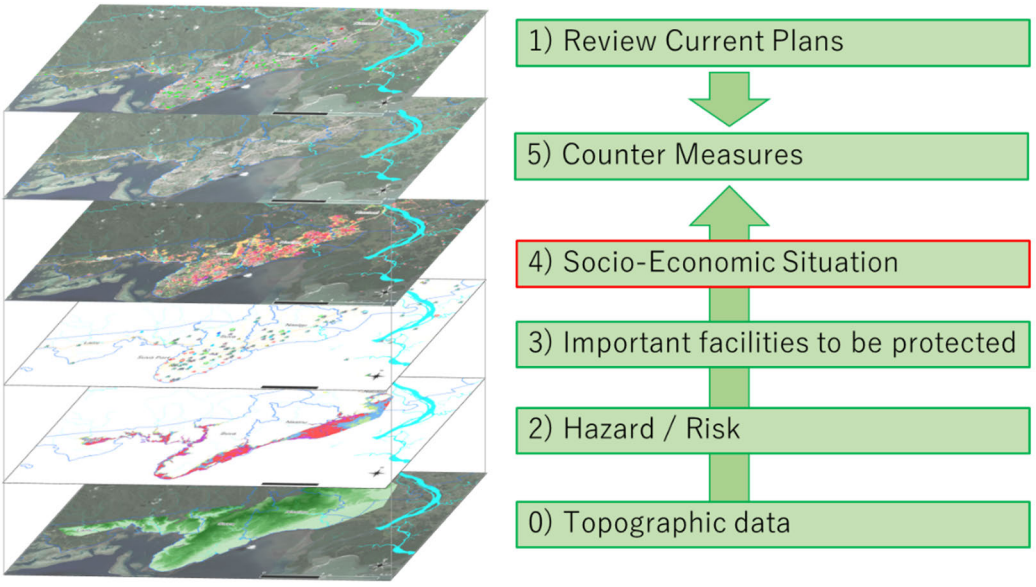
DRR Direction 2: Measures to Reduce Impact of Hazard		
1	**River Management**	Develop Comprehensive River Management Plan
2		River Management for the Rewa River (including Waimanu River)
3		River Management for the Nabua River
4		River Management in other priority Rivers in Serua Province
5		River Management in Lami River
6		River Management in other Smaller Rivers and Creeks (Samabul etc.)
7		Informal Settlement in high-risk areas to be relocated to safer grounds
8	**Drainage**	Urban Drainage Network Improvement
9		Urban Drainage Network Improvement (Suva City, Nausori Town, Nasinu Town and Lami Town)
10		Drainage improvement in creeks and low-line areas. In Nausori
11		Informal Settlements in low-line areas to be improved
12		Drainage Along Major Roads to the river or water bodies
13	**Steep Slope Management**	Steep Slope Measures in City Area
14		Steep Slope Measures along roads (Kings Road, Queens Road)
15		Steep Slope Measures in the Hilly terrain area
16		Development of public housing for relocation in the informal settlement
17	**Rewa Delta Hydrology and Risk Mitigation**	Improvement of the Delta Area in the Rewa province
18		Improvement of the Delta Area in the Tailevu Province
19	**Coastal Hazard Management**	Construction of Seawalls
20		Rehabilitation of Seawalls
21		Informal Settlement in high-risk areas to be relocated to safer grounds
22		Development of public housing for relocation in the informal settlement
23		Consideration of Coastal Risk in New Development Area
24	**Cyclone (Heavy Rain / Strong Wind) Hazard Management**	Methodological observation facility enhancement
25		ICT System Improvement for DRR Measures
26		Early Warning System for Rewa river, its tributaries, and other rivers.
27		Evacuation Center Establishment in area with less capacity
DRR Direction 3: Prevent Damage to Critical Infrastructure		
28	**Resilient Road Network with Redundancy**	Development of Resilient Road Network between Suva and Nausori
29		Upgrade of the Vulnerable Bridges
30		Development of Resilient Road for Regional Connectivity
31		Development of Road Network for Response activity and Response
32	**Prevention and Mitigation of Damage to Critical Facility**	Enhancing Resilience of Health Facility
33		Enhancing Resilience of Education Facility
34		Enhancing Resilience of Water Supply Facility
35		Enhancing Resilience of the Suva Port
36		Enhancing Resilience of Other Critical Facilities
37	**Business Continuity Planning (BCP)**	BCP Development for the Suva Port
38		BCP Development for lifeline facility

DRR Direction 4: Strengthening the Project Implementation Capacity		
39	**Institutional and Financial Arrangement**	Coordination function of the relevant agencies on urban drainage issues
40	**Urban Drainage Capacity Development**	Master plans for urban drainage for city and town central areas
41		Enhancement of institutional capacity for urban drainage measures
42	**Urban Planning Capacity Enhancement**	Formulation of Land-use plans and land management strategies
43		Enhancement of capacity for land use / building regulation

Source: JICA Project Team

4) Priority Area Plan in the Central Division (Greater Suva)

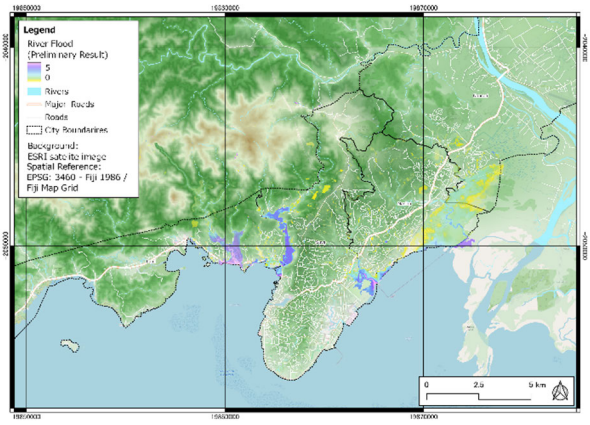
In the Central Division, the Greater Suva metropolitan area was designated as the target for the Priority Area DRR Plan. At the Priority Area level, more concrete DRR measures were examined based on the hazard analysis and risk assessment conducted under Output 1. The planning process is shown in Figure II-23. In particular, to sufficiently take into account the effects of urbanization, attention was paid to explicitly incorporating the understanding of "socio-economic conditions" within the planning process.



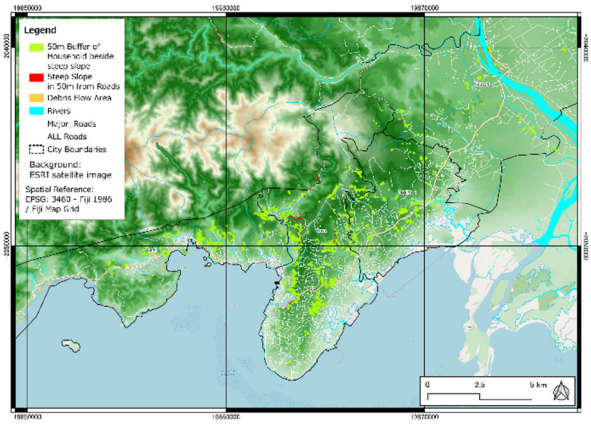
Source: JICA Project Team

Figure II-23 Planning Process for the Priority Area Plan in the Central Division

Based on the results analyzed under Output 1, the hazard analysis results for the Greater Suva metropolitan area (Figure II-24 and Figure II-25) were overlaid with the distribution of exposed facilities (Figure II-26), and the necessary measures were analyzed.



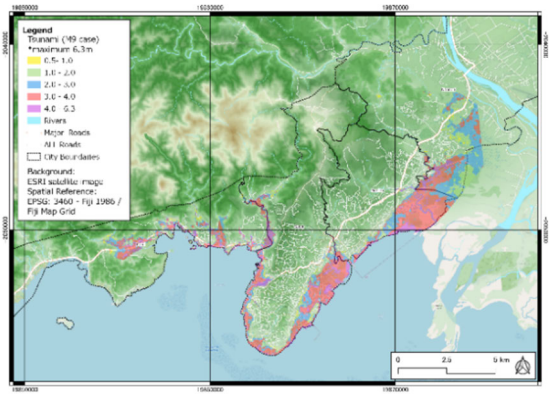
Floods



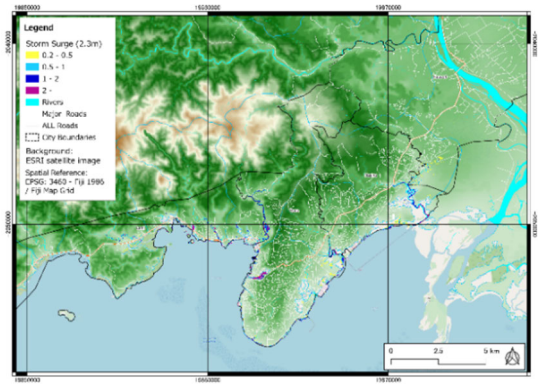
Location of Steep Slope

Source: JICA Project Team

Figure II-24 Hazard Analysis in the Priority Area of the Central Division (Floods and Steep Slopes)



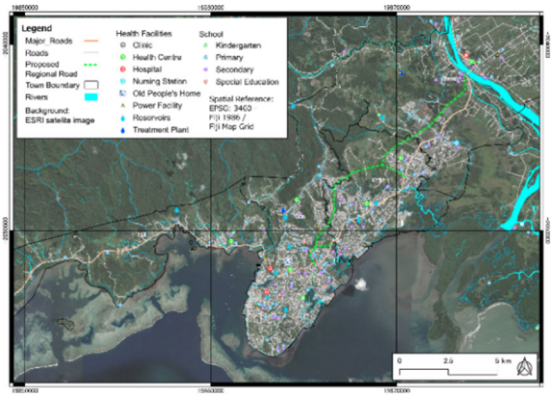
Tsunami



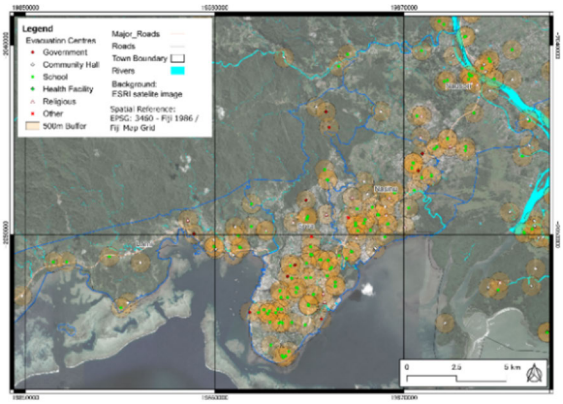
Storm Surge

Source: JICA Project Team

Figure II-25 Hazard Analysis in the Priority Area of the Central Division (Tsunami and Storm Surge)



Distribution of Facilities in Relevant Sectors

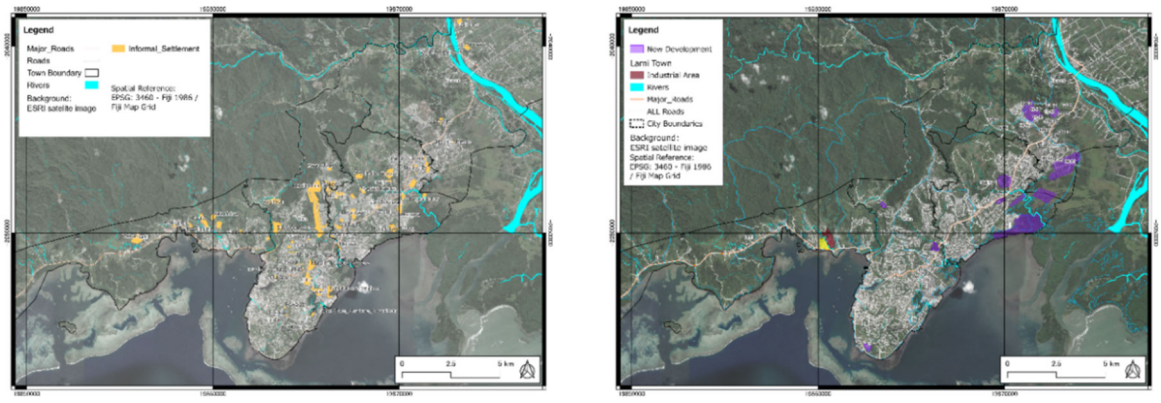


Distribution of Evacuation Center

Source: JICA Project Team

Figure II-26 Distribution of Exposure Elements in the Priority Area of the Central Division

In addition, to gain a detailed understanding of socio-economic conditions, the locations of informal settlements as well as the distribution of ongoing and planned development areas within the target region were identified (Figure II-27).



Location of Informal Settlement　　Ongoing and Future Planned and Development

Source: JICA Project Team

Figure II-27　Distribution of Socio-economic Elements in the Priority Area of Central Division

Furthermore, as confirmed in the Central Division DRR Plan, the trends of urbanization and the impacts of hazards in the Greater Suva metropolitan area were analyzed, and issues that could not be identified through a simple overlay of hazards and exposure factors were extracted (Table II-22).

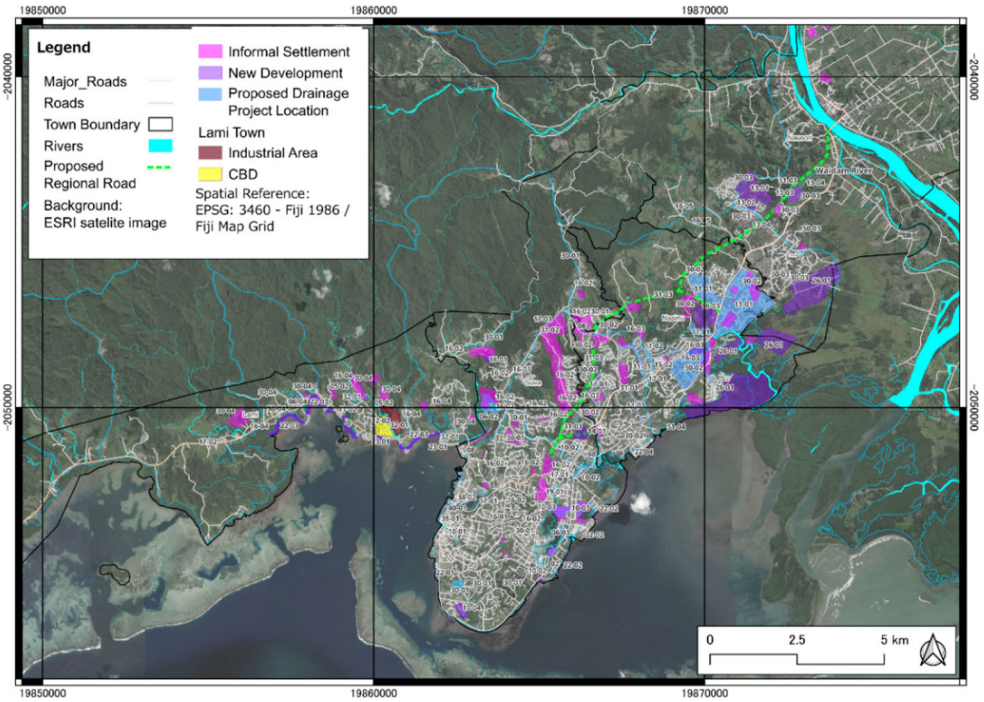
Table II-22　Analysis of Urbanization Trends and Hazard Impacts in the Central Division

Urbanization / Development Situation

Hazard / Impacts	Urban		Sub-urban	
	Central Area	Informal	Already Developed	Future Development Area
Urban Flooding	Urban Flooding caused by insufficient drainage network	Insufficient drainage facility and high risk of inundation (Wailea)	Insufficient drainage facility causing increase in damage caused at the downstream	Drainage facility shall be incorporated in the new development plans
River Flooding	Industrial or Commercial zone in river flood areas (Lami river, Samabul river)	Located in high-risk area requiring relocation or river management measures (Qauia, Maravu)	Housing development in the flood plain area	Development plan in the flood plain area
Steep Slope Measures	Steep Slope Failure occurring in housing development areas	Located in high-risk areas requiring relocation or steep slope management measures (Jittu)	Steep Slope Failure occurring in new housing development areas, and causing traffic disruption (Princes Road, Dikusha)	Development near steep slope shall be regulated or to be developed with appropriate slope stabilization measures
Coastal Hazard Measures	Rehabilitation and construction of coastal protection is necessary to prevent coastal erosion	Located in high-risk areas requiring relocation, coastal protection measures of evacuation plans (Wailea, Nanuku)	Development in the Low-line flood plain areas (in Suva)	Some plan in a low-line areas with high risk to coastal hazard (Storm surge, flooding in the Delta area)
Strong Wind Measures	Evacuation Centers lacking in some areas (areas with no evacuation center in 500m distance)	Evacuation Centers for Informal Settlement is not sufficient	Capacity of Evacuation Centers shall be confirmed	Capacity of Evacuation Centers shall be confirmed
Earthquake /Tsunami Measures	Necessity of retrofitting of critical facilities to be evaluated Business Continuity Plan (BCP) to be considered in critical facilities (Ports etc.)	Evacuation Planning and Training to be conducted in coastal settlement (Wailea, Nanuku)	Evacuation Planning and Training to be conducted in coastal settlement	Evacuation Planning and Training to be conducted in coastal settlement
Road Resilience	Road drainage of urban areas insufficient and not connected to drainage channel	Unpaved road getting unpassable during rain/storm	Lack in coordinated drainage facility of roads, drainage channel and natural water bodies	Coastal road in the east coastline between Suva and Nasinu proposed Need to be resilient

Source: JICA Project Team

Based on the above analysis, hearings were conducted with stakeholders from municipalities and relevant sectors located in the Priority Area, and the DRR measures required in the Priority Area of the Central Division were examined. The DRR measures were organized in alignment with the projects indicated in the Central Division DRR Plan (Figure II-28 and Table II-23).



Source: JICA Project Team

Figure II-28 Locations of DRR Measures Identified in the Priority Area of the Central Division

Table II-23 List of DRR Measures Identified in the Priority Area of the Central Division

ID	ID-2	DRR Measures	Program	Activity
5	05-01	River Management	River Management in Lami River	Dredging in Lami River
	05-02			Riverbank Protection in Lami River
6	06-01	River Management	River Management in other Smaller Rivers and Creeks (Samabula, Wailoku etc.)	Dredging in Sambula River
	06-02			Dredging in Wailoku River
	06-03			Dredging and Riverbank Protection in the Downstream of Wailea area
	06-04			Dredging In Wailekutu Creek
10	10-01	Drainage	Urban Drainage Network Improvement (Suva City)	Drainage Improvement in the CBD Area
	10-02			Drainage Improvement in Low Elevation Area
	10-03			Drainage and Sewerage Improvement in Wailea Area
	10-04			Drainage in New Development Area
11	11-01	Drainage	Urban Drainage Network Improvement (Nasinu Town)	Drainage Improvement in the Streets and in some residential areas
	11-02			Improvement of appropriate drainage function in new development area and proper connection to drainage channels
12	12-01	Drainage	Urban Drainage Network Improvement (Lami Town)	Drainage Improvement in Lami Central Business District (CBD)
	12-02			Drainage Improvement in Wailada Industrial Area
13	13-01	Drainage	Drainage improvement to reduce flooding from creeks and inundations in low-line areas. (Nausori Town, Nakasi - Waidamdam, Waindam River Area)	Improvement of appropriate drainage function in Nakasi new development area and proper connection to drainage channels
	13-02			Regulation to install run-off control measures in new development areas
	13-03			Drainage Improvement in Waidamdam
	13-04			Improvement of drainage Channel in the area
14	14-01	Drainage	Informal Settlements in low-line areas to be identified and their living conditions to be improved	Consideration of Relocation of Informal Settlements in Maravu Area
15	15-01	Drainage	Drainage along Major Roads to the river or water bodies	Drainage Improvement near Laqere Bridge and Kings Road Crossing
	15-02			Drainage Improvement in Kings Road near Rishikul Primary School

ID	ID-2	DRR Measures	Program	Activity
16	16-01	Steep Slope Management	Steep Slope Measures in City Area	Steep Slope Hazard Prevention Measures (Slope Stabilization, Relocation, Evacuation and Raising Awareness) in Suva City
	16-02			Review of Steep Slope Hazard Prevention Measures (Slope Stabilization, Relocation, Evacuation and Raising Awareness) in Suva City
	16-03			Review of Steep Slope Hazard Prevention Measures (Slope Stabilization, Relocation, Evacuation and Raising Awareness) in Nasinu Town
	16-04			Steep Slope Hazard Prevention Measures (Slope Stabilization, Relocation, Evacuation and Raising Awareness) in Lami Town
	16-05			Review of Steep Slope Hazard Prevention Measures (Slope Stabilization, Relocation, Evacuation and Raising Awareness) in Nausori Town
17	17-01	Steep Slope Management	Steep Slope Measures along roads (Kings Road, Queens Road and Princess Road)	Steep Slope Measures in Kings Roads
	17-02			Steep Slope Measures in Queens Roads
	17-03			Steep Slope Measures in Princess Roads
19	19-01	Steep Slope Management	Development of public housing for relocation of settlers in the informal settlement	Promotion of Measures Conducted in Jittu Settlement
22	22-01	Coastal Hazard Management	Construction of Seawalls	Construction of Seawalls in Suva City in the Section South of the Grand Pacific Hotel
	22-02			Construction of Seawalls in the East Coastline Development in Suva City
	22-03			Construction of Seawalls in the Lami Bay Coastal Areas
	22-04			Construction of Seawalls in the East Coastline of Nasinu Town
23	23-01	Coastal Hazard Management	Rehabilitation of Seawalls	Rehabilitation of Seawall in the Lami Bay Coastal Areas
26	26-01	Coastal Hazard Management	Consideration of Coastal Risk in New Development Area	Consideration of Disaster Risk Reduction Measures in New Development Area (Land Heightening, Change of Location etc.
30	30-01	Cyclone (Heavy Rain/Strong Wind) Hazard Management	Evacuation Center Establishment in area with less capacity for evacuation	Identification and Establishment of New Evacuation Center in Suva City
	30-02			Identification and Establishment of New Evacuation Center in Nasinu Town
	30-03			Identification and Establishment of New Evacuation Center in Nausori Town
	30-04			Identification and Establishment of New Evacuation Center in Lami Town

ID	ID-2	DRR Measures	Program	Activity
31	31-01	Resilient Road Network with Redundancy	Development of Resilient Road Network between Suva and Nausori	Review and upgrade on the Resilience of Kings Road between Suva and Nausori
	31-02			Review and upgrade on the Resilience of Princess Road from Suva to Nausori
	31-03			Consideration of Development of Proposed Regional Road
	31-04			Consideration of possible new road network of the East Coastline of Nasinu Town
32	32-01		Upgrade of the Vulnerable Bridges	Upgrade of the Vulnerable Bridges in Lami Town
35	35-01	Prevention and Mitigation of Damage to Critical Facility	Enhancing Resilience of Health Facility	Enhance Resilience or relocation of the Health Facility
36	35-01		Enhancing Resilience of Education Facility	Enhance Resilience or relocation of Education Facility
38	38-01		Enhancing Resilience of the Suva Port	Kings Wharf Rehabilitation Project
	38-02			Conducting DRR measures identified in the Hazard Analysis of Suva Port and Update of the Suva Port BCP
39	39-01		Enhancing Resilience of Other Critical Facilities	Enhance Resilience or relocation of Critical Public Facility
40	40-01	Business Continuity Planning (BCP)	BCP Development for the Suva Port	Update of the Existing BCP Plan

Source: JICA Project Team

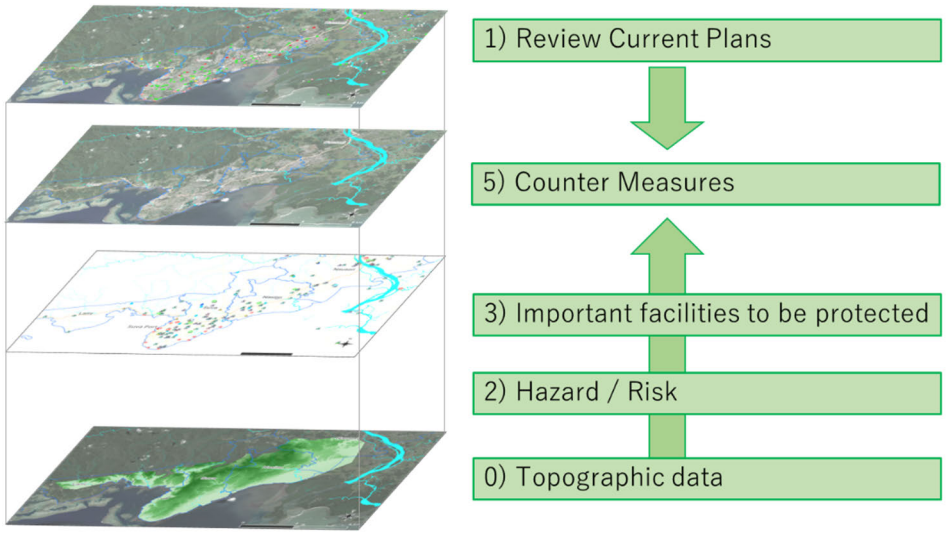
5) Priority Area Plan in the Western Division (Rakiraki Town)

In the Western Division, Priority Area DRR Plans were formulated in the first period for Nadi Town and Ba Town. Building on these initiatives, a Priority Area DRR Plan for Rakiraki Town was prepared in the second period under the leadership of NDRMO. Multiple consultations were held with the Rakiraki Town Council, during which the hazard analysis results prepared under Output 1 were presented, and a list of necessary disaster countermeasures for Rakiraki Town was compiled.

Table II-24 Consultations on the Formulation and Implementation of the Priority Area DRR Plan in Rakiraki

Date	Agency	Summary
2024 Nov. 28	Rakiraki Town Council	Explanation of the purpose and significance of formulating the Priority Area DRR Plan in Rakiraki Town
2025 Jun. 12	Rakiraki Town Council	Consultation and discussion on the list of disaster countermeasures in Rakiraki Town
Aug. 29	Rakiraki Town Council	Explanation and detailed review of the draft Priority Area DRR Plan in Rakiraki Town

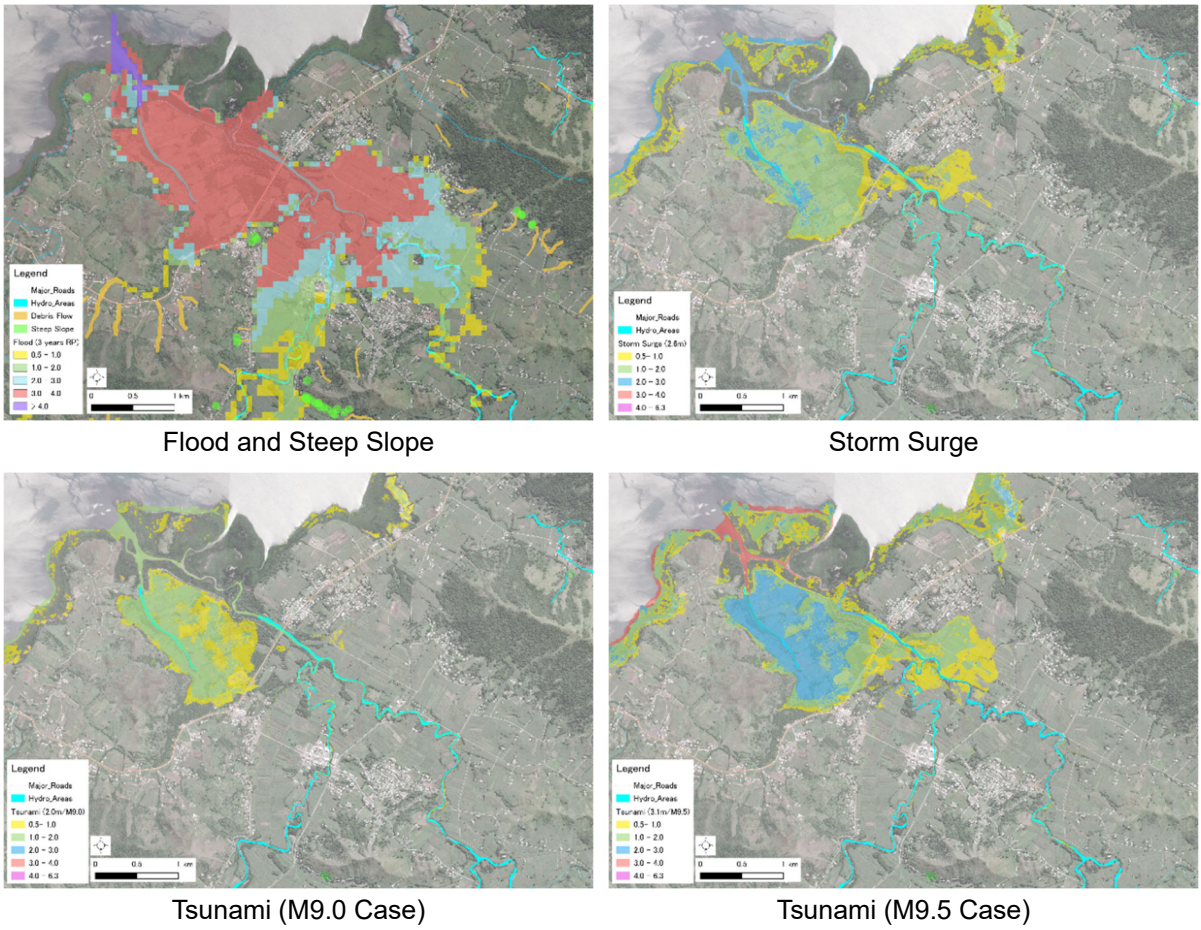
Source: JICA Project Team



Source: JICA Project Team

Figure II-29 Planning Process for the Priority Area DRR Plan in Rakiraki Town

First, to confirm the hazards in Rakiraki Town, hazards related to storm surge, tsunami, flood, and steep slopes were identified. Since much of the urban area was located outside the inundation zones of storm surge and tsunami, it was considered desirable that future urban development should not extend into these hazard-prone areas. Residential buildings and other structures located on steep slopes were also limited. On the other hand, with respect to flood hazards, the new urban district of the town was included in the inundation zone, and roads within the town were also identified as being in inundation areas, thereby separating access to key facilities. For this reason, the analysis focused primarily on flood hazards, with overlay analysis conducted between inundation areas and critical facilities. The results of the hazard analysis are shown in Figure II-30.



Source: JICA Project Team

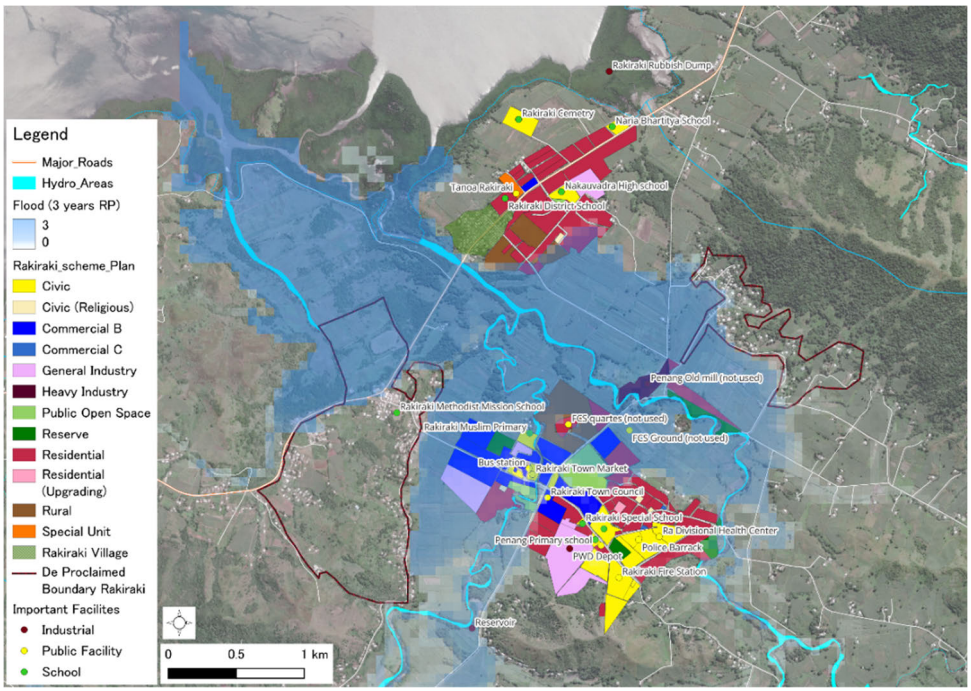
Figure II-30 Hazard Analysis in the Priority Area DRR Plan in Rakiraki Town

In the Priority Area DRR Plan for Rakiraki Town, in addition to reviewing existing plans such as the city's land use plan and identifying critical facilities within the town, the status of past countermeasures implemented in the Penang River and the Nakuavadia River, both of which affect the new central urban district of Rakiraki, was also confirmed.

Based on the analysis of flood inundation risks in relation to facilities to be preserved and land use (Figure II-31), as well as the review of past river countermeasures, the following points were identified as considerations for the examination of DRR measures in Rakiraki Town.

- Relocation or implementation of flood protection measures is required for the major facility (one school) located within the inundation area.
- Elevation of roads subject to flooding, including Kings Road, Waimari Road, and the access road from Kings Road to the new urban district, is required to ensure accessibility.
- Under the current land use plan, most areas designated for urbanization, aside from the new urban district, are outside the inundation area; therefore, future development must be examined considering flood risk.
- In the Nakuavadia River, riverbank protection measures have been implemented for the watercourse located behind the market in the new urban district, and dredging of the downstream

section has been planned. In addition, upstream retention facilities and diversion of the flow path through the new urban district have been studied. Fundamental risk reduction through such river improvement works will be required in the future.



Source: JICA Project Team

Figure II-31 Overlay of Flood Inundation Risk with Facilities to be Protected and Land Use Plan in Rakiraki Town

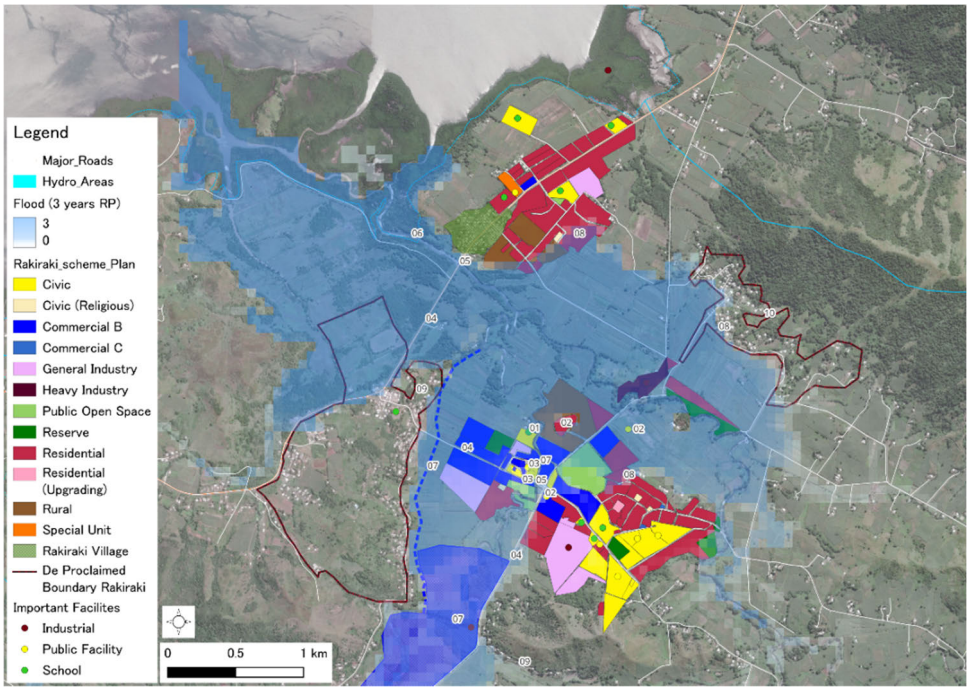
As a result of the examination, twelve countermeasures were identified as DRR measures for Rakiraki Town. The list of countermeasures (Table II-25) and their locations on the map (Figure II-32) are presented below.

Table II-25 List of DRR Measures in Rakiraki Town

No.	Hazard	Activity
1	F	Raising/Relocation of Schools (Rakiraki Muslim Primary School)
2	F	Raising/Relocation of Public Facilities (FSC Quarter, FSC Ground, Town Office)
3	F	Flood mitigation measures in Rakiraki Town Market and Bus Station
4	F, T	Road heightening of major roads (Kings Road and Waimari Road)
5	F, T	Enhancement of Bridge Resilience (Crossing in Kings Road, Crossing near the market)
6	F	Flood Control Measures for Penang River
7	F	Flood Control Measures for Nakauvadra Creek
8	F	Regulation of Urbanization in Flood Plain Areas (Identification of Hazard Risk Zone)
9	L	Raising Awareness in the Steep Slope Areas
10	C	Establishment of Evacuation Center
11	C	Evacuation Plan Formulation and Training
12	T, F	Tsunami and Flood Response Training

Hazard Type: Flood(F), Cyclone(C), Storm Surge(S), Tsunami(T), Steep Slope(L)

Source: JICA Project Team

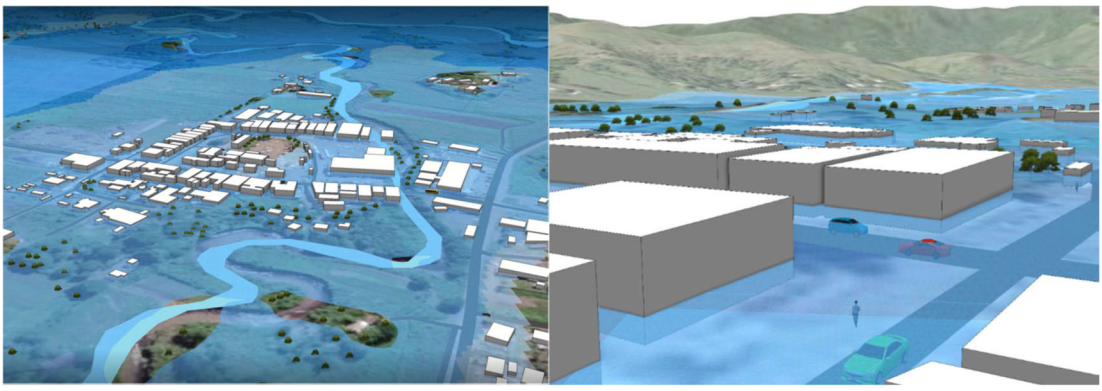


Source: JICA Project Team

Figure II-32 List of DRR Measures in Rakiraki Town

In proposing the DRR measures, multiple consultations were held with NDRMO staff and Rakiraki Town officials to confirm hazards and risks based on the analysis results of Output 1 and to verify the feasibility of projects. In addition, to facilitate intuitive understanding of disaster risks, a 3D hazard map was prepared, in which building information was simply visualized in three dimensions alongside the topography of the target area, and overlaid with inundation zones.

In Rakiraki Town in particular, although fundamental risk reduction through river improvement works has been considered multiple times in the past, such measures have not yet been realized. To secure the necessary budget, it is important to present the need for river improvement in a manner that effectively conveys the risks through visualization. At the same time, more detailed technical studies will be required in the future.



Source: JICA Project Team

Figure II-33 3D Hazard Map of the Central City Area in Rakiraki Town

[2-3]: Conduct technical supports to implement local DRR plans based on the results and the lessons learned from pilot activities.

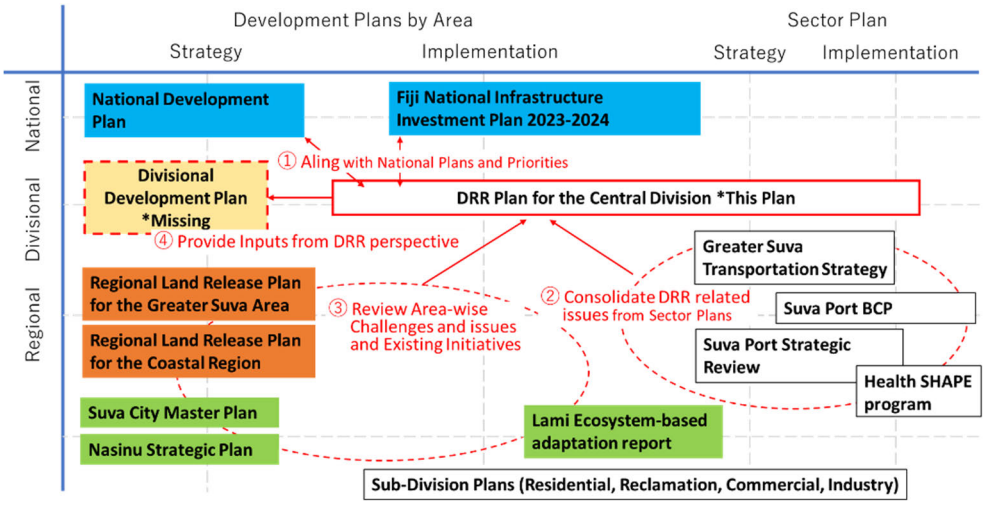
In coordination with Output 3, technical advice was provided to NDRMO, relevant agencies, divisional commissioner's offices, and provincial administrations for the implementation of the Priority Area DRR Plans formulated in the first period and the second period. The financing of specific projects was outside the scope of this project. However, it is important for local DRR plans to be practical and realistic. Therefore, attention was paid to the following points from the stage of DRR plan formulation. In the second period planning process, in addition to the viewpoints raised in the first period, further points emphasized in the Central Division were described.

1) Linkage with the Divisional Development Plan to be formulated in the future

Since no Divisional Development Plan existed in the Central Division, the formulation process was advanced by taking into account sectoral plans as well as provincial and municipal/town plans. The National Development Plan formulated in 2024, explicitly stipulated the formulation of divisional DRR plans. Therefore, the plan was positioned as one of the important initiatives of the National Development Plan, and consistency was ensured in the formulation process (Figure II-34-①). In addition, sectoral development plans (Figure II-34-②) and, the regional plan prepared by the iTaukei Land Trust Board (TLTB) in the Greater Suva metropolitan areas, which indicates land use and new development policies for the entire Greater Suva area (Figure II-34-③) was referred.

The Central Division Commissioner of MRMDDM confirmed that the divisional development plan for the Central Division would be formulated within the next few years. Accordingly, it would be ideal if the |Central Division DRR plan prepared under this project were effectively incorporated into the development plan.

To ensure that the results of the Central Division DRR Plan to be considered in the development plan in the future, continuous technical advice was provided to the Central Division administrators, using the formulated DRR policies and the list of DRR measures to explain disaster risk perspectives and emphasize the importance of risk considerations considering future development trends.



Source: JICA Project Team

Figure II-34 Linkages Among Related Plans in the Central

2) Link with the monitoring under Output 3

The purpose of the DRR plan is not the formulation itself, but rather the implementation of the DRR measures. Therefore, in compiling the list of DRR measures, a format was adopted that would be linked to the monitoring activities under Output 3. Particular attention was paid to the following points:

- For each DRR measure, the responsible agency and the implementing agency were separately identified. The responsible agency was defined as the institution accountable for recognizing the importance of implementing the DRR measure-based on hazard analysis and other results-and for ensuring its realization, including budget allocation. The implementing agency was defined as the institution technically responsible for carrying out the project.
- To indicate the priority of projects, the implementation timeline was classified into three categories: short-term (to be realized within 2-3 years), medium-term (to be implemented within approximately 5 years), and long-term (to be realized over a timeframe of more than 10 years). In particular, short-term goals included feasibility studies and detailed priority assessments for implementation, and progress in these studies was expected to promote medium- and long-term risk reduction measures.
- As items directly related to monitoring, project status was divided into two aspects: budget and implementation. For the budget, five stages were defined: before commencement, cost estimated, cost secured, under implementation, and completed. For the implementation, five stages were defined: before commencement, implementation site determined, year of completion confirmed, under implementation, and completed. These classifications enabled project status to be clearly identified.

With respect to the above points, discussions were held with the Central Division Commissioner's Office to promote the use of this framework for monitoring sectoral implementation status, as well as to consider establishing a forum to discuss the progress of DRR-related projects.

DRR Direction (2) : Measures to Reduce the Impact of Hazard

DRR Measures	Program	Activity	Responsible Agency	Proposed Implementing Agency	Location	Timeline	Financial Status		Physical Status	Remarks
River Management	Develop Comprehensive River Management Plan	Update of the Strategic Plan 2020-2024 for the Waterways			Entire Division	Short (2-3 years)		Not Started		
		Update the priority list for river management in the Divisional level	Ministry of Waterways and Environment?	Ministry of Waterways and Environment		Short (2-3 years)	2025	Not Started	Not Started	
River Management	River Management for the Rewa River (including the tributaries such as Waimanu River)	Formulation of river management Master Plan for Rewa River	Central Division, Ministry of Waterways and Environment?	Ministry of Waterways and Environment	Rewa River	Short (2-3 years)	2025	Not Started	Not Started	
		Planning for dredging and riverbank protection in the Rewa River	Central Division, Ministry of Waterways and Environment?	Ministry of Waterways and Environment		Mid (5 years)	2025	Not Started	Not Started	
		Enhance capacity on managing and regulating commercial dredging	Central Division, Ministry of Waterways and Environment?	Ministry of Waterways and Environment		Long (10 years)	2025	Not Started	Not Started	
		Implementation of the considered measures (dredging, riverbank protection)	Central Division, Ministry of Waterways and Environment?	Ministry of Waterways and Environment		Long (10 years)	2025	Not Started	Not Started	
River Management	River Management for the Nabua River	Formulation of river management Master Plan for Nabua River	Central Division, Ministry of Waterways and Environment?	Ministry of Waterways and Environment	Nabua River	Mid (5 years)	2025	Not Started	Not Started	*Dredging of the Deuba river is mentioned in the Strategic Plan 2020-2024 for the waterways
		Planning for dredging and riverbank protection in the Rewa River	Central Division, Ministry of Waterways and Environment?	Ministry of Waterways and Environment		Long (10 years)	2025	Not Started	Not Started	
		Implementation of the considered measures (dredging, riverbank protection)	Central Division, Ministry of Waterways and Environment?	Ministry of Waterways and Environment		Long (10 years)	2025	Not Started	Not Started	
River Management	River Management in other priority Rivers in Serua Province	Identification of Priorities among the rivers with	PA Serua, Central Division, Ministry of Local Government	Ministry of Waterways and Environment	Raiwaqa/ALTA, Waivunu, Wainvilase Settlement, Nakoba, Galoa, Yarawa Flat are areas raised by PA Serua	Short (2-3 years)	2025	Budget Estimated	Target Area/Facility Identified	
		Planning for dredging and riverbank protection in the priority rivers	PA Serua, Central Division, Ministry of Local Government	Ministry of Waterways and Environment		Mid (5 years)	2025	Budget Estimated	Not Started	
		Implementation of the considered measures (dredging, riverbank protection)	PA Serua, Central Division, Ministry of Local Government	Ministry of Waterways and Environment		Long (10 years)	2025	Budget Estimated	Not Started	

Monitoring

Short (2-3 years) / Mid (5 years) / Long (10 years)

Not Started / Budget Estimated / Budget Allocated / In Progress / Completed

Not Started / Target Area / Facility Identified / Goal Set / In Progress / Completed

Source: JICA Project Team

Figure II-35 Items Included in the List of DRR Measures

[2-4]: Prepare a guideline to develop and implement local DRR plans based on the results and the lessons learned from pilot activities.

Based on the experience of disaster management planning in the Central Division, draft guideline for division-level planning was amended. The basis of the draft guideline is the eight steps for local disaster management planning prepared by JICA, which reflects the findings and lessons learned during the development of the Western Division's disaster management plan and is designed to be equally effective in other areas in the first period. The following are the updated key points of the study.

1) Information Collection from Relevant Sectors

- Since divisional development plans do not exist in the Central Division, it was necessary to consolidate information individually from relevant sectors regarding planned projects.
- The same situation applied to the Northern and Eastern Divisions, where divisional plans had not been prepared, and therefore, the process of conducting hearings with each sector was added.
- In addition, the process of identifying needs at the provincial and city/town levels was also specified. For provinces and cities/towns, draft proposals for potential DRR measures were presented in line with hazard analysis results, and it was confirmed whether actual needs existed.
- Particularly in urban areas, some DRR measures included those that had not yet been implemented in Fiji. Therefore, these measures were described in the Priority Area Plan for the Greater Suva metropolitan area in the Central Division, with examples of such measures presented through photographs and other references to enable their consideration.

2) Process of Priority Area Formulation

- In the formulation of the Priority Area Plan in the Central Division, DRR measures that could not be identified solely through overlaying hazards with critical facilities were also addressed.
- Accordingly, the following two approaches were specified in the guidelines.

- Identification of socio-economic conditions, such as population distribution, the location of informal settlements, and planned new development sites, which were important for the Central Division review process.
- Introduction of an analytical matrix of urbanization trends and hazard impacts to facilitate the systematic identification of challenges associated with urbanization.
- By incorporating these two additional processes, it became possible to examine DRR measures from a more comprehensive perspective.

[2-5]: Develop an implementation plan to expand Local DRR plans, and its monitoring and evaluation procedures.

1) Collaboration and cooperation with Output 3 in the National Development Plan

To promote the nationwide rollout of local DRR plans, a draft National Rollout Plan was prepared in the first period. In the second period, for the Western Division, consultations were held with NDRMO staff to confirm the planned formulation of Priority Area Plans for towns other than Rakiraki, and this was reflected in the National Rollout Plan.

Regarding the Central Division, beyond the Greater Suva metropolitan area, the divisional DRR plan categorized the Central Division into zones based on hazard characteristics. It was therefore assumed that plans would be formulated based on these regional divisions, and the National Rollout Plan was updated accordingly.

2) Coordination and cooperation with Output 3 in monitoring

In formulating the monitoring and evaluation procedures, collaboration with Output 3 was considered essential. In the list of DRR measures prepared for the Central Division, the format was aligned with the monitoring methodology of Output 3, thereby ensuring that monitoring activities were anticipated and incorporated from the stage of plan formulation.

(4) Output 3

[3-3]: Assess and upgrade the system to plan, implement, monitor, and review DRR activities.

Regarding the management and monitoring framework for the revised NDRRP Roadmap (the Roadmap), which was considered and drafted in Activity [3-2] during the first period, consultations were held with the National Disaster Management Office (NDRMO) and relevant agencies. Subsequently, an orientation session was conducted to facilitate the commencement of the Roadmap's implementation and management.

1) Approval of the NDRRP Roadmap by the DRR Committee

The draft documents related to the Project’s outputs, including the Roadmap, Western Division DRR Plan, Priority Area DRR Plans for Nadi and Ba, and DRR Annual Report for Fiji 2022-2023, were confirmed in the MRMDDM. Then, they were put on the agenda of the DRR Committee established

under the National Disaster Management Council (NDMC) and approved by them. The NDMC's name was changed to the NDRMC with the amendment of the NDRMA in 2024.

The outline of the DRR Committee that the agenda for the Outputs during the first period of the Project was discussed is shown in the following table.

Table II-26 Agenda of the DRR Committee

Date	10:30-12:30, Thursday, 6th March 2025
Location	Holiday Inn Suva
Attendees	Approximately 40 representatives, generally at the director-level, from related ministries and agencies, and NDRMO staff. Chairperson: Permanent Secretary for Rural and Maritime Development
Agenda	Agenda (Speaker name) 1) Alert on Asian Subterranean Termites (Biosecurity Authority of Fiji) 2) Council Paper 1: Amendment of the DRR Humanitarian Policy (Acting Director NDRMO) 3) Council Paper 2: Local DRR Plans (S/A) 4) Council Paper 3: NDRRP M&E Guideline (S/A) 5) DRR Annual Report for Fiji (S/A)

Source: JICA Project Team

The Roadmap, the Western Division DRR Plan, and the Priority Area DRR Plans for Nadi and Ba which incorporated feedback from the DRR committee, were uploaded and published on the NDRMO's website. The Central Division DRR Plan, the Priority Area DRR Plan for Suva, and the National Annual Report on DRR 2023-2024, which were formulated in the second period, were prepared for submission to the NDRMC and for its approval. The NDRMC will be held before the 2025 cyclone season, with the attendance of the Minister and other officials requested and is being coordinated by the NDRMO.

2) Update of the NDRRP Roadmap

The Roadmap, originally developed during the first period and approved by the DRR Committee in March 2025, is structured as follows:

1. Roadmap for the Formulation of Local DRR Plans

   This section presents the nationwide rollout roadmap for the formulation of Divisional DRR Plans and Priority Area DRR Plans.

2. Roadmap for the Implementation of Local DRR Plans

   The Local DRR Plans (both Divisional and Priority Area Plans) outline proposed countermeasures or activities for high-risk areas based on hazard and risk analysis. This section details the implementation roadmap, which is developed through consultation with the headquarters of implementing ministries based on the local analysis and identified needs for these activities.

The roadmap, which was formulated during the first period and approved by the DRR Committee in March 2025, was updated during the second period's activities as follows:

1. Updates to the Roadmap for the Formulation of Local DRR Plans

   The Roadmap was revised to reflect the fact that the formulation of Divisional DRR Plans was set as a Key Performance Indicator (KPI) in the updated National Development Plan 2025-2029 (NDP), which was renewed in 2024. Furthermore, the timeline was updated to reflect the contents of the nationwide expansion plan for hazard and risk analysis (developed and reviewed under Project Output 1), while also considering the human capacity of the NDRMO.

2. Updates to the Roadmap for the Implementation of Local DRR Plans

   This section incorporates the proposed activities for high-risk areas identified in the Central Division DRR Plan and the Suva Area Priority Area DRR Plan, which were formulated during the second period of the Project.

   Additionally, a Roadmap Monitoring Guideline was created as part of the guidelines for preparing the National Annual Report on DRR. The implementation status of disaster countermeasures based on the Roadmap will be monitored according to this Monitoring Guideline and subsequently reported to the NDRMC and publicly released through the National Annual Report on DRR.

[3-4]: Conduct inter-organizational meetings under NDRMC on the planning, implementation, and monitoring of DRR activities.

The National Disaster Risk Management Act (NDRMA), which was reviewed under the leadership of the NDRMO in 2024, mandates that the NDRMC shall be held at least twice a year.

As previously mentioned, the DRR Committee, held in March 2025 under the NDRMC framework, included the Roadmap, the Western Division DRR Plan, the Priority Area DRR Plan for Nadi/Ba, and the DRR Annual Report for Fiji 2022-2023 on its agenda. Through the Discussion Paper accompanying these items, the participating ministries and agencies agreed to provide cooperation for the annual issuance of the National Annual Report on DRR. This cooperation explicitly includes the monitoring the Roadmap, which is a component of the Report's content.

Based on these legislative provisions and the meeting outcomes, the National Annual Report on DRR will henceforth be issued and publicly released annually with the cooperation of relevant ministries and agencies. This process will include the monitoring formulation of the Local DRR Plan, and implementation of disaster countermeasures carried out in alignment with the Roadmap.

The specific monitoring arrangements for the Roadmap will be detailed in a later section, "Organize a system for the publication of National Annual Report on DRR."

Furthermore, the National Development Plan (NDP), led by the Ministry of Finance, Strategic Planning, National Development and Statistics (MFSPNDS), includes the formulation of Local DRR Plans at the divisional level. The MFSPNDS is responsible for regularly monitoring the progress of this formulation. Consequently, a national monitoring system has been established for the formulation status of Local DRR Plans at the divisional level, meaning the NDRMO will need to respond to the MFSPNDS's monitoring requests periodically, in addition to its own roadmap monitoring.

[3-5]: Support the mainstreaming of DRR into activities implemented by related organizations.

The Project supported the mainstreaming of DRR in Fiji by prioritizing and monitoring the implementation of DRR-related activities by relevant agencies through the Local DRR Plans and the Roadmap.

As mentioned in the activity report for Output 2, priority activities that need to be advanced, especially in high-risk areas, were identified through the process of formulating the Local DRR Plans based on hazard and risk assessment. This prioritization included activities not only from the NDRMO and the MRMDDM but also from other relevant agencies. This entire process was consolidated into the Roadmap, and a system was established to monitor its implementation status.

Furthermore, for the consistent realization of the Roadmap, utilization of funding from international donor agencies is just as indispensable as activities funded by the Fijian Government's capital budget. Given this situation, individual briefings and consultations regarding the Roadmap with organizations such as the Pacific Community (SPC) and various UN agencies were conducted.

Additionally, in October 2025, a seminar was held to bring together relevant domestic and international stakeholders, placing a strong emphasis on promoting the Roadmap and appealing for cooperation in its implementation.

Table II-27 Agenda of the Seminar on DRR Mainstreaming

Date	Monday, 27th October 2025
Location	Holiday Inn Suva
Attendees	Approximately 100 representatives, including Hon. Assistant Minister for Rural Maritime Development and Disaster Management, NDRMO, Disaster management liaisons from Fiji government agencies, international donor agencies, and DRR officers in the Pacific countries
Agenda	Agenda (Speaker name) 1) Keynote speech (JICA Senior Advisor) 2) Keynote speech (Commissioner Central) 3) Activity report and discussion on hazard/risk assessment (NDRMO) 4) Activity report and discussion on Local DRR Plan (S/A) 5) Activity report and discussion on DRR promotion (S/A)

Source: JICA Project Team

The Government of Fiji is currently advancing the revision of the Public Sector Investment Programme (PSIP) guidelines and is working towards making the PSIP applicable to all government agency projects above a certain scale. The objective of the PSIP is to allocate limited public investment funds effectively and efficiently to optimize development outcomes. The development impact indicators checked during the public works budgeting screening process now include an assessment of climate change and disaster risk. This screening process, utilizing a specific form, requires evaluating and considering the potential disasters affecting the public work and the necessary response measures. Furthermore, when the public work is listed in a DRR-related plan, it is highly valued during the PSIP screening process, thereby increasing its likelihood of securing budget.

Following the approval of the Local DRR Plans and the Roadmap by the DRR Committee, it was confirmed with the MFSPNDS, which is responsible for the PSIP implementation, that the activities listed in these

documents could now be evaluated within the PSIP framework. Going forward, when preparing materials for budget requests, it is necessary to clearly state if the specific activities constituting the budget are listed in the Local DRR Plan or the Roadmap. Furthermore, from the perspective of mainstreaming DRR, there is a need to publish the hazard maps created by the project and require other projects to address PSIP screening by utilizing those hazard maps.

[3-6]: Organize a system for the publication of the National Annual Report on Disaster Risk Reduction.

During the project period, the National Annual Report on DRR was issued for the 2022-2023 and 2023-2024 fiscal years, and the draft for the 2024-2025 edition was completed. The publication process was carried out not only by the NDRMO Output 3 counterparts but also by the entire NDRMO RMR Unit, which is responsible for DRR policy formulation, implementation, and monitoring, under the guidance of the JICA Project Team.

In addition, Guidelines for Preparing the National Annual Report on DRR were created and disseminated throughout the entire NDRMO.

The content of the National Annual Report on DRR is structured as follows:

1) Summary of major disasters and corresponding responses that significantly impacted the country during the year.
2) Summary of NDRMO activities.
3) Summary of the Government of Fiji's DRR activities.

The Report was compiled using documents created during the course of regular work. Specifically, item 1) was based on Situation Reports compiled by the NDRMO after a disaster; item 2) was based on the NDRMO's Annual Activity Report submitted to the MRMDDM at the end of each fiscal year; and item 3) was based on the monitoring results of the Roadmap, the NDRRP M&E results, and reports on the Government of Fiji's DRR activities prepared for international conferences, etc. This approach streamlined the NDRMO's workload and established a feasible system for annual publication.

To ensure the timely execution of daily work by all NDRMO staff, not just the RMR Unit responsible for the Report's publication, an orientation session was conducted to disseminate the guidelines across the entire organization and emphasize the significance of annually issuing and archiving the Report.

As previously noted, the annual publication of the DRR Annual Report and the cooperation of relevant ministries were approved by the DRR Committee. It is expected that the Report will continue to be published under this framework going forward. The National Annual Report on DRR was initially referred to as the “DRR White Paper”, but at the request of the Fijian side, the name was changed to the “National Annual Report on DRR.” This was done because the term “White Paper” did not clearly convey the intent in Fiji, and the new title reflects the ambition to publish the report annually. Only the 2022-2023 edition was approved by the DRR Committee under the name “DRR Annual Report for Fiji”.

II.2 Achievements of the Project

II.2.1 Outputs and Indicators

Indicators and the achievement levels of each output are shown in Table II-28.

Almost all the planned activities for Output 1, Output 2, and Output 3 have been conducted, and the technical deliveries have been completed. Furthermore, the outputs in the first period have already been approved by the DRR Committee, indicating that the critical process towards achieving the Overall Goals has been accomplished. Conversely, the outputs in the second period have not yet received approval from the DRR Committee. Therefore, prompt approval is anticipated to ensure the timely achievement of the Overall Goal.

Table II-28 Indicators and Achievement Level of Each Output

Outputs	Objectively Verifiable Indicator		Achievement Levels
1. The capacity to assess hazards scientifically is strengthened in collaboration with technical agencies.	1.1 The hazard assessment guideline and the expansion plan have been developed.	The hazard assessment guideline The expansion plan	Fully Achieved
	1.2 Hazard assessments are conducted with technical agencies in pilot areas.	Hazard maps	Fully Achieved
	1.3 The results of hazard assessments are shared at meetings under the NDRMC structure.	Meeting minutes	Partially Achieved The results of the hazard assessment conducted in the first period of the project were shared at the DRR Committee meeting. The results of hazard assessment in the second period are expected to be shared at meetings under the NDRMC structure.
2. The implementation system is established to develop practical local DRR plans nationwide.	2.1 Local DRR plans based on the results of hazard assessments at pilot areas with the assistance of JICA experts and NDRMO are developed.	Local DRR plans in pilot areas	Fully Achieved
	2.2 A guideline to develop, implement, and review a local DRR plan has been developed, revised based on lessons learned, and uploaded to the website of NDRMO.	The guideline on local DRR plans	Partially Achieved A guideline was developed. It is expected to be uploaded to the website of NDRMO.
	2.3 A plan to expand the local DRR plan nationwide has been developed.	The plan to expand local DRR plans nationwide	Fully Achieved

Outputs	Objectively Verifiable Indicator		Achievement Levels
3. The functions to promote DRR investment are enhanced at a national level in consideration of CCA.	3.1 A roadmap to implement prioritized actions of NDRRP (NDRRP roadmap) is developed.	The NDRRP roadmap	Fully Achieved
	3.2 DRR-related meetings under the NDRMC structure are held.	Meeting minutes	Fully Achieved
	3.3 A guideline to plan, implement, monitor, and revise the NDRRP roadmap is provided.	The guideline on the NDRRP roadmap	Fully Achieved

Source: JICA Project Team

II.2.2 Project Purpose and indicators

The table below presents the indicators and their achievement levels for the project's purposes. The Project Purposes are fully achieved.

Table II-29 Indicators and their Achievement Levels of Project Purposes

Project Purpose	Objectively Verifiable Indicator		Achievement Level
Capacity of NDRMO is strengthened to implement and promote DRR activities in line with the international, regional, and national policies.	- A National Annual Report on DRR is issued every year (from the 2nd year of the project) and referred to in reports, speeches, websites, and so on.	- National Annual Report on DRR - NDRRP monitoring sheet - Reports, media articles, press releases, speeches, websites - Local DRR plans	Partially Achieved National Annual Report on DRR FY24-FY25 has not yet been issued.
	- The prioritized actions in the NDRRP roadmap are implemented and monitored.		Fully Achieved
	- Local DRR plans for 2 divisions are developed based on the results of hazard assessments with the coordination of NDRMO with related agencies.		Fully Achieved

Source: JICA Project Team

II.2.3 Overall Goal

The table below presents the indicators and their prospects for achieving the overall goals. C/P organizations understand the necessity of the preparation of the National Annual Report on DRR, the monitoring of the road map, and the preparation and implementation of the local DRR plans very well. And C/P organizations know the process and have already got the technical capacity for them at a certain level. However, the prospects to achieve the overall goals are evaluated as "Moderately Bright", since the man powers and budget necessary for their implementation may not be fully secured.

Table II-30 Indicators and their Achievement Levels of Project Purposes

Overall Goal	Objectively Verifiable Indicator		Prospect
DRR activities in the NDRRP roadmap are implemented under the coordination of NDRMO.	1 National Annual Report on DRR is issued every year.	- National Annual Report on DRR - Reports, media articles, press releases, speeches, websites - NDRRP monitoring sheet - Local DRR plans	Moderately Bright Creation of each section of the National Annual Report on DRR falls under the NDRMO's regular duties, primarily involving the collection, re-editing, and preparation of existing reports. The technical work is not difficult, and NDRMO has a strong sense of purpose regarding the work and a positive attitude.
	2 NDRRP roadmap is regularly monitored at meetings under NDRMC structure		Moderately Bright The importance of monitoring local DRR plans is well understood by all stakeholders. However, the budget and staff allocation for regular monitoring should be included in their business plan.
	3 Number of local DRR plans are increased.		Moderately Bright Through the project activities, NDRMO and C/P agencies have got the capacity to make the local DRR plans and the development of the local DRR plans in the remaining two divisions are one of the KPI of the NDP. However, the accumulation of the data for the hazard assessment, securing personnel for the hazard assessment and DRR planning and some more technical assistance will be necessary for securing the quality of the local DRR plans.

Source: JICA Project Team

II.3 Modification of PDM

Project Design Matrix (PDM) was modified based on the JCC held on the 18th of May 2022, and the revised R/D was signed on the 16th of October 2023, as shown in the table below. The organization name and the term were modified based on the JCC held on the 27th of October 2025. The main points of the modification are shown in Table II-31.

Table II-31 Contents of the Modification of PDM

Parent Document	Date of Signing	Revised Content
Revised R/D	16 October 2023	Period of Project: Before: From March 2020 to February 2024 (48 months) Amendment: From December 2020 to November 2025 (60 months)
Meeting Minutes of the JCC	27 October 2025	Change of the wording: Before: - NDMO - DRR White Paper - NDMC Amendment: - NDRMO - National Annual Report on DRR - NDRMC

Source: JICA Project Team

II.4 Others

II.4.1 Environmental and Social Consideration

Environmental and social considerations are not required for the implementation of this project. However, it is necessary to consider them since there will be many projects in the lists of LDRRMPs that will require environmental and social considerations in planning, designing, and implementation.

II.4.2 Considerations on Gender, Peace Building, and Poverty Reduction

The considerations for gender and disabilities have been required from the beginning of the project, and they have been considered in the pilot activities. The guideline for the Local DRR Planning details the points to consider ensuring their mainstreaming.

III. Joint Review Results

III.1 Review Results based on DAC Evaluation Criteria

This project will be evaluated based on the six criteria of the DAC Evaluation Criteria: Relevance, Coherence, Effectiveness, Impact, Efficiency, and Sustainability.

III.1.1 Relevance and Coherence

The "Relevance and Coherence" of this project can be assessed as "High = 3" based on the table and the rationale provided below.

Table III-1 Detailed Assessment of Relevance and Coherence

Evaluation Criteria	Perspective/Content	Score
Relevance	Consistency with the Fiji development policy and development plan.	High = 3
	Consistency with development needs	High = 3
	Appropriateness of the project approaches	High = 3
Coherence	Consistency with Japan's ODA policy for Fiji	High = 3
	Alignment with other similar projects of JICA in Fiji (Internal coherence)	High = 3
	Alignment with similar projects of other donors (External coherence)	High = 3

Source: JICA Project Team

(1) Relevance

The project is highly relevant based on the criteria below.

- The National Development Plan 2025-2029 and Vision 2050, which serves as the Fijian government's national development plan, includes "National Disaster Risk Reduction" as an independent chapter. Within this chapter, the development of DRR plans at the Division level for all four divisions by 2029 is set as a Key Performance Indicator (KPI), demonstrating that this project is aligned with the Fijian government's policy. Furthermore, with the revision of the National Disaster Risk Management Act in 2024, the name of Fiji's central disaster management organization was changed from the "National Disaster Management Office" to the "National Disaster Risk Management Office." The mainstreaming of disaster risk reduction that this project aims for will contribute to strengthening Fiji's disaster risk management capacity.
- Previous disaster management related plans focused solely on disaster response and did not incorporate the perspective of proactive risk reduction perspective. Furthermore, the need for support from the Fijian side is high, as the Sendai Framework for Disaster Risk Reduction requires the global target of '(e) Substantially increase the number of countries with national and local disaster risk reduction strategies.
- The disaster management sector is an area where Japan possesses a high comparative advantage in providing assistance, and the collaborative approach is therefore appropriate, as it allows for the full utilization of Japan's experience and expertise.

(2) Coherence

- This project aligns with Japan's cooperation policy, as demonstrated by the statements in the Pacific Islands Leaders Meeting (PALM) and the Business Development Plan for Fiji. These policies advocate for supporting disaster risk reduction (DRR) capacity, strengthening it through both hard and soft components, focusing on disaster management, climate change, regional resilience, and improving capacity from policy planning to implementation. Furthermore, the project is consistent with JICA's cooperation policy, as JICA explicitly details the Disaster Management Strengthening Program in its "Business Development Working Paper for Fiji" and also promotes contributions to the Sendai Framework for Disaster Risk Reduction.
- This project is positioned as a core component of the offer-based cooperation, "Strengthening Disaster Risk Reduction and Early Warning Systems in Fiji and the Pacific Region." The development objective of this offer-based cooperation is to promote the building of sustainable and resilient societies against climate change and natural disasters by strengthening disaster risk reduction and early warning systems across the region, thereby reducing overall disaster risk and enhancing disaster response capacity. Activities were implemented in coordination and collaboration with other support initiatives, including the "JICA DRR National/Regional Advisor" and the "Stand-by Loan for Disaster Recovery and Rehabilitation Phase 2". The policy matrix of the "Stand-by Loan for Disaster Recovery and Rehabilitation Phase 2" states that "NDRMO shall submit a draft version of Divisional DRR Plan for Western Division to MRMDDM." and "The Western Division shall select priority measures for DRR investment based on a draft version of Divisional DRR Plan." as the preceded actions after September 2024 for promoting the outputs of the project. Also, the policy matrix states the approval of the Divisional DRR Plan for Central Division, the approval of the National Annual Report on DRR by the cabinet every year, the approval of the NDRRP roadmap, and the budget allocation for the priority measures in the Divisional DRR Plan of Western Division, as the future actions.
- In this project, activities were carried out while communicating with other donors, such as UNDRR, UN Women, UNDP, and SPC. We also coordinated with them to prevent duplication and ensure consistency across projects.

III.1.2 Effectiveness and Impact

The "Effectiveness and Impact" of this project can be assessed as "High = 3" based on the table and the rationale provided below.

Table III-2 Detailed Assessment of Effectiveness and Impact

Evaluation Criteria	Perspective/Content	Score
Effectiveness	Achievement of outputs (Output Indicators)	High = 3
	Achievement of outcome (Project Purpose Indicators)	High = 3
Impact	Achievement of intended impacts (Overall Goal Indicators)	High = 3
	Observed impacts other than the Overall Goal	High = 3

Source: JICA Project Team

(1) Effectiveness

- As stated in the achievement of outputs, all output indicators have been fully achieved.
- As indicated in the achievement of the project purpose, the indicators for the project purpose have also been almost fully achieved.

(2) Impact

- As described in the prospects for achievement of overall goal, the outlook for the achievement of the overall goal is relatively positive.
- In the Western Division and Central Division, where pilot activities were conducted, the experience gained through these activities has led to increased confidence and motivation, and active contributions are expected even after the project's completion. We also conducted the Invitation Program to Japan for the respective Division Commissioners for those divisions. They are raising awareness with a view toward the implementation of disaster prevention projects and the realization of their effects following the local planning activities, and they are highly motivated to promote the development and implementation of disaster prevention plans. The Commissioner Central decided to allocate the time of every Thursday afternoon for the discussion on the DRR projects and to convene the related organizations to discuss the promotion of the DRR projects in the morning of the first Thursday every month. In November 2025, the first meeting was held and about 20 participants from the related organizations discussed securing the budget for DRR. Furthermore, the project supports the monitoring of DRR project implementation through the NDRRP Roadmap and the DRR White Paper. This accumulated experience is expected to provide valuable feedback for future expansion efforts.
- Furthermore, through activities centered on WG4, the project has supported and monitored expansion activities beyond the pilot areas. This accumulated experience is expected to provide valuable feedback for future expansion efforts.

III.1.3 Efficiency

The "Efficiency" of this project can be assessed as "High = 3" based on the table and the rationale provided below.

Table III-3 Detailed Assessment of Efficiency

Evaluation Criteria	Perspective/Content	Score
Efficiency	Actual project cost (Japanese side) vs. the plan	High = 3
	Actual project period vs. the plan	High = 3
	Actual outputs vs. the plan	High = 3

Source: JICA Project Team

- Although the project had to be extended for 12 months due to the COVID-19 pandemic, the extension period was minimized by utilizing online activities as much as possible.

- Even though the project cost had increased, the additional cost was only for the necessary actions to adapt to the COVID-19 situation, for the increase in unit costs for remuneration, travel expenses, and general administrative costs.
- Through the inputs and activities mentioned above, the planned output indicators were successfully achieved.

III.1.4 Sustainability

The " Sustainability " of this project can be assessed as "High = 3" based on the table and the rationale provided below.

Table III-4 Detailed Assessment of Sustainability

Evaluation Criteria	Perspective/Content	Score
Sustainability	Policy support to continue project effects	Very High = 4
	Institutional aspect	High = 3
	Technical aspect	High = 3
	Financial aspect	Moderately Low = 2

Source: JICA Project Team

- In terms of policies and institutional aspects, frameworks and guidelines for disaster risk reduction, such as the NDRMC and NDRRP, have already been established, providing a solid legal basis and environment to ensure sustainability. In addition, the formulation of DRR plans for the remaining two districts is listed as a KPI in the NDP, which strongly supports the continuity of these efforts.
- In terms of organizational aspects, although the NDRMO experiences a relatively high turnover of personnel, replacements are made appropriately, and the organization's overall capacity has been maintained. In the formulation of local DRR plans, the involvement of district offices is crucial; however, the organizational structure has already been established down to the local level, ensuring sustainability in planning, implementation, and monitoring. Senior government officials have deepened their understanding of disaster risk reduction activities through the invitation program to Japan. Given Fiji's tendency for top-down decision-making, the sustainability of these efforts is considered high. For example, although the DRR officer has been already assigned to work for each division, NDRMO has proposed to increase the number of DRR officers to dispatch them in the divisional commissioner's office. Unfortunately, this budget was not approved for the fiscal year 2025-2026. But Sustainability will be higher, if this budget will be approved.
- In terms of technical aspects, various activities have been implemented in close consultation with the NDRMO and related organizations, and the methodologies used for these activities have been documented in the form of guidelines. The second period of the Project has been carried out as much as possible under the leadership of the counterpart agencies, indicating a high-level evaluation of technical sustainability. (In the second period of the project, the consultant team conducted the instruction to the newly assigned C/Ps, the utilization of 3D and video expression of hazard/risk, and the schedule management etc. After the project, C/Ps will be able to expand the activities to the

other areas, though it may take time.) On the other hand, the Northern and Eastern Divisions, where future DRR planning should be promoted, are sparsely populated / low capital accumulation areas with isolation / remoteness on the communication / transportation that require a different approach, such as the early warning and emergency operations, from the more densely populated Western and Central Divisions, which are targeted in this Project. Therefore, continuous technical support is expected to further enhance the quality of planning in those areas.

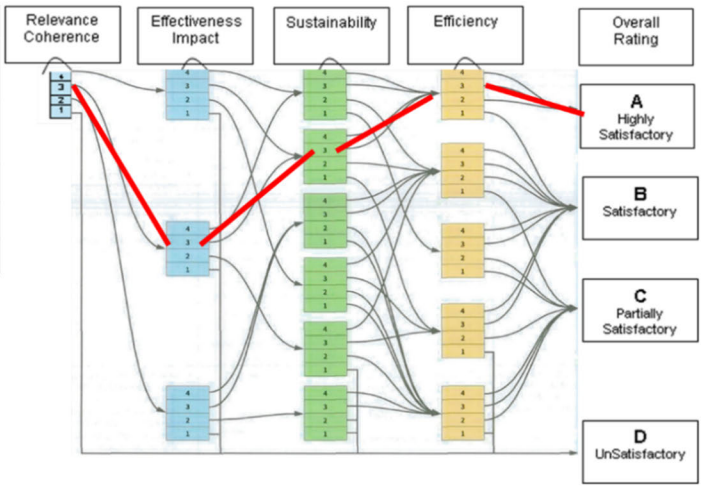
- Securing the budget for the implementation of the planned activities is important. Monitoring activities and the development of the National Annual Report on DRR are one of the project activities to visualize the actions from planning to implementation, because there are a lot of plans which are not implemented in Fiji. In the project, the activities, which do not require much budget, have been included in the local DRR plans, so that more activities will be implemented. Based on this approach, in the progress meeting / the JCC meeting of the project, the Commissioner Central explained their implemented projects such as coastal protection and bridge construction etc., and he appealed the importance of the development of local DRR plans and their implementation. In addition to the continued coordination with the Ministry of Finance, Strategic Planning, National Development, and Statistics (MFSPNDS) for budget negotiations, the continuous efforts should be made to secure funding through measures such as increasing allocations to the newly established Disaster Fund and engaging with other development partners. Furthermore, not only the budget for the implementation of the plans, necessary budget, such as for the more detailed topo data, and for the personnel and necessary cost for the planning / monitoring of the plans etc., should be secured.

III.1.5 Results of Overall Evaluation

Based on the scores of each of the evaluation criteria mentioned above, an overall project evaluation was conducted in accordance with the JICA Evaluation Guidelines. As shown in the figure below, the project is rated as "A: Highly Satisfactory."

Item	Rating
Relevance and Coherence	3
Effectiveness and Impact	3
Sustainability	3
Efficiency	3
Overall rating	A

Scoring of each Criteria
1. Very High: 4
2. High: 3
3. Moderately Low: 2
4. Low: 1



Source: JICA Project Team

Figure III-1 Results of Overall Evaluation

III.2 Challenges, Innovations, and Lessons Learned in Overall Activities

(1) Activities without a clear legal basis

In this project, the initial objective was to develop local DRR plans in the 13 City/Town Councils across Fiji, aiming to reduce disaster risk in urban areas where population and assets are concentrated. One of the reasons for this approach was that, at the time when the preparatory survey of this project was conducted, NDRMO was under the Ministry of Infrastructure, Transport, National Disaster Management, and Meteorological Services (MoITDM), making it easier to promote mainstream DRR into infrastructure projects. Furthermore, amendment of the Natural Disaster Management ACT 1998 was already underway, and it was anticipated that City/Town Councils would be legally required to formulate local DRR plans.

However, at the project's inception, NDRMO had returned under the MRMDDM, and the Natural Disaster Management ACT 1998 had not yet been amended, meaning there was no legal basis for City/Town Councils to formulate local DRR plans. After consultations with NDRMO, MRMDDM, and the Department of Town and Country Planning, it was decided to develop local DRR plans at the division level under MRMDDM. To maintain the core concept of reducing disaster risk in urban areas, areas within divisions with concentrated population and assets would be designated as Priority Areas, and DRR plans would also be developed for these Priority Areas.

Nonetheless, under the Natural Disaster Management ACT 1998, the disaster management plans to be developed at the divisional level focus primarily on disaster response. Therefore, the project continued without a legal basis for formulating local DRR plans.

In the project, efforts were made to align activities with the original objectives by involving infrastructure-related agencies in the formulation of division-level DRR plans and by engaging City/Town Councils in the development of DRR plans for Priority Areas. Additionally, by repeatedly emphasizing the importance of "disaster risk reduction," the project aimed to foster a shift in awareness, highlighting that the formulation and implementation of DRR plans is crucial regardless of legal requirements.

As a result, while the mainstreaming of DRR into infrastructure-related projects is still a work in progress, the understanding of disaster risk reduction has increased among NDRMO, MRMDDM, and other agencies such as the Ministry of Finance, Strategic Planning, National Development and Statistics (MFSPNDS), and the Ministry of Public Works, Meteorological Services and Transport (MPWMST). Moreover, some City/Town Councils have begun integrating DRR plans for priority areas into their development and land-use planning. For example, according to the interview with MFSPNDS, the project could be evaluated higher during the screening process of PSIP, if the project is listed in the local DRR plans or in the NDRRP roadmap.

(2) C/P turnover

This project period was extended from four years to five years mainly due to the COVID-19 pandemic, and the project experienced frequent staff turnover within the C/P, which at times necessitated minor setbacks in project activities. To ensure that knowledge and experience gained from the project were retained

despite turnovers in C/P personnel, activities were always conducted with multiple staff members. For new personnel, previous presentations, plans, and guidelines were shared and explained to facilitate early familiarization with ongoing activities. Even though the C/P personnel is new, he tried his best to present the progress of the project in the progress meeting and the JCC meeting conducted every half a year. At the final stage of the project, C/P staff who had participated in the training program and the invitation program in Japan engaged in project activities with a high level of awareness, and new personnel were able to learn from them, effectively inheriting knowledge, practices, and approaches.

(3) Utilization of the training program and the invitation program in Japan

At the beginning of the project, Japan already had a strong presence in DRR in Fiji, through frameworks such as the Sendai Framework, various related international conferences, and the NDRRP formulated under the leadership of the previous JICA long-term experts. This created a favorable environment for conveying the concept of "disaster risk reduction" promoted by the project. However, there was uncertainty regarding the extent to which Fijian counterparts understood specific structural measures, such as river management, landslide countermeasures, and seismic retrofitting, which had limited domestic experience. In this context, the training program and invitation program in Japan provided a valuable opportunity for participants to directly observe the concepts and approaches the project sought to convey, embodying the adage "seeing is believing." For example, C/P staff stated they could have concrete images on the river improvement and the retarding basin which were listed as one of the menus of the Nadi river flood management plan. They also stated that the idea of the retention pond could be applied for the areas in Suva where the development of the upstream made a negative impact (flooding) to the downstream. Through these programs, the project team and C/P staff developed a shared understanding, and the participants could relay this knowledge in their own words to other staff who were unable to attend. The ratio of the budget for DRR among the national budget, the seismic retrofitting rate of schools, the implementation rate (monitoring result) of DRR action plans of Shizuoka Prefecture etc. have been referred in the progress meeting and the JCC meetings several times by the participants, and C/P staff who could not participate in the training program could understand the objectives and activities of the project.

(4) Presentations at the Progress Meetings, JCCs, and international conferences

In the biannual progress meetings and JCC meetings, C/P staff delivered most presentations and responded to questions from attendees. Furthermore, among the frequent international disaster risk reduction conferences, C/P staff presented the project's achievements at the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) held in October 2024 and the Sendai Bosai Forum in March 2025. Although the presentations were short, C/P staff proactively prepared and delivered the materials based on their experience in project activities.

In technical cooperation projects like this project, providing opportunities for C/P staff to present publicly not only enhances their ownership but also allows us to assess their level of understanding. Going forward, by preparing a DRR annual report in Fiji continuously, they can continue to present at international conferences related to the Sendai Framework without needing to collect new information each time.

A lot of participants from various organizations participated in the progress meeting and the JCC meetings, and active Q&A and discussions were held every time. It was meaningful to hold the meetings to share the progress of the project every half a year from the point to hod the meeting specialized on DRR, since most of the meetings in Fiji are for the emergency operations. These meetings have contributed to the capacity enhancement of the whole of Fiji government, not only on DRR, but on the several ideas such that the hazard assessment depends on the accuracy of topo data, simulation requires the accumulation of the observation data and disaster damage information, and Japanese DRR policy learned through the training program and the invitation program to Japan etc.

(5) Building trust with C/P

The assignments in this project were limited, and unlike the past similar projects, it was not possible to work on-site for long periods. However, in a technical cooperation project aimed at helping C/P staff understand new concepts, it was necessary to allocate as much time as possible with them and consider approaches that would facilitate their understanding of our perspective. Fortunately, in this project, JICA long-term expert, Mr. Shinya Abe, had been dispatched to NDRMO and had established a strong relationship with C/P staff, which allowed the project to proceed while continuously gauging how the C/P perceived the project's approach and what kind of proposals could be accepted.

(6) Presentation of good practices and successful experiences

As described above, while training program and invitation program in Japan helped deepen understanding of the measures to reduce disaster risk, it was necessary to implement "risk reduction measures" in Fiji and establish them as good practices, to further raise awareness of the importance of disaster risk reduction among people in Fiji. At the time of the preparatory survey of the project and project inception, it was planned that the flood control project on the Nadi River would serve as good practice; unfortunately, this was not implemented during this project period. Therefore, even on a smaller scale, it was proposed to include projects contributing to disaster risk reduction - such as village-level embankments, community relocations, or construction of evacuation shelters - in local DRR plans. This would demonstrate the complete process from planning to implementing the DRR measures, thereby establishing them as good practices.

III.3 Challenges, Ideas, and Lessons Learned

(1) Output 1

1) Utilization of human resources and effective technology transfer beyond the organization by the right person in the right place

Same as the first period, the JICA experts also provided opportunities for communication between C/P organizations. For example, in the case of flooding, the GIS officer of the NDRMO instructed the GIS officer of the FMS on the preparation of watershed boundary data of the RRI model, and the NDRMO conducts flood analysis using the observed rainfall data organized by the FMS, so that the NDRMO and

FMS can collaborate and be involved in each other. In the case of sediment disaster, opportunities were set up to give lectures on hazard assessments from MRD to NDRMO (Including online lectures with JICA experts and multiple C/P organizations), to conduct hazard assessment collaboratively, and for MRD to review the results of the hazard assessment conducted by the NDRMO. Through these efforts, JICA experts have created opportunities for capacity development through mutual cooperation and collaboration between C/P organizations. For the earthquake disaster, the JICA experts tried to transfer the technology to the right places for the right counterparts. Since MRD has expertise in earthquakes, we facilitated the acquisition of technology for hazard and risk assessment content. On the other hand, since NDRMO is GIS-oriented, the JICA experts facilitated the development of GIS population data necessary for calculating the exposed population and the technical acquisition of calculation methods and scripts for hazard and risk assessment in GIS.

For seismic hazards, the Seismology Section of MRD has numerous personnel with Japanese education, making it a promising human resource for future earthquake disaster management. As for expertise, the focus is on scientific seismology related to earthquake observation. Therefore, in seismic technology and earthquake damage estimation, which lead to investment in advanced DRR, many elemental technologies exist in engineering, and the difference in expertise becomes an issue. To solve this, several technology transfers in a discussion format, which is not a one-way street, were conducted to promote an understanding of the expertise of earthquake observation entities toward hazard and risk assessment for investment in advanced DRR.

Regarding earthquakes, we focused on ensuring our counterparts acquired the appropriate technical skills based on guidelines for the right person in the right role. Given the MRD's expertise in earthquakes, we promoted the acquisition of skills covering the entirety of hazard and risk assessment content. On the other hand, since the NDRMO focuses on GIS, we encouraged the development of GIS population data necessary for calculating seismic intensity exposure populations, as well as the acquisition of skills in GIS-based hazard and risk assessment calculation methods and scripts. We set up joint meetings to encourage collaboration between the NDRMO and MRD, effectively making the meetings themselves training sessions.

The earthquake section of MRD is highly promising as a human resource for future earthquake disaster prevention, as it has many members with experience studying in Japan. However, more advanced expertise will be required in the future, such as evaluating seismic activity for probabilistic seismic hazard analysis and setting fault models for scenario earthquakes. These specialized fields require not only earthquake observation capabilities but also mastery of physical seismology for analyzing source fault models, including source mechanism analysis and asperity configuration. Therefore, continued exchange and collaboration with leading universities and research institutions in Japan and elsewhere, particularly in the fields of seismology and earthquake engineering, will be essential. Furthermore, in the areas of seismic technology and earthquake damage estimation, which are crucial for preemptive disaster prevention investment, the prevalence of engineering-based elemental technologies presents challenges due to differences in expertise. To mainstream disaster prevention, collaborative problem-solving between engineering fields (e.g., earthquake-resistant design in architecture and civil

engineering) and the physical sciences is essential. Therefore, numerous discussion-based technology transfer sessions were conducted to broaden understanding from seismic expertise including earthquake monitoring to earthquake engineering field including hazard and risk assessment, and ultimately to investment in disaster risk reduction for resilience. For example, a JICA expert discussed the importance of engineering content, stating: “The Fiji National Development Plan explicitly outlines plans for “Establishing resilient multipurpose evacuation centres”. Estimating the number of evacuees based on structural damage amount due to scenario earthquakes that caused damage in the past contributes to planning shelter locations and facility design.”.

2) Collaboration with other donor-supported projects

In Fiji, many ongoing projects related to disaster management exist, and it was necessary to avoid duplication and maximize the results of hazard and risk analysis in collaboration with other donors. Specifically, the "Tsunami Ready" project by UNESCO conducted tsunami analysis to prepare hazard maps and evacuation plans for Cuvu as the first site and Suva as the second site.

We worked closely with MRD, our primary C/P, to collaboratively develop guidelines. Since Suva overlaps with this project, we leveraged the results from MRD's prior implementation to validate them within this project, thereby enhancing the outcomes of both activities.

In addition, since the WMO project was canceled and the impact-based forecast (USAID) project had no significant progress, we decided to incorporate the contents and methods of this project into them, and its nationwide development must proceed smoothly.

3) Encouraging the acquisition information that contributes to validating analytical models

As mentioned in “II.1.3 Activities”, there are challenges in validating the developed analytical models due to limited data on actual flood information and disaster information. Therefore, particularly regarding floods, the JICA Project Team has prepared a document that summarizes the methods of conducting actual flood surveys and the cooperation framework since first period, and has repeatedly explained the importance of implementing future actual flood surveys to the C/Ps. Consequently, there has been an increased momentum for conducting actual flood surveys led by NDRMO, as described in “II.1.3”.

4) Introduction of a simple but useful hazard assessment method

The C/P appreciates that the DEM-based debris flow and steep slope collapse hazard assessments are the beneficial methods for hazard assessment of sediment disasters, compared to the current situation that “No hazard assessment has been done, or the database of the past damaged area is being developed”, even though it is a simplified hazard assessment and does not consider detailed topographical and geological conditions. The hazard assessment results were evaluated by the C/P as useful for future hazard map development and publication, and they were also proactive about horizontal expansion to areas outside the priority areas selected in the Project. Not only limited to desktop evaluation using GIS, the C/Ps worked with JICA expert to verify the assessed hazard sites through field surveys, and they

have presented specific areas that should be prioritized for development in the nationwide expansion plan, indicating that the C/P's autonomous activities are expected to continue.

(2) Output 2

1) Institutionalization and Potential for Expansion of Local DRR Plan Formulation

The most significant challenge concerning local DRR plans in Fiji was that such plans were not legally mandated. In this project, since the implementing agency, NDRMO, was an organization under MRMDDM, the policy was shifted toward formulating DRR plans at the divisional level under the jurisdiction of MRMDDM. In addition, for priority municipalities with urban characteristics, more detailed DRR plans at a quasi-municipal level were formulated.

Although local DRR plans had no formal legal status, the Fiji National Development Plan 2025–2029, adopted in September 2024, emphasized the importance of disaster risk reduction as one of the development challenges, and the formulation of DRR plans in all four divisions was established as one of the KPIs. As a result, DRR plans were positioned as plans required for the realization of the National Development Plan. The incorporation of DRR into the National Development Plan can be regarded as a significant achievement of coordination efforts led by the implementing agency, NDRMO.

In the Central Division, achieving both the detailing and feasibility of plans in the Suva–Nausori metropolitan area was a challenge. Under the leadership of NDRMO, the Divisional Commissioner’s Office took the lead, engaging divisional staff of the implementing agency and municipal representatives in substantive consultations. This process enabled the formulation of a DRR plan that combined both practicality and feasibility.

2) Consistent with Divisional Development Plans and Policy Positioning

Ensuring consistency with the Divisional Development Plan was crucial for enhancing the effectiveness of DRR plans. In the Western Division, the DRR plan was formulated at the same time as the Divisional Development Plan 2023–2032, under which 377 projects were planned across five pillars: rural service access, living standards, connectivity, risk management, and economic resilience.

In contrast, since no divisional development plan existed in the Central Division, consistency had to be ensured through hearings and surveys with relevant sectors to align with their challenges and development objectives. Accordingly, in the Central Division, particular emphasis was placed on ensuring consistency with development strategies and future urban visions for the wider Suva–Nausori metropolitan area. This included linking DRR planning with urban infrastructure development for disaster risk reduction, DRR education, and the development of DRR facilities.

Through this approach, DRR plans were not treated merely as sectoral disaster management plans but consciously designed to function as an example of “DRR mainstreaming,” connected to higher-level policy frameworks. It is expected that when DRR plans are institutionalized in the future, the approach of this project will serve as a prototype and a model for application.

(3) Output 3

1) Streamlining the DRR Annual Report Publication Process

The annual publication of the DRR Annual Report for Fiji is crucial for making the status of DRR activities visible both domestically and internationally, thereby promoting their implementation. More importantly, the Report functions as a vital "record" of disaster history, corresponding responses, and DRR projects carried out each year, making the continuation of its publication essential. To ensure the Report is issued reliably every year, efforts were made to streamline its editing and publication process as much as possible.

The Report was compiled by utilizing existing documents within the NDRMO, such as the Disaster Situation Reports, the NDRMO Annual Report, and the NDRRP Roadmap monitoring results. This approach streamlined the compilation work. Furthermore, the editing and publication schedule for the Report was designed to align with the original submission deadlines of these source documents, and this entire process was formalized in the guidelines.

2) Addressing Member Turnover

Due to staff leave and internal organizational transfers, there was a high frequency of member changes among the core Output 3 counterparts, even during the second period activities. However, under the direction of the NDRMO Director and Manager, the necessary administrative documents were completed by seeking broad information sharing and cooperation from relevant staff across the NDRMO. Following the creation of the guidelines, orientation sessions were held within the NDRMO to ensure that institutional knowledge and expertise were retained in the organization through both documented and verbal communication.

IV. For the Achievement of Overall Goal

(1) Necessity of Legal Background of Technical Organizations

FMS and MRD can conduct a series of numerical analyses on the hazard assessment to some extent. Therefore, following the guidelines, increasing the number of studies conducted in other areas, and gaining experience will develop the ability to judge technical adequacy. On the other hand, according to the endline survey, it is said that the hazard assessment is not under the jurisdiction of FMS and MRD, and financial and human support are necessary to continue the work as the daily activities. Legislation of the hazard assessment is expected to promote their activities, because only FMS and MRD can conduct the hazard assessment in Fiji.

(2) Improving the Accuracy of Hazard and Risk Assessment

This project adopted hazard and risk assessments based on available existing data as its fundamental approach. Consequently, for example, the accuracy of the US Geological Survey's open data on soil amplification remains an issue. Discussions with the MRD Seismology Section revealed that, due to the large number of personnel trained in Japan, they readily understood methods to address these challenges. To establish the basis for mainstreaming preemptive DRR investments, it is necessary to promote steady activities such as academic personnel development and personnel exchanges with Japan. This aims to establish a kind of committee to discuss improving the accuracy of nationwide ground information and earthquake occurrence probabilities.

As for the basic data and information for the hazard and risk assessment, not only for the geological information, but there are a lot of necessary activities to improve their accuracy, such as the preparation (purchase) of more accurate topographical data, the accumulation of observation data, and the preparation and accumulation of damage information. For example, observed rainfall data was organized as an inventory in this project, and the guidelines also included how to update the inventory. The necessity of checking for missing or questionable observation data was also explained. In addition, it was also suggested by the counterpart during discussions on the nationwide expansion plan that high-precision terrain data should be jointly purchased by organizations that utilize such data and shared across different sectors. Therefore, it is expected that technical organizations will systematically accumulate the necessary data and information (including updates to the inventory of observational data).

(3) Practical Formulation of Local DRR Plan

It is expected that the local DRR plans will be formulated based on the expansion plan. However, NDRMO may not be able to formulate them alone, and the support from the divisional commissioner’s office and City/Town councils is indispensable. Therefore, irrespective of the order of the formulation on the expansion plan, the formulation of the plans based on the initiative of the divisions or City/Town councils that show high motivation is preferred. If there are any areas where the other donors will support the planning or the hazard assessment, or they will support any other DRR activities, it will be good to formulate the local DRR plans in such areas in cooperation with such donors.

(4) Implementation of Timely Monitoring

This project established a system to promote the implementation of DRR activities through the annual issuance of the DRR Annual Report for Fiji and the publication of the NDRRP Roadmap monitoring results within it. For the continuation of this activity, prioritizing timeliness over meticulous detail in monitoring is key.

The NDRMO conducts monitoring by knowing the status of DRR activities in each division through the ministerial disaster management liaison officers at the divisional level via the MRMDDM's commissioner offices. However, coordination between the NDRMO and the commissioner offices, between the commissioner offices and other ministerial staff, and seeking follow-up from central ministries are all processes that typically require considerable time in Fiji, and the postponement of scheduled meetings for several months is common.

While it is ideal to monitor all activities listed in the NDRRP Roadmap, taking several months for this monitoring due to coordination efforts would place a heavy burden on NDRMO staff, risking the monitoring itself being deferred due to other urgent tasks. Therefore, it is recommended to compromise by prioritizing the record of annual monitoring at the same time each year and meeting the DRR Annual Report publication schedule. This may require describing activities where a reply could not be obtained by the deadline as "No Data" in the Report.

(5) Streamlining the DRR Annual Report Publication Process

As mentioned in the section on Output 3, efforts were made to streamline the editing and publication process as much as possible to ensure the annual issuance of the DRR Annual Report.

The Report is compiled by leveraging existing documents such as the Disaster Situation Reports, the NDRMO Annual Report, and the NDRRP Roadmap monitoring results. Crucially, the NDRMO must maintain the mindset of prioritizing publication by simply aggregating the necessary minimum information without spending excessive time on complex editing.

(6) Public Release of the DRR Annual Report

Given that annual issuance is a vital key factor for the DRR Annual Report, public release is important both for the Report's function and for securing its continued annual publication.

It is expected that setting aside time for the Report to be briefly presented and discussed at the NDRMC meeting every year, making this regular, will further enhance the sense of obligation toward its issuance.

(7) Proactive Utilization of the DRR Annual Report

The Local DRR Plan formulation and implementation roadmaps contained within the NDRRP Roadmap include activities that are both already funded and those for which funding is yet to be determined. Some activities, depending on their scale, might be difficult to implement using only the Government's budget, requiring budget negotiations with international donor agencies in addition to the MFSPNDS. The NDRMO

and implementing agencies are expected to utilize the DRR Annual Report, which annually reports on the implementation status of the NDRRP Roadmap, as a resource during these budget negotiations.

Furthermore, the Report is useful as a tool to appeal Fiji's DRR initiatives at international conferences. While the NDRMO currently appears to prepare separate booklets detailing Fiji's DRR challenges and activities for each international conference, the DRR Annual Report can serve as the primary source for the country's latest status, thereby contributing to streamlining the workload.