Republic of Ecuador
National Secretariat of Risk Management and Emergency (SNGRE)
Ministry of Urban Development and Housing (MIDUVI)

Japan International Cooperation Agency (JICA)

Project for Safe and Resilient Cities for Earthquake and Tsunami Disaster (PCSR)

Project Completion Report

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Arq. María Gabriela Aguilera Jaramillo
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Leader of Expert Team (Japan)

October 2021

GE
JR
21-059

Project Area (Pilot municipalities)

PHOTOGRAPHS

（from July 2017 to September 2021）

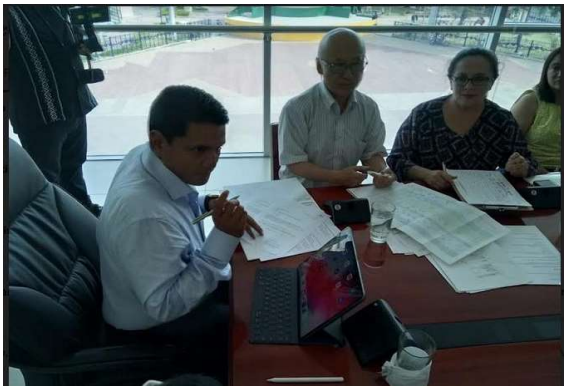
General Activities	
	
Meeting on the presentation of the Project with the Minister of MIDUVI (July 18, 2017)	**Meeting on the presentation of the Project with the Deputy Secretary of the SNGRE （July 21, 2017）**
	
Meeting on the presentation of the Project with the Mayor of Atacames (July 28, 2017）	**Approval of the work plan in the first JCC （August 15, 2017）**
	
Invitation to Japan: Participation in the national tsunami disaster prevention exercise (November 3, 2017）	**Invitation to Japan: Courtesy visit to JICA Central Office (November 9, 2017）**

Second JCC: Signing of the meeting minutes (February 27, 2018)

Public relations: Televised interview at the INOCAR seminar (January 5, 2018)

Interim evaluation at MIDUVI (January 31, 2019)

Signature of the interim evaluation documents at the fourth JCC (February 15, 2019)



Meeting with the Mayor of Santa Elena for the presentation of the Project (May 31, 2019)

Meeting with the Mayor of Sucre for the presentation of the Project (May 31, 2019)

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<tr><td>  </td><td>  </td></tr>
<tr><td>Meeting on the presentation of the Project with the President of the Galapagos Council （June 10, 2019）</td><td>Meeting on the presentation of the Project with GAD Santa Cruz (July 11, 2019）</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Press conference for the presentation of the INOCAR tsunami flood map (August 2, 2019)</td><td>Ambassador of Japan, Mr.Sudo visits SNGRE (January 10, 2020)</td></tr>
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<tr><td>Sixth JCC (February 10, 2020) （From left to right, Mr. Ishikawa Representative of JICA, Mr. Kumakura First secretary of EOJ, Architect Machiavello, Minister of MIDUVI, Dr. Ocles Secretary of SNGRE）</td><td>Virtual meeting with the SNGRE, MIDUVI and JICA experts (September 12, 2020)</td></tr>
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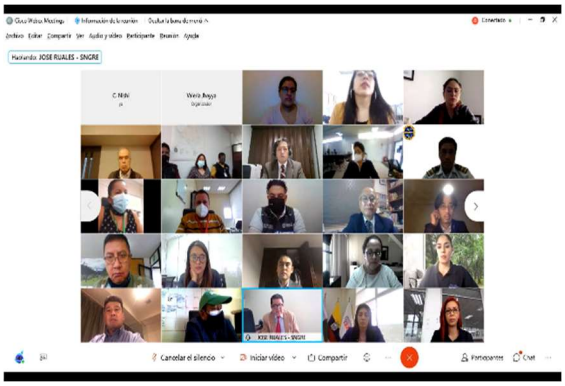	
8th virtual JCC (March 24, 2021)	Poster delivery ceremony on the prevention of natural disasters to the GAD Atacames （September 4, 2020）
Output 1 Activities (Tsunami Evacuation Plan)	
	
Discussion of the baseline survey in Salinas （August 17, 2017）	Tsunami evacuation plan and educational workshop in Atacames (November 15, 2017)
	
Participation in the education workshop of Mr. Kizaki, JOCV in Salinas （May 29, 2018）	Field discussion on tsunami evacuation sites in Atacames （June 27, 2018）

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Field discussion on the tsunami evacuation sites in Portoviejo
（October 28, 2018）</td><td>Field discussion on the tsunami evacuation sites in Portoviejo
（October 28, 2018）</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Conference on vertical evacuation in Salinas
(May 29, 2019）</td><td>Altitude board for tsunami evacuation in Atacames
(June 7, 2019)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Altitude signboard for tsunami evacuation in Salinas
(September 18, 2019）</td><td>National tsunami evacuation drill in Atacames
(January 31, 2020)</td></tr>
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Virtual meeting with GAD Atacames and GAD Esmeraldas (June 11, 2020)	**Altitude signboard for tsunami evacuation in Esmeraldas (November 17, 2020)**
	
Workshop on the Tsunami Evacuation Plan in the province of Esmeraldas (March 15, 2021)	**Workshop on the Tsunami Evacuation Plan in the province of El Oro (April 1, 2121)**
	
Final survey meeting in Salinas (July 7, 2121)	**Altitude signboard for tsunami evacuation in Santa Elena (September 1, 2021)**

	
Altitude signboard for tsunami evacuation in Santa Cruz (September 9, 2021)	Tsunami evacuation buildind in Salina (September 15, 2021)
Output 2 Activities（ARR）	
	
Discussion about the ARR in Salinas (August 14, 2017)	Discussion about the ARR in Portoviejo (February 21, 2018)
	
Discussion on risk analysis for ARR in SNGRE（May 22, 2018）	INOCAR presentation at the second meeting of the working group in Portoviejo （June 12, 2018）

Visit to CISMID, Peru to discuss the training of third country of formation (March 23, 2018)

Visit to CNET to study the tsunami warning system in Peru (July 11, 2018)

Training in Japan in 2018： Visit to Saikyo Bank (August 31, 2018)

Training in Japan in 2018：ICT Closing Ceremony, JICA (September 12, 2018)

Discussion about the ARR in Atacames (November 27, 2018)

Training in Japan in 2019: Courtesy Visit from the Governor of Shizuoka Prefecture (September 3, 2019)

Training in Japan in 2019: Tsunami Evacuation Tower in Shizuoka City (September 2, 2019)

Training in Japan: Lecture by Dr. Mas, Tohoku University (September 5, 2019)

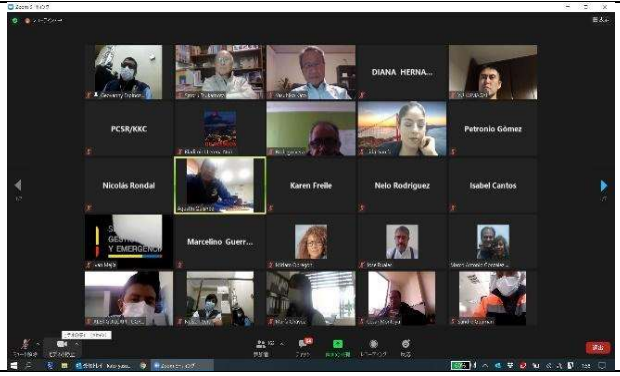
Meeting with the Mayor of Atacames (July 9, 2010)

Meeting with the Mayor of Esmeraldas (July 11, 2010)

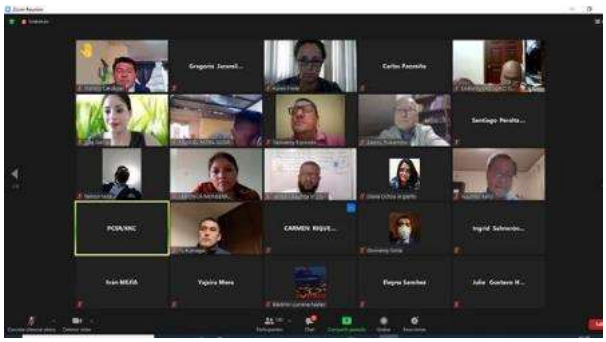
7th Working Group Meeting in Portoviejo (December 6, 2019)

Discussion about the ARR in Esmeraldas (January 29, 2020)

8th Virtual Working Group Meeting (May 29, 2020)



First National Webinar on ARR (March 17, 2021)



Second National Webinar on ARR(April 14, 2121)

Discussion about the Action Plan in SNGRE (August 25, 2021)

Output 3 Activities (Construction Operating System)

Meeting at the Association of Architects (Pichincha Province)
（September 5, 2017）

Explanation of Construction Inspections in Salinas
（October 23, 2017）

Japan Training： Construction Quality Inspection
（November 15, 2017）

Japan Training: Building Structures Inspection
(November 15, 2017）

Meeting with Dr. Ávalos, Vice Minister of MIDUVI, and Mr. Itagaki, Minister-Counselor, EOJ (December 12, 2017）

First Working Group Meeting (December 18, 2017）

Workshop on seismic resistance technology and construction regulation (February 28, 2018)

Visit to the UCA, El Salvador as a third country of training (March 12, 2018)

Discussion about the MPOPRPC in Portoviejo (March 9, 2018)

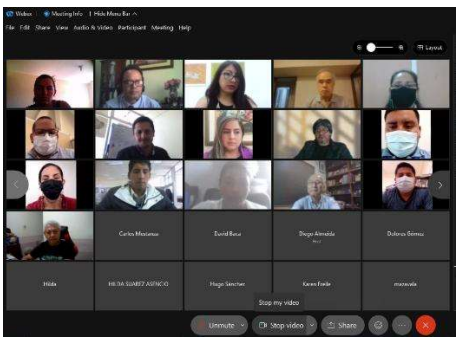
Discussion about the MPOPRPC in Atacames (March 21, 2018)

Discussion about the MPOPRPC in Salinas (March 23, 2018)

Meeting between the College of Architects, ESPE, MIDUVI about the MPOPRPC (March 26, 2018)

Delivery of the MPOPRPC （Association of Architects, ESPE, MIDUVI） （February 22, 2019）

Discussion with PortoVivienda (July 24, 2019)

	
Discussion with GAD Salinas (July 30, 2019)	Discussion with GAD Santa Elena (November 13, 2019)
	
Workshop on seismic isolation and vibration control (December 11, 2019)	Fifth Construction Workshop in Sucre (January 29, 2020)
	
Workshop on diffusion and socialization of instrument technology (March 6, 2020)	National Webinar on the MPOPRPC, Mr. Jaime García Alvear (October 21, 2020)
	
Virtual workshop of Santa Elena (November 26, 2020)	11th Virtual Workshop Meeting (June 29, 2121)

Minutes of Report of Project Compleiton

Project for the Construction of Safe and Resilient Cities Against Earthquake and Tsunami Disasters

Japan International Cooperation Agency (JICA) together with Japanese Experts Team, the National Service for Risk and Emergency Management (SNGRE) and the Ministry of Urban Development and Housing (MIDUVI) convened the Meeting of the Final Report of the Project for the Construction of Safe and Resilient Cities Against Earthquake and Tsunami (hereinafter referred to as "the Project") in Ecuador.

The event for the presentation of the Final Project Report was held on September 10, 2021 in virtual mode, Co-chaired by the Deputy Secretary General of the SNGRE Ing. Rodrigo Rosero, the Vice Minister of MIDUVI, Arch. María Gabriela Aguilar, Chief Advisor from the PCSR-JICA, Mr. Satoru Tsukamoto, also with the participation of the staff of the Team, JICA, SGR, MIDUVI and other related organizations.

As a result, the Team, JICA, SNGRE and MIDUVI agree with the final report of the project, attached document.

This Meeting Minutes have been prepared in both English and Spanish. The texts are the same.

Guayaquil, September 14, 2021

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PCSR Director (SNGRE)
Ecuador

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Project Director (MIDUVI)
Ecuador

Mr. Satoru Tsukamoto
Chief Advisor/ Integral management
Disaster Reduction
Japan

Abbreviation List

Abbreviations	Name
ADRA	Adventist Development and Resource Agency
AME	Association of Ecuadorian Municipalities
APCI	Peruvian International Cooperation Agency
ARR	Risk Reduction Agenda
C/P	Counterpart
CARE	Cooperative for Assistance and Relief Everywhere
CEC	Ecuadorian Construction Standard
CGR	Risk management committee
CICP	Pichincha Association of Civil Engineers
CISMID	Japanese Peruvian Center for Seismic Research and Disaster Mitigation
CNAT	National Tsunami Warning Center
CNH	Growing with Our Children
COE	Emergency Operations Committee
COOTAD	Organic Code of Territorial Organization, Autonomy and Decentralization
CSN	Community Seismic Network
DAC	Development Assisitance Committe
DGR	Risk Management Department
DHN	Department of Hydrography and Navigation
ECU911	Integrated Security Service (SIS) ECU911
ESPE	University of the Armed Forces ESPE
ETABS	Extended three-dimensional analysis of building systems
GADM	Municipal Decentralized Autonomous Government
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Cooperation Agency)
GPS	Global Positioning System
GT / WG	Working Group
IDB/BID	Inter American Development Bank / Banco Interamericano de Desarrollo
IG-EPN	Geophysical Institute of the National Polytechnic School
IGM	Geographic Military Institute
INAMHI	National Institute of Meteorology and Hydrology
INDECI	National Institute of Civil Defense
INIGMM	National Institute of Geological Mining Metallurgical Research
INOCAR	Oceanographic and Antarctic Institute of the Ecuadorian Navy.
JCC/CCC	Joint Coordination Committee/ Comité de Coordinación Conjunta
JICA	Japan International Cooperation Agency /Agencia de Cooperación Internacional de Japón
JOCV	Japan Overseas Cooperation volunteers/ Cooperación de Voluntarios Extranjeros de Japón
JSSI	Japan Society of Seismic Isolation/Sociedad Japonesa de Aislamiento Sísmico
JV	Joint Venture/Proyecto Conjunto
KIZUNA	Engineering project

Abbreviations	Name
LB/BL	Base Line / Línea Base
LF/EL	Endline/ Línea Final
LPARR	Guidelines for the Preparation of the Risk Reduction Agenda
M/M	Minutes of meeting /Minutas de Reunión
MIDUVI	Ministry of Urban Development and Housing
MINEDUC	Ministry of Education
MPOPRPC	Building Regulation Management Handbook
MTEPET	Technical Manual for the Preparation of the Tsunami Evacuation Plan
NEC	Ecuadorian Construction Standard
NGO/ONG	Non Govermental Organization/Organización No Gubernamental
PCSR	Project for the Construction of Safe and Resilient Cities Against Earthquake and Tsunami Disasters
PDM/MDP	Project Design Matrix/Matriz de Diseño de Proyecto
PDOT	Development Plan and Territorial Organization
PET	Tsunami Evacuation Plan
PIRPC	Implementation Plan for Building Regulation Management
PTWC	Pacific Tsunamis Warning Center
PUCE	Pontifical Catholic University of Ecuador
RC/CR	Reinforced Concrete/Concreto Reforzado
RD	Record of Discussions
RRD	Disaster Risk Reduction
SAT	Early Warning System
SDGs/MDS	Sustaina ble Development Goals/ Metas de Desarrollo Sostenible
SGR	Risk Management Secretariat
SNGRE	National Risk and Emergency Management Service
SNS/ SRS	Social Networking Service /Servicio de redes sociales
TAISHIN	TAISHIN Project
UGR	Risk Management Units
UNDP/ PNUD	United Nations Development Programme/Programa de las Naciones Unidas para el Desarrollo
UNI	National University of Engineering
UNISDR/UNDRR	United Nations Office for Disaster Risk Reduction/Oficina de las Naciones Unidas para la Reducción del Riesgo de Desastres
USD	United States dollar
USGS	United States Geological Survey
UTM	Technical University of Manabí
WS	Workshop

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Annex

I. Basic Information of the Project

1. Country

Republic of Ecuador

2. Title of the Project

Project for the Construction of Safe and Resilient Cities against Earthquakes and Tsunami Disasters (PCSR)

3. Duration of the Project (Planned and Actual)

From July 17, 2017 to September 30, 2021 (51 months, approximately)
At the eighth meeting of the Joint Coordination Committee (JCC), the extension of the project completion date from March 31, 2021 to September 30, 2021 (6 months) was approved.

4. Background (from the Record of Discussions"R/D")

In the Republic of Ecuador (hereinafter referred to as "Ecuador") there is a high risk of natural disasters, such as earthquakes, tidal waves, inundation, volcanic eruptions, etc., being very frequent earthquakes in oceanic trenches and consecutive tidal waves, due to because the country is in a plate subduction zone, so among the disasters of the past, the damage caused especially by earthquakes and tsunamis was enormous.

In view of the high frequency of this type of natural disaster, the government of Ecuador has made an effort to minimize the damage, establishing a National Policy for Risk Reduction in which the taking of measures against disasters will be placed as an important issue within the National Development Plan (five-year plan). The main organizations related to risk reduction include: the National Service for Risk and Emergency Management (SNGRE), a unified technical institution against disasters; the Geophysical Institute of the National Polytechnic School (IG-EPN), which conducts seismic monitoring; the Oceanographic Institute of the Navy (INOCAR), in charge of investigating tsunami and issuing tsunami warning, and the Ministry of Urban Development and Housing (MIDUVI), competent authority of the urban development and construction system.

The Japan International Cooperation Agency (JICA) has been providing support to Ecuador to improve earthquake monitoring techniques and tsunami analysis, as well as capacities to respond to disasters, through the implementation of the Project to improve the Capacity of Earthquake and Tsunami Monitoring for Tsunami Early Warning (hereinafter referred to as "Tsunami Projects") and the

Community Capacity Building Program for Tsunami Disaster Risk Prevention and Reduction (hereinafter referred to as “Tsunami Training”).
Other cooperation agencies also started some projects, achieving favorable results up to a certain level, however, a 7.8 magnitude earthquake occurred on April 16, 2016, with an epicenter in the north of the province of Manabí (hereinafter referred to as “Earthquake 7.8 Pedernales”), causing enormous damage and causing 677 deaths. The factors of these losses were attributed, among others, to the lack or insufficiency of planning for risk reduction by the municipalities, since an adequate system of building regulation management was not applied, so these problems were put highlighted again.

Under these circumstances, the government of Ecuador asked the government of Japan for a technical cooperation project in order to reduce damage from natural disasters. In response to this request, JICA decided to conduct the Project for the Construction of Safe and Resilient Cities against Earthquakes and Tsunami Disasters (hereinafter referred to as “the PCSR”), in relation to tsunami evacuation, risk reduction plan and building regulation management.

5. Overall Goal and Project Purpose(from the Record of Discussions "R/D")

＜Overall Goal＞
SNGRE and MIDUVI implement nation-wide activities to build safe and resilient cities from disasters.

＜Project Purpose ＞
Technical support structure from SNGRE and MDUVI to municipalities is established with the objective of risk reduction from earthquakes and tsunamis.

6. Implementing Agency

- National Service for Risk and Emergency Management (SNGRE)
- Ministry of Urban Development and Housing (MIDUVI)
- Primary pilot municipalities (Atacames, Portoviejo and Salinas)
- Secondary pilot municipalities (Esmeraldas, Sucre, Santa Elena and Santa Cruz)

(Note): On October 3, 2018, the name of the organization was changed from the Risk Management Secretariat (SGR) to the National Risk and Emergency Management Service (SNGRE).

II. Results of the Project

1. Results of the Project

1.1. Input by the Japanese side (Planned and Actual)

1.1.1. Expert dispatch

A total of 16 short-term experts were deployed to work on the following topics:

- Integral disaster reduction management
- Tsunami evacuation plan
- Disaster reduction plan
- Construction systems
- Training plan

Long-term experts (Coordinator): 2 people
Project assistants: 8 people

1.1.2. Receipt of training participants in Japan and third country

The project included capacity building for the authorities and technical team participating in the project by institutions such as SNGRE, MIDUVI and the primary pilot municipalities and secondary pilot municipalities.

Table 1. Training Participants in Japan

Topics of visits	Place	Number of Participants	Date of visit to Japan
Invitation of authorities	Japan	10	November 2017
Output 3 Training	Japan	17	November 2017
Output 3 Training	El Salvador	4	March 2018
Output 2 Training	Peru	6	March and Juliy 2018
Output 2 Training	Japan	15	August 2018
Output 2 Training	Japan	12	August 2019

1.1.3. Equipment Provision

In the activities during the Project period, as well as once the project ended, the necessary equipment and materials were supplied and donated so that SNGRE, MIDUVI and the pilot municipalities could continue with their activities.

Table 2. List of equipment and materials donated by the PCSR

Name / Manufacturer / Model	Quantity	Destination and time of donation
Megaphone /king Sound/KS1200	6 units	SGR / May 2018
Portable GPS/ GARMIN/64 S	3 units	SGR / May 2018
Barometric altimeter /BRUNTON/ADCPRO	3 units	SGR / May 2018
Vehicle/Toyota /New Fortuner (4000cc)	1 unit	SGR / June 2018
Structural calculation software /CSI/ETABS	1 license	MIDUVI and pilot municipalities (common use) / September 2018
QUANTAB/Chloride content meter in fresh concrete	24 unit for each GAD	Primary Pilot Municipalitie/ June 2018, Secondary Pilot Municipalitie / September 2021
Distance laser/Nicon/ Prostaff 7i	3 units	SNGRE / February 2019
Digital camera /SONY/DSC-W830	3 units	SNGRE / February 2019
Wireless Radio / Motorola/DEP450	6	SNGRE / September 2019
SPEAKER SYSTEM /Roswell/20000W	3 sets	SNGRE / September 2019
Drone/DJI/MARVIC 2 Pro	1 unit	SNGRE / March 2021
Tent/TECNODIMENSIÓN/203-902	2 unit	SNGRE / March 2021

1.1.4. Overseas activities cost

Table 3. List of expenses to strengthen projects abroad

Year	Summary
2017	▪ Long-term expert communication costs, stationery for the project office, printing costs ▪ Banners for events and files for distribution ▪ Domestic travel expenses (4 trips to Quito, 1 to Cuenca, 1 long-term expert) ▪ Medical check-up for 4 project assistants ▪ Production of goods for disaster prevention
2018	▪ Communication costs for the long-term expert, stationery for the project office, printing costs. ▪ Domestic travel expenses (12 trips to Quito, 4 to Portoviejo, 3 to Salinas, 1 to Atacames, 1 long-term expert). ▪ Output 1: Production of brochures for disaster prevention education ▪ File expenses for relations

	・ National travel expenses, interpreter and car rental for the interim evaluation team ・ Travel expenses abroad (training in Japan, 2 counterparts) ・ Internal travel expenses (Quito, 2 counterparts). ・ Cost of medical check-up for project assistants (4 people)
2019	・ Communication costs for long-term experts, office supplies for the project office, printing costs ・ Domestic travel expenses (Quito 12 times, Portoviejo 3 times, Salinas 3 times, Atacames 2 times, Manta, Santa Elena, Sucre 1 time, 2 long-term experts) ・ National travel expenses (Galapagos, 6 short-term experts) ・ Cell phone (1 unit for long-term experts) ・ Travel expenses of a speaker at the seismic resistance, seismic isolation and damping seminar in relation to Output 3 (1 counterpart person) ・ National travel expenses (between Guayaquil and Quito, 3 round trips for 1 long-term expert) ・ Travel expenses for participants in the Japan-Ecuador Public-Private Disaster Prevention Seminar (15 counterparts) ・ Travel expenses to Galapagos (Santa Cruz) (3 short-term experts) ・ Expenses to print the “Tsunami Evacuation Awareness Poster” in relation to Output 1 (municipalities of Esmeralda and Santa Elena) ・ Travel expenses of the workshop instructors to share the “Building Regulation Management Handbook” (2 counterparts) in relation to Output 3 ・ Cost of medical check-up for project assistants (4 people)
2020	・ Expenses to print the “Disaster Reduction Agenda” in relation to Output 2 (municipalities of Esmeraldas and Portoviejo) ・ Expenses to print the “Tsunami Evacuation Awareness Poster and Stickers” (7 pilot municipalities) in relation to Output 1 ・ COVID 19 infection prevention equipment (gloves, thermometers, sprays, hygienic mats, protective clothing, alcohol, masks) ・ Awareness posters and videos on preventing COVID-19 infection ・ Food kits, etc. for the province of Chimborazo ・ Expenditures to prepare the “tsunami altitude signboard” (7 pilot municipalities and La Libertad municipality) in relation to Output 1
2021	・ Long-term expert communication costs, stationery for the project office, printing costs ・ Shipping costs for instructors of the “Tsunami Evacuation Plan Workshop” and their fees in relation to Output 1 ・ Expenses for imparting the “Training on drone management” (8 counterparts) in relation to output 1 ・ Expenses to print the “Disaster Reduction Agenda” (municipalities of Santa Elena, Santa Cruz and Sucre) in relation to Output 2

	・ National travel expenses (Quito 2 times, Atacames, Esmeraldas, Sucre, Galapagos, Salinas 1 time, 1 long-term expert) ・ National travel expenses (Galapagos, 1 short-term expert) ・ Expenses to print the "Implementation Plan for the Regulation of Construction Processes" in relation to Output 3 ・ Expenses to prepare the "signboard of the vertical evacuation building before tsunami" in relation to Output 1 ・ National travel expenses (Salinas, Sucre, Porto Viejo, Santa Elena, Galapagos, 1 counterpart

1.2. Inputs by Ecuadorian side (Planned and Actual)

1.2.1. Counterparty assignment (hereinafter referred to as "C / P"):

Government ministries and agencies:

Project Directors: Deputy Secretary General of SNGRE and Vice Minister of MIDUVI

・ **Project Manager:** Director of Strengthening and Development of Capacities in Risk Management of SNGRE

・ Project Coordinator: Technician of the Department of Strengthening and Development of Capacities

・ **Technician in Charge of the Project:** Personnel from the Department of Strengthening and Development of Capacities in Risk Management of SNGRE, Personnel of the Department of Preparation and Response to Disaster of SNGRE and Personnel of the Department of Public Space of the MIDUVI

Pilot municipalities:

・ **Project Director:** Mayors of Atacames, Portoviejo and Salinas

・ **Project Manager:** Director of the Risk Management Unit and Director of Planning of each municipality

・ **Technicians in Charge of the Project:** Risk Management Personnel and Personnel of Planning of each municipality

1.2.2 Provision of the office and necessary facilities:

For the work of the JICA experts in Ecuador, a space was adapted in the offices of MIDUVI and SNGRE.

The Ecuadorian part also covers the costs of Internet connection, telephone and electricity rates, etc. for the proper functioning of the office.

1.2.3. Other items borne by the Ecuadorian side:

After donating the Project Vehicle to SNGRE, the Ecuadorian party assumed the cost of storage, maintenance and fuel for the Project vehicle, driver expenses, vehicle insurance, etc.

1.3. Activities related to the entire Project

1.3.1. Preparation of the Work Plan and discussions

The Work Plan for the execution of this Project was prepared. The content of said plan was determined at the first meeting of the Joint Coordination Committee (hereinafter referred to as "JCC"), held in August 2017, through discussions between JICA Global Environment Department, the sector responsible for supervision of the Project, and the Ecuadorian C / P.

Table 4. Work Plan Index

Chapters	Summary of descriptions
Chapter 1 Introduction	▪ Development and results obtained in previous projects ▪ Background and antecedents of this Project ▪ Objectives and scope
Chapter 2 Guidelines for implementation	▪ Basic guidelines for execution ▪ Guidelines from a technical point of view ▪ Guidelines from an operational point of view
Chapter 3 Execution plan and method	▪ Items and details of the activities according to each Output ▪ Schedule of each activity ▪ Method of execution of the activities related to each Output.
Chapter 4 Execution system	▪ Collaboration system between experts from JICA, C / P, JCC, people related to previous projects and aid organizations ▪ Public relations ▪ Work process and security control system
Chapter 5 Human resources plan	▪ Concept on the designation of personnel and Human resources plan.
Chapter 6 Others	▪ Construction equipment and materials required for local studies ▪ Facilities and measures by the Ecuadorian executing entity.

1.3.2. Confirmation of the Project progress through Monitoring Sheet

At the time of initiation of this Project, the Expert Team and the C / P prepared the Monitoring Sheet for the management and follow-up of the Project's progress, monitoring the progress every 6 months, the result of which was reported in the CCC.

1.3.3. Holding the JCC meeting

JCC meetings were held in order to promote the activities of the CSR Project and manage its progress, as well as to identify and address the difficulties presented. A total of nine JCC meetings were held, with an interval of 6 months, throughout the Project.

These meetings took place in the cities of Quito and Samborondón; In the last year and a half due to the COVID19 pandemic, the JCC developed virtually.

Table 5. Holding of Joint Coordination Committee (JCC) Meetings

JCC (Date and place of meeting)	Main topics and results
1st meeting August 15, 2017, in Samborondón	The Work Plan was explained and officially agreed, the members of the JCC, the composition of the Work Group (hereinafter referred to as "GT/WG") Activities guidelines, education, and training plan Managing the progress of activities through the Monitoring Sheet Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities
2nd meeting February 27, 2018, in Quito	A space for discussions of the different GT / WG was created JICA experts confirmed and explained the progress of the PCSR through the Monitoring Sheet Improvement of the Project execution system The Ecuadorian C / P reported on the improved points according to the discussions held in the GT / WG Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities
3rd meeting August 2, 2018 in Samborondón	The activities of each Output were reported The JICA Experts Team confirmed the progress of the PCSR through the Monitoring Sheet; and proposed the revision of the PDM The organization of the Project and the selection method of the secondary pilot municipalities were reconfirmed The Director of the JICA Office in Ecuador expressed his concern regarding the change in personnel in the institutions of the Ecuadorian C / P and how this would affect the Project Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities
4th meeting	The activities of each Output were reported.

February 15, 2019 in Quito	The JICA Experts Team confirmed the progress of the PCSR through the Monitoring Sheet and reconfirmed the organization of the project The process and results of the selection of the secondary pilot municipalities were reported and approved. The results of the interim evaluation conducted by JICA and the C / P, the consequent recommendations, etc. were explained. Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities
5th meeting August 2, 2019 in Samborondón	The activities of each Output were reported. PDM changes were reported Tsunami inundation simulation maps were delivered by INOCAR The activities of the pilot municipalities and the Project Execution Plan were reported. Modifications to the PDM proposed in the Interim Evaluation were approved. Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities
6th meeting February 10, 2020 in Quito	The JICA Experts confirmed the progress of the PCSR through the Monitoring Sheet of each Output and the status of the activities of the pilot municipalities. Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities, except for the mayor of Salinas, who later signed it because he was not present.
7th meeting September 30, 2020 Virtual Meeting	Due to the spread of the COVID19 infection (hereinafter referred to as the pandemic), the meeting was held virtually The JICA Experts Team confirmed the progress of the PCSR through the Monitoring Sheet The activities of each Output were reported (Pilot Municipalities Portoviejo and Esmeraldas) Changes in the PDM, the Project Execution Plan are reported Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities (The signature was taken in each of the municipalities)
8th meeting March 24, 2021 Virtual Meeting	Due to the COVID19 pandemic, the meeting was held virtually The JICA Experts Team confirmed the progress of the PCSR through the Monitoring Sheet The activities of each Output were reported (Pilot Municipalities Salinas and Sucre) The Project Execution Plan for the remaining period of the PCRS was reported.

	Minutes signature and delivery to SNGRE, MIDUVI, JICA and Primary Pilot Municipalities (The signature was taken in each of the municipalities)
9th meeting September 14, 2021 Virtual Meeting	The meeting was held with the participation of the General Director of SNGRE and the Minister of MIDUVI as guests. Although the meeting was held online due to the pandemic, it was a semi-online meeting in which experts from their respective institutions also participated. The reports of the pilot mayors, the introduction of the action plan and the PCR were presented.)

1.3.4. Training in Japan

The training in Japan was given to the staff of C / P and the pilot municipalities that played a central role in the Project in order to visit and learn about different systems, policies and technologies for disaster prevention in Japan, to achieve the Project Objective and the effective execution of its activities. In 2017, executive staff, including the SGR secretary, were invited to Japan to discuss issues related to Output 2. The invitation to Japan of ministerial-level staff was an extremely exceptional case, so the maxim attention was given to planning and preparation. In the same year, a training session was also held in Japan on topics related to Output 3. As of 2018, 2 trainings were conducted (2018 and 2019): on the preparation of the guide to update the Risk Reduction Agenda in relation to Output 2, and to contribute to the renewal of said Agenda at the municipal level in accordance with this guide. The invitation to Japan regarding Output 2 and the trainings in Japan were conducted to coincide with the date of World Tsunami Awareness Day, November 5, and with the date of Disaster Prevention Day, September 1, so that they could participate in disaster prevention drills in Japan.

Table 6. Japan Training Summary

Date	Topics and purposes	Participants	Places visited and instructors
From October 29 to November 10, 2017	Invitation to Japan regarding ARR: Disaster Prevention Management, Kumamoto Earthquake Reconstruction, Large-Scale Tsunami Disaster Prevention General Drill, Private Business Participation, etc.	Secretary and directors of SGR, mayors of the pilot municipalities, responsible for risk reduction, etc., in a total of 10 people.	JICA, Kumamoto Prefecture, Kumamoto Municipality, Miyazaki Prefecture, Kochi Municipality, Konan Municipality, Kurosaki Municipality, Nagoya University, Toyo University, Private companies, Kokusai Kogyo, etc.

November 13-30, 2017	Training in Japan on building regulation management: summary of construction regulations, earthquake resistant government buildings, seismic isolation structure, measures against soil liquefaction, requirements for tsunami evacuation buildings, recovery after the Great Hanshin - Awaji Earthquake, etc.	Deputy secretary of Habitat and Public Space of MIDUVI, executives of MIDUVI, staff of SGR, those in charge of Output 3 of the pilot municipalities, etc., in a total of 17 people.	JICA. Ministry of Land and Transportation, Building Research Institute, Yokohama National University, Urban Rebirth Agency, Hyogo National University, Human Renewal and Disaster Reduction Institution, private companies, Kokusai Kogyo, etc.
From August 29 to September 12, 2018	Japan ARR Training: Local Government Disaster Prevention Management, Disaster Prevention Planning, Tsunami Measures, Disaster Prevention Education, Risk Reduction Drills, Fire Fighting Management, Fire Technology fire fighting, etc.	Executives of SGR and MIDUVI, mayors and those responsible for risk reduction in the pilot municipalities, personnel in charge of the Ministry of Education, personnel of JICA Office in Ecuador, etc. in a total of 16 people.	JICA, Municipality of Kokubunji, Joint disaster prevention drill of 9 prefectures and municipalities, Wakayama City Fire Department, Inamura-no-Hi no Yakata, Hirokawa Municipality, Nagoya University, Tokyo University of Economics, Kokusai Kogyo, etc.
From August 30 to September 9, 2019	ARR Japan Training: Tsunami Risk Reduction Drills, Community Disaster Prevention, Prefectural Disaster Prevention Management, Tsunami Measures, Great East Japan Earthquake Damage, Reconstruction Situation, transfer of earthquake records, etc.	Deputy Director of SNGRE, responsible for risk reduction of MIDUVI and the pilot municipalities, etc., in a total of 12 people.	JICA, Shizuoka Prefecture, Yaizu Municipalities. Yoshida, Ishimaki, Sendai, Arahama School, Tohoku University, Nagoya University, and Toyo University.
2020	Training suspended due to COVID19	The suspension was accepted by the deputy director of SNGRE, Mr. Alex Anchundia.	

1.3.5. Training in the third country

Training courses were conducted in third countries (Peru and El Salvador), with the cooperation of JICA, with the aim of assimilating the good practices conducted in third countries that could serve as a reference for this Project, as well as to try to improve the Project through cooperation with the countries and executing entitties of previous projects.

(1) Training in El Salvador on earthquake-resistant construction

Object of the training: Know the norms and laws related to the building management in other countries (Activity 3.2)
Training location: El Salvador
Results: Activities were developed to prepare and apply the construction regulations, in order to collect information on the know-how and good practices of the TAISHIN Project, and finally contribute to the promotion of the achievement of Output 3 of this Project.
Training summary: The counterpart entities of the TAISHIN JICA Project were visited, among others, to learn about the results of the Phase 2 Project (improvement of seismic resistance of private homes, application of the norm for their construction, promotion of supply of earthquake-resistant homes, real results of the housigns in the pilot areas, etc.) and exchange opinions on the matter, making it possible to establish an exchange system between both countries.
Date: From March 11 (Sunday) to March 17 (Saturday), for a total of 7 days.
Number of Participants: 4 people, 2 people from MIDUVI (Deputy secretary of Habitat and Public Space and Deputy secretary of Housing) and 1 person from each invited pilot municipality (Portoviejo and Salinas)

(2) Training in Peru on the Risk Reduction Agenda (ARR)

Object of the training: Study Technologies and know-how applied in other JICA projects, CISMID Peru (Activity 2.3)
Results: Learn from the Peruvian entities the good practices of the Project for Strengthening Technology for Earthquake and Tsunami Disaster Mitigation in Peru, conducted by JICA and on the disaster prevention system and the tsunami evacuation system, applied in Peru, to finally contribute to promoting the achievement of Output 2 of this Project. 2 trips were made for this training.
Training summary: On the first trip, collaboration was previously requested to organize the training, and 1 JICA expert, 1 person from Ecuadorian C / P and 1 assistant visited Peru for 3 days, who explained the purpose of the visit and the training summary.
On the second trip, as training in a third country, 1 JICA expert, 5 people from Ecuadorian C / P and 1 assistant were delegated for 1 week, in order to visit Peruvian entities and do local studies, as well as participate in training to learn about the disaster prevention system, the

functions of the different entities and the real situation regarding risk management in Peru. Likewise, a workshop was held to explain JICA projects in both countries, exchange opinions and knowledge, and establish a cooperative relations with a view to the future.
Date of the first trip: From March 22 (Thursday) to March 24 (Saturday), for a total of 3 days.
Participants in the first trip: 1 person from SNGRE Headquarter
Date of the second trip (training): From July 8 (Sunday) to July 14 (Saturday), for a total of 7 days.
Number of Participants: 1 person from SNGRE Headquarter, 1 person from SNGRE Zone Office 5, and 1 person from each of the 3 pilot municipalities (Portoviejo, Atacames and Salinas)

1.3.6. Preparation and approval of the internal regulations (CONSIDERING) on the Project management

Once more than a year had elapsed since the start of the Project, the need to introduce improvements for the proper performance of the Project activities became evident. The organizational system and the hierarchy of the authorities in the normal works made it difficult for the smooth execution of the Project, including delays in the approval of the activities execution related to the Project. For this purpose, the functions and authorities of the heads of the main entities were clarified and internal regulations (CONSIDERING) were drawn up to guarantee the proper execution of each activity, which was approved at the 4th meeting of the JCC. Before these regulations were established, the signers of the JCC meeting minutes had been the chief advisor of the Experts Team, SGR Deputy secretary, vice-minister of MIDUVI and the director of JICA Office in Ecuador, in a total of 4 people, but currently the number of signers has changed to 7 people, including the Mayors of Atacames, Portoviejo and Salinas.

1.3.7. Interim Evaluation

From January to February 2019, the Interim Evaluation was conducted, in which the Study Mission of the JICA Headquarter, together with the evaluating consultants, conducted interviews with the staff of the Ecuadorian C / P, among others. This Interim Evaluation was reported at the 4th meeting of the JCC, held on February 15, 2019, whose content was approved by the parties related to the PCSR, who signed the corresponding Minutes.

The points indicated in the Interim Evaluation Report were confirmed, continuing with the study on the measures to be taken for the second half of the Project.

1.3.8. Participation in events

The experts, C / P and attendees participated in the following events at the request of the related entities.

Table 7. Participation of the PCSR in Events

Date	Event and organizer	Speakers	Activity performed
October 12-13, 2017	Seminar and exhibition of "Together for Risk Reduction" (International Day for Disaster Reduction) SNGRE	Experts: Satoru Tsukamoto Haruka Yoshida Seiichi Horikoshi	On tsunami damage caused by the Great East Japan Earthquake and on disaster prevention in Japan
Jan 31, 2018	National Tsunami Evacuation Drill	Experts: Shio Kuwabara Takeshi Kuwano Emilio Wakita	Drill observation
October 16 and 17, 2018	National Tsunami Workshop (SNGRE) Muisne GAD	Experts: Takeshi Kuwano	Project Presentation
November 5, 2018	Seminar "Facing the TSUNAMI" by INOCAR, Open House event Development of Seminars on Tsunami Warning	Experts: Tomohiro Nishimura Emilio Wakita, Coordinador de PCSR: Kumiko Kitaura	Project Presentation
November 12, 2018	Open House event on World Tsunami Day GADM Salinas	Expertos: Tomohiro Nishimura Emilio Wakita	Tsunami Mechanism Exhibition and Sketch Contest
November 19, 2018	Seminar and exhibition of "Together for Risk Reduction" (International Day for Disaster Reduction) SNGRE	Experts: Satoru Tsukamoto Emilio Wakita	Explanation of risk reduction and case study from Japan
From November 26 to December 1, 2018	International Weeks and event of Japan presentation GAD Cuenca	Experts: Emilio Wakita	Project Presentation
Jan 31, 2019	National Tsunami Evacuation Drill	Experts: Satoru Tsukamoto Shio Kuwabara Kumiko Kitaura	Drill observation
May 29, 2019	Conference on Vertical Evacuation against Tsunami GAD Salinas	Experts: Tomohiro Nishimura Chiaki Nishi	Tsunami disaster in Japan, tsunami forecast and evacuation plan in Salinas

November 5, 2019	Workshop and Open House event by INOCAR	Technical assistant: Miriam Obregón	Measures against tsunami in Japan, JICA cooperation and presentation of the Project
From December 11 to 13, 2019	Workshop by the Japanese Association of Seismic Isolation Structure on seismic isolation system and vibration control, Ecuadorian and Japanese experience	Expert: Akira Inoue	Explanation of the Building Regulation Management Handbook
January 31, 2020	National Tsunami Evacuation Drill	Experts: Satoru Tsukamoto Tomohiro Nishimura Yasuhiko Kato Yu Kumagai	Drill observation
November 5, 2020	Webinar by INOCAR: "Reducing the risk against tsunamis through local strategies"	Technical Assistant: Miriam Obregón	Presentation of the Project and Tsunami Evacuation Plan

Figure 1. Invitation to GAD Salinas Conference, 2019

Figure 2. INOCAR Webinar, 2020

1.3.9. Information exchange with other aid agencies and international organizations

At the beginning of the project in 2017, visits were made to the Inter-American Development Bank (IDB) and the United Nations Development Program (UNDP) in order to explain the general vision of the Project and convey the desire for information exchange.

In February 2019, the staff of JICA Office, Mr. Santiago Guerrón, and JICA expert, Mr. Akira Inoue, visited the German International Cooperation Agency (GIZ), IDB and UNDP in order to explain and exchange opinions on the content and background of theBuilding Regulation Management Handbook (MPOPRPC) and the Informative material aimed at residents and building owners.

Figure 3. Information exchange meeting and collaboration with GIZ, IDB, and UNDP (Respectively)

1.3.10. Selection of secondary pilot municipalities

At the end of November 2018, in collaboration with SNGRE, MIDUVI and primary pilot municipalities, information was collected on the municipalities of the Coastal Region, they were visited by JICA experts, to know the situation of each one of them.

According to this information, the following municipalities were considered as candidates:

Municipality of Esmeraldas
Municipality of Muisne
Municipality of Sucre
Municipality of Manta
Municipality of La Libertad
Municipality of Santa Elena
Municipality of Playas
Municipality of Santa Cruz (Government Council of the Special Regime of Galapagos should be eliminated because it is another institution)

Of these eight Municipalities, the following were selected as secondary pilots:

1. Municipality of Esmeraldas
2. Municipality of Sucre
3. Municipality of Santa Elena
4. Municipality of Santa Cruz

These Municipalities were approved at the 4th meeting of the JCC, held in February 2019.

1.4. Activities related to Output 1

The expected results of the Output 1 activities are as follows:

Output 1: Pilot Municipalities provide timely assistance to evacuate communities rapidly in response to tsunami warning issued in accordance with Tsunami Warning Technical Protocol.

Activity 1.1: Update of the Tsunami Warning Technical Protocol and follow-up
Activity 1.2: Baseline Survey on the understanding of the inhabitants regarding tsunami evacuation
Activity 1.3: Improvement of the Tsunami Warning Communication System, Protocol and Evacuation Plan of the pilot municipalities
Activity 1.4: Preparation of educational documents for risk reduction, public awareness and tsunami evacuation drills in the pilot municipalities
Activity 1.5: EndLine Survey on the understanding of the inhabitants regarding tsunami evacuation drills in the pilot municipalities

1.4.1 Activities related to all of Output 1

(1) Online meetings

Since May 2018, online meetings have been held with the team responsible for Output 1 (SNGRE Operations Department), three primary pilot municipalities and since June 2019 the four secondary pilot municipalities participate in these meetings, in order to confirm progress of each activity, the schedule of future activities, etc.

From August 2019 to August 2021, the meetings were held as detailed below:

Table 8. Matrix of Online Meetings with Experts

Participants	Number of Meetings
SNGRE headquarter	27 Meetings (Project Start)
Atacames/SNGRE Headquarter –ZO1	33 Meetings (Project Start)

Esmeraldas/SNGRE Headquarter –ZO1	25 Meetings (Since August 2019)
Portoviejo/SNGRE Headquarter	31 Meetings (Project start)
Sucre/SNGRE Headquarter	25 Meetings (Since August 2019)
Salinas SNGRE Headquarter –ZO5	28 Meetings (Project start)
Santa Elena/Galápagos/SNGRE-Headquarter –ZO5	21 Meetings (Since August 2019)

(2)Topics discussed

In the online meetings, some topics related to Output 1 were discussed:
The situation regarding shakes, earthquakes and tsunamis that occurred in recent years was confirmed
Documents and data necessary to conduct the activities planned in the PCSR were collected
Status of recent activities was monitored
They notified the travel arrangements of the experts and PCSR Technicians
Since the development of the COVID19 Pandemic, the issue of numbers of infected, deceased and restrictions taken by the authorities of the Ecuadorian C / P was included

August 8, 2019

July 16, 2020

June 24, 2021

Figure 4. Online meetings with SNGRE and primary and secondary pilot municipalities

(3) Holding meetings of Working Group (GT / WG)

From the start of the Project until September 2021, eight Working Groups of Output 1 have been developed.

The Working Group (GT / WG), led by JICA experts and technicians responsible for Output 1, provided information on:

Damage caused by tsunamis and countermeasures applied in Japan
Information on the Technical Manual for the Preparation of the Tsunami Evacuation Plan (MTEPET)
Pilot municipalities reported the results of their activities such as preparation for cantonal tsunami evacuation drills
Presentation of good practices in disaster prevention education
Exchange of experiences, including solutions to different situations presented in the implementation of risk reduction actions
INOCAR presented the process of preparing the simulation of tsunami inundation maps and progress on the progress and result of the tsunami inundation simulation,
The Ministry of Education (MINEDUC) made a presentation on the current state of education on disaster prevention in educational places and the challenges to be faced.
Discussion spaces were generated with JICA experts who made suggestions about the measures to be taken against the problems related to the activities of Output 1

Table 9. State of WG(Working Group) Meetings of Output 1

No.	Date	Topic
1	November 24, 2017	Current status of the Technical Tsunami Warning Protocol Study report on understanding of residents Draft awareness materials.
2	April 23, 2018	Progress report of Activity 1.4 (Strengthening of capacities) of each municipality Drafting of awareness materials and improvement of the method of communicating the tsunami warning and evacuation
3	July 18, 2018	Presentation of the MTEPET proposal Report on the development of the tsunami evacuation map of the primary pilot municipalities.
4	November 16, 2018	Status of preparation of the Tsunami Evacuation Plan in the primary pilot municipalities Procedure for preparing the tsunami evacuation map for the primary pilot municipalities Summary of information communication method Progress of INOCAR tsunami simulation.
5	February 4, 2019	Revision of citizen awareness activities MINEDUC Policy on Crisis Management Critical nodes in collaboration with schools located in areas of difficult evacuation Presentation of the file "General Planning of the timeline for Evacuation Drill".
6	June 14, 2019	Report on the current status of the MTEPET INOCAR tsunami inundation simulation result

		Status of activities of each primary pilot municipality and good practices.
7	January 24, 2020	Tsunami Evacuation Plan in the primary pilot municipalities Study on Tsunami Safety Zones in Secondary Pilot Municipalities Revision of citizen awareness activities
8	September 8, 2020	Report on the current status of the MTEPET Progress of the INOCAR tsunami inundation simulation for Santa Elena Progress of activities in the 7 pilot municipalities.

1.4.2. Activities of Output 1

(1) SNGRE, IG-EPN and INOCAR update the Tsunami Warning Technical Protocol in due course of regular simulation as well as evacuation drills, and the project members monitor approval processes of the Protocol by SNGRE, IG-EPN and INOCAR. (Activity 1.1)

The update and monitor of the Technical Protocol for the Evaluation and Definition of the Tsunami Warning was conducted as planned.

The Tsunami Warning Technical Protocol, developed as part of the JICA Project "Tsunami Warming System Co-Creation of Knowledge Program, which specifies the communication of information on tsunami among SNGRE, IG-EPN and INOCAR and the operation of the Tsunami Early Warning System (SAT).

SNGRE, in collaboration with IG-EPN and INOCAR, and with the support of the experts, conducted evacuation drills and their evaluation twice a year, as well as the periodic validation of the Protocol, proposing its improvement, in order to update it to be more practical.

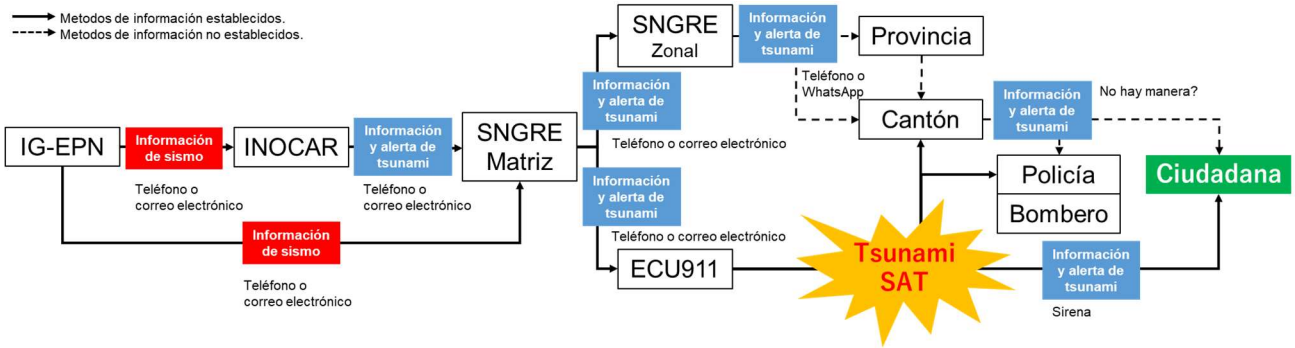


Figure 5. Current status of the Information Communication System on Earthquake and Tsunami (Technical Protocol for the Evaluation and Definition of the Tsunami Warning, Version 3)

National information on earthquakes and tsunamis is obtained from IG-EPN and INOCAR, while international information comes from the United States Geological Survey (USGS) and the California Integrated Seismic Network (CISN). Information is provided to IG-EPN and INOCAR by the Pacific Tsunami Warning Center (PTWC), XML Service, SeisComP System and Public Services.

Most public entities receive the tsunami alert from ECU911 and SAT, which is activated by ECU911. Even tsunami warning routes are being studied from the SNGRE Zone Offices to the prefectures, municipalities, police, firefighters, residents, etc., through telephone calls and Messageing servise (WhatsApp), but these routes are limited to complementary use. In the future, also the information system from SNGRE Zone Offices should be further improved, within the Protocol prepared by SNGRE.

It should be noted that in order to improve the process, in March 2020, the Technical Protocol for the Evaluation and Definition of the Tsunami Warning was revised in Version 3 through discussions among IG-EPN, INOCAR and SNGRE.

Version 3 mainly includes the changes listed below, but there are no major changes to the information flow:

- Clarification of jurisdictions and responsibilities of related entities
- Clarification of the data resources used to issue the tsunami warning
- Clarification of the methodology and level of issuance of the tsunami warning
- Special cases for the exercise of the Protocol (for example, decisions in case of information interruption).

In recent years the SAT has developed very rapidly in the Coastal Region of Ecuador, having installed the System in most of the localities of the coastal profile, including the 7 pilot municipalities. During the tsunami evacuation drill on January 31, 2020, the alert was issued through the SAT, numerous residents were evacuated after the alert was issued. However, there were some problems such as: Difficulty hearing the sound of the SAT in some areas, so some improvements were made.

During the Project period, several small and medium earthquakes were observed, but none of them resulted in the issuance of a tsunami alert from the SAT. Therefore, there is no immediate need to renew the Protocol, however, it is expected to update it in the future, as needed.

(2) The pilot municipalities, with assistance of SNGRE, conduct the base line survey concerning understanding level of local community on tsunami evacuation. (Activity 1.2)

The pilot municipalities, with the support of SGR and JICA experts, conducted the survey, in order to quantitatively know the level of understanding of the inhabitants about the tsunami evacuation. The survey was conducted until the end of September 2017 in the pilot municipalities Atacames, Portoviejo (Crucita) and Salinas, whose scrutiny ended in mid-October, with the help of SGR and other members of the Project. Since mid-October, the results of the survey, which consisted of 4 areas, began to be analyzed:
"Awareness of tsunami risk"
"Means to obtain the earthquake and tsunami alert, and daily preparation"
"Knowledge of meeting points and tsunami evacuation routes"
"Concerns and wishes about daily preparation"

The survey targeted three groups: residents, public institutions (schools, police, fire station, hospitals and clinics, etc.), and tourists.

Table 10. Content of the Baseline Survey on the understanding of the inhabitants regarding tsunami evacuation

Information		Study content
Demographic information		Population of the municipality and population by areas
Situation of the inhabitants	Awareness of tsunami hazard	Knowledge of the inhabitants about tsunami, measures against earthquakes, start of tsunami evacuation and subsequent actions
	Means of obtaining the earthquake and tsunami alarm	Means of obtaining the alarm, such as SAT, TV, radio, SNS, Internet or through neighbors
	Knowledge of tsunami risk areas, meeting points and evacuation routes	Understanding of tsunami hazard zones, meeting points, and evacuation routes
	Tsunami and other disaster prevention	Participation in evacuation drills, conversation with family members, knowledge of the way of contact, conversation with neighbors, etc.
Situation of public institutions (schools, police, fire station, hospitals, health centers, etc.)		Understanding of tsunami hazard, means of obtaining tsunami information, knowledge of meeting points and evacuation routes, etc.
Situation of tourists		Place of residence, purpose and frequency of the trip, means of obtaining information on tsunami in a state of emergency, knowledge of meeting points and evacuation routes, etc.

【Summary of Survey Results】

More than 80% of the respondents from the pilot municipalities answered: “I have knowledge about tsunami”. However, regarding the first action against tsunami ("When do you start the evacuation?"), In the municipality of Portoviejo about 60% responded: "Immediately after feeling shakes", while, in the municipality of Salinas, the people who gave this answer corresponded to less than 40%, there being a variation of understanding in this regard among the pilot municipalities.
Regarding the means of obtaining the tsunami alert in a state of emergency, 30% of the respondents from the pilot municipalities answered “TV”, which was the most prominent response, followed by “Radio”, “ SNS ”, “ Internet ”, “ Neighbors ”and“ Sirena ”, in order from highest to lowest.
People with experience of having participated in evacuation drills occupied 45% in Atacames, and approximately 25% in the municipalities of Portoviejo and Salinas.
The inhabitants of the municipality of Atacames have a higher awareness regarding the tsunami, making a comparison between the 3 pilot municipalities.
Regarding public institutions, awareness regarding the tsunami is higher in the municipalities of Atacames and Portoviejo. In the municipality of Atacames, 90% of the schools surveyed (19 schools) have developed the Tsunami Evacuation Plan, and in Portoviejo, 93% (14 schools) conducted evacuation drills, which deserves a special mention.
Among the tourists there were numerous responses that they did not know the meeting points or the evacuation routes.

This Activity was conducted as planned when the Project started. The report of this study (draft) was completed in January 2018, and shared with related individuals in July 2018.

(3) The pilot municipalities, with guidance of SNGRE, improve tsunami warning information dissemination structure/ protocol/ evacuation plan, which includes vertical evacuation, for local communities including tourists (‘Risk Reduction Agenda’ prepared in activities for Output 2 covers evacuation plan(s)). (Activity 1.3)

This Activity was greatly affected by the delay in the delivery of the tsunami inundation simulation by INOCAR, and by travel restrictions, meetings, curfew, etc. due to the COVID19 pandemic, despite the aforementioned, the initial objective could be reached before the end of the Project.

(a) Technical Manual for the Preparation of the Tsunami Evacuation Plan (MTEPET)

SNGRE began to study the MTEPET in July 2018 and published the MTEPET Version 1 in January 2021, after repeated discussions within SNGRE and in the 7 pilot municipalities.

Taking this Manual as a reference, the Socialization Workshop of the Technical Manual for the Preparation of the Tsunami Evacuation Plan was held for all 28 municipalities of the

coastal profile, from March to September 2021, thanks to this seminar, the MTEPET could be distributed not only to the 7 municipalities of the PCSR, but also to all the municipalities of the coastal profile, SNGRE Zone Offices among other first response institutions, making known the method of formulating the PET.

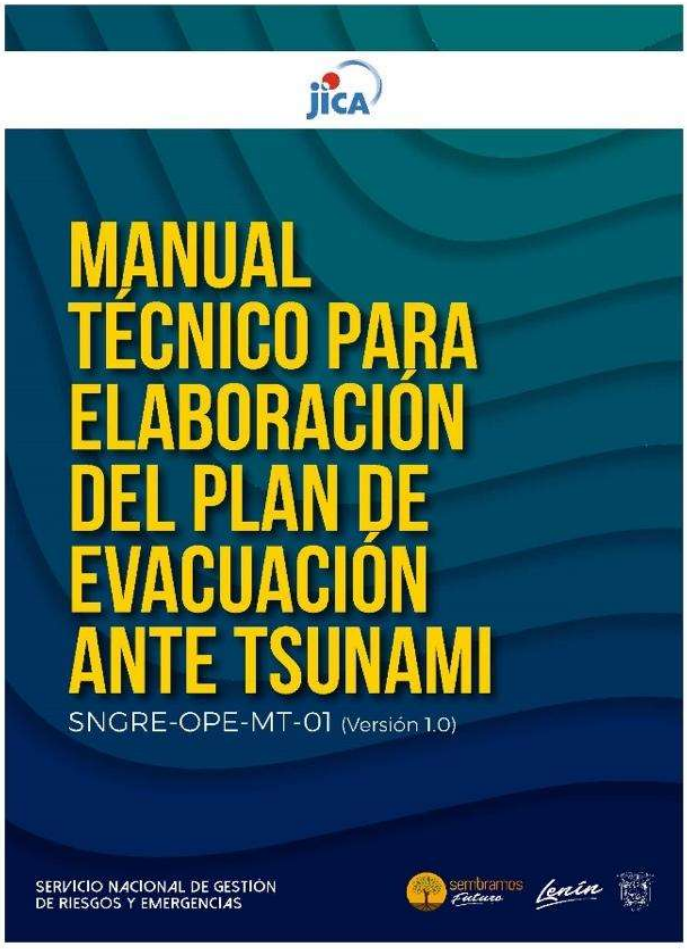


Figure 6. Cover of MTEPET version 1 prepared by the PCSR

(b) Tsunami inundation simulation by INOCAR

The tsunami inundation simulation, which forms the basis of the PET, was developed by INOCAR, which received the transfer of technology through the JICA Project "Strengthening capacities for monitoring earthquakes and tsunami in Ecuador". The results of the simulation were made known to the primary pilot municipalities in June 2019, making it possible to take advantage of them in the preparation of the PET and other actions related to risk reduction. Regarding the secondary pilot municipalities of Esmeraldas and Sucre, these results were published in November 2019, leaving the data to prepare the PET available. On the other hand, in Santa Elena, the publication of these results was delayed until October 2020. In the case of Santa Cruz, version 1 of the simulation map was officially

delivered in August 2021, and studies are being conducted for the delivery of version 2 of the Galapagos map in the short term.

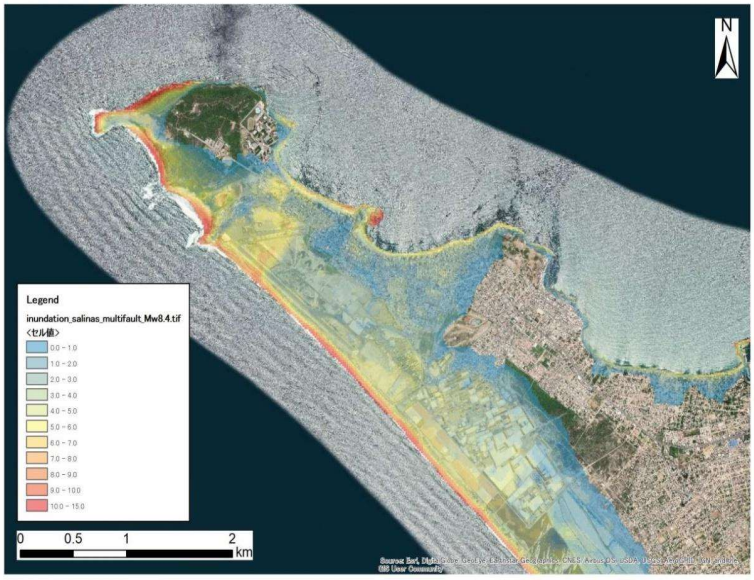
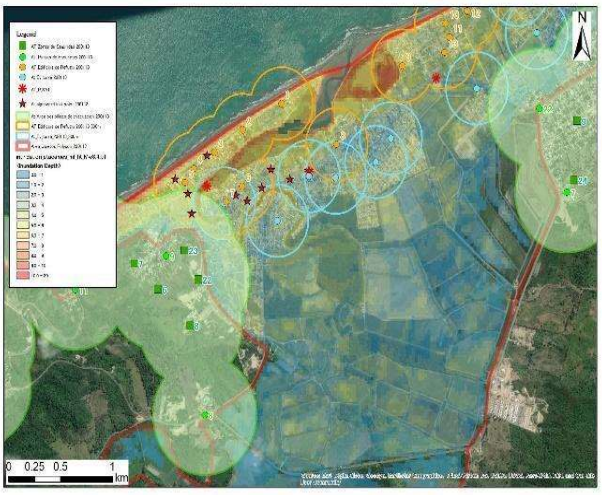
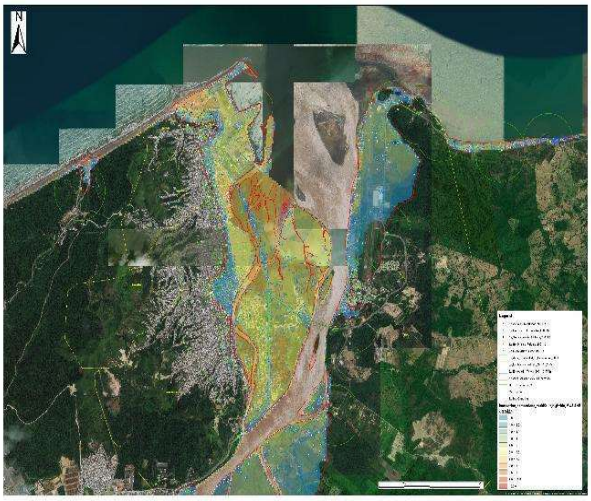


Figure 7. Tsunami Inundation Simulation Map conducted by INOCAR (Salinas)

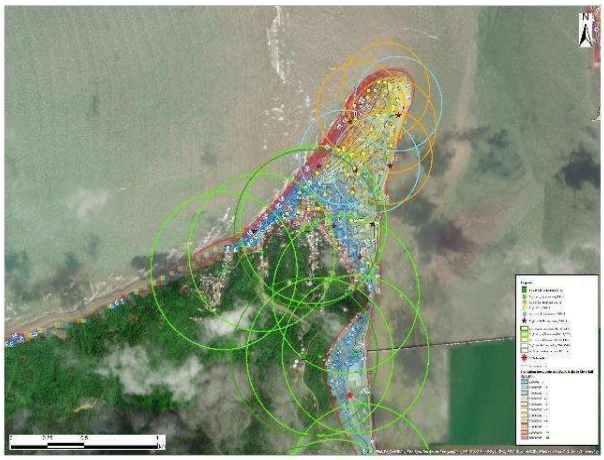
(c) Preparation of the tsunami evacuation map

Using the results of the tsunami inundation simulation, the tsunami evacuation map of the pilot municipalities was developed. It should be noted that the difference between this map provided by INOCAR and the temporary tsunami inundation risk map, previously prepared by SNGRE, was small, confirming that most of the safety zones, the tsunami meeting points, were determined within the PCSR and the evacuation routes were established with SNGRE and GAD, on which studies had already been done and could be used without modifications, however, some of them were improved by moving to more suitable and safe places. In the secondary pilot municipalities, the same process was conducted in accompaniment of SNGRE, the primary pilot municipality and PCSR experts.

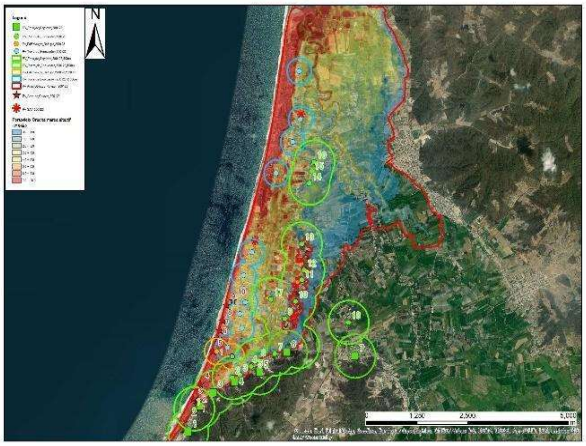




Atacames (Atacames Area)

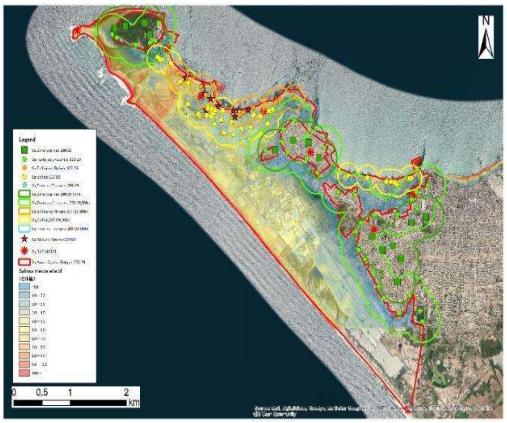


Esmeraldas (Downtown area)



Sucre (Bahía de Caráquez Area)

Portoviejo (Crucita Area)



Santa Elena (Palmar Area)

Salinas (Salinas /José Luis Tamayo Area)

Figure 8. Tsunami Inundation Simulation Maps of Primary and Secondary Pilot Municipalities (Including future plans for buildings and tsunami evacuation towers)

(d) Preparation of the Tsunami Evacuation Plan (PET) in each municipality

The seven pilot municipalities prepared their respective PET in accordance with SNGRE's MTEPET. The PET of each municipality consists of the following components:

① Confirmation of tsunami inundation simulation results (inundation area, water depth and arrival time).
② Determination of the target areas to tsunami evacuation and knowledge of their current status (target population to evacuation and composition of it).
③ Study of evacuation routes, meeting points and safety zones in the event of a tsunami, and knowledge of the current state of the facilities (equipment and capacity).
④ Determination of the areas with the greatest possibility of tsunami evacuation and knowledge of their current status.
⑤ Recognition of tsunami difficult evacuation areas and understanding of the current situation in them.

⑥ Study on tsunami evacuation measures in difficult evacuation areas (selection of tsunami vertical evacuation buildings, evacuation with the use of cars, buses and motorcycle taxis, among others.).
⑦ Education on tsunami disaster prevention for residents, tourists and people who need special care.
⑧ Method of communication of information related to disaster prevention.
⑨ Implementation of tsunami evacuation drills.
⑩ Preparation of emergency items and supplies to take with.
⑪ Tsunami evacuation plan (PET) according to each area.

Figue 9. PET of the Municipalities of Atacames, Portoviejo, Salinas, Esmeraldas, Sucre, Santa Elena and Santa Cruz

(e) Preparation of altitude signboards for tsunami

20 tsunami altitude signboards were installed in the coastal areas of the 7 pilot municipalities, respectively, and 10 signboards in the municipality of La Libertad, as a tool to raise interest in tsunami-related issues in the daily lives of citizens and tourists; in order to raise awareness of the need for adequate evacuation.

During the project period, a total of 150 signboards was installed in the coastal areas of Ecuador, a QR code has been installed in each signboard, which allows mobile devices to link to the tsunami evacuation map, open to the public in the server managed by SNGRE.

Figure 10. Tsunami altitude signboards

(f) Study on tsunami vertical evacuation buildings

In tsunami difficult evacuation areas where there were buildings usable for vertical evacuation, the pilot municipalities had been conducting the preselection of candidate buildings and the negotiation with their owners for the evaluation and use of the building.

At the end of June 2021, the municipality of Esmeraldas had a building that could be used as a vertical site, while the municipalities of Atacames and Salinas were conducting studies on some buildings as candidates to be used for this purpose.

Buildings that are in one of the three safety levels may officially become vertical evacuation buildings, and the corresponding signboard will be placed before the end of the Project.

Starting on January 2019 with the tsunami evacuation drill, the municipality of Salinas began to provisionally use some buildings as vertical tsunami evacuation sites, which will serve to significantly reduce the evacuation time for residents and tourists in difficult evacuation areas.

Even after the end of the Project, negotiations will be conducted so that all these candidate buildings can be used officially, and the municipalities, SNGRE and MIDUVI will continue to collaborate with each other to have all the corresponding evaluations.

Figure 11. Examples of Vertical Evacuation Buildings and image of signboards placement (Esmeraldas and Salinas)

(g) Preparation of the Guide on Evacuation Measures and Guide on Tsunami Evacuation Towers

So that the evacuation measures in case of tsunami can continue even after the end of the Project, and there is a change in the personnel in charge of disaster prevention, the guide on these measures was developed, which offers a general picture of the tsunami, of the damages caused, as well as the concept and examples of said measures.

Figure 12. Examples of components of the Tsunami Evacuation Measures Guide

In addition, a Compendium of Exemplary Cases of Tsunami Evacuation Towers was prepared, summarizing the procedure to study the introduction of said tower and the way to select the appropriate sites, so that it can serve as a reference for its future adaptation in Ecuador. This Compendium, after being translated into Spanish, was delivered to the Ecuadorian C / P.

Figure 13. Exemplary cases of Tsunami Evacuation Towers

In the municipalities of the coastal profile, the SAT was installed, and the Tsunami Warning Technical Protocol was established, which is why the communication system of said warning has improved notably.

The preparation of the evacuation map and the PET was conducted based on the results of the tsunami inundation simulation in the primary and secondary pilot municipalities, and new safety zones and evacuation routes were established, identifying areas of difficult evacuation, for which evacuation methods were studied. In the target areas of tsunami evacuation, it is difficult to improve the current situation immediately, since it is necessary

to select vertical evacuation buildings and construct evacuation towers, however, future challenges have been identified and there are development plans with measures solution in this regard, even after the end of the Project. On the other hand, according to the PET, tsunami evacuation drills began to be conducted, they are carried out twice a year: the first at national level under the responsibility of SNGRE and the second at cantonal level and under the responsibility of each municipality. In addition, to complete these drills, the installation of tsunami altitude signboards and evacuation buildings was conducted, which has led to the constant improvement of tsunami awareness among residents and tourists.

Thanks to all these activities, residents and tourists have assimilated knowledge about risk reduction measures and participate in evacuation processes on a voluntary basis; And in the event of a major earthquake or tsunami alert (issued by the SAT), they will know what action to take.

(4) The pilot municipalities, with guidance of SNGRE, carry out capacity development activities for local communities including tourists utilizing raising-awareness materials that produced in the Project, and conduct tsunami evacuation drills utilizing the said materials. (Activity 1.4)

(a) Teaching materials to raise awareness about earthquakes and tsunami

① Creation of videos

The first version of the video was made in October 2017; and the video was later updated, in May 2018. Since then, these videos have been used in awareness-raising activities by each primary and secondary pilot municipality.

Due to the COVID19 pandemic, awareness activities have focused on digital media, for example:

・ Online system, and the use of videos has increased. The videos are also available on YouTube (https://www.youtube.com/watch?v=E_M0GPmks6k), with 9,805 views as of July 2, 2021.

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<td>Image of the first version of the video for tsunami awareness</td>
<td>Image of the second version of the video for tsunami awareness</td>
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Figure 14. PCSR Tsunami Video Images

② Creation of tryptics and posters

Tryptics were prepared for the 3 primary pilot municipalities. This version was delivered in October 2018 and the second version of the triptychs in May 2019, in this distribution only the secondary pilot municipalities of Santa Elena and Esmeraldas requested brochures, 2,500 copies having been distributed among the three municipalities.

First version of the triptych	Second version of the triptych

Figure 15. Informational tryptics on tsunami

Posters were designed, printed, and distributed in the primary and secondary pilot municipalities. They were delivered to Santa Elena and Esmeraldas in January 2020; But due to the COVID19 pandemic, the posters were redesigned to include biosecurity measures against the pandemic and were delivered in August 2020. These posters were delivered to five of the 7 municipalities while Santa Elena and Esmeralda were given stickers with biosecurity measures so that they could be placed on the posters already printed.

In the case of the posters delivered to Galapagos, they were delivered to the municipality of Santa Cruz (secondary pilot municipality), and to the municipalities of Isabela and San Cristóbal.It should be noted that they were the only municipalities with a poster in two languages, english and spanish.

The information that was included in the posters was the following:

- Preventive measures against tsunami
- Biosecurity measures against COVID19
- Tsunami Safety Zones

Poster
(Example of Esmeraldas)

Poster with measures against the pandemic
(Example of Sucre)

Sticker
(Example of Esmeraldas)

Figure 16. Versions of posters and stickers designed and distributed to the municipalities of the PCRS

Table 11. Number of brochures and posters distributed

Pilot Municipality		Brochure	Poster	Sticker
Primary	Salinas	2500	200*	—
	Portoviejo	2500	200*	—
	Atacames	2500	200*	—
Secondary	Santa Elena	2500	200	200
	Esmeraldas	2500	200	200
	Sucre	—	500*	—
	Galápagos	—	500* (english) 500* (spanish)	—

*** Poster with measures against the pandemic**

③ Preparation of the Tsunami Evacuation Guide

In June 2020, a Tsunami Evacuation Guide was produced in the form of slides so that it could be used for virtual awareness, even during the pandemic. This information was shared with SNGRE and each municipality through monthly online meetings. This Guide includes:

- Natural disasters in Ecuador
- What is an earthquake?
- What is a tsunami?
- What to do in case of a tsunami warning?

GAD preparations for the communities (tsunami simulation and inundation forecast map, signboards of safety zones, safety zones in each area, altitude signboards, evacuation routes, tsunami vertical evacuation buildings)
Earthquake and tsunami evacuation during a pandemic.

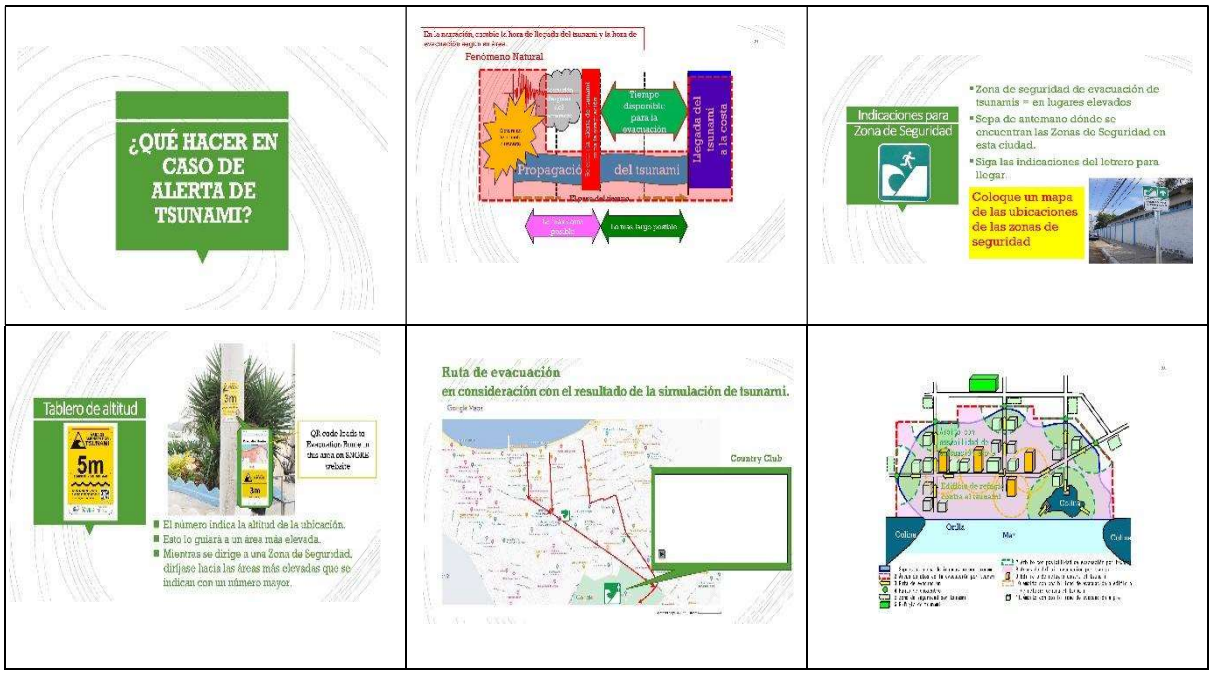


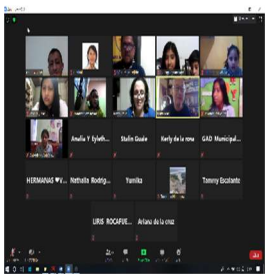
Figure 17. Earthquake and Tsunami Evacuation Guide Slides (excerpt)

(b) Awareness activities for earthquake and tsunami evacuation

In 2018 and 2019, each pilot municipality, together with the experts, drew up the educational activities plan, with which awareness-raising activities were conducted in a positive way for the Community Risk Reduction Committees (Brigades), created in the schools and communities between the municipalities and SNGRE. In August 2019, the awareness activities plan was developed, but as of 2020, due to the COVID19 pandemic, the educational activities could not be conducted as planned. Despite this, the pilot municipalities continued to conduct the activities through virtual meetings using the corresponding guide and with their own ideas of taking advantage of news on the Internet, etc.

As regards the municipality of Santa Cruz, until the tsunami inundation forecast map is drawn up, it is not possible to offer precise information on evacuation routes, meeting

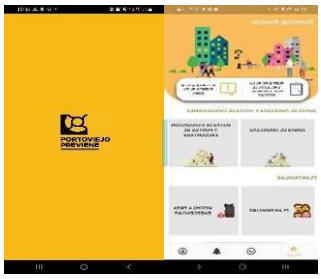
points and safety zones, among others, making it impossible to carry out awareness activities, except for early evacuation and other general aspects.



Online awareness activity in the municipality of Salinas (June 2020)

Awareness-raising activity in the municipality of Santa Elena (December 2019)

The municipality of Portoviejo promotes Risk Reduction activities through the Mural Contest in Schools, with the theme What is a tsunami? (Sep 2019)



The municipality of Portoviejo has the application **"Portoviejo Previene"** supported by GIZ, this App will allow users to be prepared and find out about recommendations and emergency alerts issued by the Risk Department in the event of possible natural events

Explanation on the activities related to Output 1 and meeting on the Preparation of the awareness plan in the Autonomous Decentralized Municipal Government of Santa Cruz canton (August 2019)

Meeting on the development of the awareness plan in the municipality of Atacames (August 2019)

Awareness-raising activity in the municipality of Esmeraldas (June 2021)

Figure 18. Awareness-raising activities in the municipalities during the development of the PCSR

(c) Earthquake and tsunami evacuation drill

① Conduct of earthquake and tsunami evacuation drill (national level and municipal level)

During the project period, evacuation drills were conducted nationwide by SGR, in January 2018, January 2019 and January 2020. During drill in January 2020, a vertical evacuation drill was also conducted in Portoviejo and Salinas. In 2021, it was deliberated on the possibility of conducting only a simulation with the performers of the canton, but due to the pandemic and the changes in personnel caused by various reasons, so far SNGRE has not decided on the dates for conducting the activities related to the drill or simulation. While the Municipality of Portoviejo conducted a simulation for a tsunami alert, which was conducted at the desk with the members of Parish COPAE, at the facilities of the Parish Government of Crucita on July 9, 2021

In 2018 and 2019, evacuation drills were conducted at municipal level in the primary pilot municipalities. In the drills of 2019, the personnel of the secondary pilot municipalities were present, with the intention of preparing for the application from 2020. In the municipalities of Salinas, Portoviejo and Atacames, vertical evacuation tests were conducted.

In 2020 and 2021, evacuation drills could not be conducted due to the COVID 19 pandemic.

② Support in the revision of the format for evaluating tsunami evacuation drills and the report format

This Activity was conducted as initially planned until the end of 2019. However, awareness-raising activities and evacuation drills, which are conducted in person with the communities,

were greatly affected by the pandemic, which is why they could not be carried out in 2020 or 2021.

(5) The pilot municipalities, with assistance of SNGRE, conduct the end line(EL) survey concerning understanding level of local communities on tsunami evacuation. (Activity 1.5)

Between June and July 2021, an EL Survey was carried out in the primary pilot municipalities in order to know the level of understanding of the tsunami evacuation among residents and tourists as a result of the implementation of the Project

(a) Comparison of the results between the Baseline(BL) Survey and the EL Survey on the level of understanding of the residents

Table 12 shows the comparison of the results between the Baseline Survey, the initially established objective values and the EL Survey.

The municipalities of Portoviejo and Salinas improved the level of understanding in all areas, so it can be said that the objectives were achieved.

In the BL Survey, the correct answer had been considered to correspond to "Right after the earthquake was felt", however, in the EL Survey, the answer "As soon as it stops shaking" was added, which was later considered correct. This is due to the fact that, since INOCAR tsunami simulation results were released, the Experts Team had been explaining to each municipality about the evacuation action, clarifying the steps in time, that is, “Protect yourself during the shaking and evacuate as soon as it ceases”.

On the other hand, the municipality of Atacames did not improve neither in point 3: "Do you know the tsunami evacuation route from your home to the Safety Zone?" nor in point 4: "Go immediately to look for them." Regarding point 3, in the BL Survey, it was asked about "Routes to the meeting point", but in the EL Survey it was clarified that this referred to "Routes to the safety zone", on whose awareness the Project insisted, and it can be thought that this clarification has caused a decrease in the corresponding value.

Table 12. Results of Baseline (BL) and EndLine (EL) Surveys and initial target values

No.	Question no. (BL up and EL down)	Options		Atacames	Portoviejo	Salinas	Total
1	9-1 (10-1)	Go immediately to find them	BL	46%	57%	39%	47%
			EL	58%	59%	47%	54%

			Initial value	60% (+15%)	60% (+2%)	60% (+14%)	60% (+15%)
2	5-1 (5-1)	Do you know the Tsunami Safety Zone?	BL	80%	56%	50%	61%
			EL	94%	81%	79%	85%
			Initial value	80% (Reached)	60% (+4%)	60% (+14%)	61%+
3	5-3 (5-3)	Do you know the tsunami evacuation routes from your home to the Safety Zone?	BL	93%	60%	50%	65%
			EL	91%	73%	79%	81%
			Initial value	93% (Reached)	60% (Reached)	60% (+10%)	65%+
4	9-2 (10-2)	Go immediately to find them	BL	14%	35%	40%	31%
			EL	28.6%	28%	30%	29%
			Initial value	Decrease the number of responses			
5	6-1 (7-1)	Have you ever participated in a Tsunami Evacuation Drill?	BL	45%	25%	26%	31%
			EL	67%	53%	47%	56%
			Initial value	Increase value improvement 3)			

* The BL Survey was carried out in September 2017, and the EL Survey between June and July 2021.

Table 13 shows the comparison of the results between the BL Survey and the EL Survey regarding the answer to the question "In case of a large earthquake, when would you start to evacuate?" In the total of the 3 primary pilot municipalities, the response “Right after feeling the earthquake” has decreased significantly, with the response “As soon as it stops shaking” being greater, which means that the correct action is well socialized. On the other hand, in the municipalities of Portoviejo and Salinas, the number of citizens who take into account the SAT sirens has not decreased so much. The 3 primary pilot municipalities should clarify and raise awareness about the priority to initiate the evacuation in their future activities.

Table 13. Comparison of the results of the Baseline(BL) Survey and those of the EndLine(EL) Survey regarding "In the event of a major earthquake, when would the evacuation begin?"

Q. 9-1.(10-1)		Atacames	Portoviejo	Salinas	Total
1) Right after feeling the earthquake.	BL	46%	57%	39%	47.2%
	EL	7.4%	13.0%	14.6%	12.0%
2) When you hear the sirens.	BL	34.0%	24.3%	39.9%	32.7%
	EL	28%	23.0%	33.1%	39.9%
5) As soon as I stop shaking.	BL	--	--	--	--
	EL	58.3%	59.0%	47.0%	53.8%

(b) Understanding of the results of the activities conducted in the second half of the Project

New questions have been added to the EL Survey in order to measure the success of the activities carried out for Output 1. Thanks to these questions, some suggestions for the future could be found for the primary pilot municipalities.

Since the end of 2019, the posters began to be distributed and displayed. From now on, the primary pilot municipalities are expected to place them in highly visible locations, which will help to achieve positive effects.

Table 14. Have you seen posters like the ones below?

Answer	Atacames	Portoviejo	Salinas	Total
1) Yes	47%	36%	39%	41%
2) No	53%	64%	61%	59%

Regarding the altitude signboards, it has been placed in only 10 places in each pilot municipality, and its socialization has not progressed as expected, as a result of exit restrictions due to the pandemic. In some municipalities, residents who live near altitude signboards tend to be more aware of it, but it is expected that it will be posted more widely in many areas in the future, so that more people can learn of its existence which will lead to the safe evacuation of a greater number of residents.

Table 15. Have you seen a board like the one in this altitude signboard?

	Answer	Atacames	Portoviejo	Salinas	Total
	1) Yes	37%	38%	33%	36%
	2) No	63%	62%	67%	64%

Table 16. Do you know what this altitude signboard is for?

Answers	Atacames	Portoviejo	Salinas	Total
1) To inform you of the altitude of the terrain in which you live and to help you evacuate to a higher place in the event of a tsunami	45%	53%	56%	52%
2) To inform you of your distance to the sea and to help you evacuate to a place further from the sea in the event of a tsunami.	35%	13%	34%	28%
3) I do not know.	20%	34%	10%	20%

* The correct answer is 1).

It was also asked about the awareness of residents regarding evacuation under the pandemic state. Most of them answered that they would not hesitate to evacuate despite the pandemic. It can be thought that the call from the pilot municipalities through their website and online workshops has had a positive effect. On the other hand, it has also been known that a large number of people are concerned about "We can come into contact with someone infected with Covid-19 without realizing it." The Experts Team, through online conferences, made a presentation addressed to each municipality on some exemplary measures of Japan against infection in shelters. These measures should be included in the future operation plan of the shelters in each municipality, without being limited to the case of a pandemic.

Table 17. In this pandemic, would you hesitate to evacuate in the event of a tsunami?

Answer	Atacames	Portoviejo	Salinas	Total
1) Yes	33%	32%	45%	38%
2) No	67%	68%	55%	62%

There are several schools and medical facilities participating in the evacuation drills organized by the municipalities and SNGRE that express their concern about evacuation through busy roads and the poor state of evacuation routes and safety zones.

Table 18. Has your institution participated in the tsunami evacuation drill conducted by SNGRE / municipality?

Answer	Atacames		Portoviejo		Salinas		Total	
	No. of institutions	%	No. of institutions	%	No. of institutions	%	No. of institutions	%
1) Yes	1	100 %	12	86%	24	75%	37	79%
2) No	-	-	2	14%	8	25%	10	21%

Regarding the evacuation of tourists, some municipalities made calls to the tourism sector, but no significant progress has been seen in communicating information about the evacuation to tourists. For example, the number of people who know the location of the closest safety zone reached only 30% in Salinas and Atacames, which are tourist municipalities. There were people who cited websites and social networks as a source of information for the tourism sector, in addition to television, radio and newspapers, and there were also other people who indicated the tsunami evacuation maps posted in the city. From now on, information needs to be broadcast more effectively, through hotels, restaurants and taxis frequently used by tourists, and from other places and people in close contact with them.

Table 19. Do you know the Tsunami Safety Zone (a designated place where you go to be safe from the tsunami) around here?

Answer	Atacames	Portoviejo	Salinas
1) Yes	29%	83%	29%
2) No	71%	17%	71%

1.5. Activities related to Output 2

The expected effects through Output 2 activities are as follows:

Output 2: ARR focusing on Mitigation/ Prevention and Preparedness is updated by municipalities.

Activity 2.1: Baseline Survey on hazard information according to each disaster by SGR

Activity 2.2: Understanding the content of the ARR feasible by SGR
Activity 2.3: Review of knowledge of other JICA projects
Activity 2.4: Baseline Survey on hazard information in pilot municipalities
Activity 2.5: Determination of the basic guidelines of the ARR of the pilot municipalities
Activity 2.6: Review of the Contingency Plan of the pilot municipalities
Activity 2.7: Update of the ARR of the pilot municipalities
Activity 2.8: Elaboration of Guidelines for the Update of the ARR focused on earthquakes and tsunami of the municipalities that are not pilot
Activity 2.9: Support in the update of the ARR focused on earthquakes and tsunami of the municipalities that are not pilot

1.5.1. Activities related to all of Output 2

(1) Holding of WG meetings

The status of holding of WG meetings for the preparation of the ARR by the pilot municipalities is as shown in Table 20

Table 21. Status of the WG meetings of Output 2

No.	Date	Topic
1	December 24, 2017	ARR comparison between Japan and Ecuador Change from the ARR to the Regional Plan for Disaster Reduction.
2	June 12, 2018	Report on the preparation of the ARR by the primary pilot municipalities Status of the INOCAR tsunami inundation simulation map.
3	July 30, 2018	Report on the preparation of the ARR by the primary pilot municipalities.
4	November 16, 2018	Report on the progress of completion of the ARR by the primary pilot municipalities Official approval of the ARR by the city council and mayor Confirmation of the ARR publication schedule by the primary pilot municipalities Presentation of the Action Plan prepared in October 2018 by the participants in the training in Japan.
5	January 25, 2019	Report on the status of official approval and publication of the ARR by the primary pilot municipalities Explanation of the summary of the Guidelines for the Preparation of the ARR (LPARR) by SNGRE.
6	July 22, 2019	Explanation of the schedule of future activities for the preparation of the ARR of the secondary pilot municipalities by JICA experts

		Summary of ARR finalized by primary pilot municipalities ARR status report to be prepared by secondary pilot municipalities Explanation of the LPARR summary by SNGRE.
7	December 6, 2019	Report on the status of preparation of the ARR by the secondary pilot municipalities Report on the monitoring of the implementation status of the disaster reduction measures proposed in the ARR by the primary pilot municipalities Presentation of the training result in Japan.
8	May 29, 2020	Report by secondary pilot municipalities on the status of official approval of the ARR by the municipal council and mayor Report on the status of implementation of the disaster reduction measures proposed in the ARR by the primary pilot municipalities.

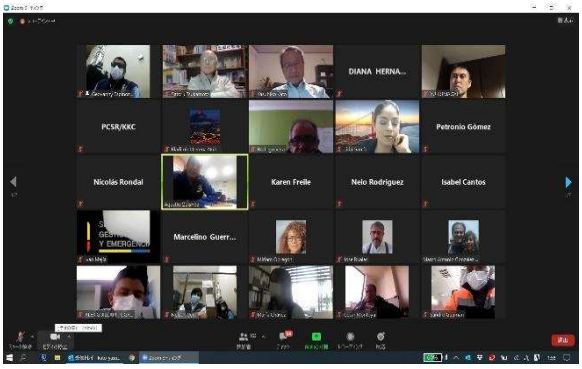
(2) Preparation of the Guide for the Preparation of the ARR

As a complement to the LPARR prepared (January 2019) by SNGRE and JICA experts in Activity 2.8, the preparation of the Guidelines for the Preparation of the ARR began in August 2020, which was completed in March 2021.

(3) Holding the National Dissemination seminar on ARR

Once the Project is finished, SNGRE will promote the preparation of the ARR by all the municipalities of the country, except for the 7 pilot municipalities that have already prepared their own ARR with the help of the PCSR.

For this purpose, on March 17, 2021, SNGRE, with the support of the Experts Team, held the first national dissemination seminar on the ARR (Virtual) for all cantonal municipalities (221) and provincial (24) governements of the country, as a final part of the Output 2 activities. This seminar was delivered successfully, and was attended by 193 participants. On April 14, SNGRE planned, prepared and organized on its own initiative, the second seminar also at national (virtual) level aimed at all cantonal municipalities and provincial governments, the workshop concluded successfully with the attendance of approximately 170 participants.



First National Dissemination Seminar on ARR for Output 2 （March 17, 2021）

Second National Dissemination Seminar on ARR for the Output（April 14, 2021）

Figure 19. National Seminar on ARR

1.5.2. Different Activities of Output 2

(1) SNGRE, with cooperation of MIDUVI and other technical collaborating member(s), conducts nation-wise baseline(BL) survey on current hazard data of earthquake and tsunami disasters. (Activity 2.1)

SNGRE, with the support of the experts, conducted the BL Survey at national level based on the confirmation of the state of disposition and management of the existing information on hazards according to each disaster.

To conduct hazard and risk evaluations, existing data have been used, with a view to preparing the ARR of the primary pilot municipalities, a report was also prepared on the current state of disclosure, accessibility and use of the information regarding the institutions indicated in Table 21.

Table 21. National baseline (BL) suvey on hazards according to each disaster

Hazards	Tsunami, earthquake, inundation, landslide, volcanic eruption, forest fire and basic information of the national territory
Institutions under survey	SGR, INOCAR, IG-EPN, INAMHI, INIGMM, IGM (Geographic Military Institute)

In August 2017, confirmation was made on the information on hazards according to each disaster with the Department of Risk Information Management and the Department of Risk Analysis of SNGRE, specifically on the status of preparation of hazard maps, method of hazard assessment, among others.

According to the results of the interviews with the related institutions, a summary was made on the state of availability of said information. The survey report was completed in December 2017, as initially planned.

(2) SGR, with cooperation of MIDUV and other technical collaborating member(s), understands feasible contents of ARR ' (e.g., development of hazard map(s), classification of land use/ development of urban planning) based on the existing hazard information and/or data. (Activity 2.2)

This Activity was conducted in order to know the basic information necessary so that SNGRE, with the help of the expert, could update the ARRs based on the information on hazards from the three primary pilot municipalities.

(a) Current status of SGR support in the preparation of the ARR

In July 2017, interviews were conducted with SNGRE, obtaining the following information:

SNGRE Department for Strengthening and Development of Risk Management Capacities is in charge of the general coordination of the ARR.
Direct support to prefectures and municipalities is provided by SNGRE Zone Offices.
SGR Headquarter prepared in 2015 the Guidelines for the Preparation of the ARR (hereinafter, referred to as "LPARR 2015") for the prefectures and municipalities, which prepare their own ARR in accordance with said Guidelines.

According to SGR, 121 of the 221 municipalities in the country have already prepared the ARR based on the 2015 LPARR (as of June 2020). All completed provincial and municipal ARRs are managed and stored in SGR Headquarters.

There is no link between the provincial and the cantonal ARRs, since the municipalities are totally independent from the prefectures.

The ARR based on the 2015 LPARR does not include aspects that correspond to disaster reduction planning, disaster preparedness, among others.

(b) Status of ARR preparation in the primary pilot municipalities, etc.

As of July 2017, the ARR had not yet been prepared in the primary pilot municipalities, except for Salinas.

From July 26 to 31, 2017, meetings were held on the general situation of the ARR in the primary pilot municipalities between the parties: Municipalities, Zone Offices, SNGRE Headquarters and the Experts Team.

In August 2017, the ARR prepared by the municipality of Salinas was reviewed and analyzed, this ARR consists mainly of descriptions of background information, such as: Topography, climate, geology and environment, and does not include a disaster reduction plan or plan disaster preparedness. Descriptions of these plans are found only in the Action Plan. This Plan was prepared by the COE Technical Working Group for emergency response. This WG is mainly made up of members not belonging to the UGR of Salinas, who have no direct relationship with the disaster reduction plan or the disaster preparedness plan. Therefore, the Action Program does not maintain any relation to the aforementioned plans in its content.

Due to these circumstances, the activity in the three primary pilot municipalities was not an "update" of the ARR, but actually a "new creation".

(c) Explanation and discussions about the guidelines for the development of the ARR

In November 2017, in the meetings indicated below, JICA experts explained the difference between the Regional Plan for Disaster Prevention of Japan, the ARR and the Contingency Plan, obtaining a clear understanding from the Ecuadorian side.

On November 15: The meeting was held with the Department of Strengthening and Development of Capacities in Risk Management and with the Department of Risk Information Management.
November 24: The first meeting of the Working Group (WG) was held, with representatives of SNGRE Headquarters, SNGRE Zone Offices and primary pilot municipalities
November 28: The meeting was held between SNGRE Assistant Secretary General, Mr. Ricardo Peñaherrera with JICA experts, where it was agreed that the ARR would not be unified with the Contingency Plan, that it would not change its name and would not handle emergency response but would be developed with a focus on the disaster mitigation plan and the disaster preparedness plan.

In accordance with the agreements established with the Deputy Seretary of SNGRE, on December 1 in Portoviejo, on December 4 in Salinas and on December 8 in Atacames, approval was obtained from the UGR, Zone Offices and the Headquarter of SGR to modify according to the commitments reached in the WG.

(3) SNGRE and the pilot municipalities study techniques and know-how applied in JICA projects for the objective of revision of the ARR (e.g., CISMID in Peru). (Activity 2.3)

In order to SNGRE and the primary pilot municipalities be able to effectively and efficiently prepare the ARR, the "Earthquake and Tsunami Disaster Mitigation Technology Strengthening Project in Peru" was revised, which was successful in disaster prevention planning. The revision was carried out within the training in a third country, specifically, as shown in Table 22.

Table 22. Summary of training on the JICA project in Peru

Project's name	Contact	Summary of training in Peru (2 trips are made)
Earthquake and Tsunami Disaster Mitigation Technology Strengthening Project in Peru	**<Institutions of C / P>** National Engineering University (UNI), Japanese Peruvian Center for Seismic Research and Disaster Mitigation (CISMID) **<Related institutions>** Peruvian International Cooperation Agency (APCI) National Institute of Civil Defense (INDECI), National Center for the Estimation, Prevention and Reduction of Disaster Risk (CENEPRED), Department of Hydrography and Navigation of the	・**Places to visit:** CISMID, INDECI, DHN and municipalities of Lima and Callao, which achieved positive results (Regional Disaster Mitigation Plan and evacuation drills) similar to Outputs 1 and 2 of this Project ・**No. visitors:** First trip: 1 person from the Ecuadorian side, 1 JICA expert and 1 assistant Second trip: 5 people from the Ecuadorian side, 1 JICA expert and 1 assistant ・**Permanence in Peru:** First trip: March 22 - March 24 (3 days) Second trip: July 9 - July 14 (6 days) ・**Activity content:** First trip: Explain the training summary and get acceptance for the subsequent training. Second trip: Visit Peruvian institutions and in-situ study, to know the content of the Project and the state of subsequent adaptation. Explain the status of the Project in Ecuador. Hold a workshop to explain the JICA Project in each country and exchange know-how and opinions.

	Peruvian Navy (DHN), National Tsunami Warning Center (CNAT), COER of the Government of Callao Region, COEL of the Municipality of Lima. **<Japanese part>** Chiba University (Prof. Fumio Yamazaki)	・**Expected results:** Make the most of for the activities of this Project the know-how and experiences on the analysis of hazards and risks of earthquakes and tsunami in Peru, preparation of the Regional Plan for Disaster Mitigation and land use measures, awareness activities on the disaster prevention, etc.

① From March 22 to 24, 2018, Expert Tsukamoto and the Director of Strengthening and Development of Risk Management Capacity Department of SGR traveled to Peru (first training), to discuss the activities and schedule of the second training, among others
② From July 8 to 14, 2018, Expert Tsukamoto and the Peruvian C / P gave the second training, in which there was a presentation of the JICA project and explanations by the Peruvian side about the organizations involved, the system and mitigation plan disasters and tsunami evacuation drills, also explaining the situation in Ecuador in this regard.

This Activity was completed, as initially planned, in July 2018.

(4) The pilot municipalities, with assistance of SNGRE, conduct baseline(BL) survey on current hazard data of earthquake and tsunami disasters. (Activity 2.4)

The primary pilot municipalities, with the support of SNGRE and JICA experts, conducted a BL Survey regarding the understanding and use of information on hazards throughout the country, as well as on the content and scope of the ARR, the updating system and its dissemination plan, citizens' access to information, etc.

This Activity was not limited to mere information on hazards according to each disaster, but covered all the basic information on the disaster cycle (mitigation, preparation, emergency response, recovery and reconstruction), necessary for the preparation and updating of the ARR by the primary pilot municipalities.

(a) Collection of basic information

In September 2017, a basic information survey was conducted on the following dates:

- Atacames (September 1): SNGRE Zone Office 1 and URG
- Portoviejo (September 5): SNGRE Zone Office 4 and URG
- Portoviejo (September 18): Department of Strengthening and Development of capacities in risk management of SNGRE and UGR
- Salinas (September 11): Department of Strengthening and Development of Capacities in Risk Management of SNGRE, Zone Office 5 and UGR

(b) Discussions on vulnerability and gender during a disaster

In September 2017, the primary pilot municipalities, with the support of experts, conducted interviews on infrastructure, industrial and personal vulnerability in the entities listed below. Support in the evacuation of disabled people, prevention of violence against women and girls, the infrastructural and industrial plan, and coordination during recovery and reconstruction were issues that needed to be approached.

- Atacames: (September 1) Department of Health, Potable Water and Sewerage Company (EAPA) and School for disabled (Raúl Aray Ortiz School), by Zone Office 1 and UGR.
- Portoviejo: (September 6) Health Department and Tourism Department, (September 18) CARE NGO, (September 19) World Vision NGO and Public Works Department and (September 20) Red Cross, by Zone Office 4 and UGR.
- Salinas: (September 8) Private Elementary Schools, Department of Public Works, Department of Tourism, Family Association for People with Disabilities and Red Cross; and (September 12) MIES, Department of Health and Department of Social Participation, by the UGR.
- Regarding the general situation of damages to people with disabilities, women and children in the provinces of Esmeralda and Manabí after the Pedernales earthquake, JICA experts, together with the person in charge of SNGRE Zone Office 9, held interviews in Quito with MIES (September 15) and with UN-Woman (September 14).

Aid for the evacuation of the elderly, disabled and sick, and the prevention of violence against women and girls are issues to be approached.

(c) Preparation of the Study Report

The primary pilot municipalities, with the support SGR and JICA experts, prepared the Baseline Survey Report in November 2017, which was revised in January 2018 according to the comments of the related entities, and completed on May 22, 2018 reflecting the opinions of SGR.

This Activity ended, as initially planned, in May 2018. The final and official version of the report was completed in September 2018, SGR including a list with the names of those in charge on the last page of the report.

(5) The pilot municipalities, with assistance of SNGRE, determine an outline of ARR, which covers priority area and countermeasure(s) on risk reduction. (Activity 2.5)

The primary pilot municipalities, with the support of SGR and JICA experts, determined the basic guidelines of the ARR, taking advantage of the knowledge acquired through activities 2.3 and 2.4 and in the training in Japan, and paying attention to the points indicated in the Table 23.

Table 23. Points of attention in the discussions on the basic guidelines of the ARR

Topics	Points of attention
Sendai Framework for Disaster Risk Reduction	Contribute to the Global Objective (e).
Taking advantage of JICA projects (prior to the PCSR)	Take advantage of the know-how of similar projects of the past conducted in Peru and other neighboring countries.
Risk evaluation	Take advantage, by the pilot municipalities, of the currently available resources (existing data and collaboration of related entities, universities, etc.), without conducting activities that require a large investment, taking into account the horizontal development of the other municipalities.
Risk reduction plan and previous preparations	Focus the risk reduction plan and previous preparations within the disaster cycle. Do not include emergency responses or recovery / reconstruction.
Seismic resistance of critical infrastructures, etc.	Select critical infrastructures and show anti-seismic measures, etc. to avoid the loss of the administrative functions of the municipality in the event of a disaster.
Action program	Multi-year execution plan, municipality execution plan, budget assurance, etc.

In November 2017, the (provisional) ARR index was determined, focusing on the disaster reduction plan and previous preparations.

In February 2018, based on the previous index and the results of the Baseline Survey (Activity 2.4), a survey was conducted on the 6 points to include in the ARR, indicated in the table below, to determine the basic guidelines of the ARR (draft).

This Activity was completed in July 2018, as originally planned.

(6) The pilot municipalities, with assistance of SNGRE, review the existing Contingency Plan and other relevant document(s). (Activity 2.6)

The primary pilot municipalities revised the plans related to the response to the emergency in Japan and Ecuador, with the support of SGR and JICA experts (Table 24).
The ARR of the primary pilot municipalities gives importance to disaster mitigation and preparedness, and in Ecuador's disaster prevention system, unlike the Japanese system, the following are handled:

The disaster reduction plan
Contingency plan clearly separated

Reason for which it was decided not to include contingency-related aspects in the ARR.

Table 24. Comparison between Ecuador's Contingency Plan and Japan's Emergency Response Plan

Country	**Ecuador**	**Japan**
Plan name	**Contingency plan**	**Emergency response plan**
Content	Commissioning of the COE, Method of issuing alerts and warnings, Establishment of safety zones	Establishment of emergency activities system / Collection and broadcasting of information and media assurance / Accurate communication of information to disaster victims / Prevention of secondary disasters / First aid, rescue, medical care and fire fighting. Emergency transportation / Acceptance of refugees / Acquisition and supply of food, drinking water and basic necessities / Health, hygiene and epidemic prevention activities. Activities for the affected housings / Maintenance of social order and price stability.
Elaboration and updating	Preparation and updating each year by each municipality under the guidance of the SNGRE Zone Office	The emergency response plan is part of the regional disaster prevention plan and is established by the governor and the mayor at their respective meetings. Updating is done as needed.

SGR Headquarter has established the format for the Contingency Plan. The table of contents according to this format is as follows:

Contents of the Contingency Plan according to SGR

1. General rules
2. Background
3. Objective
4. Scope
5. Risk analysis
6. Mitigation actions
7. Preparation and response
8. Information management
9. Communication

In August 2017, it was confirmed that the municipality of Atacames and the municipality of Salinas had already prepared the Contingency Plan against El Niño and tsunami inundations and El Niño (2 separate versions), respectively. Tsunami Contingency Plan of Salinas refers for the most part to disaster preparedness for tsunami evacuation, including safety zones, evacuation routes, etc. more than emergency response.
This Activity was completed as initially planned in August 2017.

(7)The pilot municipalities, with assistance of SNGRE, prepare ARR, which gives focus on mitigation/ prevention and preparedness (the updated ARR is referred during implementation of the planned activities for Output 1 and Output 3). (Activity 2.7)

The primary pilot municipalities, with the support of SGR and JICA experts, prepared the ARR based on the ARR basic guidelines determined in Activity 2.5, focusing on the mitigation plan and disaster preparedness.

Due to the complete change in the structure of the ARR under the 2015 LPARR, there was not an “update”, but rather a “new elaboration”. The chapters of the new ARR were as follows:

Chapters of the ARR prepared through this Project
Chapter 1 Introduction
Chapter 2 Risk Analysis
Chapter 3 Disaster Mitigation Planning
Chapter 4 Disaster Preparedness Planning
Chapter 5 Program of Action for Disaster Risk Reduction

Next, the process of the development of the ARR by the primary pilot municipalities is shown in chronological order.

May 2018:

It was confirmed that the risk analysis would be conducted in Salinas on May 28, in Portoviejo on May 31 and in Atacames on June 4, with the participation of SGR Headquarters, Regional Coordinations and JICA experts.

June 2018:
On June 12, the second WG meeting on the "Risk Analysis of Chapter 2" was held in Salinas, in which the results obtained from the 4 municipalities were presented and shared.
From June 13 to 28:
A survey was made to allocate the disaster prevention budget regarding the Chapter 3 Disaster Mitigation Planning" and the "Chapter 4 Disaster Preparedness Planning".

July 2018:

The municipalities of Portoviejo on July 2, Salinas on July 16, and Atacames on July 24, discussed the justification of the allocated budget, in a joint effort with the Zone Offices, SGR Headquarters and JICA experts. Once the discussions were finished, the primary pilot municipalities proceeded with the study and drafting of "Chapter 5: Action Program for Disaster Risk Reduction".

August to September 2018

During the training in Japan on September 11, JICA experts asked the participants from the municipalities to confirm the progress of the elaboration of "Chapter 3: Planning for Disaster Mitigation" and "Chapter 4: Planning for Disaster Preparedness". Both Chapters were completed on September 28 by the primary pilot municipalities.

October 2018:
SNGRE and JICA experts held discussions with the URG of Atacames (October 23) and with the DGR of Salinas (October 30), to support the final drafting of "Chapter 2: Risk Analysis".

November 2018:
On November 6, a meeting was held in Portoviejo to prepare the final draft of "Chapter 2: Risk Analysis".

At the 4th WG meeting, held on November 16 at SNGRE, the progress of each pilot municipality in the final drafting of the ARR was confirmed, and on the schedule of November and December for the official approval of the ARR by the Mayor or Municipal Council and the publication of it.

At the Portoviejo DGR (November 13), at the Salinas DGR (November 21) and at the Atacames UGR (November 27), support was provided for the final drafting of “Chapter 1 Introduction” and “Chapter 5 Action Program for Disaster Risk Reduction” of the ARR, with the online participation of SNGRE Headquarter and its Zone Office.

January 2019:
The UGR / DGR of the 3 primary pilot municipalities, with the help of JICA experts, finished preparing the ARR, and SNGRE subsequently conducted a peer review of the ARR drawn up by each municipality. With this, the development of the ARR of the 3 pilot municipalities was completed.
The municipality of Salinas officially approved the ARR, signed by the mayor, on December 28, 2018, and then the UGR published 200 copies of it with its own budget.

March 2019:
The UGR of Atacames and the DGR of Portoviejo obtained the official approval of their ARR by the Municipal Council on March 13 and February 12, respectively (the deliberation took place in March, but the date of the signature was delayed) . With this, the ARRs of the three pilot municipalities were officially approved.

June 2019:
JICA experts visited the DGR of Portoviejo on July 2, and the UGR of Atacames on July 9, to confirm the progress of preparation for the publication of the ARR and the expected date of publication.

November 2019:
The Atacames UGR printed the ARR. By order of the mayor, the original plan to print 200 copies was expanded to 500. This UGR took the opportunity of the National Tsunami Evacuation Drill on January 31, 2020 to distribute the ARR to numerous related people who gathered at the office of evacuation drill operations.

JICA experts visited each municipality to learn the results of the monitoring and evaluation of the progress of implementation of the disaster prevention measures proposed in the ARR in 2019 (from January to September 2019).

January 2020:

JICA experts visited each municipality to learn the results of the monitoring and evaluation of the progress of implementation of the disaster prevention measures proposed in the ARR throughout 2019 (from January to December 2019).

August 2020:
The municipality of Portoviejo finished printing 500 copies of the ARR.

Figure 20. ARR prepared by the three primary pilot municipalities (Printed version)

(8) SNGRE develops ARR Guideline for Earthquake and Tsunami Disasters' that will be utilized by municipalities other than the pilot municipalities. (Activity 2.8)

The LPARR should reflect the experiences and knowledge acquired through the preparation of the ARR in the primary pilot municipalities (Activity 2.7), and be practical enough so that other municipalities that are not pilot can prepare the ARR on their own. Therefore, SNGRE, with the support of JICA experts, began preparing the LPARR in October 2018, in parallel with the final drafting of the ARR.

At the 5th WG meeting, held on January 25, 2019, SNGRE explained the content of the LPARR (provisional) to the 3 primary pilot municipalities and their Zone Offices, and reflected the comments of the WG participants, finishing elaborating the draft of it on March 22. This draft was circulated within SNGRE, to be reviewed and modified by the Deputy Secretary and other authorities, and was completed after obtaining internal approval on May 22. The publication of the LPARR (300 copies) ended with the LPARR project budget on July 1, 2019. With this, all the activities in this regard were completed.

SNGRE distributed the LPARR to all municipalities in the country and other relevant entities, and uploaded it on SNGRE Website.

Figure 21. LPARR cover

The LPARR table of contents is as indicated below. This table fully matches that of the ARR.

Preface
Chapter 1: Introduction
1.1 Background
1.2 Justification
1.3 Objective
1.4 Structure of the Cantonal Risk Reduction System

Chapter 2: Risk Analysis
2.1 Hazards in the Canton
2.2 Vulnerability analysis
2.3. Information on risks in the canton
2.4 Existing disaster risk reduction / residual risk measures

Chapter 3: Disaster Risk Reduction Planning
3.1 Land use planning considering disaster risk
3.2 Regulation of land use considering disaster risk
3.3 Strengthening disaster risk governance
3.4 Risk mitigation and preventive maintenance
3.5 Promotion of Resilient Essentials Elements

Chapter 4: Planning for Disaster Preparedness

4.1 Improvement of local capacity in disaster prevention

4.2 Evacuation measures in the event of dangerous events

4.3 Preparedness for emergency response

Chapter 5: Program of Action for Disaster Risk Reduction

5.1 Priority actions (short, mid and long term)

5.2 Measures to guarantee the disaster risk reduction budget

5.3 Monitoring, evaluation and updating of the ARR

5.4 Recommendations

This Activity will be completed in July 2019, as initially planned.

(9) SNGRE provides assistance to municipalities other than the pilot municipalities in revising ARR. (Activity 2.9)

In July 2019, the UGRs of the 4 secondary pilot municipalities, with the support of the primary pilot municipalities, Zone Offices, SNGRE Headquarters, and JICA experts, began to prepare the ARR using the LPARR from Activity 2.8. None of the secondary pilot municipalities had prepared the ARR, so it was confirmed that a new ARR would be prepared through Activity 2.9, instead of updating it.

Table 25. Current status of preparation of the ARR in the secondary pilot municipalities

Items	Esmeraldas	Sucre	Santa Elena	Santa Cruz
Population	218,000 people	57,000 people	200,000 people	20,000 people
Elaboration of the ARR	Not elaborated	Not elaborated	Not elaborated	Not elaborated
Preparation of the Contingency Plan	Elaborated	Not elaborated	Elaborated	Elaborated
No. of UGR managers	4 people	3 people	10 people	1 person
Participation in SNGRE training on the preparation of the ARR	No	No	No	No
ARR official approval process	City council / mayor	City council / mayor	City council / mayor	City council / mayor
Existence of the PDOT	Yes	Yes	Yes	Yes

Existence of the tsunami evacuation map prepared by SNGRE	Yes	Yes	Yes	Yes

The 6th WG meeting on Activity 2.9 took place at SNGRE on July 22, 2019, in which it was explained about: 1) Overview of the preparation of the ARR and schedule of activities by JICA experts, 2) Overview of the ARR by the primary pilot municipalities, 3) Current status of the ARR by the secondary pilot municipalities, and 4) Overview of the LPARR by SNGRE, to discuss it subsequently.

The process and progress of writing “Chapter 1 Introduction” and “Chapter 2 Risk Analysis” by the UGR of the respective secondary pilot municipalities is as shown in Table II.1.16. The level of understanding of the LPARR by the UGRs, their ability to develop the ARR and their enthusiasm for meeting the deadline, as well as the position of SNGRE to support the preparation of the ARR were excellent, more than initially expected, thanks to which the preparation of the ARR proceeded without major problems.

The 7th WG meeting was held in Portoviejo on December 6, 2019, to present and discuss the results of the activities and the results of the training conducted in Japan in August and September 2019. In November-December 2019, JICA experts visited the UGRs of the secondary pilot municipalities, and held study sessions on “Chapter 3: Planning for Disaster Risk Reduction”, “Chapter 4: Planning for Disaster Preparedness” and “Chapter 5: Program of Action for Disaster Risk Reduction”, of the LPARR. It should be noted that the UGR of Esmeraldas showed great will and speed in conducting the activity, having already completed the first drafts of Chapters 3 and 4 on its own before starting the study session.

Based on the knowledge acquired during the study session, and with the support of JICA experts and SNGRE, the UGR of each municipality began to prepare Chapters 3 to 5 of the ARR on its own initiative.

In January and February 2020, the experts visited the UGR of Santa Elena, Esmeraldas and Sucre to advise and guide in the review and completion of each Chapter, based on the drafts of Chapters 3 to 5 prepared by each UGR.

Receiving the peer review and correction of the experts and SNGRE, Chapters 3 to 5 of the ARR were completed by the UGR of Esmeraldas and Santa Elena in February, and then by the UGR of Sucre and Santa Cruz in April, at their own expense. It is worth noting the enthusiasm of the UGR of each municipality, which continued the preparation of the ARR in the difficult circumstances of the pandemic as of March 2020, and also the will of SNGRE, which provided support in said preparation.

The ARR, which began preparation in July 2019, was successfully completed by all municipalities in April 2020.

Each UGR proceeded with the procedures for the official approval of the final version of the ARR by the Municipal Council, using simple alternative methods, such as online meetings, emails, etc., in difficult circumstances to hold meetings of said Council in a normal manner due to the pandemic. The UGR of Esmeraldas and Sucre received the official approval of the ARR by the Municipal Council without inconveniences on May 15, 2020 and May 30, 2020, respectively.

Under the situation of the pandemic, the 8th WG meeting was held on May 29, 2020, through an online meeting. Each UGR reported on the progress and problematic points of the official approval procedures of the ARR by the Municipal Council, sharing the information among the related parties. Although it was the first time that the WG meeting had been held online, and despite the situation where a significant number of A / P staff had been forced to continuously work at home, it was possible to communicate sufficiently among more of 20 participants, without the risk of contagion and without the hassle of traveling.

Figure 22. Aspect of the 8th WG meeting of the ARR held online

The process for officially obtaining Municipal Council approval of the final version of the ARR and the process for printing the approved ARR is as shown in Table 26. All secondary pilot cities have successfully completed official approval and printing of the ARR.

Table 26.. Process of obtaining the official approval and printing of the ARR in the secondary pilot municipalities

Process	Obtain official approval from the Municipal Council of the final version of the ARR	Print the final version of the ARR	Remarks
Esmeraldas	It was obtained on May 15, 2020.	In August 2020, 200 copies were printed.	Printing expenses were covered by JICA. The UGR held the ARR award ceremony on October 13, 2020, which was officially handed over to the mayor.
Sucre	It was obtained on May 30, 2020.	In June 2021, 500 copies were printed.	Printing expenses were covered by JICA. The UGR held the ARR award ceremony on June 23, 2021, which was officially handed over to the mayor.
Santa Elena	Obtained August 23, 2021	250 copies were printed in September 2021	The official approval process of the ARR was delayed for more than a year due to the change of the Director of the UGR and the official responsible for the ARR. Printing expenses were covered by JICA.
Santa Cruz	It was obtained on April 1, 2021.	In June 2021, 300 copies were printed.	Printing expenses were covered by JICA.

The secondary pilot municipalities obtained the official approval of the ARR by the Council and Mayors until August 2021, and they finished printing it before September 2021.

At the end of the Project, in September 2021, SNGRE, with the support of JICA experts, conducted a study on the state of preparation of the ARR in all the municipalities of Ecuador (to know how many municipalities had prepared the ARR, and if the ARR considered mitigation planning and disaster preparedness, etc.). The results are shown in Table 27.

Table 27. Status of ARR preparation in all municipalities of the country (until September 2021)

Period	Level of preparation of the ARR in the municipalities	No. of municipalities in the country	No. of municipalities with the ARR elaborated	Existence of disaster mitigation and preparedness plan	Remarks
2015 – 2019	Preparation of the ARR in municipalities throughout the country in accordance with the 2015 LPARR	221	121	No	The concept of what is "Planning" of the Disaster Mitigation Plan is not included at all in the ARR.
2017 – 2019	Preparation of the ARR in the primary pilot municipalities as an activity of this Project	221	3	Yes	
2019 – 2021	Preparation of the ARR according to the LPARR 2019 in the secondary pilot municipalities as an activity of this Project	221	4	Yes	

2021	Preparation of the ARR in municipalities throughout the country in accordance with the Technical Manual for the preparation of risk reduction agendas (2020) after the national dissemination seminar on ARR organized by SNGRE (March and April 2021)	221	0	Yes	・SNGRE prepared, as a revised version of the LPARR (2019), the Technical Manual for the preparation of risk reduction agendas (2020), without support from the Project. Currently, 25 cantons of the ZO5 are preparing the ARR

At the present time, only 7 municipalities (primary and secondary pilot) have finished preparing the ARR that includes the mitigation and the preparedness plan. The remaining 214 municipalities must prepare this ARR from now on. In September 2021, some thirty of these municipalities have started to prepare the ARR, they are not yet complete

This Activity was completed as initially planned in September 2020

1.6. Activities related to Output 3

The expected effects through the activities for Output 3 are as follows:

At the municipal level, the implementation structure for the management of regulation of construction processes is established, based on the Building Regulation Management Handbook.

Activity 3.1： Baseline Survey on construction and habitability permits and inspections
Activity 3.2： Review of laws and regulations of other countries and results of JICA projects
Activity 3.3： Preparation of the Building Regulation Management Handbook (MPOPRPC) (draft)
Activity 3.4： Preparation of the Building Regulation Management Plan in accordance with the MPOPRPC (draft), and experimental implementation and updating
Activity 3.5： Holding workshops on earthquake resistant techniques and construction systems

Activity 3.6： Preparation of teaching materials for residents on earthquake-resistant techniques and construction systems

Activity 3.7： Activities to promote understanding and awareness of residents

Activity 3.8： Support in the elaboration of the Building Regulation Management Plan of other municipalities that are not pilot

Activity 3.9： EndLine Survey on construction and habitability permits and inspections

1.6.1. Activities related to all of Output 3

(1) Holding of WG meetings

The WG meetings of Output 3 were held approximately every 3 months, to know the progress of each activity and the inconveniences identified. Starting from the 9th meeting, the meetings were held not face to face, but online.

Table 28. Status of the WG meeting of Output 3

No.	Date	Topics
1	December 18, 2017	General plan, Report on training in Japan, Plan of training in a third country, and Discussions on the content of the MPOPRPC.
2	May 28, 2018	Report on training in a third country and Report on the progress of Activity 3.4 in each municipality.
3	August 1, 2018	Report on the progress of the Implementation Plan for Building Regulation Management in each municipality and Presentation of the equipment supplied by JICA.
4	November 8, 2018	Explanation about the MPOPRPC Ver.2 workshop, Presentation of teaching materials (Activity 3.6) and equipment supplied by JICA, and Report on the progress of Activity 3.4.
5	February 14, 2019	Preparation of the MPOPRPC (draft) by MIDUVI and the pilot municipalities (Activity 3.3), and MPOPRPC distribution plan
6	June 7, 2019	Report on the current situation of the primary pilot municipalities and Collaboration system with the secondary pilot municipalities.
7	November 8, 2019	Current status of construction quality inspection during construction
8	January 30, 2020	Presentation of the general vision of the workshop on the structure of seismic isolation and vibration control, Status of implementation of the Implementation Plan for Building Regulation Management in the pilot municipalities. Enforcement of the corresponding ordinance and Status of its preparation.
9	September 11, 2020 (online)	Preparation of the Implementation Plan for Building Regulation Management in the pilot municipalities, State of application of said Plan and enforcement of the corresponding ordinance.

10	March 18, 2021 (online)	Status of application of said Implementation Plan for Building Regulation Management in the pilot municipalities and enforcement of the corresponding ordinance.
11	June 29, 2021 (online)	Status of progress of Activities 3.4 and 3.8 and Baseline Survey (Activity 3.9).

(2) Activities related to the dissemination of the Building Regulation Management Handbook (MPOPRPC)

(a) Pilot training

MIDUVI, CICP (Association of Civil Engineers of the Province of Pichincha), and ESPE University organized a pilot training to present the MPOPRPC, the final version of which was prepared in February 2019. This training was held from July 22 to 26, 2019 (5 days) in the CICP conference room in Quito the average number of participants was about 20 people per day. In addition, a conference on the MPOPRPC was held in the hall of the Association in the evening on July 24 and 25. The number of participants was 193 on July 24 and 146 on July 25.

Figure 24. Pilot training (July 22-26, 40-hour course)

Figure 25. Information about the conference (July 24 and 25) (MIDUVI and CICP websites) and appearance of the conference room)

(b) Seismic resistance seminar and MPOPRPC workshop

From December 11 to December 13, 2019, the Seismic Resistance Seminar (a project subsidized by the Ministry of Land, Infrastructure, and Transportation), organized by the Japanese Society for Seismic Isolation (JSSI) and MIDUVI, was held, with the participation of institutions, universities and private companies related to disaster prevention in Ecuador. The first day the presentation of the Building Regulation Management Handbook took place, as part of Output 3 of this Project.

Figure 26. Seismic resistance seminar and Building Regulation Management Handbook workshop

(c) Workshop for all the municipalities of the country

On March 6, 2020, AME (Association of Municipalities of Ecuador), in collaboration with the Expert Team and MIDUVI, organized a workshop to disseminate the Building Regulation Management Handbook in the AME Hall. 65 people participated in this workshop, including construction managers from different municipalities.

Figure 27. Building Regulation Management Handbook Workshop (March 6, 2020)

(d) National Dissemination seminar for the Building Regulation Management Handbook

On October 21, 2020, a national online deployment seminar was held related to the Building Regulation Management Handbook, organized by MIDUVI directed for people from Guayaquil and Cuenca. 223 people that were connected to the MIDUVI platform and another 113 through SNS ("Facebook") attended it. Initially, the seminar was scheduled to be held in person in Guayaquil in May 2020 and in Cuenca in August 2020, but due to the pandemic, it was held online.

On April 27, 2021, MIDUVI gave a double seminar on the revision of the Ecuadorian Construction Code (NEC) and the presentation of the Building Regulation Management Handbook.

(e) Implementation Plan for Building Regulation Management (PIRPC) (draft)

The PIRPC (draft) was prepared in order to support the development of the PIRPC and the establishment of the corresponding ordinance in municipalities throughout the country in accordance with the Building Regulation Management Handbook. The PIRPC (draft) was reviewed and modified by MIDUVI's Deputy Secretary of Habitat and Public Space in July 2020, and was reviewed again by AME in September 2020. In December 2020 MIDUVI's Communication Department prepared a draft, the final version, which was completed in February 2021.

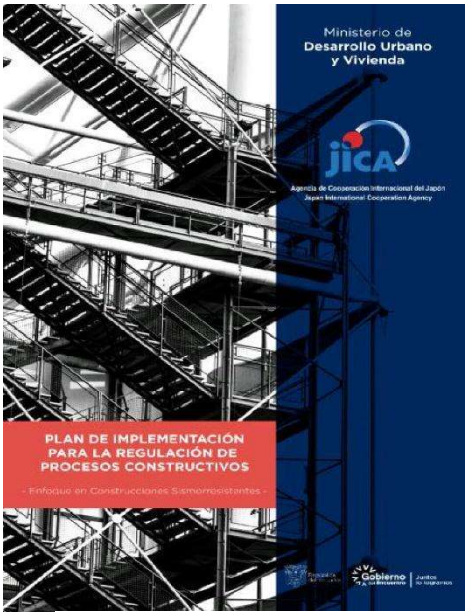


Figure 28. PIRPC (Cover)

(f) Guide for Output 3

The Guide for Output 3 (Result 3) was prepared according to each achievement with the presentation of the activities for Output 3, including 25 work points. This Guide was

completed in October 2020, inserting articles with the opinions sent by MIDUVI, SNGRE, and the municipality of Salinas.

Figure 29. Guide for Output 3 (Cover)

1.6.2. Activities of Output 3

(1) MIDUVI and the pilot municipalities, with collaboration of the technical collaborating members, conduct baseline survey to understand the current situation of building construction permit/ inspections/ occupation permit. (Activity 3.1)

At the beginning of the Project, the Baseline Survey was carried out for the three pilot municipalities and MIDUVI. In September 2017, the draft report was prepared, and in December 2017, the survey was completed with subsequent complementary observations, etc. This activity was carried out as initially planned.

Table 12. Items of the Baseline Survey and End line Survey of the three pilot municipalities in relation to Output 3

Items	Content of the survey
General information about buildings	Number of buildings, number of buildings by use, number of buildings by type of structure, number of informal constructions or without engineering design, number of constructions per year, and construction status of public buildings.
Constructive systems ordinance	Ordinance content, existence or not of penalties and their content
Approval by the mayor and	Status of approval of the operation plan of construction systems by the Mayor and Municipal Council.

municipal council	
Organization and system	Organization in charge of construction and habitability permits and inspections, and state of improvement of the systems.
Capacity and specialty	Technical history of the personnel in charge and experience and expertise in structural design evaluation and inspection.
Fulfillment of seismic resistance normative	Compliance status with the anti-seismic standards CEC1977, CEC2001, and NEC15.
Construction permit	Necessary documents, the content of inspection of the structure, registration status, and number of buildings allowed per year, number of days for inspection and examination, cost of inspection and examination, need or not of notice to start the work, content of notice, and content and level of inspection and examination.
Structural calculation	Status of use of software, method of confirmation on the relevance of input and output of data, and level of understanding of the content of the calculation.
Structural design	Composition of designs, level of standard drawings and detailed drawings, description of material specifications, and content of testing and inspection of materials.
Soil Study	Content of soil study
Intermediate Inspection	Existence or not of formats, inspection content, material testing status, registration status, and cost and level of inspection.
Final Inspection	Existence or not of formats, inspection content, material testing status, registration status, and cost and level of inspection
Inspection Fee	Intermediate inspection and final inspection rate, and habitability permit rate.

(2) MIDUVI and the pilot municipalities study foreign building regulation (e.g., Architect and Building Engineer Law, Construction Business Law) as well as JICA projects (e.g., TAISHIN in El Salvador) for the objective of development of MPOPRPC. (Activity 3.2)

In addition to the overview of related Japanese laws (translated into Spanish), a review of the knowledge acquired in the TAISHIN project in El Salvador was carried out as part of the JICA Project. Regarding the training in a third country (El Salvador), carried out in March 2018, a mention has been made in the Section 1.3.5 . This Activity was completed in March 2018, taking place as initially planned.

(3) MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, develop MPOPRPC (draft)' in consultation with building engineers, construction companies and other relevant association(s).(draft) (Activity 3.3.)

The preparation of the Building Regulation Management Handbook was completed in February 2019, and 500 copies were printed and bound. The Building Regulation Management Handbook was distributed to related entities, in addition to being published on the MIDUVI website in May 2020 in all cities of the country on the AME seminar. In March 2020, the printed and bound copies were distributed to all municipalities in the country. The Building Regulation Management Handbook was titled Manual for the Regulation of Construction Processes -Focus on Earthquake-resistant Constructions-. The title page and the index are shown in Figure II.1.30 and Table II.1.20, respectively, and the background to the development of the Building Regulation Management Handbook is shown in Figure II.1.31. This Activity, in general terms, was carried out as initially planned.

Figure 30. Cover of Building Regulation Management Handbook

Index of Building Regulation Management Handbook

Preface
Introduction
A: Operation of building regulation management
B: Procedure flow of review and inspection
1. Building construction permit procedure
2. Construction quality Inspection and procedure for an occupation permit
C: Structural Review

1. General considerations for evaluating the design of structures
2. Considerations of regularity and elevation on the floor
3. Document necessary for the review of building construction permit
4. Review method to obtain the building construction permit
5. Structural review method
6. Parameters for redesign, reconstruction, restoration, conservation, readjustment, expansion, or modification of buildings
7. Issue of building construction permit

D: Construction Quality Inspection

1. Method of construction quality inspection during construction
2. Method of construction quality inspection upon construction and procedure to issue occupation permit.

E: Annex

E-1. Reference material related to NEC 15, ordinance, and others
E-2. Reference materials for Seismic design
E-3. Reference materials for Seismic retrofit (Only for reference)

Figure 31. Background to the development of Building Regulation Management Handbook

Figure 32. Scenario of use with related personnel

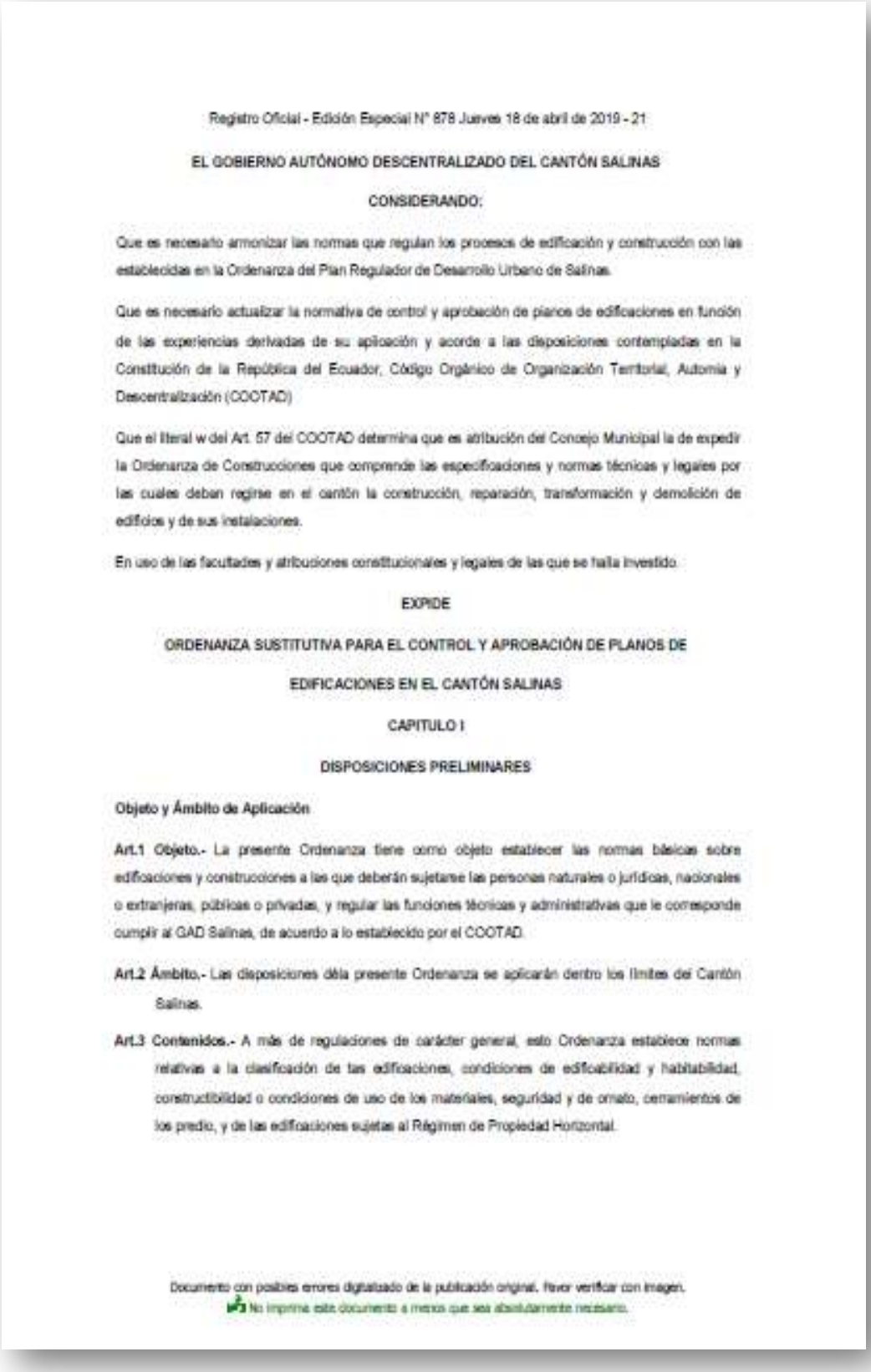
(4) The pilot municipalities, with assistance of MIDUVI, develop, execute and update building regulation management plan(s) in accordance with the MPOPRPC.(draft) (Activity 3.4)

Table 13. Status of approval and application of the ordinance in the three primary pilot municipalities

Municipality	Status of approval	Status of application
Atacames	On May 9, 2019, the ordinance was provisionally approved, but did not enter into force due to incomplete details and lack of official registration. Subsequently, the first approval by the City Council took place in June 2021, the second and last approval during the month of July, and finally, in August it has been officially registered.	Inspection sheets for the foundation, floor beams, columns, and slabs are prepared for the construction quality inspection during the construction site. The municipal staff carries out the quality inspection of the construction during the work. The municipal staff also do the structural review at the time of granting the construction permit. No subcontracting is foreseen.
Portoviejo	The technical ordinance was approved on December 29, 2017. On April 16, 2018, the	The municipality staff carries out the structural review and the final inspection of the construction at the time of

	complementary ordinance on construction (tributary ordinance) was approved. The revised ordinance related to inspections during construction was passed on March 29, 2019.	granting the construction permit. Portovivienda (Municipal Housing Supply Corporation) carries out the construction quality inspection during the work. This inspection became mandatory as of May 29, 2019 (the ordinance went into effect 2 months after approval).
Salinas	The City Council and Mayor approved the ordinance on February 1, 2019.	The official registration of the construction ordinance took place in May 2019. This ordinance became operational in mid-July 2019. During construction, visual inspections are sometimes carried out from the outside. There are several cases where construction does not start even after the building permit has been obtained.

Figure 33 Cover of PIRPC, Municipality of Portoviejo (for public relations)



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EL GOBIERNO AUTÓNOMO DESCENTRALIZADO DEL CANTÓN SALINAS

CONSIDERANDO:

Que es necesario armonizar las normas que regulan los procesos de edificación y construcción con las establecidas en la Ordenanza del Plan Regulador de Desarrollo Urbano de Salinas.

Que es necesario actualizar la normativa de control y aprobación de planos de edificaciones en función de las experiencias derivadas de su aplicación y acorde a las disposiciones contempladas en la Constitución de la República del Ecuador, Código Orgánico de Organización Territorial, Autonía y Descentralización (COOTAD)

Que el literal w del Art. 57 del COOTAD determina que es atribución del Concejo Municipal la de expedir la Ordenanza de Construcciones que comprende las especificaciones y normas técnicas y legales por las cuales deban regirse en el cantón la construcción, reparación, transformación y demolición de edificios y de sus instalaciones.

En uso de las facultades y atribuciones constitucionales y legales de las que se halla investido

EXPIDE

ORDENANZA SUSTITUTIVA PARA EL CONTROL Y APROBACIÓN DE PLANOS DE EDIFICACIONES EN EL CANTÓN SALINAS

CAPITULO I

DISPOSICIONES PRELIMINARES

Objeto y Ámbito de Aplicación

Art.1 Objeto.- La presente Ordenanza tiene como objeto establecer las normas básicas sobre edificaciones y construcciones a las que deberán sujetarse las personas naturales o jurídicas, nacionales o extranjeras, públicas o privadas, y regular las funciones técnicas y administrativas que le corresponde cumplir al GAD Salinas, de acuerdo a lo establecido por el COOTAD.

Art.2 Ámbito.- Las disposiciones déla presente Ordenanza se aplicarán dentro los límites del Cantón Salinas.

Art.3 Contenidos.- A más de regulaciones de carácter general, esta Ordenanza establece normas relativas a la clasificación de las edificaciones, condiciones de edificabilidad y habitabilidad, constructibilidad o condiciones de uso de los materiales, seguridad y de ornato, cerramientos de los predio, y de las edificaciones sujetas al Régimen de Propiedad Horizontal.

Documento con posibles errores digitalizado de la publicación original. Favor verificar con imagen.
No imprima este documento a menos que sea absolutamente necesario.

Figure 34. Salinas Municipal Building Ordinance Officially Registered

This Activity had the changes shown below compared to what was initially planned.

In the municipality of Atacames, the approval of the construction ordinance was delayed due to the change of mayor and planning director in office in May 2019. In addition, the law required the preparation of the PDOT and the Plan for the Use and Management of the Land and the establishment of the ordinance on these plans before September 2021, in line with which the approval process of the construction ordinance was carried out. Likewise, due to the limitations of face-to-face activities because of the pandemic, the general progress of the Activity was delayed, despite this; the construction system ordinance was finally approved in July 2021.

In the municipality of Salinas, the initial plan was complied with until the ordinance was approved. However, because of the subsequent reduction of personnel due to municipal financing problems, as well as the impact of the pandemic, as of March 2020, it was difficult to carry out the quality inspection of the construction during the work and the inspection of the quality of construction at the end of the work.

In the municipality of Portoviejo, the performance of the above-mentioned inspections was limited by the pandemic since March 2020.

(5) MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, organize seminars on earthquake-resistance/ seismic resilient engineering and building regulation management, which are targeting architects, construction companies, construction workers and other relevant association(s). (Activity 3.5)

Half-day workshops were held twice a year on construction systems and earthquake-resistant technology in relation to the building permit, inspections, and occupation permit. With the meeting in Esmeraldas on March 4, 2021, the plan was completed for seven sessions. This activity was carried out as initially planned.

Table 31. Workshop for experts (Topic: Construction systems and earthquake-resistant technology)

No.	Municipality	Date	Venue	Participants
1st Workshop	Quito	January 28, 2018	Hall of Association of Civil Engineers of Pichincha	245 people
2nd Workshop	Portoviejo	August 8, 2018	Hall of Technical University of Manabí	179 people
3rd Workshop	Salinas	February 7, 2019	Hall of Hotel Rivera del Mar	50 people
4th Workshop	Atacames	August 7, 2019	Meeting hall Atacames municipality	26 people

5th Workshop	Sucre	January 29, 2020	Meeting hall of Education department (Sucre municipality)	42 people
6th Workshop	Santa Elena	January 25, 2020	Online	-
7th Workshop	Esmeraldas	March 4, 2021	Online	37 people

(6) MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, produce socialization materials on earthquake-resistance/ building regulation management in order to raise awareness of local communities (materials produced by JICA project implemented in El Salvador may be referred). (Activity 3.6)

The preparation of the teaching materials was completed in January 2019, consisting of 8 pages in A5 format. 5,000 copies were printed and distributed to the primary and secondary pilot municipalities, related entities, and workshop participants. The cover is shown in figure II.1.35. This activity was carried out as initially planned.

Figure 35. Cover of educational materials for raising awareness about earthquake-resistant buildings

(7) MIDUVI and the pilot municipalities organize activities utilizing the materials developed in Activity 3.6 with the objective of raising-awareness of local communities. (Activity 3.7)

Workshops on the awareness and socialization of earthquake-resistant buildings were held for residents and building owners in the pilot municipalities starting in 2018. The workshop in Santa Elena, scheduled for August 2020, was held on November 26 online due to the pandemic.

The 6 scheduled workshops were completed with the last one held in Esmeraldas in March 2021. This Activity was carried out as initially planned.

Table 32. Workshop for residents and building owners (Topic: Awareness and socialization of earthquake-resistant buildings)

No.	Municipality	Date	Venue	Participants
1st Workshop	Portoviejo	August 9, 2018	Hall of Technical University of Manabí	77 people
2nd Workshop	Salinas	February 8, 2019	Hall of Hotel Rivera del Mar	30 people
3rd Workshop	Atacames	August 8, 2019	Meeting hall Atacames municipality	22 people
4th Workshop	Sucre	January 30, 2020	Meeting hall of Education department (Sucre municipality)	36 people
5th Workshop	Santa Elena	November 26, 2020	Online	—
6th Workshop	Esmeraldas	March 5, 2021	Online	23 people

(8) MIDUVI, with cooperation of the pilot municipalities, provides assistance to 3 municipalities in preparing building regulation management plan in accordance with the MPOPRPC. (Activity 3.8)

MIDUVI and JICA experts provided support to the secondary pilot municipalities in the establishment of the Implementation Plan for the Regulation of Construction Processes and in the elaboration of the ordinance. The implementation of the ordinance was scheduled for August 2020 in Esmeraldas, May 2020 in Sucre, and August 2020 in Santa Elena. Due to the influence of the pandemic, at the end of August 2021, none of these municipalities has been able to enact the ordinance; however, the construction system ordinance of the GAD Santa Elena was approved on September 3.

Table 33. Status of preparation and application of the ordinance in the four secondary pilot municipalities

Municipality	Status of approval	Status of application

Esmeraldas	The ordinance on construction processes consisted of Chapters from 1 to 10, but for legal reasons the structure was changed to Chapters from 1 to 8 together with annexes. The development of the PDOT (Plan of Development and Territorial Planning) on land use was carried out in parallel. The approval procedure for the construction ordinance review is underway and approval is scheduled for October 2021.	The structural review at the time of granting the building permit will be carried out by the Planning Department. The building inspector carries out inspection and advice during construction. The construction quality inspection for the occupation permit will be carried out separately.
Sucre	The draft ordinance was developed in consultation with the legal department in January 2019 and sent to the mayor's office in February. The Development Planning Department, on its own initiative, plans to obtain approval of the ordinance on the Land Use and Management Plan until the end of September 2021 and the ordinance of the construction system until December 2021, as part of the Urban Code (provisional name).	The Planning Department, in charge of examining the construction and granting construction permission, observes the construction and structure. The Construction Department plans to carry out the quality inspection of the construction during the work and at the end of the work.
Santa Elena	The first debate with the City Council and the Mayor took place on February 12, 2020. The first approval was obtained by the City Council in November 2020. In 2021, the ordinance approval process is expected to go ahead. At the time of July, in the municipality there have been several discussions with the residents through visits to each community to gain their understanding. The building system ordinance was approved on September 3, 2021	Once the ordinance is approved, an attempt will be made to create a review and inspection system by hiring new staff.
Santa Cruz	The review of the ordinance of the construction processes will be carried out in parallel to the development of the PDOT. The construction ordinance will be approved together with the approval of the	A study was carried out on how the ideal organization of the municipality should be, together with the issue of elaboration of the ordinance. Now, the municipality does not have civil (structural) engineers.

	ordinance on Land Use and Management Plan in September 2021. The ordinance is scheduled to be passed in December 2021.	

This Activity was modified in the points indicated below, comparing with what was initially planned.
The pandemic forced a delay in face-to-face activities. In addition, the law required the preparation of the PDOT and the Land Use and Management Plan and the establishment of the ordinance on these plans before September 2021, in line with which the municipalities have to carry out the review of construction processes adjusting the corresponding schedule.

(9) MIDUVI and the pilot municipalities conduct the end line survey on building construction permit/ inspections/ occupation permit. (Activity 3.9)

Between May and July 2021, the End line survey was carried out through online meetings.

The result of the said survey is indicated below in order of primary pilot municipalities, secondary pilot municipalities, and MIDUVI.

(a) Primary pilot municipalities

The status of approval and application of the ordinance in each municipality is as shown in Table 33.

Table 34. Status of preparation and application of the ordinance in the three pilot municipalities

Municipality	Status of approval	Status of application
Atacames	The Municipal Council approved the construction ordinance after having held 2 debate sessions on July 11 and 18, 2021. The official registration of this ordinance is scheduled for the following days.	The construction ordinance was approved in July 2021 but has to be implemented. According to the Implementation Plan, the municipal staff, according to the inspection sheet, carry out the quality inspection of the construction during the work. The municipal staff also do the structural review at the time of granting the construction permit. No subcontracting is foreseen.
Portoviejo	The technical ordinance was approved on December 29, 2017, the tributary ordinance on April 16, 2018, and the	The municipality's staff carry out the structural review at the time of granting the construction permit and the construction quality inspection at the end of the work. Portovivienda (Municipal

	revised ordinance regarding inspections during the work on March 29, 2019.	Housing Supply Corporation) carries out the construction quality inspection during the work. The number of buildings for which a building permit was requested was 1,380 in 2019, of which 931 were allowed. The total number of types 3 and 5, which are general buildings, is 95. In 2020, there were 1,203 applications, of which 715 were approved. There are 52 general buildings, type 3 and 5. In 2021 (until June) 756 applications were submitted, of which 463 were approved. There are 41 buildings in total for type 3 and 5, which are general buildings. The structural examination rate for buildings in general is 100%. The number and rate of construction quality inspection buildings during construction. In 2019, 326 of 931 buildings were implemented (35.05%), in 2020, 481 of 715 buildings were implemented (79%). The number of general buildings is about 10% of the total and the inspection rate is 100%. The number and rate of inspection buildings at the time of completion of construction. In 2019, there was 126 buildings (13%), in 2020, there was 142 buildings (19.9%) and in 2021 (until June), there was 91 buildings (19.5%). The number of general buildings is about 10% of the total and the inspection rate is 100%. In inspection format, it is exclusive to the city. All general buildings other than private houses are inspected, including private housing. As one of the reasons why the reviews and inspections could not be carried out sufficiently, the impact of the pandemic can be cited as of March 2020.
Salinas	The City Council and Mayor approved the replacement ordinance on February 1, 2019. The official registration	Between April 2019 and the end of July 2021 (28 months), there were 508 applications for the building permit, the breakdown of which was 483 for private homes and 25 for general buildings

	of the construction ordinance took place in May 2019. Following the preparation of the annexes to the ordinance and the development of the computerized cost system, the ordinance became operational in mid-July 2019.	The ratio between the number of revisions for the general building construction permit and the number of applications for this permit is 18/25 = 72.0%> 50% (target value). The proportion regarding quality inspections of the construction of general buildings during the work is 0/25 = 0% <50% (target value). Due to a lack of labor, no inspections have been conducted during construction. Regarding these inspections at the time of completion of the work, the proportion is 13/13 = 100%> 50% (target value). The fact that the number of cases is relatively low suggests that the building owners did not submit some requests for inspection. As reasons why the municipality did not carry out sufficient reviews and inspections, we can cite the decrease in human resources due to the lack of the municipal budget and the impact of activity restrictions due to the pandemic as of March 2020.

(b) Secondary pilot municipality

Table 34 shows the status of approval and application of the ordinance in the secondary pilot municipalities

Table 35. Status of approval and application of the ordinance in the secondary pilot municipalities

Municipality	Status of approval	Status of application
Esmeraldas	It is intended to complete the approval procedures for the revision of the construction ordinance in September 2021, in order to obtain its approval in October.	The Planning Department performs the structural review at the time of granting the construction permit. The construction inspector carries out inspection and advice during construction. The construction quality inspection for the occupation permit is carried out separately.
Sucre	Approval is expected until December 2021, as part of the Urban Code (provisional translation). The main causes of the delay include the impact of the pandemic and the delay in hiring the land-use consultant for the PDOT ordinance.	An engineer will be hired for the structural review at the time of granting the building permit. The support of the Association of Engineers and Architects of the province of Manabí is not considered at this time. The Construction

		Department plans to carry out the quality inspection of the construction during the construction and at the end of the construction.
Santa Elena	The approval of the City Council was obtained in the first session of November 2020. However, there were protests from the representatives of the local communities about the payment of the fees. Faced with this situation, socialization activities had to be reinforced in this regard, and it took several days to make the necessary adjustments due to the pandemic. The ordinance of the construction system was approved on September 3, 2021, in agreement with the neighbors.	Once the ordinance is approved, the municipality plans to hire 3 technicians (2 structural engineers and an architect), as members of the Construction Control Unit. After the ordinance is approved, it is intended to establish a review and inspection system by hiring new personnel.
Santa Cruz	Approval of the construction ordinance is expected in December 2021, together with the ordinance of the "Land Use and Management Plan".	In accordance with the ordinance, it is being studied how the ideal organization of the municipal government should be. Now, the municipality does not have any civil (structural) engineers.

(c) MIDUVI

The products listed below were produced as originally planned.

- Building Regulation Management Handbook (Activity 3.3)
- Implementation Plan for the Regulation of Construction Processes (Activity 3.4)
- Educational material for residents about earthquake-resistant technology and construction process (Activity 3.6)

The Building Regulation Management Handbook was developed in February 2019 and uploaded to the MIDUVI website in May 2019. However, the ministerial decree regarding the framework of the Handbook has not yet entered in force as of September 2021. So far, MIDUVI has given priority to the introduction and actual dissemination of the Building Regulation Management Handbook among interested parties. In addition to the seminars in the pilot municipalities, to date, it has carried out the following seminars and workshops:

Table 36. Seminars and workshops for the dissemination of Building Regulation Management Handbook

	Name	Venue	Date	No. of participants and other
1	Pilot training	Conference hall of CICP in Quito	July 22-26, 2019 (5 days)	20 people/day approx.

2	Conference	Conference hall of CICP in Quito	July 24 and 25, 2019	193 people (day 24) and 146 people (day 25)
3	Workshop	Conference hall of CICP in Quito	December 11, 2019	On the 12th and 13th there was also a seminar on earthquake resistance (seismic isolation and damping).
4	Workshop for all municipalities in Ecuador	Conference hall of AME Quito	May 3, 2020	65 people, including construction managers in each municipality.
5	National dissemination workshop	Online	October 21, 2020	People related from Guayaquil and Cuenca
6	NEC revision seminar and presentation of Building Regulation Management Handbook	Online	April 27, 2021	Note: NEC is the Ecuadorian Construction Code

In relation to the issuance of the ministerial decree for the Building Regulation Management Handbook, MIDUVI has carried out or plans to carry out the following activities:

- On June 4, 2021, the MIDUVI Deputy Secretary issued a letter in order to convene the Technical Committee meeting to review Handbook and discuss the NEC approval processes.
- The first meeting of the Technical Committee was held on July 8, 2021, to develop the roadmap from July to November 2021. The approval of the Handbook by the Technical Committee is expected in October, the approval of the "Recognized Document", that will be part of the NEC, by the Executive Committee of the NEC in October, and the socialization at the national level in November.

2. Achievements of the Project

2.1. Outputs and Indicators (Target values and actual values at completion)

The degree of compliance with the indicators is expressed in three levels: High (more than 80%), Medium (from 50% to 80%), and Low (less than 50%), together with the percentage of achievement, observing globally generating positive effects.

2.1.1. Indicator 1: Before project completion, at least two tsunami evacuation drills are conducted in each of the pilot municipalities, in accordance with the evacuation plan and protocol improved through the Project

Evaluation of the degree of compliance with the objectively verifiable Indicator: High (More than 100% achieved)

Indicator 1 of the Project Objective consists of: “Before the end of the Project, at least two evacuation drills due to a tsunami are carried out in each of the pilot municipalities, in accordance with the evacuation plan and the improved protocol by the Project”.

The primary and secondary pilot municipalities, in accordance with the SNGRE guidelines, make an effort to carry out a nationwide tsunami evacuation drill annually since 2018, around January 31, a total of 3 times until now. In addition to these drills, in accordance with the objective of the Project, the pilot municipalities also tried to carry out an evacuation drill at the municipal level as of 2018, which took place 2 times in total with dates established by each municipality. Since February 2020, due to the pandemic, this municipal drill was canceled or postponed to avoid activities that caused crowds. Once this impediment is removed, tsunami evacuation drills are expected to be held twice a year, one at the national level and one at the municipal level.

In the tsunami evacuation drill, SNGRE, after receiving the information on seismic observations from IG-EPN and the information on the tsunami prediction from INOCAR, decides on the need to issue the tsunami alert and, if so, gives instructions to the ECU 911 so that they can give the alert through the SAT, this being the protocol for the ECU 911. The residents and tourists who heard the SAT alert moved towards the security zones located outside the areas with the possibility of flooding by a tsunami, passing through the evacuation routes established by the Project and following the guidance of the firefighters, police officers and disaster prevention managers of each municipality. Some municipalities planned and practiced the drill opting for vertical evacuation, due to the long distance to a high and safe place, pointing to the tsunami evacuation buildings that host the refugees, which was an idea that had never been adopted in Ecuador. The tsunami evacuation towers, visited during the training in Japan, are also needed in some places in Ecuador, which is why a study was carried out in this regard in the Project.

2.1.2. Indicator 2: ARR is developed in 5 of 6 municipalities that received technical guidance from SNGRE

Evaluation of the degree of compliance with the objectively verifiable Indicator: High (100% achieved)

Indicator 2 of the Project Objective consists of: "ARR is developed in 5 of 6 municipalities that received technical guidance from SNGRE."

All of the seven pilot municipalities, 3 primaries, and 4 secondaries, successfully prepared the ARR almost on their own, with the support of the SNGRE and experts from JICA. Therefore, it is considered that Result 2 has been achieved more than what is established in the Indicator.

2.1.3. Indicator 3: Required works are implemented, in accordance with the Building Regulation Management (MPOPRPC), prepared in the Project, in each of the pilot municipalities

Evaluation of the degree of compliance with the objectively verifiable Indicator: High (90% achieved)

Activity 3.4 in the primary pilot municipalities and Activity 3.8 in the secondary municipalities were highly affected by the pandemic. Some municipalities suffered a reduction in staff due to the budget reduction. However, the activities for the entire Project have been sufficiently carried out, with the hope that they will be further developed in the future, so it is considered that, in general terms, the activities have been carried out almost successfully, achieving the positive effects established in the Project Objective to a great extent.

2.1.4. Indicator 4: SNGRE and MIDUVI, before the end of the Project, conduct training for the officials of all the zone offices using the guides and manuals prepared

Evaluation of the degree of compliance with the objectively verifiable Indicator: High (90% achieved)

Towards the middle and in the second half of the Project, the SNGRE and the pilot municipalities held workshops and seminars for the transfer of technology to the personnel of the zone offices, to the personnel of other municipalities outside the pilot municipalities, to residents, among others, using the intermediate products produced by the Project. In these events, they invited the jurisdictional zone offices to participate, especially notifying them from the planning stage, so that they also performed the function of organizers. Table 36 shows the activities in which the personnel of the zone offices and the municipalities indicated above participated. Thanks to these activities, it is evaluated that compliance with this Indicator is high.

Table 37. Training and technology transfer to the personnel of the Zone Offices and the GADs outside the pilot municipalities

Date	Event	Activity
March 15 and 16, 2021	Workshop on PET in the province of Esmeraldas (Atacames)	1.3
March 22 and 23, 2021	Workshop on PET in the province of Manabí (Portoviejo)	1.3
March 31 and April 1, 2021	Workshop on PET in the province of El Oro (Machala)	1.3
June 10 and 11, 2021	Workshop on PET in the province of Santa Elena and Guayas (Salinas)	1.3
July 8-14, 2018	Training of RRA in a third country (Peru)	2.3
August 29 until September 10, 2019	Training in Japan	2.2
March 17, 2021	1st seminar of RRA at a national level (online)	2.9
April 14, 2021	2nd seminar of RRA at a national level (online) (online)	2.9
January 28, 2018	Workshop on earthquake resistant technology and construction processes (Quito)	3.5
August 8, 2018	Workshop on earthquake resistant technology and construction processes (Portoviejo)	3.5
February 7, 2019	Workshop on earthquake resistant technology and construction processes (Salinas)	3.5
August 7, 2019	Workshop on earthquake resistant technology and construction processes (Atacames)	3.5
December 11, 2019	Workshop on earthquake resistant technology and construction processes (Quito)	3.5
January 29, 2020	Workshop on earthquake resistant technology and construction processes (Sucre)	3.5
March 6, 2020	Workshop on earthquake resistant technology and construction processes organized by AME (Quito)	3.5
October 21, 2020	National seminar of Building Regulation Management Handbook (Guayaquil and Cuenca) (online)	3.5
November 26, 2020	Workshop on earthquake resistant technology and construction processes (Santa Elena)	3.5
From June 2021	National seminar of Building Regulation Management Handbook (online)	3.5

2.2. Project Objective and Indicators (values to be achieved and real values achieved at the end of the Project)

2.2.1 Evaluation of the fulfillment degree of the Project Objective

The technical assistance structure of SNGRE and MIDUVI is established at the municipal level for the reduction of damages caused by earthquakes and tsunami.
Evaluation of the degree of compliance with the objectively verifiable Indicator: High (90% achieved)

From the beginning of this Project, the activities were carried out together with the three pilot municipalities (Atacames, Portoviejo and Salinas). Since the fourth CCC, the 4 secondary pilot municipalities (Esmeraldas, Sucre, Santa Elena, and Santa Cruz) were incorporated, which led on to work with seven municipalities in total. The SNGRE and MIDUVI promoted the Project with a view to establishing a technical support system for the municipalities. The intermediate products were prepared by the Project based on the experiences and real cases of the pilot municipalities. Due to the frequent change of staff in the regional offices, a trend towards instability of the support system was observed. In general, it is considered that the project objectives are evaluated, the degree of fulfillment of the Project Objective is high.

2.2.2. Establishment of the collaboration system between SNGRE, MIDUVI, and the pilot municipalities

In this Project, SNGRE and MIDUVI were assigned the initiative of the activities, both being responsible for preparing the Project Execution Plan, carrying out the Project activities, preparing products and approving results. In addition, the staff of the MIDUVI headquarter and/or the technical offices participated in the activities of the pilot municipalities, respecting the positions of the different parties, and working together in the execution of the Project. Although SNGRE and MIDUVI took the initiative in the CCC and WG meetings, in local activities, in training in Japan, etc., they respected the ideas and wishes of the pilot municipalities.

2.2.3. Activation of WG

From the beginning of the Project, SNGRE, MIDUVI, the pilot municipalities and related entities formed a WG whose members worked until the end of the Project confirming the objectives, guidelines, activities, progress, and results obtained.

2.2.4. Dissemination in secondary pilot municipalities

In the second half of the Project, municipalities similar to the three primary pilot municipalities were selected in terms of disaster risks, in which there was the hope of deploying the Project, with a view to its horizontal development, using the results obtained to date. This work was carried out taking into account the points indicated below. To this end, technical support was very actively provided, not only by the SNGRE and MIDUVI, but also by the members of the primary pilot municipalities, including the understanding of the mayors.

In Output 1, the MTEPET and awareness-raising brochures and videos were used to develop the concept and method of tsunami evacuation, etc., with the cooperation of the primary pilot municipalities**.**

In Output 2, the LPARR was used for the pilot municipalities (Activity 2.8), in order to provide support in updating the RRA specialized in earthquakes and tsunami to other municipalities that are not pilot municipalities (Activity 2.9).

In Output 3, the MPOPRPC (Activities 3.3 and 3.4) was used to deepen the understanding of construction processes. Through the call for participation in the workshops, an attempt was made to socialize these processes among the many related people from the secondary pilot municipalities.

2.2.5. National dissemination of the Project in municipalities throughout the country in the final phase

The years 2020 and 2021 have been called “Years of National Deployment,” in which the SNGRE and MIDUVI have demonstrated their leadership. Deployment in the secondary pilot municipalities began in all seriousness after the mayors took office in May 2019. Based on the experiences and achievements of the primary pilot municipalities, and also using the MTEPET of Output 1, LPARR of Output 2, MPOPRPC of Output 3, and other documents already prepared, smooth deployment of the Project was carried out in the secondary pilot municipalities.

As a national deployment, in Output 1 seminars on PET were held for municipalities in coastal areas. In Output 2, seminars on RRA in municipalities across the country. In Output 3, seminars on the MPOPRPC were held in Quito, Guayaquil, and Cuenca.

3. History of PDM modification

3.1. Revision of PDM ver.1 to PDM ver.2 (2nd meeting of the JCC)

Numerical figures were assigned to the PDM ver.1 indicators without value, to prepare the PDM ver.2.

3.1.1. Output 1 Indicators:

The degree of understanding about tsunami evacuation is increased by 50%, compared to the result of the Baseline Study. → X% was changed to 50%.

3.1.2. Output 2 Indicator:

More than three municipalities other than the pilot municipalities receive technical guidance from SNGRE on the revision of the Risk Reduction Agenda. → YY municipalities were changed to three municipalities.

3.1.3. Output 3 Indicator:

In the pilot municipalities, the rate of the intermediate and final inspection of constructions is increased by 50%, compared with the result of the Baseline Study. → X% was changed to 50%.

The Municipal Plan of Procedures for Obtaining Permits and Regulation of Construction Processes in three municipalities different from the pilot municipalities is established. → DD municipalities were changed to three municipalities.

3.2. Revision of PDM ver.2 to PDM ver.3 (3rd meeting of the JCC)

Once the proposed changes were agreed at the 3rd WG of Output 1, they were proposed at the 3rd JCC, and the following Indicator was approved:
The level of understanding of the essential aspects for tsunami evacuation reaches at least 60% of the result of the End line survey in each pilot municipality.

3.3. Revision of PDM ver.3 to PDM ver.4 (5th meeting of the JCC)

The proposals of the Mid-term Review were announced at the 5th meeting of the CCC, becoming official changes.

Table 38. Confirmation of changes in the PDM

Paragraphs to change	Changes to introduce
Paragraph 2 of Superior Goal	Added: "using the Guidelines for the Preparation of the Risk Reduction Agenda."
Paragraph 4 of Superior Goal	Change from “ZZ” to “4” (number of secondary pilot municipalities.

Paragraph 4 of Project Objective	It is added: "SNGRE and MIDUVI, before the end of the Project, carry out training for the officials of all the zonal coordination's using the guides and manuals prepared."
Paragraph 3 of Output 2 (about RRA)	Change from "More than 3" to "3 or more".
Activity 1.1	The XXXX entities that approve are specified as follows: "as approved by SNGRE, IG-EPN and INOCAR."
Activity 2.7	Change from "Output 3" to "Output 1 and Output 3"
Activity 3.8	Change from "ZZ municipalities" to "3 municipalities

3.4. Revision of PDM ver.4 to PDM ver.5 (7th meeting of the JCC)

The two changes indicated below were due to the pandemic, which made it impossible to carry out the planned activities in Ecuador.

3.4.1. Change of the Project period (extension of 6 months):

From July 2017 to September 2021 (51 months)

3.4.2. Change of Japan Training of 2020:

Regarding the "Training in Japan", it is changed to "Training on tsunami evacuation plan and disaster risk reduction in Japan and Ecuador: For the directive level and for the technical level. Refer to the attached PDM and PO.

4. Others

4.1. Results of Environmental and Social Considerations

This Project was always carried out based on the fundamental guidelines on environmental and social considerations. Although there were no activities that could cause changes in the environment, low-impact places were chosen when studying and planning evacuation routes due to tsunami and safety zones. The RRA describes the prevention of environmental deterioration due to disasters. Environmental and social considerations are included in the PIRPC in terms of promoting safer housing construction. Since the secondary pilot municipality of Santa Cruz is in the Special Galapagos Regime, in this Project the studies, plans, etc. were carried out, in accordance with the regulations of the authorities regarding environmental considerations.

4.2. Results of Considerations on Gender

In this Project, an attempt was made to know the current situation of gender considerations through the Baseline Survey regarding the understanding and knowledge of residents regarding disaster risks. The Team of Experts ordered monthly records of the participants in the awareness-raising activities according to each gender, to promote that equal participation was taken into account. The SNGRE, MIDUVI and the pilot municipalities, C / P entities, have a large number of female staff, so an attempt was made to encourage their active participation in each of the activities of this Project, such as awareness raising, risk assessment, preparation of the risk reduction plan, development of human resources, etc.

III. Result of Joint Review

1. Result of Review based on DAC Evaluation Criteria

1.1. Relevance

General evaluation: High

1.1.1. Relevance of Indicator 1

Relevance: High

Output 1 is consistent with Ecuadorian policy, the Sendai Framework for Disaster Reduction, and the needs of the SNGRE, so its relevance is high.

The improvement of evacuation measures due to tsunamis coincides with the priority policy of the National Development Plan of Ecuador 2017-2021 (1.11). This policy defines the reduction of vulnerability and the promotion of a culture of prevention and comprehensive risk management, including natural disasters, among citizens, so this activity, which promotes the strengthening of capacities of Ecuador in disaster prevention by tsunami and earthquake, may contribute to it.

In addition, this activity is closely related to the Sendai Framework for Disaster Risk Reduction 2015-2030, therefore, through the collection, analysis and use of data on disasters, the preparation of the RRA and of budget assurance for risk reduction. It can contribute to the following Priority Actions: 1 “Understanding disaster risk”, 2 “Strengthening disaster risk governance to manage it” and 3 “Investing in disaster risk reduction for resilience”.

The mission of the SNGRE and the UGR of each municipality is to protect people and communities from the negative impacts of natural or human-caused disasters, and this activity seeks to strengthen the capacity for earthquake and tsunami disaster management to a municipal level, thus coinciding with the mission of the C/P entities. Likewise, it meets the needs of indirect beneficiaries (Ecuadorian people) by promoting Safe and Resilient Cities against Earthquake and Tsunami Disasters.

1.1.2. Relevance of Indicator 2

Relevance: High

Output 2 is consistent with Ecuadorian policy, the Sendai Framework for Disaster Reduction, and the needs of the SNGRE, so its relevance is high.

Article 35 of the Organic Law Project of the Decentralized National Risk Management System of Ecuador stipulates that local governments (provincial and municipal) must prepare their RRA in harmony with the National Disaster Mitigation Plan (not yet finalized) and include it within the PDOT, which is why the development of the RRA by the pilot municipalities coincides with said policy. On the other hand, the SNGRE promotes the following Global Objective of the Sendai Framework for Disaster Reduction 2015-2030: "(e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020", by what the elaboration of the ARR also agrees with this objective.

1.1.3. Relevance of Indicator 3

Relevance: High

Output 3 activities contribute to Priority Action 3 of the Sendai Framework for Disaster Risk Reduction: "Invest in disaster risk reduction for resilience", and meet the needs of MIDUVI, C/P institution. Therefore, the relevance of Indicator 3 is high.

This Project promotes earthquake-resistant constructions by improving the system for the implementation of construction processes at the municipal level, which coincides with MIDUVI's mission of providing safe housing to citizens. Likewise, this mission coincides with the needs of indirect beneficiaries (Ecuadorian citizens) by promoting Safe and Resilient Cities against Earthquake and Tsunami Disasters in Ecuador.

1.1.4. Relevance of Indicator 4

Relevance: High

The intermediate products (guides, manuals, guidelines, etc.) of the Project were prepared at the initiative of the SNGRE and MIDUVI, having discussed the details with the Zone offices and the pilot municipalities during the test phase (WG meetings, local information sessions, etc.), and reflecting the real situation and wishes of the pilot municipalities. The content meets the needs of the SNGRE and MIDUVI, so the relevance is high.

1.2. Effectiveness

General Evaluation: Relatively high

1.2.1. Indicator 1 effectiveness

Effectiveness: High

Because of this activity, in the 7 pilot municipalities, it was possible to visualize the areas assumed to be inundated by a tsunami and the times of arrival of the tsunami, and in accordance with all these data, maps and evacuation plans were drawn up. Based on all this information, altitude signage and evacuation buildings were improved, and more than 5 evacuation drills were carried out. Thanks to a series of activities, citizens and tourists were able to raise their awareness of tsunami, the safety methods and zones being widely recognized, which is why the effectiveness is considered high.

1.2.2. Indicator 2 effectiveness

Effectiveness: High

Output 2 is considered very effective since the ARRs have been developed and socialized in the seven pilot cities. The importance of disaster prevention always remained high during the Projects execution period, under the background that the Project Organic Law of the Decentralized National Risk Management System in Ecuador is on the table.

1.2.3. Indicator 3 effectiveness

Effectiveness: Relatively High

Regarding the perspective of achieving the Project objective, there are some partial delays, however, the system for implementing construction processes has been sufficiently improved, and the achievement of the Indicator is promising, which is why it is considered that the effectiveness is relatively high. As an external condition for the achievement of the Project Objective, it is indicated that “the priority of risk management in Ecuador's policy should not be lowered,” but this priority has never suffered a decline.

1.2.4. Indicator 4 effectiveness

Effectiveness: High

The Zone Offices and the pilot municipalities have minimal human resources, and there is a limit to creating their own technical manuals. They also have few opportunities to participate in training courses, etc. Under these circumstances, it is very effective for the SNGRE and MIDUVI to prepare intermediate products (guides, manuals, guidelines, etc.) to guide the personnel of the Zone Offices and the pilot municipalities and improve their capacities and techniques. For

this purpose, personnel from different offices were included in their training programs in Japan and third countries, in order to improve their understanding of the Project.

1.3. Efficiency

General Evaluation: Medium

1.3.1. Indicator 1 Efficiency

Efficiency: Relatively high

Due to the numerous dismissals and movement of C/P personnel in the SNGRE Headquarters and in Zone offices, the contributions were insufficient until the middle of the Project. Although the positive effects of the training in Japan and third countries were very important, it was not possible to make effective use of all the inputs, as many of the participants who participated in the training were forced to leave their jobs or move later, therefore they did not have the opportunity to get involved in tsunami evacuation measures.

For this reason, the efficiency is considered relatively high.

1.3.2. Indicator 2 Efficiency

Efficiency: Relatively high

There were some dismissals and movements in the C/P personnel who actively participated in the preparation of the ARR despite their multiple occupations, both in the pilot municipalities, as well as in the Zone Offices and Headquarters of the SNGRE. Fortunately, there were no changes in the C/P personnel of the SNGRE Headquarters that carried out the driving force of the activities. Although inputs were not used sufficiently in some aspects, Output 2 was successfully achieved.

Although the positive effects of the training in Japan and third countries were very important, it was not possible to make effective use of all the inputs, since many of the participants in the training had to leave their jobs or move, and they did not have opportunities to get involved in the development of the ARR.

For this reason, the efficiency is considered relatively high.

1.3.3. Indicator 3 Efficiency

Efficiency: Medium

Overall, the expected positive effects have largely been achieved, although some activities were delayed due to the reduction in the municipal budget and the impact of the pandemic. Face-to-face activities were limited, and instead, the number of online videoconferences increased to deal with the situation. The equipment and materials supplied were used efficiently and effectively. Human resources, equipment and local activity expenses were used effectively.

The C/P entities highly evaluate the specialty of the JICA experts and recognize that the number of days of their stays has been sufficient to achieve the expected effects.

The effects of the training in Japan and in third countries were significant, contributing to the implementation of the constructive processes applicable in Ecuador, which served to establish and strengthen the relationship of trust between related people. On the other hand, the contributions were not used sufficiently due to the changes and movement of the participants in the training in Japan and third countries for Output 3.

There were numerous dismissals and movements of the C / P personnel, the contributions being insufficient, so it is considered that the efficiency in general is of a medium level.

1.3.4. Indicator 4 Efficiency

Efficiency: Medium

Although the necessary training has been carried out, the contributions were not used sufficiently due to the numerous dismissals and movements of the personnel of the Zonal Offices. According to the previous manager, the Project experience of the previous managers was not sufficiently transferred to their successors. In this situation, it is evaluated that the efficiency, in general, is of medium level.

1.4. Impact

General Evaluation: High

1.4.1. Impact of Indicator 1

Impact: Very High

From the middle to the end of the Project, there were multiple positive impacts. The SNGRE published the MTEPET (Ver.1) reflecting the experiences of tsunami disasters in Japan and based on this Manual held a workshop on the MTEPET for all municipalities and prefectures located in coastal areas 4 times, in total , from March to June 2021. This workshop was completely directed at the initiative of the SNGRE, from planning to preparation and organization, taking place with the participation of numerous municipalities in the Coastal Region, and during the same, the MTEPET was distributed (Ver.1) to all municipalities and Zone Offices of the SNGRE. The pilot municipalities also held their own seminars and events on tsunami measures for citizens. INOCAR organized an annual tsunami evacuation event on November 5, matching the date with World Tsunami Awareness Day, and began disseminating information about it to government officials, researchers, and students.

The pilot municipalities have experience in the preparation of the PET and in conducting evacuation drills on their own, with the support of the SNGRE and experts from JICA. It can be judged that the experience of the SNGRE Headquarters and Zone Office and the primary and secondary pilot municipalities, having worked together during the Project may be sufficiently used for subsequent horizontal development.

The municipalities of the coastal areas of Ecuador are very aware of the tsunami crisis and have high expectations about the PET, constantly conducting evacuation drills twice a year, for which it is considered that the Project Objective Indicators will be achieved.

1.4.2. Impact of Indicator 2

Impact: High

At the end of the Project, there were multiple positive impacts. On one hand, the development of the Technical Manual for the Preparation of Risk Reduction Agendas in 2020 by the SNGRE, as a revised version of the LPARR (2019), outside the activities of the Project and without its support. On the other hand, in April 2021, SNGRE Headquarters planned, prepared, organized, and successfully held the second ARR national deployment seminar (Webinar) for municipalities and provinces throughout the country, with numerous participants, from completely independently and without support from the Project Team. With all this, it can be judged that the SNGRE has sufficient capacity and enthusiasm to develop ARR at the national level in a sustainable way.

The pilot municipalities have experience in preparing the new ARR almost on their own, with the support of the SNGRE and JICA experts. Therefore, it is considered that these municipalities have the capacity to update their ARR by themselves, which is why the Higher Objective Indicators will be achieved. Likewise, more than 3 UGRs that do not belong to the pilot

municipalities have begun to prepare the ARR with the support of SNGRE headquarters, for which it is considered that the Project Objective Indicators will be achieved.

1.4.3. Impact of Indicator 3

Impact: High

In the pilot municipalities, the promotion of understanding and the development of capacities has been clearly recognized regarding the need to carry out the structural review at the time of granting the construction permit, the quality inspection during construction, and the quality inspection of the construction at the end of the construction.

The number of workshops in Quito and the pilot municipalities for engineers, architects, residents, and building owners exceeded the 13 planned, and with the addition of 6 workshops for professionals (including 1 for municipalities across the country by AME) with a total of 19.

MIDUVI has begun preparing for the national deployment of the MPOPRPC throughout the country, in harmony with the dissemination of the NEC (Ecuadorian Construction Code). For this purpose, the issuance of a ministerial agreement is expected towards the end of 2021. For this national deployment, it is necessary to review the construction ordinance of each municipality, and to this end, a path is being opened.

1.4.4. Impact of Indicator 4

Impact: High

An attempt has been made to involve the Zone Offices as far as possible in the Project activities to be carried out in the pilot municipalities, thanks to which the coordination between the SNGRE and MIDUVI, the Zone Offices, and the pilot municipalities was improved. On the other hand, the Zone Offices became able to provide guidance and support to other municipalities that are not pilot municipalities, making it possible to develop the Project within their jurisdictions, which is why it is evaluated that the impact of this Project at the level of Zone Offices is high.

1.5. Sustainability

General Evaluation: Medium

1.5.1. Sustainability of Indicator 1

Sustainability: Relatively high

Sustainability regarding political and institutional aspects is high. Currently, the Organic Law Project of the Decentralized National Risk Management System of Ecuador, which is in the process of deliberation in the National Congress, specifies that local governments (provincial and municipal) must prepare their ARR, etc. Therefore, if such a law comes into force, it is assumed that the sustainability in the development and updating of the tsunami evacuation plan will also rise further.

Organizational sustainability is of medium level. The number of personnel involved in tsunami evacuation measures is limited, in addition to changes and movements of personnel in charge. Therefore, there is some concern regarding sustainability if the trained personnel are terminated or moved to a totally unrelated section. However, if the MTEPET (Ver.1) developed to train new human resources is used well, it can be considered that sustainability will not be affected.

Financial sustainability is relatively high. The preparation of the PET and the carrying out of evacuation drills by the municipalities do not require a significant budget, since they only need personnel expenses and printing of socialization materials.

Technical sustainability is high. The SNGRE has already prepared the MTEPET through the Project activities. A workshop on PET was organized as well for coastal municipalities between March and June 2021 and shared the manual with all related municipalities and provinces.

1.5.2. Sustainability of Indicator 2

Sustainability: Medium

Sustainability regarding political and institutional aspects is high. Currently, the Organic Law Project of the Decentralized National Risk Management System of Ecuador, which is in the process of deliberation in the National Congress, specifies that local governments (provincial and municipal) must prepare their ARR, etc. Therefore, if such a law comes into force, it is assumed that sustainability will rise even higher.

Organizational sustainability is of medium level. The number of personnel involved in the preparation of the ARR is limited, and there have been changes and movements of personnel in charge. Therefore, there is some concern regarding sustainability if the trained personnel are terminated or moved to a totally unrelated section.

Financial sustainability is relatively high. The preparation of the ARR by the municipalities and the provision of support by the SNGRE do not require a significant budget, since they only require personnel and printing costs of the ARR. The pilot municipalities carry out the monitoring and evaluation of the disaster prevention measures proposed in the ARR and budgeted by the municipalities, and progress on the status of application of these measures is relatively good.

Technical sustainability is high. The SNGRE has already prepared the MTEPET through the Project activities. It also organized a national deployment seminar of the ARR for the municipalities in March and April 2021, sharing the LPARR with the municipalities and provinces.

Technical sustainability is high. The SNGRE already developed the LPARR through the Project activities. It also organized a national deployment workshop for the ARR in March and April 2021, sharing this Guideline with the municipalities and provinces.

1.5.3. Sustainability of Indicator 3

Sustainability: Medium

Sustainability regarding political and institutional aspects is relatively high. The cooperative relationship between related entities (C/P entities, pilot municipalities, AME, universities, etc.) is being established or strengthened through this Project, and it is considered that this relationship will contribute to the sustainability of the Results.

Organizational sustainability is of medium level. There are no problems regarding the participation of the A / P entities, as “owners” of the Project, and the capacity of the personnel is improving through the same. In return, the number of personnel participating in the Project is limited, and there are frequent changes and movements of the personnel in charge. Therefore, the sustainability of the Project Results constitutes a challenge when the trained personnel cease or move to a totally unrelated section.

Technical sustainability is medium level. Manuals, guides, and teaching materials that convey technical details are developed and shared within the organization. A significant number of the staff of the C/P entities and the pilot municipalities have strengthened their capacity through training in Japan or third countries and through the activities of the Project, being in a position to provide support to other municipalities as an instructor. However, developing training systems within the organization remains a challenge. Among the measures applied to this effect, it can be given as an example that in June 2021 three small online seminars were organized, two for municipal staff and another for engineers and technicians to strengthen their personal training.

1.5.4. Sustainability of Indicator 4

Sustainability: Medium

The understanding of the role of the Zone Offices to carry out the Project activities has deepened. Manuals and guides have been developed that serve to transfer techniques regarding all Results, sharing them within the organization. Taking into account the frequent movements of personnel, it is evaluated that the technical sustainability is of medium level.

1.6. Coherence

General Evaluation: High

1.6.1. Coherence of Indicator 1

Coherence: High

During the execution of this Project in Ecuador, the BID and the Non-reimbursable Cooperation for Community Human Security Projects of Japan helped to develop the SAT and the emergency sirens, setting the challenge of how to use them to evacuate citizens and tourists. In the Project, through the preparation of the map and evacuation plan due to tsunamis, an attempt was made to clarify the current situation and problems of each municipality, to carry out studies on

evacuation measures that "leaves no one behind", as indicated in the Sustainable Development Goals (ODS).

In the tsunami evacuation drills and other activities involving citizens and tourists, not only Ecuadorian entities, but also agencies, such as USAID and **ADRA**, JICA youth volunteers, Japanese researchers in disaster prevention education, etc. collaborated in search of a way to improve evacuation measures, which is why it is considered that synergy effect has been achieved between the projects.

1.6.2. Coherence of Indicator 2

Coherence: Relatively high

In order for the C/P staff of the SNGRE and the primary pilot municipalities to be able to prepare the ARR efficiently and effectively, training was carried out in a third country, Peru, where a very positive result had been achieved in the development of the disaster prevention plan. This personnel was able, through this training, to improve their knowledge of similar JICA projects in a neighboring country, achieving important synergistic effects between the projects, which is why coherence is considered relatively high.

1.6.3. Coherence of Indicator 3

Coherence: High

Regarding internal coherence with the Ecuadorian Construction Code (NEC), which guarantees the earthquake resistance of buildings, MIDUVI framed the MPOPRPC as a tool to apply and complement the NEC in the national deployment seminar of Result 3, which is why it is considered as high coherence. In addition, synergistic effects are recognized with respect to the Land Use and Management Plan, the preparation of which will be required by law before September 2021 for all municipalities in the country.

Regarding external coherence, there is cooperation with the UNDP, a donor that provided support in the preparation of the explanatory guide to the NEC, for which is it considered of high coherence.

1.6.4. Coherence of Indicator 4

Coherence: High

Disaster prevention management is the responsibility of each Risk Management Committee (CGR) and Emergency Operation Committee (COE), established at the national, provincial, and

municipal levels, respectively. Risk management at the municipal level is assumed by the UGR or DGR of each municipality, while coordination at the provincial level is the responsibility of the provincial governments and the Zone Offices. In this sense, it is important that the SNGRE and MIDUVI provide training and orientation courses to their respective Zone Offices, in order to link the national, provincial, and municipal levels, which maintains coherence from the organizational and institutional point of view.

1.7. Comprehensive evaluation

Table III.1.1 summarizes the evaluation results of the 6 criteria. The executing entities carried out the activities in a very positive way, in harmony with the policies of Ecuador, the National Deployment Plan 2017-2021, Global Objectives of the Sendai Framework for Disaster Risk Reduction, and the needs of the SNGRE, MIDUVI, and pilot municipalities. The final stage of the Project was greatly affected by the pandemic, and it is undeniable that sufficient efforts could not be made to address pending issues and new challenges.

Table 39. Summary of general evaluations

Evaluation Criteria	General Evaluation	Indicator 1	Indicator 2	Indicator 3	Indicator 4
Relevance	High	High	High	High	High
Effectiveness	Relatively high	High	High	Relatively high	High
Efficiency	Medium	Relatively high	Relatively high	Medium	Medium
Impact	High	Very high	High	High	High
Sustainability	Medium	Relatively high	Relatively high	Medium	Medium
Coherence	High	High	Relatively high	High	High

2. Key Factors Affecting Implementation and Outcomes

2.1. Transfer or resignation of Project staff

In the SNGRE, the MIDUVI, the Zone Offices, and the municipalities, there were numerous movements of personnel and retirements, giving rise to frequent changes of the managers, which made it difficult to transfer the technology developed to date. This problem was very particular to government institutions, such as SNGRE, MIDUVI, and pilot municipalities, so the director of the JICA Office in Ecuador expressed his concern at the CCC meeting, also requesting the experts to minimize the risks by not changing C / P personnel whenever possible. In particular, it was requested that the participants in the training in Japan be able to maintain the relationship with the Project for as long as possible. However, the situation of frequent transfers and retirements did not improve.

The Expert Team tried exhaustively that the C/P comply with the delivery of the work and with the preparation of manuals and guides promptly enough so that SNGRE, MIDUVI, their respective Zone Offices, and the 3 pilot municipalities to expand their capacities with the participation of as to many personnel as possible.

2.2. National mayoral elections in March 2019

In March 2019, the national mayor elections took place. These elections were also held in the 3 primary pilot municipalities. Because of these, the mayor of Atacames was replaced, although this did not imply a significant impact on the activities of the Project, since most of the C/P personnel were able to maintain their position. In the secondary pilot municipalities, before the start of the project, 3 mayors had been replaced, but their willingness to participate in the Project was transferred to their successors, thanks to which the Project was implemented without major problems.

2.3. Political instability in Ecuador

In the entire country, there were strikes by people in charge of transportation and various entities against the policy of financial austerity (for example, a rise in the price of gasoline, etc.), which came into effect on October 3, 2019, causing a dangerous situation. The WG meeting on Outcome 1, scheduled for October 4, was suddenly postponed. Expert Mr. Nishi left Guayaquil on October 6 to return to Japan in order to keep safe from danger, and Expert Mr. Kato's trip from Narita, Japan, on October 8, was postponed. Subsequently, on October 14, it was reported that the protest activities had ended, and communication with the JICA Office continued to confirm the situation. Finally, on November 22, JICA granted the experts permission to travel to Ecuador.

2.4. Change of Government in May 2021

On May 24, 2021, a new Government was formed, and the heads of SNGRE and MIDUVI were replaced. Consequently, the deputy director of the SNGRE and the vice minister of MIDUVI, who assumed the positions of director and co-director of the Project were also replaced. In accordance with the transition to the new administration, explanations were given to those responsible for the Project about the activities planned for the final stage of the Project, making it possible to deepen their understanding. There was hardly any impact on the execution of the Project, since most of the personnel in charge at a practical level were able to maintain their position.

2.5. Spread of infection by the pandemic

In Ecuador, since the first case of coronavirus infection within the country was confirmed on February 29, 2020, the number of infections continued to increase rapidly. For this reason, a state

of emergency was declared, and various measures were applied, such as the suspension of national and international flights, the closure of airports, the prohibition of travel between provinces, and restrictions of leaving the house. Since then, the declaration and lifting of the state of emergency have been repeated.

The Expert Team, following the activities carried out in Ecuador in February 2020, has continued to exchange information and discuss the work with the C/P by email and through online meetings for approximately one year and six months. The C/P responsible for crisis management was engaged in infection prevention activities, while the rest of the C/P worked mainly from home. Both the Team of Experts and the C/P had difficulties carrying out on-site work, which led to the stagnation of Project activities. In view of this situation, at the 7th JCC meeting on September 30, 2020, a 6-month extension of the Project period was approved, until the end of September 2021.

Vaccination in Japan was an important advance, and the vaccinated experts resumed their travels in August 2021, taking the utmost care in preventing being infected in order to complete the Project's activities.

3. Evaluation on the resuts of the Project Risk Management

There were some difficulties in the execution of the Project in the organizational and institutional aspects in Ecuador. Furthermore, the deterioration of the social and security situation was difficult to foresee before the start of the Project, and preventive measures were not taken into consideration at the planning stage. Once an incident has occurred, alternative measures have been taken to deal with the suspensions and changes in order to minimize the impact on the Project. The very sudden change in the situation brought on by the pandemic was difficult to foresee, but the C / P and the experts worked together to minimize the damage as much as possible. The absence of major natural catastrophes during the Project period was also a favorable factor in its execution.

The main points of consideration were the following:

3.1. Organizational matters

3.1.1. Activation of Working Group (WG)

From the beginning of the Project, a WG was formed for each Result, where the members reported on their activities and results obtained. There were opinions that the frequency of the WG meetings was not enough to share information and clarify guidelines and problems, so at the 2nd meeting of the JCC, the decision was made to activate the WG. From this meeting forward, the activities of the WG began to be carried out in a more positive way through the collaboration of the SNGRE, MIDUVI and, the pilot municipalities.

3.1.2. Measures against dismissals and movements of C / P personnel

In the SNGRE, the MIDUVI, the Zonal Offices, and the municipalities there were numerous changes and layoffs of personnel, and it happened frequently that each time an expert arrived; the person in charge was already another person. In these circumstances, it was difficult to carry out the technology transfer that had been developing to date. This situation could not be changed due to specific problems of the administrative institutions, such as SNGRE, MIDUVI, and pilot municipalities; however, in a meeting of the CCC, the director of the JICA Office expressed his concern in this regard, has also requested experts not to move the C / P staff as much as possible. It was requested that the participants in the training in Japan could continue the relationship with the Project for as long as possible. However, the situation did not improve, following the frequent movements and resignations even at the top level.

The Expert Team tried that the C / P comply with the delivery of the work exhaustively and with the preparation of manuals and guides promptly enough and that the SNGRE, MIDUVI, their respective Zonal Offices, and the 3 pilot municipalities expanded their bases with the participation of as many personnel as possible.

3.2. Social affairs

3.2.1. Overcome the limitations of Project activities due to the pandemic

After the 6th JCC meeting on February 10, 2020, the pandemic began in Japan and, as of March 2020, the infection began to spread in Ecuador as well, hindering social and Project activities. Subsequently, due to the spread of the infection in both countries, the Project activities were restricted to being carried out online and with the use of e-mails to provide support. The UGR of SNGRE and the pilot municipalities were very busy between the tasks of responding to emergencies, preventing infection, carrying on disinfection, supporting the livelihoods of citizens, etc., and there were cases in which the staff of C/P and the assistants were infected, including their relatives. The experts provided support in the work as long as it did not interfere with the activities of the C/P.

Starting in June 2020, as the infection risk signal changed from red to yellow, online meetings and the use of emails to learn about the situation and advise on activities were more actively carried out. Individual meetings and WG meetings were held online, and training via Webinar. The effects were not as good as those of the on-site activities were, but it was possible to achieve positive results up to a certain level. Under these circumstances, the role of the Project assistants was very important. They played a highly relevant role, making visits to the different entities, communicating instructions from the experts, planning, and preparing online meetings, interpreting services, preparing minutes, holding local workshops, etc.

3.3. Operational aspects

3.3.1. Conduct of tsunami inundation drills by INOCAR

In response to the results of the INOCAR tsunami inundation simulation, it was planned to review the tsunami evacuation maps, develop evacuation plans based on these maps, and plan awareness-raising activities.

However, the delivery of the results indicated above was delayed, affecting the progress of the Project, which is why the expert Mr. Wada was sent in April 2019, to solve the technical problems of INOCAR. Because of this, progress was made in the tsunami flood simulations of the 3 primary pilot municipalities, the results of which were provided at the end of April 2019. These results were released at the 6th WG meeting in June 2019, and they were officially delivered to the SNGRE at the end of that month. They were also delivered in July to the 3 pilot municipalities where they were used to prepare the tsunami evacuation plan.

INOCAR is expected to ensure and improve its capabilities in numerical simulation techniques and has the appropriate analysis equipment, so that it can establish and maintain a system that allows it to provide simulation results before the requested delivery date.

It is assumed that, from now on, there will be numerous cases in which other municipalities, besides the pilot municipalities, study the possibility of elaborating the evacuation plan for a tsunami. For this reason, it is necessary that the simulations of flooding by tsunami in the Ecuadorian coastal areas be carried out in a planned manner at the initiative of INOCAR, in order to present the results as quickly as possible when requested.

3.3.2. Delay in the approval of the revision of the construction ordinance in the municipality of Atacames

As of May 2019, the former mayor of Atacames approved the conditional construction ordinance before leaving office. However, this ordinance did not come into force due to incomplete drafting and the lack of official registration. As of May 2019, the new system under the new mayor took a long time to get up and running. Despite having proceeded with the procedures for the approval of the ordinance together with the PDOT and the "Planning Code" with the hope of obtaining it in May 2021, however, because of the pandemic, it took a long time but was finally approved by July 2021.

3.3.3. Delay in the ministerial decree on the MPOPRPC

The MPOPRPC (Activity 3.3) was prepared in February 2019, and the PDF version of the same was published on the MIDUVI website in May of the same year.

Regarding the legal position of the MPOPRPC, discussions continued with those in charge since before the issuance of the decree by MIDUVI. However, over time, there was a change in the minister of MIDUVI and movement of personnel in the Department of Habitat and Public Space, an entity of C/P, in the positions of deputy secretary, director, and personnel in charge, so there is no obtained the expected results in this regard. In August 2019, the Team of Experts, together with the director of the JICA Office, had the opportunity to meet with the minister and vice-minister, at this meeting he asked them to take this matter into account. The minister and vice-minister responded that the legal department would be in charge of reviewing it. In February 2020, the staff in charge was asked to issue the ministerial decree before the JCC meeting, scheduled for September 2020. Subsequently, the pandemic began and there was a change in the minister and staff in charge in May 2020. In July 2020, during the online meeting, the staff in charge were again asked to take forward the issue in question. Right after, the MIDUVI has prepared a roadmap to be incorporated into the NEC, beginning its activities with the intention of validating the ministerial decree in November 2021.

4. Lessons learned

4.1. Lessons learned in all the activities of the Project

4.1.1. Expert visits and efficient on-site studies

With 7 pilot municipalities, plus the SNGRE and MIDUVI, as C/P entities, complaints were raised by Ecuador about the lack of involvement of JICA experts and the scarcity of visits to each of these municipalities. The experts had to travel between the cities of Quito, Guayaquil, Atacames, Portoviejo, and Salinas. In some cases, they were not able to respond sufficiently to the needs of each municipality, since the dates of visits, the people they visited, and the nature of their activities differed according to the area in which they were in charge.

In the second half of the Project, in order to meet the needs of the pilot municipalities and carry out the Project within the period of allocation, which was gradually decreasing, the experts shared information among themselves and helped each other in different areas, also starting to count on local assistants. They also participated in online meetings from Japan to try to cover for the miscommunication.

4.1.2. Exchange of information with those responsible for the Project and high-level authorities

In the first year of the Project, the activities were carried out around the WG. However, there were objections regarding the results by the Project Director, which caused the activities and decisions of the WG to be revoked and to return to the starting point. To avoid this situation, the WG leaders and experts met with the director as often as possible, to try to explain the content of the Project. With this, a better understanding of the Project manager and greater fluidity in management and decision-making was achieved.

In order to carry out the activities, an attempt was made to periodically exchange opinions on the status of progress with the deputy secretary of SNGRE and the vice minister of MIDUVI, paying due attention to sharing the information in this regard.

4.2. Lessons learned from activities related to Output 1

4.2.1. Inspection and revision process for the publication of products (Activity 1.3)

The situation persisted in which the basic results of the Project, such as the tsunami flood simulation, the MTEPET, among others, had not yet made themselves known, which was an obstacle to carrying out the planned activities. In the SNGRE there is a strong tendency to internally review the documents to be published several times to ensure that they are perfect, after which another department reviews them and makes changes and then the head of the first department reviews them again and makes more changes. This procedure gives rise to a significant delay in the delivery of the products, even in cases where personnel changes occur during this period, which makes the review return to the starting point.

In the case of products that require numerous confirmations and reviews, the lesson learned is that all the people and departments involved in the same product need to be brought together at a given time, to make mutual confirmations and determine the points to review. This way they can proceed to build the next version, which is the way to make fast and safe progress.

4.2.2. On the selection of posters and leaflets (Activity 1.4)

For awareness-raising activities in the communities, brochures were produced in collaboration with experts and C / P entities. However, some municipalities commented on the possibility that people would look at the brochure during the workshop but leave it there or throw it away afterward, which was a waste. Faced with this situation, they switched to posters, which can be placed for a long time in public places, hotels, and restaurants.

Brochures, on the other hand, are easier to disseminate among tourists and other temporary visitors, being necessary to use brochures or posters depending on the people to target. If we consider the contents of the evacuation backpack, brochures are more effective, as they include

the necessary information that can be viewed at home. The tsunami safety zone list, on the other hand, is most effective when posted in public places.

Awareness activities should be planned in a strategic way, considering the people they are targeting, the information to be conveyed and the means of communication to be used.

4.3. Lessons learned from activities related to Output 2

4.3.1. Activities related to the preparation of the ARR by the secondary pilot municipalities (Activity 2.9)

In the second half of the Project, when the UGR was prepared for each secondary pilot municipality, it was initially expected that the primary pilot municipalities and the SNGRE Zone Offices would play the role of instructors. However, through the activities, it became clear that this was difficult, from the point of view of their experience and ability. The lesson learned was that it would be more practical for the UGR of each secondary pilot municipality, which had the experience of having fought to develop the ARR on its own and the SNGRE Head Quarter to act as instructors and promoters for the future National deployment in other municipalities. At the ARR National Deployment Seminars (Webinars), organized by SNGRE in March and April 2021, SNGRE staff and UGR members from each secondary pilot municipality served as teachers and flag bearers.

4.3.2 Restrictions on activities in secondary pilot municipalities due to the pandemic (Activity 2.9)

Due to the pandemic, it was not possible to provide face-to-face support to the UGRs of the secondary pilot municipalities in the preparation of the ARR. However, thanks to remote support from SNGRE and from experts via email and online WG meetings, all municipalities were able to successfully complete their ARR before April 2020. As one of the important factors in the successful preparation of the ARR can be cited the high level of motivation, initiative, and responsibility of the UGR staff of each secondary municipality, which allowed them to work remotely in said preparation by themselves, although with the help of the SNGRE and the experts.

4.4. Lessons learned from activities related to Output 3

4.4.1. On the preparation and execution of the Project Execution Plan

There are cases where the C/P lacks the experience and ability to develop and implement detailed plans and processes. When the C/P is, too busy doing urgent work and unable to anticipate the next steps, such situations can cause delays in the process. When experts do not take the time and hassle to deal with procedures and measures to avoid such problems, delays in operations often result. The active and thorough response is required from the experts, but in some cases, this did not work.

4.4.2. Movements of personnel related to the Project and progress of activities

Regarding those in charge of the Project for Output 3, there were a total of 20 people trained abroad, 16 in Japan and 4 in El Salvador (including one in both countries). Among these people, seven ceased their jobs and five were transferred to other departments not related to the Project.

Furthermore, the change of minister, vice-minister, deputy secretary, and responsible director of MIDUVI resulted in the impossibility of issuing the ministerial agreement on the MPOPRPC by MIDUVI during the Project period. In this course of time, an attempt was made to disseminate and socialize the information in practical aspects by holding workshops and seminars.

IV. For the Achievement of Overall Goals after Project completion

1. Prospects to achieve Overall Goal

1.1. Suggestions for activities related to Integral Disaster Management

Overall Goal: SNGRE and MIDUVI implement activities at the national level for the construction of safe and resilient cities against disasters

During the second half of the Project, an attempt was made to carry out a national deployment of the Project, in addition to the activities in the pilot municipalities. However, there was a difference in the level of experience and knowledge between the pilot municipalities and the other municipalities under national deployment, making it necessary to provide continuous support in a more active manner by the SNGRE and MIDUVI.

Here are the key points in this regard:

① Awareness and sensitization on threats and risks at the national level
② Promotion of structural measures
③ Publication and use of the Project Results (organizing seminars of national deployment, etc.)
④ Repeated updates of Project Results
⑤ Creation of a horizontal cooperation organization in each Zone Offices and each province (creation of a cooperation mechanism)
⑥ Cooperation with related ministries, universities, and institutions of investigation
⑦ Cooperation with JICA and other international agencies
⑧ Preparation for the response to disasters under the state of pandemic and prevention against complex disasters

The SNGRE, MIDUVI, and the Team of Experts consider that the objectives of the Project have been largely achieved. However, SNGRE and MIDUVI regret the lack of sufficient technology transfer at the end of the Project, because the experts were not able to carry out local activities in Ecuador.

The SNGRE and MIDUVI wish that the following activities of the Project continued to face the new challenges and achieve the Higher Goal. Technical support is expected to continue where possible.

① Evaluation of evacuation measures in hard-to-reach areas (evacuation plans with vehicles, layout plans for evacuation facilities due to tsunamis, etc.)
② Construction of evacuation tower / hill, evaluation of buildings for vertical evacuation.
③ Formulation of the installation manuals for the tsunami evacuation tower/tsunami evacuation building.

④ Improve educational processes for risk reduction in education centers, workplaces, etc.
⑤ Strengthen evacuation measures due to tsunami in the event of a tsunami alert emergency for residents and tourists who stay on the Ecuadorian and Galapagos coasts
⑥ Strengthening tsunami evacuation measures for communities.
⑦ Improve INOCAR's tsunami simulation capacity
⑧ Creation and strengthening of community risk management committees and their equipment.
⑨ Incorporation of Inclusive Management within the training processes.
⑩ Implementation of prevention processes in the tourism sector.

1.2. Suggestions for activities related to Output 1

After Project completion, at least two tsunami evacuation drills are conducted each year in the pilot municipalities, and procedures are revised.

Thanks to the activities of this Project, SNGRE and each municipality began to conduct tsunami evacuation drills once a year, respectively, (2 times a year in total). In the activities carried out in the pilot municipalities, they suggested various ideas on tsunami evacuation measures and disaster prevention education, which have been put into practice, and their results have been shared within the Project.

Some of these ideas have been reflected in the MTEPET (Ver.1), published by SNGRE in January 2021, however, due to the long period of time required for the study of the Manual, it is difficult to say that much of the knowledge and concrete results obtained during this study have been sufficiently covered. Therefore, it is necessary to update the Manual so that it covers in a comprehensive and exhaustive way the knowledge acquired in the Project. The MTEPET (Ver.2) should incorporate a large number of exemplary cases on the evacuation measures applied in the pilot municipalities and order these cases so that they serve as a reference to the municipalities that plan to develop their evacuation plan or that are not capable of elaborating it with current measures.

It is desired to establish a cycle that consists of annually conducting evacuation drills, updating evacuation measures to address the problems identified, renewing the MTEPET based on these experiences and disseminating this Manual at the national level. It is also necessary to create a system to share extensively the latest scientific knowledge and experiences of personnel working in the field.

1.3. Suggestions for activities related to Output 2

- The Risk Reduction Agenda of the pilot municipalities is updated, using the LPARR even after the end of the Project.
- The "Risk Reduction Agenda" is updated using the LPARR development guide in three or more non-pilot municipalities.

Once the Project is finished, the UGRs of the seven pilot municipalities will periodically update their ARR already prepared by them, in accordance with the LPARR (2019), which the SNGRE developed through the Project activities.

Since the seven pilot municipalities have experience of having prepared the ARR on their own initiative with the support of the SNGRE and experts, it is considered that they have sufficient capacity to update their ARR on their own once the Project is completed. However, when carrying out the full review every 5 years, it is recommended that the UGR request the SNGRE for a peer review of the changes, if they are substantial.

In the printing of the officially approved ARR, a large part of the pilot municipalities could not cover the expenses with their own budget, having finally resorted to the help of JICA (from the fund for strengthening projects abroad). This constitutes a problem from the point of view of sustainability, so it is recommended that these expenses be sufficiently considered in the budget of the pilot municipalities when carrying out the full review of the ARR and printing it every 5 years.

The function of the SNGRE Zone Offices in the ARR is to review by peers and make additions and corrections to the draft if there is a request from the municipality within its jurisdiction. It is recommended that the SNGRE Headquarters, in order to reduce its own burden, strengthen the system and function of the Zone Offices to support the preparation of the ARR through training courses, etc.

It is also recommended that the SNGRE Headquarters have a system that allows several members to work together to advise preparation of the ARR of the different municipalities, so that it is possible to follow the advice even when one of them is transferred.

Likewise, when the SNGRE Headquarters gives training courses on the preparation of the ARR, the inexcusable participation of several members is recommended to acquire the corresponding know-how, both from the Headquarters and in the Zone offices.

1.4. Suggestions for activities related to Output 3

The Municipal Plan for Obtaining Permits and Regulation of Construction Processes in three different municipalities is applied to the pilot municipalities.

Both the construction permit, as well as the procedures and content of the construction quality inspection during construction are specified by the construction ordinance of each municipality. The secondary pilot municipalities had already prepared the proposal to modify said ordinance, which was in the process of deliberation with the Municipal Council and the mayor, however, it has not been possible to obtain such approval during the Project period, until July 2021. Due to the influence of the pandemic, the shortage of human resources caused by financial austerity, and the delay in the formulation of the ordinance on the Land Use and Management Plan that was being deliberated in parallel.

However, the draft of the Implementation Plan for the Regulation of Construction Processes has already been prepared, which shows the concrete human structure and socialization (public relations activities and dissemination of results) for its operation. The Construction ordinance is approved in September 2021, as planned, it is expected that said Plan would come into operation after a certain period of preparation. If the seven pilot municipalities carry out the construction processes, the impact on other cities will be very great.

MIDUVI is also expected to issue a ministerial decree for the national deployment, which is expected by the end of 2021.

2. Plan of Operation and Implementation Structure of the ecuadorian side to achieve the Overall Goal

Overall Goal: SNGRE and MIDUVI implement activities at the national level for the construction of safe and resilient cities against disasters

SNGRE and MIDUVI need formulate the Action Plan to achieve the Overall Goal for the next 3 years. In the final stage of this Project, discussions with the C/P and Experts have been held on the Action Plan. SNGRE and MIDUVI will follow up activities every half year to confirm the status of achievement. The achievement indicators will be considered by each institution.

2.1. Output 1 Activities (SNGRE)

After Project completion, at least two tsunami evacuation drills are conducted each year in the pilot municipalities, and procedures are reviewed.

In order for the SNGRE to achieve the indicator of Result 1 indicated above, the implementation plan and the execution system of the Ecuadorian side are summarized below after the end of the Project.

2.1.1 Revision of MTEPET

The MTEPET (Ver. 1) was prepared by the SNGRE and distributed to all municipalities in the coastal areas; however, it took too long for the preparation of the draft of the Manual to be published. For this reason, it was not possible to reflect the results of the activities carried out in the different pilot municipalities during this period.

Since the middle of this Project, numerous experiences and ideas have been proposed on evacuation measures in areas of difficulty to evacuate and on education for tsunami disaster prevention. The SNGRE should prepare the MTEPET (Ver.2) reflecting these experiences and ideas and advise the municipalities located in the coastal areas so that they can study their own evacuation measures in harmony with local conditions. From now on, the MTEPET will need to be continuously reviewed and always include the latest knowledge and technologies on evacuation measures in the event of a tsunami.

2.2.1 Continuous holding of seminars on PET

There were movements of personnel from both the SNGRE and the municipalities, and it is unknown whether the C/P personnel of this Project will be able to continue to be involved in the evacuation measures due to tsunami. Under this situation, the SNGRE will continue to hold seminars on PET for municipal officials and others in coastal areas, in accordance with the revised MTEPET.

2.2. Output 2 Activities (SNGRE)

- The Risk Reduction Agenda of the pilot municipalities is updated, using the Guidelines for the Preparation of the “Risk Reduction Agenda” even after the end of the Project.
- The "Risk Reduction Agenda" is updated using the development guide of the "Risk Reduction Agenda" in 3 or more non-pilot municipalities.

Below is a summary of the implementation plan and the execution system for the preparation of the ARR by all municipalities in the country (at least more than 3 municipalities besides the pilot municipalities) with the support of the SNGRE once the Project has finalized.

2.2.1 Priority order of municipalities to prepare the ARR

From now on, all the municipalities of the country will prepare the ARR according to the priority order indicated below. However, each municipality on a voluntary basis must prepare the ARR, so each one must take initiatives in this regard, without being bound by the priority order.

- **Priority 1:** All municipalities with the possibility of being affected by a tsunami
- **Priority 2:** Important municipalities in the interior of the country with a large population
- **Priority 3:** Other municipalities in the interior of the country

2.2.2 Function and structure of the UGR staff of each municipality that prepares the ARR

The UGR staff of each municipality will prepare and update the ARR in accordance with the new guide, in consultation with other municipal departments and/or competent related ministries, receiving support from the SNGRE according to needs.
Once the Project is finished, the UGRs of the pilot municipalities will update their complete ARRs as follows. The UGRs of other municipalities outside the pilot will prepare their ARRs as soon as possible and will update them periodically.

(1) Annual partial update: The UGR will review and, if necessary, partially update the ARR. This ARR does not require other official approval from the City Council or Mayor, nor does it need to be printed.
(2) General update every 5 years: The UGR will carry out a general review and update of the ARR. The ARR will be officially re-approved by the City Council and Mayor, and this ARR will be reprinted.

2.2.3 Role and structure of the pilot municipalities staff that provide support to other municipalities in the preparation of the ARR

The personnel of the UGR of the seven pilot municipalities that have prepared the ARR through this Project will take advantage of their experience and the lessons learned in the development of the ARR to actively support the preparation of the ARR of other municipalities through the coordination of the SNGRE.

2.2.4 Function and structure of the SNGRE Zone Offices that provide support in the preparation of the ARR of each municipality

The Zone Offices of the SNGRE will carry out the peer review, additions and corrections of the draft ARR of each municipality when requested.

2.2.5 Function and structure of the SNGRE Headquarter, which provides support in the preparation of the ARR of each municipality

The SNGRE Headquarter will provide support and general coordination for the preparation of the ARR by the municipalities, including the following points:

① Development of a strategy for the deployment of the ARR in municipalities throughout the country.
② Review of the 2019 LPARR as needed.
③ Training for the UGR and the SNGRE Zone Offices on the preparation of the ARR based on the 2019 LPARR.
④ Strengthening the capacity of the SNGRE Zone Offices to support the peer review and correction of the draft ARR of each municipality.
⑤ Peer review and correction of the draft ARR of each municipality directly according to the request and needs of the municipality.
⑥ Publication of the ARR of different municipalities on the SNGRE website and creation of the database.
⑦ Monitoring the progress status of the preparation of the ARR at the national level.

2.3. Output 3 Activities (MIDUVI)

The Municipal Plan of Procedures for Obtaining Permits and Regulation of Construction Processes in three different municipalities is applied to the pilot municipalities.

The implementation plan of the Ecuadorian part so that MIDUVI can achieve the above-mentioned Indicator once the Project is finished is as follows:

2.3.1. MIDUVI's Headquarters and Zone Offices, on their initiative, will periodically monitor the activities of the secondary pilot municipalities and will hold periodic meetings. The primary pilot municipalities will participate in these meetings as observers.
2.3.2. MIDUVI and the pilot municipalities will share the problems identified in the different municipalities, to work on solving them from a technical and institutional point of view.
2.3.3. Have opportunities to exchange opinions with other municipalities interested in the construction processes to develop the Projects Results at the national level.
2.3.4. Carry out activities in cooperation with local associations of engineers and architects, universities, and other institutions.

3. Recommendations for the Ecuadorian side

Overall Goal: SNGRE and MIDUVI implement activities at the national level for the construction of safe and resilient cities against disasters

The Overall Goal is not limited to earthquakes and tsunamis but includes all natural disasters likely to occur in cities and communities across the country. Therefore, the SNGRE should be aware of possible disaster risks at the national level and prepare measures to deal with each disaster.

The city construction and urban development plan was implemented at the initiative of MIDUVI. Although this ministry has carried out the construction of safe cities until now, it should promote Disaster Risk Reduction (RRD) within the framework of the urbanization plan in collaboration with the SNGRE. RRD is a challenge that cuts across various sectors of development. In this sense, the SNGRE should take initiatives to place RRD at the center of a policy in which the various sectors adopt the point of view of said reduction in their respective development challenges.

Figure 26. Disaster Risk Reduction Integration (JICA)

3.1. Output 1 Activities (SNGRE and the Pilot minicipalities)

After Project completion, at least two tsunami evacuation drills are conducted each year in the pilot municipalities, and procedures are reviewed.

Recommendations for the SNGRE to achieve the Indicator of Output 1 are summarized below.

3.1.1. Efforts to disseminate PET in municipalities other than the pilots

The PET and the evacuation measures in case of a tsunami is being developed and applied in other municipalities located in the coastal areas outside the pilot ones. Since the results of the simulations of possible tsunami floods to be provided by INOCAR are essential for such efforts, the SNGRE must request INOCAR to develop these simulations in all coastal areas of Ecuador. When other municipalities outside the pilot ones prepare the PET, not only the SNGRE Headquarters and Zonal Offices, but also the neighboring pilot municipalities must offer advice using the experience acquired in the Project.

3.1.2. PET improvement based on tsunami evacuation drills

The PET will undergo practical verification during the tsunami evacuation drills that will be carried out twice a year, in order to introduce the appropriate improvements based on the problems encountered. By continuing this effort, PET will improve systematically, maximizing the impact of the Project.

3.2. Output 2 Activities (SNGRE and the Pilot minicipalities)

> The Risk Reduction Agenda of the pilot municipalities is updated, using the Guidelines for the Preparation of the "Risk Reduction Agenda" even after the end of the Project.
>
> The Risk Reduction Agenda is updated using the development guide of the Risk Reduction Agenda in three or more non-pilot municipalities.

The following summarizes the recommendations for the SNGRE to achieve Indicator of Output 2.

Training by SNGRE in the preparation of the ARR and its implementation system

The SNGRE Headquarters, using the 2019 LPARR as a basis, must provide periodic training on the preparation of the ARR for 1) the UGR of all the municipalities of the country that are interested in said preparation, and 2) the Zone Offices of the SNGRE that provide support to the UGR.

(1) During the pandemic: To prevent the spread of the infection by following measures that should be taken: 1) reduce the number of participants 2) Take comprehensive infection control measures 3) Use videoconferencing systems.

(2) After pandemic convergence: It will be possible to conduct the training by convening the participants in a conference room. However, it would be desirable not to go back to the traditional way, but to devise new ways of carrying it out, such as the use of online conferencing systems.

3.3. Output 3 Activities (MIDUVI and the Pilot minicipalities)

The Municipal Plan of Procedures for Obtaining Permits and Regulation of Construction Processes in three different municipalities is applied to the pilots.

Below are the points to pay attention to and recommendations so that MIDUVI can achieve the Indicator of Result 3 once the Project is finished.

3.3.1. MIDUVI and the Zonal Offices, on their own initiative, must periodically monitor the activities of the secondary pilot municipalities and hold periodic meetings for this purpose. The primary pilot municipalities will participate in these meetings as observers and will provide advice as needed.

3.3.2. MIDUVI should identify and share the problems of the secondary municipalities, and work to solve them from a technical and institutional point of view.

3.3.3. For the national deployment, MIDUVI must issue a ministerial decree on the MPOPRPC and disseminate the construction processes, as well as create opportunities to exchange opinions with numerous municipalities that are interested. Likewise, AME shall support the activities to be carried out at the municipal level with a view to national deployment.

4. Monitoring Plan from the end of the Project to the Ex-post Evaluation

(1) After project completion, the JICA office and C/P institutions will check the progress of activities every quarter until the end of until March 2022 (Japan fiscal year 2021). The method will be decided later.

(2) If the 2021 request for proposal of the individual project (national training in Ecuador) "Dissemination of the Construction of Safe and Resilient Cities against Disasters due to Earthquakes and Tsunami" is approved, throughout the project, we will work with the institutions of C/P to carry out the "actions after project completion" described in the previous section. The method will be discussed later.

Project Monitoring Sheet I (Revision of Project Design Matrix)

Project Title: Project for Safe and Resilient Cities for Earthquake and Tsunami Disaster
Implementing Agency: National Secretariat of Risk Management and Emergency (SNGRE), Ministry of Urban Development and Housing (MIDUVI)
Project Period: July 2017 to September 2021 (51 months)
Project Site: Primary Pilot Municipalities (Atacames, Portoviejo and Salinas), Secondary Pilot Municipalities (Esmeraldas, Sucre, Santa Elena y Santa Cruz)

Version: 9
Dated: September 10th, 2021

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
SNGRE and MIDUVI implement nation-wide activities to build safe and resilient cities from disasters.	• Tsunami evacuation procedures are revised as the results of exercises and drills that are conducted twice every year even in the pilot municipalities after the project termination. • 'Risk Reduction Agenda' (ARR) is revised utilizing "ARR Development Guideline" in the pilot municipalities even after the project termination. • ARR is revised utilizing ARR development guideline in 3 or more municipalities that are not the pilot municipalities. • Building regulation management plan is implemented in 3 municipalities that are not the pilot municipalities.	• Most recent 'Risk Reduction Agenda' in the pilot municipalities • Most recent 'Risk Reduction Agenda' in municipalities that are not the pilot municipalities • Building regulation management plan produced in municipalities other than the pilot municipalities		Due to the spread of infection of COVID19 (pandemic), PCSR activity is generally limited. Tsunami evacuation plan based on INOCAR's tsunami simulation has been formulated, and evacuation drills are scheduled twice a year in each pilot municipality before pandemic. As the pandemic continued, pilot municipalities were encouraged to develop online disaster education and disaster prevention applications. SNGRE held nationwide seminars for ARR preparation based on the Guideline in March and April 2021. Based on the seminars, several municipalities other than the pilot municipalities are now preparing their ARRs based on the Guideline.	

				Building regulation management handbook was developed and the execution of its management plan is undergoing in two primary pilot municipalities. As for Output 1, Output 2 and Output 3, workshops and seminars for nationwide deployment have been conducted.	
Project Purpose					
Technical support structure from SNGRE and MDUVI to municipalities is established with the objective of risk reduction from earthquakes and tsunamis.	1. Evacuation drills are conducted in accordance with the evacuation plan and protocol, which are improved under the Project, more than twice in each pilot municipality by the time of the project termination.	1. Tsunami evacuation drills report(s), JICA Project Report(s)	A level of importance given to Disaster Risk Reduction Sector by the Government of Ecuador stays high.	Tsunami evacuation plan is being revised based on the finalized Tsunami inundation simulation, and it is almost complete in three of the seven municipalities. Altitude display boards have been installed in seven pilot municipalities and La Libertad. Posters of tsunami evacuation and eight disasters have been printed. Until September 2021, evacuation drills were conducted through the revised tsunami evacuation plan in the pilot municipalities. Signs indicating tsunami evacuation buildings have been installed in three of the pilot municipalities.	
	2. 5 out of 6 municipalities that received technical guidance from SNGRE in due course of new ARR development develop 'Risk Reduction Agenda'	2. Updated ARR and JICA Project Report(s)		ARR were prepared and approved by three primary pilot municipalities. ARR development guideline was developed and approved by SNGRE. ARRs were prepared by four secondary pilot municipalities and approved by three secondary pilot municipalities. ARR of	

				GAD Santa Elena is under the process of approval.	
	3. Required tasks[1] stated in 'Building Regulation Management Handbook' (MPOPRPC) are executed in each pilot municipality.	3. JICA Project Report(s), Records of inspections during construction and upon completion produced by the pilot municipalities		MPOPRPC was approved and distributed in three primary pilot municipalities. Building management implementation plan has been executed in two out of three primary pilot municipalities. Draft of building regulation management implementation plans was developed in the secondary pilot municipalities.	
	4. SNGRE and MIDUVI, before the end of the Project, carry out training for officials of all zone offices using guides and manuals developed by the Project.	4. JICA Project report(s)		SNGRE and MIDUVI have been carrying out trainings for officials of all zone offices and GADs using guidelines and manuals developed by the Project through nationwide workshops and seminars.	
Outputs					
1. Pilot Municipalities provide timely assistance to evacuate communities rapidly in response to tsunami warning issued in accordance with Tsunami Warning Technical Protocol.	• The understanding level of the essential aspects for tsunami evacuation in the end line survey reaches at least 60% in each pilot municipality.	• JICA Project Report(s), Activities reports produced by UGR • JICA Project Report(s), Approval letter/ notice issued by concerned municipalities • JICA Project Report(s), Most recent evacuation plan, tsunami warning information flow chart, protocol・evacuation route(s)		The base line study was completed. The end line survey was conducted, and it was found that the understanding of tsunami evacuation in the primary pilot municipalities has beeb improved.	
	• The evacuation drills, which are conducted in accordance with the protocol developed under the Project, are completed with the expected time in each pilot municipality.			Evacuation drills have not conducted in seven pilot municipalities periodically by the pandemic after Feb 2020. However, two municipalities made efforts to confirm the flow of information in the event of a tsunami at the COE. "General Planning and Drill and Simulation Timeline" and "Evaluation Sheet of Communication Flow of Tsunami	

[1] Required tasks are 1) document review related to building construction permit, 2) inspection of building during construction, 3) inspection of building upon completion, 4) issuance of occupation permit.

				Alert" for the evacuation drill, it is in the final stage of review.	
	• Evacuation Plan/ Dissemination Structure/ Protocol/ Evacuation Route(s) that are developed under the Project are approved by the mayor in each pilot municipality.			Tsunami inundation simulation in seven pilot municipalities was completed. Tsunami evacuation plans were revised in six municipalities in line with the manual issued by the SNGRE. Education materials (video, tryptic, leaflets, altitude display boards and posters) have been elaborated. Tsunami evacuation planning manual was finalized by SNGRE and printed.	
2. ARR focusing on Mitigation/ Prevention and Preparedness is updated by municipalities.	• ARR updated in each pilot municipality is approved by the mayors/ municipal council/ SNGRE.	• JICA project report(s), approval letter(s)/ notice(s) issued by the concerned mayor/ municipal council/ SNGRE • JICA project report(s), approval letter/notice issued by SNGRE • JICA project report(s), most recent ARR in the 3 or more municipalities		Risk Reduction Agendas (ARRs) were prepared and officially approved by three primary pilot municipalities.	
	• ARR development guideline is approved by SNGRE.			ARR Guideline was developed and published by SNGRE.	
	• 3 or more municipalities, which are not the pilot municipalities, received technical guidance from SNGRE for revision of ARR.			ARRs were prepared and approved by four secondary pilot municipalities.	
3. Implementation structure of building regulation management in	• Percentages of inspection during construction and upon completion are increased by 50% against the base line result in the pilot municipalities.	• JICA project report(s) • Documents such as application of building construction permit and other		Two out of three pilot municipalities started the inspection during construction and upon completion. Low progress because of the COVID19 and lack of budget in 2020 and 2021.	

Activities	Input	Pre-condition
1.1. SNGRE, IG-EPN and INOCAR update the Tsunami Warning Technical Protocol in due course of regular simulation as well as evacuation drills, and the project members monitor approval processes of the Protocol by SNGRE, IG-EPN and INOCAR. 1.2. The pilot municipalities, with assistance of SNGRE, conduct the base line survey concerning understanding level of local community on tsunami evacuation. 1.3. The pilot municipalities, with guidance of SNGRE, improve tsunami warning information dissemination structure/ protocol/ evacuation plan, which includes vertical evacuation, for local communities including tourists ('Risk Reduction Agenda' prepared in activities for Output 2 covers evacuation plan(s)). 1.4. The pilot municipalities, with guidance of SNGRE, carry out capacity development activities for local communities including tourists utilizing raising-awareness materials that produced in the Project, and conduct tsunami evacuation drills utilizing the said materials. 1.5. The pilot municipalities, with assistance of SNGRE, conduct the end line survey concerning understanding level of local communities on tsunami evacuation.	<u>Input: Japanese Side</u> 1.Experts Long-Term: Project coordination 1 person Short-Term: • Team leader and vice team leader • Tsunami evacuation plan • DRR plan (Response, Reconstruction, Mitigation/Prevention, Preparedness) • Building regulation management 2.Training (in Japan, in the third countries and in Ecuador) • Training on ARR in Japan (for senior management, for technical officers • Training on ARR in the third country • (Peru) (for technical officers • Training on Building Regulation Management in Japan (for senior management/ technical officers • Training on Building Regulation Management in the third country (El Salvador) (for senior management/ technical officers • Action plan workshop 4. Procurement of Equipment Equipment related to Tsunami Evacuation Plan (Output 1), Megaphone(6), Portable GPS(3), Altimeter(3), Digital camera(3), Distance meter(3), Radio Portatiles(6), System of altavoces(3)	Municipalities selected as the pilot Municipalities assign more than one technical officer per Output for implementation of the Project.
2.1. SNGRE, with cooperation of MIDUVI and other technical collaborating member(s), conducts nation-wise baseline survey on current hazard data of earthquake and tsunami disasters. 2.2. SNGRE, with cooperation of MIDUV and other technical collaborating member(s), understands feasible contents of ARR[3] (e.g., development of hazard map(s), classification of land use/ development of urban planning) based on the existing hazard information and/or data. 2.3. SNGRE and the pilot municipalities study techniques and know-how applied in JICA projects for the objective of revision of the ARR (e.g., CISMID in Peru). 2.4. The pilot municipalities, with assistance of SNGRE, conduct baseline survey on current hazard data of earthquake and tsunami disasters. 2.5. The pilot municipalities, with assistance of SNGRE, determine an outline of ARR, which covers priority area and countermeasure(s) on risk reduction. 2.6. The pilot municipalities, with assistance of SNGRE, review the existing Contingency Plan and other relevant document(s). 2.7. The pilot municipalities, with assistance of SNGRE, prepare ARR, which gives focus on mitigation/ prevention and preparedness (the updated ARR is referred during implementation of the planned activities for Output 1 and Output 3). 2.8. SNGRE develops ARR Guideline for Earthquake and Tsunami Disasters' that will be utilized by municipalities other than the pilot municipalities.		

[3] 'Risk Reduction Agenda' (ARR) is a document name, which municipalities are requested to prepare by SNGRE. The outline of 'Risk Reduction Agenda' is similar to an outline of Disaster Risk Reduction Plan, which Japanese side initially proposed.

accordance with 'Building Regulation Management Handbook (MPOPRPC)[2]' is established at a municipality level.	• Contents of the reports related to building construction permit, inspections during construction and upon completion produced in the pilot municipalities observe the tables and checklist of the Handbook.	relevant documents • Reports of inspections during construction and upon completion, and other relevant documents • JICA project report(s) (including the end line survey results) • Approval letter/ notice issued by MIDUVI • Building Regulation management plan(s) produced by municipalities other than the pilot municipalities		The preparation of the report has started. Note: reports related to building construction permit include structural review on structural calculation documents and drawings. Low progress because of the pandemic and lack of budget in 2020 and 2021.	
	• An ordinance which includes building regulation management plan at a municipality level is approved by mayor/ municipal council.			The ordinance and the management plan based on the MOPPRPC was officially approved in three primary pilot municipalities.	
	• Required personnel, budget and others are allocated as per the approved building regulation management plan			Required personnel, budget and others were allocated in 1 out of 3 pilot municipalities. A few personals in 1 municipality were fired by the change of employment policy.	
	• Ministerial decree stating approval of MPOPRPC is issued.			MPOPRPC was approved by MIDUVI, and PDF was uploaded to homepage and distributed to all 224 municipalities through AME. Handbook revision process, to be issued by Ministerial Agreement to it as a Recognized Document of NEC. Socialization at national level will take place in 2022 period.	
	• Building regulation management plan is developed in 3 municipalities, which are not the pilot municipalities.			Ordinance including building regulation management plan in 3 municipalities, which are not the pilot municipalities, is under the development. Draft has been developed and waiting for the approval of the city council and the mayor. Low progress because of the pandemic in 2020 and 2021.	

[2] 'Building Regulation Management Handbook(MPOPRPC)' illustrates an outline of processes related to building construction permit, inspections and occupation permit. Each municipality is expected to develop building regulation management plan in accordance with the MPOPRPC.

2.9. SNGRE provides assistance to municipalities other than the pilot municipalities in revising ARR.	Drone(1) • Equipment related to 'Risk Reduction Agenda' (Output 2): None • Equipment related to Building Regulation Management (Output 3), ETABS (1 license for 3 pilot municipalities and MIDUVI), • QUANTAB (24 packs for each primary pilot municipality plus 24 packs for each secondary municipality including Santa Cruz)	
3.1. MIDUVI and the pilot municipalities, with collaboration of the technical collaborating members, conduct baseline survey to understand the current situation of building construction permit/ inspections/ occupation permit. 3.2. MIDUVI and the pilot municipalities study foreign building regulation (e.g., Architect and Building Engineer Law, Construction Business Law) as well as JICA projects (e.g., TAISHIN in El Salvador) for the objective of development of MPOPRPC. 3.3. MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, develop MPOPRPC (draft)' in consultation with building engineers, construction companies and other relevant association(s). 3.4. The pilot municipalities, with assistance of MIDUVI, develop, execute and update building regulation management plan(s) in accordance with the MPOPRPC. 3.5. MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, organize seminars on earthquake-resistance/ seismic resilient engineering and building regulation management, which are targeting architects, construction companies, construction workers and other relevant association(s). 3.6. MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, produce socialization materials on earthquake-resistance/ building regulation management in order to raise awareness of local communities (materials produced by JICA project implemented in El Salvador may be referred). 3.7. MIDUVI and the pilot municipalities organize activities utilizing the materials developed in Activity 3.6 with the objective of raising-awareness of local communities. 3.8. MIDUVI, with cooperation of the pilot municipalities, provides assistance to 3 municipalities in preparing building regulation management plan in accordance with the MPOPRPC. 3.9. MIDUVI and the pilot municipalities conduct the end line survey on building construction permit/ inspections/ occupation permit.	• Project vehicle <u>Input: Ecuador Side</u> 1.Counterpart Personnel: • Project Director (SNGRE) • Project Director (MIDUVI) • Coordinators (1 person for each Output) • WG members for Output 1 • WG members for Output 2 • WG members for Output 3 2.Wokring Space and Facilities for JICA Experts at: • SNGRE • MIDUVI 3.Project Cost: • Domestic travel including accommodation and per diem for the counterpart persons • Project vehicle driver and necessary cost	**<u>Issues and Countermeasures</u>**

Hoja del Seguimiento del Proyecto I (Revisión de Matriz de Diseño del Proyecto)

Título del Proyecto: Proyecto para la Construcción de Ciudades Seguras y resilientes contra Desastres por Terremotos y Tsunami
Entidades ejecutoras: Servicio Nacional de Gestión de Riesgos y Emergencias (SNGRE), Ministerio de Desarrollo Urbano y Vivienda (MIDUVI)
Periodo del Proyecto: De julio de 2017 a septiembre de 2021 (51 meses)
Zonas objeto: Municipios Pilotos Primarios (Atacames, Portoviejo y Salinas), Municipios Pilotos Secundarios (Esmeraldas, Sucre, Santa Elena y Santa Cruz)

Versión: 9.0
Fecha:10 de septiembre de 2021

Resumen del Proyecto	Indicadores de objetivos verificables	Medios de verificación	Aspectos importantes	Logros	Nota
Meta Superior					
SNGRE and MIDUVI implementan actividades a nivel nacional para la construcción de ciudades seguras y resilientes contra desastres.	• Después de la finalización del Proyecto, se realizan por lo menos dos simulacros de evacuación por tsunami cada año en los municipios pilotos y se revisan el procedimiento. • Se actualiza la Agenda de Reducción de Riesgos (ARR) de los municipios pilotos, utilizando el lineamiento para la preparación de la ARR **incluso** después de la finalización del Proyecto. • La ARR es actualizada utilizando el lineamiento para la preparación de la ARR en 3 o más municipios no pilotos. Se aplica el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos en 3 municipios diferentes a los pilotos.	• La última Agenda de Reducción de Riesgos de cada uno de los municipios pilotos. • La última Agenda de Reducción de Riesgos de otros municipios diferentes a los pilotos. • Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos en otros municipios diferentes a los pilotos		Debido a la propagación de la infección por COVID19 (pandemia), la actividad del PCSR es generalmente limitada. Se ha formulado el plan de evacuación por tsunami basado en la simulación por tsunami del INOCAR, y se programan simulacros de evacuación dos veces al año en cada municipio piloto antes de la pandemia. A medida que continuaba la pandemia, se alentó a los	

				municipios piloto a desarrollar aplicaciones en línea de educación y prevención de desastres. SNGRE llevó a cabo seminarios a nivel nacional para la preparación de ARR basados en el Lineamiento en marzo y abril de 2021. Con base en los seminarios, varios municipios además de los municipios piloto están preparando sus ARR basados en el Lineamiento. Se desarrolló el manual de gestión para la regulación de la construcción y se está ejecutando su plan de gestión en 2 de los municipios piloto primarios. En cuanto al Resultado 1, Resultado 2 y Resultado 3, se han realizado talleres y seminarios para la réplica	

				a nivel nacional.	
Objetivo del Proyecto					
Se establece la estructura de asistencia técnica de SNGRE y MIDUVI al nivel municipal para la reducción de daños causados por terremotos y tsunami.	1. Antes de la finalización del Proyecto, se realiza, por lo menos, dos simulacros de evacuación por tsunami en cada uno de los municipios pilotos, de acuerdo con el plan de evacuación y el protocolo mejorados a través del Proyecto.	1. Informe (s) de simulacros de evacuación de tsunami, Informe (s) del Proyecto JICA.	El nivel de importancia otorgado al Sector de Reducción de Riesgo de Desastres por parte del Gobierno de Ecuador sigue siendo alto.	Se está revisando el plan de evacuación por tsunami con base en la simulación de inundación por tsunami finalizada, y está casi completo en tres de los siete municipios. Señaléticas que indican altura instaladas en siete municipios piloto y La Libertad. Se han impreso afiches para la evacuación por tsunami y ocho desastres. Hasta Septiembre de 2021 se llevaron a cabo simulacros de evacuación a través del plan revisado de evacuación por tsunami en los municipios piloto. Se han instalado señaléticas que indican edificios de evacuación por tsunami en tres de los municipios piloto.	
	2. Se desarrolla la Agenda de Reducción de Riesgos en 5 de 6 municipios que recibieron la orientación técnica de SNGRE	2. Informe(s) de Proyecto de JICA y ARR y actualizados		Las ARR fueron preparadas y aprobadas por los 3 municipios	

				pilotos primarios. El lineamiento para la preparación de la ARR fue desarrollado y aprobado por SNGRE Las ARR fueron preparadas y aprobadas por cuatro municipios piloto secundarios.	
	3. Las tareas requeridas que se detallan en el "Manual de administración de regulaciones de construcción" (MPOPRPC) se ejecutan en cada municipio pilotos.	3. Informe (s) del proyecto JICA, registros de inspecciones durante la construcción y una vez finalizados por los municipios pilotos		El MPOPRPC fue aprobado y distribuido en los 3 municipios pilotos primarios. El plan de implementación para la gestión de la construcción se ha ejecutado en 2 de los 3 municipios piloto primarios. Se elaboró un borrador de planes de implementación para la gestión de la construcción en los municipios piloto secundarios.	
	4. SNGRE y MIDUVI, antes de la finalización del Proyecto, realizan la capacitación a los funcionarios de todas las coordinaciones zonales utilizando las guías y los manuales elaborados.	4. Informes del Proyecto		SNGRE y MIDUVI han llevado a cabo capacitaciones para funcionarios de todas las oficinas zonales y GADs utilizando lineamientos y	

				manuales desarrollados por el Proyecto a través de talleres y seminarios a nivel nacional.	
Resultados					
1. Con base a la alerta de tsunami emitida a través del Protocolo Técnico de Alerta de Tsunami, los municipios piloto suministran asistencia oportuna para evacuar rápidamente las comunidades.	• El nivel de comprensión de los aspectos esenciales para la evacuación por tsunami alcanza en la encuesta final al menos un 60% en cada municipio pilotos.	• Informe (s) del Proyecto de JICA, informes de actividades producidos por la UGR. • Informe (s) del Proyecto de JICA, Carta de aprobación / aviso emitido por los municipios interesados • Informe (s) del Proyecto de JICA, Plan de evacuación más reciente, diagrama de flujo de información de alerta de tsunami, protocolo route ruta (s) de evacuación		El estudio de línea base ha sido terminado. Se realizó la encuesta de la línea final y se encontró que la comprensión de la evacuación por tsunami en los municipios piloto primarios ha mejorado.	
	• Se ejecuta la evacuación dentro del tiempo establecido según el Protocolo elaborado en el Proyecto, en el simulacro realizado en cada uno de los municipios pilotos.			Se han realizado periódicamente simulacros de evacuación en siete municipios pilotos por la pandemia después de febrero de 2020. Sin embargo, dos municipios hicieron esfuerzos para confirmar el flujo de información en caso de un tsunami en el COE. La "Planificación General y Línea de Tiempo del Simulacro y Simulación" y la " Ficha de Evaluación del Flujo de	

				Comunicación de Alerta de Tsunami" para el simulacro de evacuación se elaborado está en etapa final de revisión.	
	• Plan de Evacuación / Estructura de Difusión / Protocolo / Ruta (s) de Evacuación que se desarrollan en el marco del Proyecto son aprobados por el alcalde en cada municipio piloto.			Se completó la simulación de inundación por tsunami en siete municipios pilotos. Se revisó el plan de evacuación por tsunami en seis municipios de acuerdo con el manual emitido por el SNGRE. Se han elaborado materiales educativos (video, folletos, afiches y señaléticas que indican altitud y afiches). SNGRE finalizó e imprimió el manual para la elaboración de plan de evacuación por tsunami.	
2. Se actualiza la ARR enfocada en la mitigación, prevención y preparación.	• La Agenda de Reducción de riesgos ARR actualizada en cada municipio piloto es aprobada por los alcaldes/ el consejo municipal/ SNGRE	• Informe (s) de proyecto de JICA, carta (s) de aprobación / aviso (s) emitidos por el alcalde / consejo municipal / SNGRE. • Informe (s) del proyecto JICA, carta de aprobación / aviso		Las Agendas de Reducción de Riesgos (ARR) fueron preparadas y oficialmente aprobadas por tres municipios pilotos primarios.	

	• El lineamiento para la preparación de la ARR es aprobado por SNGRE.	emitido por SNGRE • Informe (s) del proyecto JICA, la última ARR en 3 o más municipios		El lineamiento de la ARR fue desarrollado y publicado por SNGRE.	
	• 3 o más municipios diferentes a los piloto reciben la orientación técnica de SNGRE sobre la revisión de la Agenda de Reducción de Riesgos.			Las ARR fueron preparadas por cuatro municipios piloto secundarios y aprobados por tres municipios piloto secundarios. La ARR del GAD Santa Elena están en proceso de aprobación. SNGRE realizó seminarios a nivel nacional para la preparación de ARR basadas en el Lineamiento en marzo y abril de 2021.	
3. La estructura de implementación de la gestión de la regulación de la construcción de acuerdo con el "Manual de Gestión de la Regulación de	• En los municipios piloto, se incrementa en el 50%, la tasa de la inspección intermedia y la final de construcciones, comparando con el resultado del estudio de línea base.	• Informe (s) del proyecto JICA • Documentos como la solicitud de permiso de construcción de edificios y otros documentos relevantes • Informes de inspecciones durante la construcción y al finalizar, y otros documentos		Dos de los tres municipios piloto iniciaron la inspección durante y al final de la construcción. Poco avance por el COVID19 y falta de presupuesto en 2020 y 2021.	

la Construcción (MPOPRPC)" se establece a nivel municipal.	• El contenido de los informes del permiso de construcción, la inspección intermedia y la inspección final de los municipios piloto respeta las tablas y el check list del Manual.	relevantes • Informe (s) del proyecto JICA (incluidos los resultados de la encuesta de la línea final) • Carta de aprobación / aviso emitido por MIDUVI. • Plan (es) de gestión de regulación de la edificación producidos por municipios distintos de los municipios piloto		Ha comenzado la preparación del informe. Los informes relacionados con el permiso de construcción, incluida la revisión estructural del documento de cálculo estructural y los planos. Poco progreso debido a la pandemia y falta de presupuesto en 2020 y 2021.	
	• Una ordenanza que incluye el Plan Municipal de procedimientos para la Obtención de Permisos y de Procesos Constructivos, por parte del alcalde / concejo municipal.			La ordenanza y el plan de gestión basados en el Manual fueron aprobados oficialmente en tres municipios piloto primarios.	
	• Se asignan el personal, el presupuesto y otros aspectos necesarios, según el Plan Municipal de procedimientos para la Obtención de Permisos y de Procesos Constructivos.			El personal requerido, el presupuesto y otros fueron asignados en 1 de los 3 municipios piloto. Algunos funcionarios en 1 municipio fueron despedidos debido al cambio de política de empleo.	
	• Se emite un decreto ministerial que aprueba el MPOPRPC.			MPOPRPC fue aprobado por MIDUVI, y el PDF se subió al portal web y se distribuyó a los 221 municipios a través de	

				AME. Proceso de revisión del Manual, para expedir por Acuerdo Ministerial al mismo como Documento Reconocido de la NEC. La socialización a nivel nacional se realizará en el periodo 2022.	
	• Se establece el Plan Municipal de procedimientos para la Obtención de Permisos y de Procesos Constructivos en 3 municipios diferentes a los pilotos.			El plan de gestión para la regulación de la construcción en 3 municipios, que no son los municipios piloto, está en desarrollo. El anteproyecto ha sido elaborado y se espera la aprobación de la ordenanza por parte del municipio y el alcalde. Poco progreso debido a la pandemia en 2020 y 2021.	

Se determina un nivel de satisfacción dentro de los 6 meses posteriores al inicio del proyecto.

Actividades	Aportes	Condiciones Previas
1.1. Se hace seguimiento a la actualización del Protocolo Técnico de Alerta de Tsunami entre SNGRE, IG/EPN e INOCAR a través de simulaciones y simulacros periódicos, como su aprobación por parte de SNGRE, IG-EPN and INOCAR. 1.2. Los municipios pilotos, con la ayuda de SNGRE, realizan un estudio de línea base del grado de comprensión de la comunidad sobre la evacuación por tsunami evacuación por tsunami.	<u>Aportes: Parte Japonesa</u> 1.Expertos: Coordinación del Proyecto 1 persona De corto plazo: • Líder y vice líder de Equipo • Expertos en el plan de evacuación por tsunami	Asegurar la participación de, por lo menos, un funcionario técnico, por resultado del Proyecto, de cada uno de los municipios piloto.

1.3. Los municipios pilotos, con la ayuda de SNGRE, mejoran el protocolo y el mecanismo de comunicación de la alerta de tsunami hacia la comunidad, incluyendo los turistas, y el plan de evacuación, incluyendo la evacuación vertical (La Agenda de Reducción de Riesgos preparada en las actividades del Resultado 2 abarca el plan de evacuación). 1.4. Los municipios pilotos, con la ayuda de SNGRE, realizan trabajo de fortalecimiento de capacidades a la comunidad, a través de la construcción de materiales didácticos tanto para la comunidad como para los turistas, y simulacros de evacuación por tsunami. 1.5. Los municipios pilotos, con la ayuda de SNGRE, realizan un estudio de línea final del grado de comprensión de la comunidad sobre la evacuación por tsunami.	• Expertos en el Plan de RRD (Respuesta/Reconstrucción, Mitigación/Prevención y Preparación) • Expertos en la gestión de la operación de sistemas constructivos. 2.Capacitación (en Japón, en terceros países y en Ecuador) • Capacitación sobre la ARR en Japón (para el nivel directivo) para el nivel técnico • Capacitación sobre la ARR en el tercer país (Perú) (para funcionarios técnicos) • Capacitación sobre la Gestión de Regulación de Construcción en Japón (para el nivel alto directivo/funcionarios técnicos) • Capacitación sobre la gestión de la regulación de la construcción en el tercer (El Salvador) (para altos directivos / funcionarios técnicos • Taller de Plan de Acción 4.Equipos y materiales • Equipos y materiales relacionados con el plan de evacuación por tsunami (Resultado 1), Megáfono (6), GPS portátil (3) y altímetro (3), Cámara Digital (3), Distanciómetro (3), Radio portátiles (6), Sistema de Altavoces (3) Drone (1) • Equipos y materiales relacionados con la Agenda de Reducción de Riesgos (Resultado 2): Ninguno • Equipos y materiales relacionados con la Gestión de la Operación de Sistemas Constructivos (Resultado 3). ETABS (1 licencia para los 3 municipios pilotos y MIDUVI) • QUANTAB (24 paquetes por cada municipio piloto primario más 24 paquetes para cada	
2.1. SNGRE, con la colaboración de MIDUVI y el apoyo de colaboradores técnicos, realiza un estudio de línea base a nivel nacional sobre los datos existentes de amenazas de terremotos y tsunami. 2.2. SNGRE, con la colaboración de MIDUVI y el apoyo de colaboradores técnicos, profundiza el conocimiento sobre el contenido de la ARR factibles (la elaboración de mapas de amenazas, la restricción del uso de suelo y de desarrollo urbano, la capacitación y educación, etc.) a partir de la información y los datos existentes de amenazas. 2.3. SNGRE y los municipios pilotos estudian tecnologías y know-how aplicados en otros proyectos de JICA (CISMID de Perú, etc.) con el fin de actualizar la ARR. 2.4. Los municipios pilotos, con la ayuda de SNGRE, realizan un estudio de línea base sobre los datos existentes de amenazas de terremotos y tsunami. 2.5. Los municipios pilotos, con la ayuda de SNGRE, definen los lineamientos básicos de la ARR se muestran prioridades y medidas importantes para la Reducción de Riesgos. 2.6. Los municipios pilotos, con la ayudad e SNGRE, revisan los planes existentes como el plan de contingencia. 2.7. Los municipios pilotos, con la ayuda de SNGRE, actualizan la ARR, enfocando en la mitigación, prevención y preparación (La Agenda de Reducción de Riesgos actualizada será consultada durante la implementación de las actividades planificadas del Resultado 1 y Resultado 3). 2.8. SNGRE fortalece las Directrices para la Actualización de la ARR enfocadas en Terremotos y Tsunami, las cuales serán utilizadas por otros municipios diferentes a los pilotos. 2.9. SNGRE apoya a otros municipios piloto diferentes a los pilotos en la actualización de la ARR.		
3.1. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, realizan un estudio de línea base sobre la situación actual de permisos de construcción y habitabilidad e inspecciones.		**Temas y Contramedidas**

3.2. MIDUVI y los municipios pilotos revisan las leyes y normas relacionadas con la administración de la construcción en otros países (Ley de Arquitectos, Ley de Empresas Constructoras, etc.) y resultados de otros proyectos de JICA (KIZUNA en Chile, TAISHIN en El Salvador, etc.) con el fin de definir el MPOPRPC- 3.3. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, teniendo en cuenta opiniones de diseñadores, constructores y asociaciones relacionadas con el tema, elabora el (borrador) del MPOPRPC- 3.4. Los municipios pilotos, con la ayuda de MIDUVI, establecen, implementan y actualizan el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos, según el MPOPRPC- 3.5. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, realizan seminarios sobre tecnologías de sismo resistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos para trabajadores, profesionales, y ejecutores de la construcción, y asociaciones relacionadas con el tema. 3.6. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, elaboran materiales didácticos para la comunidad, con el fin de fomentar la comprensión sobre tecnologías de sismo resistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos (se pueden aprovechar materiales elaborados en El Salvador). 3.7. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, realizarán actividades de capacitación y sensibilización para la comunidad, utilizando materiales didácticos desarrollados en la Actividad 3.6. 3.8. MIDUVI, con la cooperación de las municipalidades pilotos, brinda asistencia a los 3 municipios en la preparación del plan de gestión de regulación de edificios de acuerdo con el MPOPRPC. 3.9. MIDUVI y los municipios pilotos realizan un estudio de línea final sobre la situación de permisos de construcción y habitabilidad de inspecciones.	municipio secundario incluyendo Santa Cruz) • Vehículo del Proyecto <u>Aportes: Parte Ecuatoriana</u> 1.Personal de la Contraparte: • Director del Proyecto (SNGRE) • Director del Proyecto (MIDUVI) • Coordinadores del Proyecto (uno por resultado) • Miembros del Grupo de Trabajo del Resultado 1 • Miembros del Grupo de Trabajo del Resultado 2 • Miembros del Grupo de Trabajo del Resultado 3 2.Povision del espacio de oficina y facilidades necesarias para expertos japoneses: • SNGRE • MIDUVI 3.Asignaciones del presupuesto para el Proyecto: • Costo personal de la contraparte ecuatoriana. • Viatico y costo de transporte de viajes domésticos para el personal de la contraparte ecuatoriana. • Chofer para el vehículo del proyecto y costo necesario.	

[3] La Agenda de Reducción de Riesgos (ARR) es un documento que debe establecer un GAD según la orientación de SNGRE. Tiene una estructura similar al plan de gestión de riesgos que la parte japonesa plantea para el Proyecto.

Project Monitoring Sheet II (Revision of Plan of Operation)

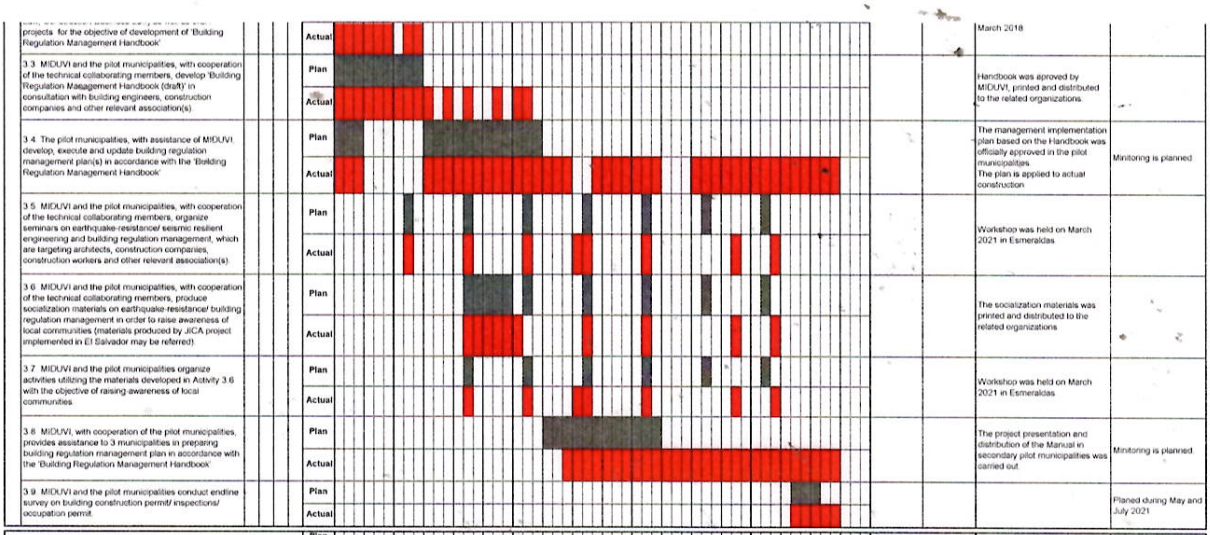
Version 8

Dated: September 10th, 2021

Project Title: Project for Safe and Resilient Cities for Earthquake and Tsunami Disaster

Inputs	Year	2017		2018				2019				2020				2021				Remarks	Monitoring: Issue	Monitoring: Solution
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
Expert																						
Team leader/Integrate DRR 1	Plan																					
	Actual																					
Vice team leader/Integrate DRR 2	Plan																					
	Actual																					
Tsunami evacuation plan	Plan																					
	Actual																					
Organization formulation 1/Risk reduction plan	Plan																					
	Actual																					
Organization formulation 2	Plan																					
	Actual																					
DRR plan	Plan																					
	Actual																					
Hazard evaluation	Plan																					
	Actual																					
Vulnerability evaluation/Gender consideration	Plan																					
	Actual																					
Building regulation management	Plan																					
	Actual																					
Construction quality management	Plan																					
	Actual																					
Citizen education for seismic building	Plan																					
	Actual																					
Training management	Plan																					
	Actual																					
DRR plan/ Project coordination: 1 person	Plan																					
	Actual																					
Equipment																						
Equipment related to Tsunami Evacuation Plan (Output 1)	Plan																					
	Actual																					
Equipment related to 'Risk Reduction Agenda' (Output 2)	Plan																					
	Actual																					
Equipment related to Building Regulation Management (Output 3)	Plan																					
	Actual																					
Training in Japan																						
Training on 'Risk Reduction Agenda' in Japan for senior management	Plan																					
	Actual																					
Training on 'Risk Reduction Agenda' in Japan for technical officers and in Ecuador	Plan																					
	Actual																					
Training on Building Regulation Management in Japan for senior management/ technical officers	Plan																					
	Actual																					
In-country/Third country Training																						
Training on Building Regulation Management in third countries for senior management/ technical officers	Plan																					
	Actua																					

Activities / Sub-Activities	Year	2017		2018				2019				2020				2021				Responsible Organization: Japan	Responsible Organization: GOE	Achievements	Issue & Countermeasures
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Output 1:																							
1.1 SNGRE, IG-EPN and INOCAR update the Tsunami Warning Technical Protocol in due course of regular simulation as well as evacuation drills, and the project members monitor approval processes of the Protocol by SNGRE, IG-EPN and INOCAR	Plan																						
	Actual																					The protocol is continuously monitored when earthquakes occur	
1.2 The pilot municipalities, with assistance of SGR, conduct baseline survey concerning understanding level of local community on tsunami evacuation	Plan																						
	Actual																					The activity was completed in January 2018	
1.3 The pilot municipalities, with guidance of SGR, improve tsunami warning information dissemination structure/ protocol/ evacuation plan, which includes vertical evacuation, for local communities including tourists.	Plan																						
	Actual																					The tsunami evacuation plan has been prepared by 3 pilot municipalities and 4 are being reviewed based on the final simulation of the tsunami inundation. Signboards that indicate altitude have been developed and installed in 7 GAD	
1.4 The pilot municipalities, with guidance of SGR, carry out capacity development activities for local communities including tourists utilizing raising-awareness materials that produced in the Project, and conduct tsunami evacuation drills utilizing the said materials.	Plan																						
	Actual																					The document that guides "General Planning and Drill and Simulation Timeline is based in the Implementation Guide for Simulations and Drills by SNGRE" and the evaluation of evacuation drill tools have been designed, discussed. Tsunami evacuation planning manual was finalized by SNGRE and printed.	Workshops are being held for GADs in coastal areas using the manual for the development of the tsunami evacuation plan
1.5 The pilot municipalities, with assistance of SGR, conduct endline survey concerning understanding level of local communities on tsunami evacuation	Plan																						
	Actual																						Planned during May and July 2021
Output 2:																							
2.1 SGR, with cooperation of MIDUVI and other technical collaborating member(s), conducts nation-wise baseline survey on current hazard data of earthquake and tsunami disasters.	Plan																						
	Actual																					The activity was completed in December 2017	
2.2 SGR, with cooperation of MIDUV and other technical collaborating member(s), understands feasible contents of 'Risk Reduction Agenda' based on the existing hazard information and/or data.	Plan																						
	Actual																					The activity was completed in November 2017	
2.3 SGR and the pilot municipalities study techniques and know-how applied in JICA projects for the objective of revision of the 'Risk Reduction Agenda' (e.g., CISMID in Peru).	Plan																						
	Actual																					The activity was completed in February 2018	
2.4 The pilot municipalities, with assistance of SGR, conduct baseline survey on current hazard data of earthquake and tsunami disasters.	Plan																						
	Actual																					The activity was completed in November 2017	
2.5 The pilot municipalities, with assistance of SGR, determine an outline of 'Risk Reduction Agenda', which covers priority area and countermeasure(s) on risk reduction.	Plan																						
	Actual																					The activity was completed in February 2018	
2.6 The pilot municipalities, with assistance of SGR, review the existing Contingency Plan and other relevant document(s).	Plan																						
	Actual																					The activity was completed in November 2017	
2.7 The pilot municipalities, with assistance of SNGRE, prepare ARR, which gives focus on mitigation/ prevention and preparedness (the updated ARR is referred during implementation of the planned activities for Output 1 and Output 3)	Plan																						
	Actual																					ARRs of three primary pilot municipalities were prepared and officially approved. The monitoring of the ARRs was conducted.	
2.8 SGR develops 'Risk Reduction Agenda Guideline for Earthquake and Tsunami Disasters' that will be utilized by municipalities other than the pilot municipalities.	Plan																						
	Actual																					ARR Guideline was developed in January 2019 and officially published by SNGRE on June 2019.	
2.9 SGR provides assistance to municipalities other than the pilot municipalities in revising 'Risk Reduction Agenda'	Plan																						
	Actual																					ARRs were prepared by four secondary pilot municipalities and approved by three municipalities.	SNGRE held nationwide seminars for ARR preparation in 2021
Output 3:																							
3.1 MIDUVI and the pilot municipalities, with collaboration of the technical collaborating members, conduct baseline survey to understand the current situation of building construction permit/ inspections/ occupation permit.	Plan																						
	Actual																					The activity was completed in December 2017	
3.2 MIDUVI and the pilot municipalities study foreign building regulation (e.g., Architect and Building Engineer Law, Construction Business Law) as well as JICA	Plan																						
																						The activity was completed in	



projects for the objective of development of 'Building Regulation Management Handbook'	Actual	March 2018	
3.3 MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, develop 'Building Regulation Management Handbook (draft)' in consultation with building engineers, construction companies and other relevant association(s).	Plan / Actual	Handbook was aproved by MIDUVI, printed and distributed to the related organizations.	
3.4 The pilot municipalities, with assistance of MIDUVI, develop, execute and update building regulation management plan(s) in accordance with the 'Building Regulation Management Handbook'	Plan / Actual	The management implementation plan based on the Handbook was officially approved in the pilot municipalities. The plan is applied to actual construction	Minitoring is planned.
3.5 MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, organize seminars on earthquake-resistance/ seismic resilient engineering and building regulation management, which are targeting architects, construction companies, construction workers and other relevant association(s).	Plan / Actual	Workshop was held on March 2021 in Esmeraldas	
3.6 MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, produce socialization materials on earthquake-resistance/ building regulation management in order to raise awareness of local communities (materials produced by JICA project implemented in El Salvador may be referred).	Plan / Actual	The socialization materials was printed and distributed to the related organizations	
3.7 MIDUVI and the pilot municipalities organize activities utilizing the materials developed in Activity 3.6 with the objective of raising awareness of local communities.	Plan / Actual	Workshop was held on March 2021 in Esmeraldas	
3.8 MIDUVI, with cooperation of the pilot municipalities, provides assistance to 3 municipalities in preparing building regulation management plan in accordance with the 'Building Regulation Management Handbook'	Plan / Actual	The project presentation and distribution of the Manual in secondary pilot municipalities was carried out	Minitoring is planned.
3.9 MIDUVI and the pilot municipalities conduct endline survey on building construction permit/ inspections/ occupation permit.	Plan / Actual		Planed during May and July 2021
Duration / Phasing	Plan / Actual		

Monitoring Plan	Year	2017		2018				2019				2020				2021				Remarks	Issue	Solution
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoring																						
Joint Coordinating Committee	Plan / Actual																			Project period was extended until September 2021		
Set-up the Detailed Plan of Operation	Plan / Actual																					
Submission of Monitoring Sheet	Plan / Actual																					
Monitoring Mission from Japan	Plan / Actual																					
Joint Monitoring	Plan / Actual																					
Post Monitoring	Plan / Actual																					
Reports/Documents																						
Project Progress Report	Plan / Actual																					
Project Completion Report	Plan / Actual																					
Public Relations																						
	Plan / Actual																					

Hoja de Monitoreo de Proyecto II (Revisión de Plan de Operación)

Version 8

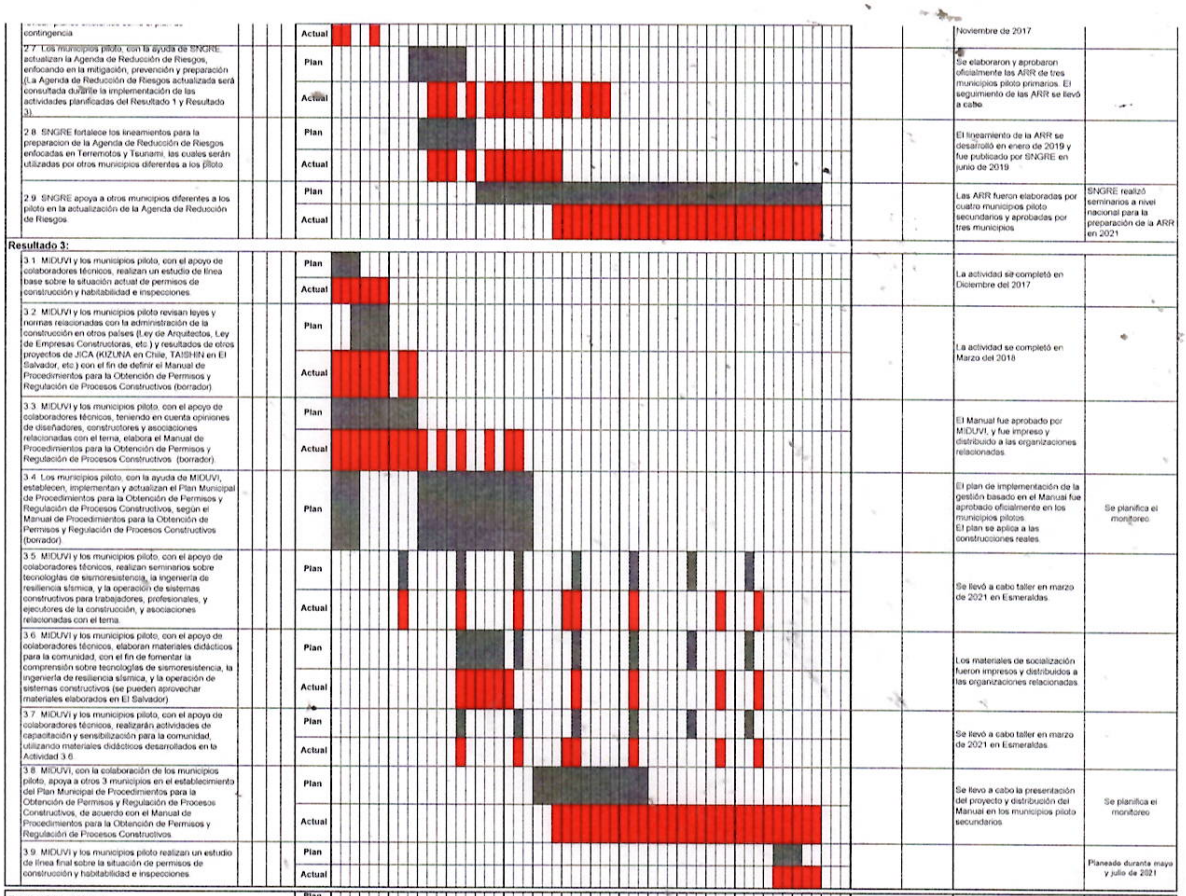
Fecha: 10 de septiembre de 2021

Título del Proyecto: Proyecto para la Construcción de Ciudades Seguras y Resilientes contra Desastres por Terremotos y Tsunami

Monitoreo

Entradas	Año	2017 III	2017 IV	2018 I	2018 II	2018 III	2018 IV	2019 I	2019 II	2019 III	2019 IV	2020 I	2020 II	2020 III	2020 IV	2021 I	2021 II	2021 III	2021 IV	Observaciones	Tema	Solucion
Expert																						
Asesor-Jefe/Integra RRD 1	Plan																					
	Actual																					
Asesor Subjefe/Integra RRD 2	Plan																					
	Actual																					
Plan de Evacuación de Tsunami	Plan																					
	Actual																					
Formulación de la Organización 1/Plan de Reducción de Riesgos	Plan																					
	Actual																					
Formulación dela organización 2	Plan																					
	Actual																					
Plan RRD	Plan																					
	Actual																					
Evaluación de Riesgos	Plan																					
	Actual																					
Evaluación de la vulnerabilidad/Consideración de genero	Plan																					
	Actual																					
Gestión de la Regulación de Edificios	Plan																					
	Actual																					
Gestión de la Calidad de la Construcción	Plan																					
	Actual																					
Educación Ciudadana para construcción sísmica	Plan																					
	Actual																					
Gestión de la Formación	Plan																					
	Actual																					
Plan RRD/ Coordinación del Proyecto: 1 persona	Plan																					
	Actual																					
Equipo																						
Equipo relacionado con el Plan de Evacuación por Tsunami (Resultado 1)	Plan																					
	Actual																					
Equipo relacionado con la 'Agenda de Reducción de Riesgos' (Resultado 2)	Plan																				El dron fue enviado a SNGRE pronto. Se donaron 2 Carpas de Acción Rápida	
	Actual																					
Equipo relacionado con la Gestión de la Operación de Sistemas constructivos (Resultado 3)	Plan																					
	Actual																					
Capacitación en Japón																						
Capacitación sobre la 'Agenda de Reducción de Riesgos' en Japón para el nivel directivo	Plan																					
	Actual																					
capacitación sobre la ' Agenda de Reducción de Riesgos' en Japón y en Ecuador para el nivel técnico	Plan																				Dado que es difícil realizar la capacitación en Japón, el taller del plan de acción se planifica en Ecuador	
	Actual																					
Capacitación sobre la Operación de Sistemas Constructivos en Japón para el nivel directivo y el nivel técnico	Plan																					
	Actual																					
Capacitación en el país/en el tercer país																						
Capacitación sobre la Operación de sistemas constructivos en tercer país para el nivel directivo/y para el nivel técnico	Plan																					
	Actual																					

Actividades / Sub-Actividades	Year	2017 III	2017 IV	2018 I	2018 II	2018 III	2018 IV	2019 I	2019 II	2019 III	2019 IV	2020 I	2020 II	2020 III	2020 IV	2021 I	2021 II	2021 III	2021 IV	Organización Responsable: Japon	Organización Responsable: GOE	Logros	Temas & Contramedidas
Resultado 1:																							
1.1 Se hace seguimiento a la actualización del Protocolo Técnico de Alerta de Tsunami entre SNGRE, IG-EPN e INOCAR a través de simulaciones y simulacros periódicos, como su aprobación por parte de SNGRE, IG-EPN e INOCAR	Plan																					El Protocolo se monitorea continuamente cuando ocurren terremotos	
	Actual																						
1.2 Los municipios piloto, con la ayuda de SNGRE, realiza un estudio de línea base del grado de comprensión de la comunidad sobre la evacuación por tsunami	Plan																					La actividad se completó en Enero de 2018	
	Actual																						
1.3 Los municipios piloto, con la ayuda de SNGRE, mejoran el protocolo y el mecanismo de comunicación de la alerta de tsunami hacia la comunidad, incluyendo los turistas, y el plan de evacuación, incluyendo la evacuación vertical (La Agenda de Reducción de Riesgos preparada en las actividades del Resultado 2 abarca el plan de evacuación)	Plan																					El plan de evacuación por tsunami ha sido elaborado por 3 municipios pilotos y 4 están revisando en función de la simulación final de la inundación por tsunami. Señaléticas que indican altitud han sido elaboradas e instaladas en los 7 GAD	
	Actual																						
1.4 Los municipios piloto, con la ayuda de SNGRE, realizan trabajo de fortalecimiento de capacidades a la comunidad, a través de la construcción de materiales didácticos tanto para la comunidad como para los turistas, y simulacros de evacuación por tsunami	Plan																					El documento que orienta la "Planificación General y la Línea de Tiempo del Simulacro y Simulación está basado en la Guía de Implementación para Simulaciones y Simulacros del SNGRE" y las herramientas para la evaluación de los simulacros de evacuación se han diseñado, discutido SNGRE finalizó e imprimió el manual para la elaboración del plan evacuación por tsunami	Se están llevando a cabo talleres para los GAD en las áreas costeras utilizando el manual para la elaboración del plan de evacuación por tsunami
	Actual																						
1.5 Los municipios piloto, con la ayuda de SNGRE, realizan un estudio de línea final del grado de comprensión de la comunidad sobre la evacuación por tsunami	Plan																						Planeado durante mayo y julio de 2021
	Actual																						
Resultado 2:																							
2.1 SNGRE, con la colaboración de MIDUVI y el apoyo de colaboradores técnicos, realiza un estudio de línea base a nivel nacional sobre los datos existentes de amenazas de terremotos y tsunami	Plan																					La actividad se completó en Diciembre del 2017	
	Actual																						
2.2 SNGRE, con la colaboración de MIDUVI y el apoyo de colaboradores técnicos, profundiza el conocimiento sobre el contenido de la Agenda de Reducción de Riesgos factibles (la elaboración de mapas de amenazas, la ratificación del uso de suelo y de desarrollo urbano, la capacitación y educación, etc.) a partir de la información y los datos existentes de amenazas	Plan																					La actividad se completó en Noviembre del 2017	
	Actual																						
2.3 SNGRE y los municipios piloto estudian tecnologías y know-how aplicados en otros proyectos de JICA (CISMID de Perú, etc.) con el fin de actualizar la Agenda de Reducción de Riesgos	Plan																					La actividad se completó en Febrero de 2018	
	Actual																						
2.4 Los municipios piloto, con la ayuda de SNGRE, realizan un estudio de línea base sobre los datos existentes de amenazas de terremotos y tsunami	Plan																					La actividad se completó en Noviembre de 2017	
	Actual																						
2.5 Los municipios piloto, con la ayuda de SNGRE, definen los lineamientos básicos de la Agenda de Reducción de Riesgos donde se muestran prioridades y medidas importantes para la reducción de Riesgos	Plan																					La actividad se completó en Febrero de 2018	
	Actual																						
2.6 Los municipios piloto, con la ayuda de SNGRE, revisan planes existentes como el plan de	Plan																					La actividad se completó en	



contingencia	Actual	Noviembre de 2017	
2.7. Los municipios piloto, con la ayuda de SNGRE, actualizan la Agenda de Reducción de Riesgos, enfocando en la mitigación, prevención y preparación (La Agenda de Reducción de Riesgos actualizada será consultada durante la implementación de las actividades planificadas del Resultado 1 y Resultado 3).	Plan Actual	Se elaboraron y aprobaron oficialmente las ARR de tres municipios piloto primarios. El seguimiento de las ARR se llevó a cabo	
2.8. SNGRE fortalece los lineamientos para la preparacion de la Agenda de Reducción de Riesgos enfocadas en Terremotos y Tsunami, las cuales serán utilizadas por otros municipios diferentes a los piloto	Plan Actual	El lineamiento de la ARR se desarrolló en enero de 2019 y fue publicado por SNGRE en junio de 2019	
2.9. SNGRE apoya a otros municipios diferentes a los piloto en la actualización de la Agenda de Reducción de Riesgos	Plan Actual	Las ARR fueron elaboradas por cuatro municipios piloto secundarios y aprobadas por tres municipios	SNGRE realizó seminarios a nivel nacional para la preparación de la ARR en 2021
Resultado 3:			
3.1. MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, realizan un estudio de línea base sobre la situación actual de permisos de construcción y habitabilidad e inspecciones	Plan Actual	La actividad se completó en Diciembre del 2017	
3.2. MIDUVI y los municipios piloto revisan leyes y normas relacionadas con la administración de la construcción en otros países (Ley de Arquitectos, Ley de Empresas Constructoras, etc.) y resultados de otros proyectos de JICA (KIZUNA en Chile, TAISHIN en El Salvador, etc.) con el fin de definir el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador)	Plan Actual	La actividad se completó en Marzo del 2018	
3.3. MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, teniendo en cuenta opiniones de diseñadores, constructores y asociaciones relacionadas con el tema, elabora el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador)	Plan Actual	El Manual fue aprobado por MIDUVI, y fue impreso y distribuido a las organizaciones relacionadas	
3.4. Los municipios piloto, con la ayuda de MIDUVI, establecen, implementan y actualizan el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos, según el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador)	Plan	El plan de implementación de la gestión basado en el Manual fue aprobado oficialmente en los municipios pilotos. El plan se aplica a las construcciones reales.	Se planifica el monitoreo
3.5. MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, realizan seminarios sobre tecnologías de sismoresistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos para trabajadores, profesionales, y ejecutores de la construcción, y asociaciones relacionadas con el tema.	Plan Actual	Se llevó a cabo taller en marzo de 2021 en Esmeraldas.	
3.6. MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, elaboran materiales didácticos para la comunidad, con el fin de fomentar la comprensión sobre tecnologías de sismoresistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos (se pueden aprovechar materiales elaborados en El Salvador)	Plan Actual	Los materiales de socialización fueron impresos y distribuidos a las organizaciones relacionadas	
3.7. MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, realizarán actividades de capacitación y sensibilización para la comunidad, utilizando materiales didácticos desarrollados en la Actividad 3.6	Plan Actual	Se llevó a cabo taller en marzo de 2021 en Esmeraldas.	
3.8. MIDUVI, con la colaboración de los municipios piloto, apoya a otros 3 municipios en el establecimiento del Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos, de acuerdo con el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos	Plan Actual	Se llevo a cabo la presentación del proyecto y distribución del Manual en los municipios piloto secundarios	Se planifica el monitoreo
3.9. MIDUVI y los municipios piloto realizan un estudio de línea final sobre la situación de permisos de construcción y habitabilidad e inspecciones	Plan Actual		Planeado durante mayo y julio de 2021
Duración / Fase	Plan Actual		

Plan de Monitoreo	Año	2017		2018				2019				2020				2021				Observaciones	Tema	Solución
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoreo																						
Comité de Coordinacion Conjunta	Plan Actual																			El período del proyecto se extendió hasta septiembre de 2021		
Establecimiento de Plan Detallado Plan de Operación D	Plan Actual																					
Presentacion de Hoja de Monitoreo de Proyecto	Plan Actual																					
Misión de Monitoreo de Japon	Plan Actual																					
Monitoreo Conjunto	Plan Actual																					
Monitoreo Posterior	Plan Actual																					
Reportes/Documentos																						
Informe de Progreso del Proyecto	Plan Actual																					
Informe de terminación del Proyecto	Plan Actual																					
Relaciones Públicas																						
	Plan Actual																					
	Plan Actual																					

MINUTES OF MEETINGS
AMONG
JAPAN INTERNATIONAL COOPERATION AGENCY,
NATIONAL SERVICE OF RISK MANAGEMENT AND EMERGENCY,
AND
MINISTRY OF URBAN DEVELOPMENT AND HOUSING
FOR AMENDMENT OF THE RECORD OF DISCUSSIONS
ON
THE PROJECT FOR SAFE AND RESILIENT CITIES FOR EARTHQUAKE AND TSUNAMI DISASTER

The Japan International Cooperation Agency, National Service of Risk Management and Emergency and Ministry of Urban Development and Housing hereby agree that the Record of Discussions on the Project for Safe and Resilient Cities for Earthquake and Tsunami Disaster signed on April 11, 2017 (attached in Annex 1) shall be amended as follows:

1. Organizational name (throughout the document)

Before	Amended Version
Secretary of Risk Management	National Service of Risk Management and Emergency
Reason: Change of organization name	

2. Organizational name (throughout the document)

Before	Amended Version
SGR	SNGRE
Reason: Change of organization name	

3. II. OUTLINE OF THE PROJECT
   2. Duration

Before	Amended Version
45 months from the arrival of the first expert in Ecuador.	51 months from the arrival of the first expert in Ecuador.
Reason: The project duration needs to be extended.	

Project Design Matrix and Plan of Operation shall be updated as Annex 2 and Annex 3 respectively, attached hereby.

This amendment will become effective as of October 16, 2020.

Annex 1 : Record of Discussions (signed on April 11, 2017)
Annex 2 : Project Design Matrix
Annex 3 : Plan of Operation

October 16, 2020

Mr. Takeo Ishikawa
Resident Representative
Ecuador Office
Japan International Cooperation Agency
Japan

MSc. Rommel Salazar Cedeño
Director General
National Service of Risk Management and Emergency
Republic of Ecuador

Arch. Julio Fernando Recalde Ubidia
Minister
Ministry of Urban Development and Housing
Republic of Ecuador

ANNEX 2

Project Design Matrix (PDM)

Project Title: Project for Safe and Resilient Cities for Earthquake and Tsunami Disaster
Project Period: July 2017 to **September 2021 (51 months)**
Project Target Area: Pilot Municipalities (Atacames, Portoviejo, Salinas)
Counterpart Organizations: National Service of Risk Management and Emergency(SNGRE), Ministry of Urban Development and Housing (MIDUVI)

Date: September 30, 2020
Version: 5

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal			
SNGRE and MIDUVI implement nation-wide activities to build safe and resilient cities from disasters.	• Tsunami evacuation procedures are revised as the results of exercises and drills that are conducted twice every year even in the pilot municipalities after the project termination. • 'Risk Reduction Agenda' is revised utilizing 'Risk Reduction Agenda' development guideline in the pilot municipalities even after the project termination. • 'Risk Reduction Agenda' is revised utilizing 'Risk Reduction Agenda' development guideline in 3 or more municipalities that are not the pilot municipalities. • Building regulation management plan is implemented in 3 municipalities that are not the pilot municipalities.	• • Most recent 'Risk Reduction Agenda' in the pilot municipalities • Most recent 'Risk Reduction Agenda' in municipalities that are not the pilot municipalities • Building regulation management plan produced in municipalities other than the pilot municipalities	
Project Purpose			
Technical support structure from SNGRE and MIDUVI to municipalities is established with the objective of risk reduction from earthquakes and tsunamis.	1. Evacuation drills are conducted in accordance with the evacuation plan and protocol, which are improved under the Project, more than twice in each pilot municipality by the time of the project termination. 2. 5 out of 6 municipalities that received technical guidance from SNGRE in due course of new 'Risk Reduction Agenda' development develop 'Risk Reduction Agenda' 3. Required tasks[1] stated in 'Building Regulation Management Handbook' are executed in each pilot municipality. 4. SNGRE and MIDUVI, before the end of the Project, carry out training for officials of all zone offices using guides and manuals developed by the Project.	1. Tsunami evacuation drills report(s), JICA Project Report(s) 2. Updated 'Risk Reduction Agenda', JICA Project Report(s) 3. JICA Project Report(s), Records of review for building construction permits and inspections during construction and upon completion produced by the pilot municipalities 4. JICA Project report(s)	A level of importance given to Disaster Risk Reduction Sector by the Government of Ecuador stays high.

[1] Required tasks are 1) document review related to building construction permit, 2) inspection of building during construction, 3) inspection of building upon completion, 4) issuance of occupation permit.

Outputs			
1. Pilot Municipalities provide timely assistance to evacuate communities rapidly in response to tsunami warning issued in accordance with Tsunami Warning Technical Protocol.	• The understanding level about the essential aspects for tsunami evacuation in the EL survey reaches at least 60% in each pilot cities. • The evacuation drills, which are conducted in accordance with the protocol developed under the Project, are completed with the expected time in each pilot municipality. • Evacuation Plan/ Dissemination Structure/ Protocol/ Evacuation Route(s) that are developed under the Project are approved by the mayor in each pilot municipality.	• JICA Project Report(s), Activities reports produced by UGR • JICA Project Report(s), Approval letter/ notice issued by concerned municipalities • JICA Project Report(s), Most recent evacuation plan, tsunami warning information flow chart, protocol・evacuation route(s)	
2. 'Risk Reduction Agenda' focusing on Mitigation/ Prevention and Preparedness is updated by municipalities.	• 'Risk Reduction Agenda' updated in each pilot municipality is approved by the mayor/ municipal council/ SNGRE. • 'Risk Reduction Agenda' development guideline is approved by SNGRE. • 3 or more municipalities, which are not the pilot municipalities, received technical guidance from SNGRE for revision of 'Risk Reduction Agenda'.	• JICA project report(s), approval letter(s)/ notice(s) issued by the concerned mayor/ municipal council /SNGRE. • JICA project report(s), approval letter/notice issued by SNGRE • JICA project report(s), most recent 'Risk Reduction Agenda' in YY municipalities	
3. Implementation structure of building regulation management in accordance with 'Building Regulation Management Handbook[2]' is established at a municipality level.	• Percentages of inspection during construction and upon completion are increased by 50% against the baseline result in the pilot municipalities. • Contents of the reports related to building construction permit, inspections during construction and upon completion produced in the pilot municipalities observe the tables and checklist of the Handbook. • An ordinance which includes Building regulation management plan at a municipality level is approved by mayor/ municipal council. • Required personnel, budget and others are allocated as per the approved building regulation management plan. • Ministerial degree stating approval of 'Building Regulation Management Handbook' issued. • Building regulation management plan is developed in 3 municipalities, which are not the pilot municipalities.	• JICA project report(s) • Documents such as application of building construction permit and other relevant documents • Reports of inspections during construction and upon completion, and other relevant documents • JICA project report(s) (including the endline survey results) • Approval letter/ notice issued by MIDUVI • Building Regulation management plan(s) produced by municipalities other than the pilot municipalities	

[2] 'Building Regulation Management Handbook' illustrates an outline of processes related to building construction permit, inspections and occupation permit. Each municipality is expected to develop building regulation management plan in accordance with the Handbook.

Activities	Input	Pre-condition
1.1. SNGRE, IG-EPN and INOCAR update the Tsunami Warning Technical Protocol in due course of regular simulation as well as evacuation drills, and the project members monitor approval process(es) of the Protocol by SNGRE, IG-EPN and INOCAR. 1.2. The pilot municipalities, with assistance of SNGRE, conduct baseline survey concerning understanding level of local community on tsunami evacuation. 1.3. The pilot municipalities, with guidance of SNGRE, improve tsunami warning information dissemination structure/ protocol/ evacuation plan, which includes vertical evacuation, for local communities including tourists ('Risk Reduction Agenda' prepared in activities for Output 2 covers evacuation plan(s)). 1.4. The pilot municipalities, with guidance of SNGRE, carry out capacity development activities for local communities including tourists utilizing raising-awareness materials that produced in the Project, and conduct tsunami evacuation drills utilizing the said materials. 1.5. The pilot municipalities, with assistance of SNGRE, conduct endline survey concerning understanding level of local communities on tsunami evacuation.	Input: Japanese Side 1.Experts Long-Term: DRR plan/ Project coordination 1 person Short-Term: • Team leader • Tsunami evacuation plan • DRR plan (Response, Reconstruction, Mitigation/Prevention, Preparedness) • Building regulation management 2.Training (in Japan, **Ecuador and** Third Countries) • Training on 'Risk Reduction Agenda' in Japan **and Ecuador** (for senior management, for technical officers) • Training on Building Regulation Management in Japan and/or third countries (for senior management/ technical officers 3.Procurement of Equipment • Equipment related to Tsunami Evacuation Plan (Output 1) • Equipment related to 'Risk Reduction Agenda' (Output 2) • Equipment related to Building Regulation Management (Output 3) Input: Ecuador Side 1.Counterpart Personnel: • Project Director (SNGRE) • Project Director (MIDUVI) • Coordinators (1 person for each Output) • WG members for Output 1 • WG members for Output 2 • WG members for Output 3 2.Wokring Space and Facilities for JICA Experts at: • SNGRE	Municipalities selected as the pilot Municipalities assign more than one technical officer per Output for implementation of the Project.
2.1. SNGRE, with cooperation of MIDUVI and other technical collaborating member(s), conducts nation-wise baseline survey on current hazard data of earthquake and tsunami disasters. 2.2. SNGRE, with cooperation of MIDUV and other technical collaborating member(s), understands feasible contents of 'Risk Reduction Agenda[3]' (e.g., development of hazard map(s), classification of land use/ development of urban planning) based on the existing hazard information and/or data. 2.3. SNGRE and the pilot municipalities study techniques and know-how applied in JICA projects for the objective of revision of the 'Risk Reduction Agenda' (e.g., CISMID in Peru). 2.4. The pilot municipalities, with assistance of SNGRE, conduct baseline survey on current hazard data of earthquake and tsunami disasters. 2.5. The pilot municipalities, with assistance of SNGRE, determine an outline of 'Risk Reduction Agenda', which covers priority area and countermeasure(s) on risk reduction. 2.6. The pilot municipalities, with assistance of SNGRE, review the existing Contingency Plan and other relevant document(s). 2.7. The pilot municipalities, with assistance of SNGRE, prepare 'Risk Reduction Agenda', which gives focus on mitigation/ prevention and preparedness (the updated 'Risk Reduction Agenda' is referred during implementation of the planned activities for Output 1 and Output 3). 2.8. SNGRE develops 'Risk Reduction Agenda Guideline for Earthquake and Tsunami Disasters' that will be utilized by municipalities other than the pilot municipalities. 2.9. SNGRE provides assistance to municipalities other than the pilot municipalities in revising 'Risk Reduction Agenda'.		
3.1. MIDUVI and the pilot municipalities, with collaboration of the technical collaborating members, conduct baseline survey to understand the current situation of building construction permit/ inspections/ occupation permit. 3.2. MIDUVI and the pilot municipalities study foreign building regulation (e.g., Architect and Building Engineer Law, Construction Business Law) as well as JICA projects (e.g., KIZUNA in Chile, TAISHIN in El Salvador) for the objective of development of 'Building Regulation Management Handbook'. 3.3. MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, develop 'Building Regulation Management Handbook (draft)' in consultation with building engineers, construction companies and other relevant association(s).		**Issues and Countermeasures**

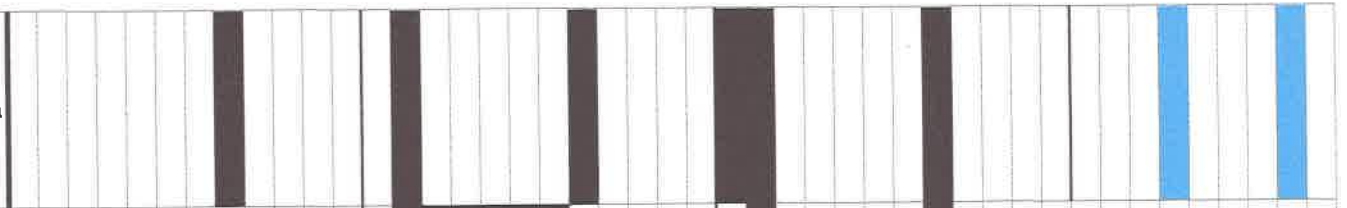
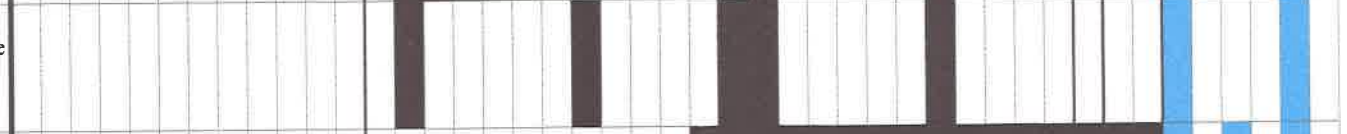
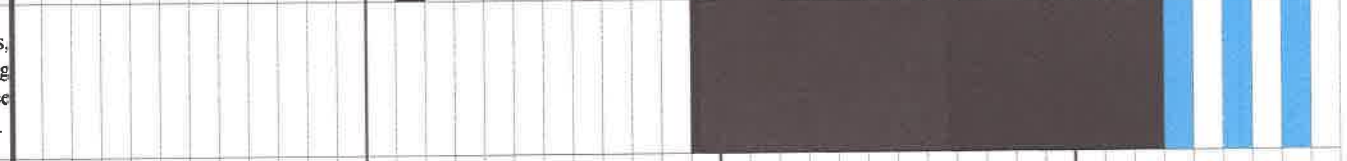
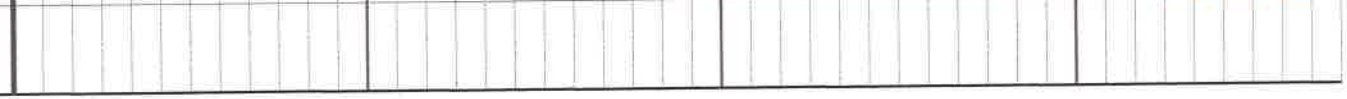
[3] 'Risk Reduction Agenda' is a document name, which municipalities are requested to prepare by SNGRE. The outline of 'Risk Reduction Agenda' is similar to an outline of Disaster Risk Reduction Plan, which Japanese side initially proposed.

3.4. The pilot municipalities, with assistance of MIDUVI, develop, execute and update building regulation management plan(s) in accordance with the 'Building Regulation Management Handbook'. 3.5. MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, organize seminars on earthquake-resistance/ seismic resilient engineering and building regulation management, which are targeting architects, construction companies, construction workers and other relevant association(s). 3.6. MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, produce socialization materials on earthquake-resistance/ building regulation management in order to raise awareness of local communities (materials produced by JICA project implemented in El Salvador may be referred). 3.7. MIDUVI and the pilot municipalities organize activities utilizing the materials developed in Activity 3.6 with the objective of raising-awareness of local communities. 3.8. MIDUVI, with cooperation of the pilot municipalities, provides assistance to 3 municipalities in preparing building regulation management plan in accordance with the 'Building Regulation Management Handbook'. 3.9. MIDUVI and the pilot municipalities conduct endline survey on building construction permit/ inspections/ occupation permit.	• MIDUVI 3.Project Cost: • Salary of the counterpart persons • Domestic travel including accommodation and per diem for the counterpart persons	

Tentative Plan of Operation (PO) (Version 3.0) (as of Oct. 12, 2020)

Year	Year 1												Year 2												Year 3												Year 4												
	2017						2018						2018						2019						2019						2020						2020												20
Month	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3			
Project Period																																															
Joint Coordination Committee (JCC)			● 1					● 2							● 3					● 4						● 5					● 6							● 7					● 8				
Monitoring Sheet								●							●					●						●					●							●					●				
Mid-term Review (M), Terminal Evaluation (T)																				M																											
Output 1: Tsunami Evacualtion Plan																																															
1.1 SNGRE, IG-EPN and INOCAR update the Tsunami Warning Technical Protocol in due course of regular simulation as well as evacuation drilled, and the project members monitor approval process(es) of the Protocol by SNGRE, IG-EPN and INOCAR.																																														
1.2 The pilot municipalities, with assistance of SNGRE, conduct baseline survey concerning understanding level of local community on tsunami evacuation.																																														
1.3 The pilot municipalities, with guidance of SNGRE, improve tsunami warning information dissemination structure/ protocol/ evacuation plan for local communities including tourists ('Risk Reduction Agenda' prepared in activities for Output 2 will cover evacuation plan(s), which includes vertical evacuation).																																														
1.4 The pilot municipalities, with guidance of SNGRE, conduct raising-awareness activities and tsunami evacuation drills based on the outcome(s) of Activity 1.3, and utilizing DRR promotion/ teaching materials that are addressed to local communities including																																														
1.5 The pilot municipalities, with assistance of SNGRE, conduct endline survey concerning understanding level of local community on tsunami evacuation.																																														
Output 2: Disaster Risk Reduction Plan																																														
2.1 SNGRE, with cooperation of MIDUVI and other(s), conducts nation-wise baseline survey on curren hazard data of earthquake and tsunami disasters.																																														
2.2 SNGRE, with cooperation of MIDUV and other(s), understands feasible contents of 'Risk Reduction Agenda' based on the existing hazard information																																														
2.3 SNGRE and the pilot municipalities study techniques and know-how applied in JICA projects for the objective of revision of the 'Risk Reduction Agenda' (e.g., CISMID in Peru).																																														
2.4 The pilot municipalities, with assistance of SGR, conduct baseline survey on current hazard data of earthquake and tsunami disasters.																																														

2.5	The pilot municipalities, with assistance of SNGRE, determine an outline of 'Risk Reduction Agenda', which covers priority area and organization(s) of risk reduction and important countermeasure(s).	
2.6	The pilot municipalities, with assistance of SNGRE, review the existing Contingency Plan and other relevant document(s).	
2.7	The pilot municipalities, with assistance of SNGRE, prepare 'Risk Reduction Agenda', which gives focus on mitigation/ prevention and preparedness (the updated ' Risk Reduction Agenda ' will be referred during implementation of the planned activities for Output 1 and Output 3).	
2.8	SNGRE develops 'Risk Reduction Agenda Guideline' that will be utilized by municipalities other than the pilot municipalities.	
2.9	SNGRE provides assistance to municipalities other than the pilot municipalities in revising 'Risk Reduction	
Output 3: Building Regulation Management		
3.1	MIDUVI and the pilot municipalities, with collaboration of the technical collaborating members, conduct baseline survey to understand the current situation of building construction permit/ inspections/ occupation permit.	
3.2	MIDUVI and the pilot municipalities study foreign building regulation (e.g., Architect and Building Engineer Law, Construction Business Law) as well as JICA projects (e.g., KIZUNA in Chile, TAISHIN in El Salvador).	
3.3	MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, develop 'Building Regulation Management Handbook (draft)' in consultation with building engineers, construction companies and other relevant association(s).	
3.4	The pilot municipalities, with assistance of SNGRE, develop and update 'Building Regulation Management Plan(s)' in accordance with 'Building Regulation Management Handbook'.	

3.5	MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, organize seminars on earthquake-resistance/ seismic resilient engineering and building regulation management, which are targeting architects, construction companies, construction workers and other relevant association(s).	
3.6	MIDUVI and the pilot municipalities, with cooperation of the technical collaborating members, produce socialization materials on earthquake-resistance/ building regulation management in order to raise awareness of local communities (materials produced by JICA project implemented in El Salvador may be referred).	
3.7	MIDUVI and the pilot municipalities organize activities utilizing the materials developed in Activity 3.6 with the objective of raising-awareness of local communities.	
3.8	MIDUVI, with cooperation of the pilot municipalities, provides assistance to 3 municipalities in preparing building regulation management plan in accordance with the 'Building Regulation Management Handbook'.	
3.9	MIDUVI and the pilot municipalities conduct endline survey on building construction permit/ inspections/ occupation permit.	

ACTA DE REUNIÓN
ENTRE
AGENCIA DE COOPERACIÓN INTERNACIONAL DEL JAPÓN,
SERVICIO NACIONAL DE GESTIÓN DE RIESGOS Y EMERGENCIAS,
Y
MINISTERIO DE DESARROLLO URBANO Y VIVIENDA
PARA LA ENMIENDA DEL REGISTRO DE DISCUSIONES
DEL
PROYECTO PARA LA CONSTRUCCIÓN DE CIUDADES SEGURAS Y RESILIENTES CONTRA DESASTRES POR TERREMOTOS Y TSUNAMI

La Agencia de Cooperación Internacional del Japón, el Servicio Nacional de Gestión de Riesgos y Emergencias y el Ministerio de Desarrollo Urbano y Vivienda acuerdan que el Registro de Discusiones del Proyecto Ciudades Seguras y Resilientes contra Desastres por Terremotos y Tsunami firmado el 11 de abril de 2017 (adjunto en Anexo 1) se modifica de la siguiente manera:

1. Nombre de la organización (en todo el documento)

Antes	Versión enmendada
Secretaría de Gestión de Riesgos	Servicio Nacional de Gestión de Riesgos y Emergencias
Motivo: Cambio de nombre de la organización	

2. Nombre de la organización (en todo el documento)

Antes	Versión enmendada
SGR	SNGRE
Motivo: Cambio de nombre de la organización	

3. II. RESUMEN DEL PROYECTO

2. Duración

Antes	Versión enmendada
45 meses desde la llegada del primer experto a Ecuador.	51 meses desde la llegada del primer experto a Ecuador.
Motivo: Es necesario ampliar la duración del proyecto.	

La Matriz de Diseño del Proyecto y el Plan de Operación se actualizarán como Anexo 2 y Anexo 3 respectivamente, adjuntos a la presente.

Esta enmienda entrará en vigencia a partir del 16 de octubre de 2020.

Anexo 1: Registro de Discusiones (firmado el 11 de abril de 2017)
Anexo 2: Matriz de Diseño del Proyecto
Anexo 3: Plan de Operación

16 de Octubre de 2020

Sr. Takeo Ishikawa
Representante Residente
Oficina en Ecuador
Agencia de Cooperacion Internacional del Japón
Japón

MSc. Rommel Salazar Cedeño
Director General
Servicio Nacional de Gestión de Riesgos y Emergencias
República del Ecuador

Arq. Julio Fernando Recalde Ubidia
Ministro
Ministerio de Desarrollo Urbano y Vivienda
República del Ecuador

ANEXO 2

Matriz de Diseño del Proyecto (MDP)

Título del Proyecto: Proyecto para la Construcción de Ciudades Seguras y Resilientes contra Desastres por Terremotos y Tsunami
Período del Proyecto: De julio de 2017 a **septiembre de 2021 (51 meses)**
Zonas objeto: Municipios piloto (Atacames, Portoviejo y Salinas)
Entidades ejecutoras: Servicio Nacional de Gestión de Riesgos y Emergencias (SNGRE) y Ministerio de Desarrollo Urbano y Vivienda (MIDUVI)

Fecha de Elaboración: 30 de septiembre de 2020
Versión: 5

Resumen del Proyecto	Indicadores objetivos verificables	Medios de verificación	Aspectos importantes
Meta Superior			
SNGRE y MIDUVI implementan actividades a nivel nacional para la construcción de ciudades seguras y resilientes contra desastres.	• Después de la finalización del Proyecto, se realizan por lo menos dos simulacros de evacuación por tsunami cada año en los municipios pilotos y se revisan los procedimientos. • Se actualiza la Agenda de Reducción de Riesgos de los municipios pilotos, utilizando el Lineamiento para la Preparación de la "Agenda de Reducción de Riesgos" incluso después de la finalización del Proyecto. • La "Agenda de Reducción de Riesgos" es actualizada utilizando la guía de desarrollo de la "Agenda de Reducción de Riesgos" en 3 o más municipios no pilotos. • Se aplica el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos en 3 municipios diferentes a los pilotos.	• La última Agenda de Reducción de Riesgos de cada uno de los municipios pilotos • La Agenda de Reducción de Riesgos de otros municipios diferentes a los pilotos • Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos de otros municipios diferentes a los pilotos	
Objetivo del Proyecto			
Se establece la estructura de asistencia técnica de SNGRE y MIDUVI al nivel municipal para la reducción de daños causados por terremotos y tsunami.	1. Antes de la finalización del Proyecto, se realizan, por lo menos, dos simulacros de evacuación por tsunami en cada uno de los municipios piloto, de acuerdo con el plan de evacuación y el protocolo mejorados a través del Proyecto. 2. Se desarrolla la Agenda de Reducción de Riesgos en 5 de 6 municipios que recibieron la orientación técnica de SNGRE. 3. Se implementan trabajos requeridos[1], de acuerdo con el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos elaborado en el Proyecto, en cada uno de los municipios piloto. 4. SNGRE y MIDUVI, antes de la finalización del Proyecto, realizan la capacitación a los funcionarios de todas las coordinaciones zonales utilizando las guías y los manuales elaborados.	1. Informes de simulacros e informes del Proyecto 2. Agendas de Reducción de Riesgos actualizadas e informes del Proyecto 3. Informes del Proyecto y registros de revisión para el permiso de 4. construcción y controles de edificaciones durante y una vez finalizada la construcción elaborados por los municipios pilotos.	Que no se baje la prioridad de la gestión de riesgos en Ecuador

[1] Los trabajos requeridos son: 1) la revisión de documentos relacionados con el permiso de construcción, 2) la inspección intermedia durante la ejecución de la obra, 3) la inspección del final de la construcción y 4) la emisión del permiso de habitabilidad.

		5. Informes del Proyecto	
Resultados			
1. Con base en la alerta de tsunami emitida a través del Protocolo Técnico de Alerta de Tsunami, los municipios pilotos suministran asistencia oportuna para evacuar rápidamente las comunidades.	• El nivel de comprensión sobre los aspectos esenciales para la evacuación por tsunami alcanza al menos el 60% del resultado del estudio de línea final en cada municipio piloto. • Se ejecuta la evacuación dentro del tiempo establecido según el Protocolo elaborado en el Proyecto, en el simulacro • realizado en cada uno de los municipios pilotos. • Se aprueban el plan y las rutas de evacuación, el protocolo y el mecanismo de comunicación de la información, desarrollados en el Proyecto por parte del alcalde de cada uno de los municipios pilotos.	• Informes del Proyecto (informe de estudio de línea base) • Informes del Proyecto, informes de actividades elaborados por UGR • Informes del Proyecto y el documento de aprobación emitido por cada uno de los municipios pilotos	
2. Se actualiza la Agenda de Reducción de Riesgos enfocando en la mitigación, prevención y preparación por municipios.	• En cada uno de los municipios pilotos la Agenda de Reducción de Riesgos actualizada a través del Proyecto, se aprueba por el alcalde/el concejo municipal correspondiente /SNGRE. • Las Directrices para el desarrollo de la Agenda de Reducción de Riesgos se aprueba por SNGRE. • 3 o más municipios diferentes a los pilotos reciben la orientación técnica del SNGRE sobre la revisión de la Agenda de Reducción de Riesgos.	• Informes del Proyecto y el documento de aprobación emitido por el alcalde /el consejo municipal y SNGRE. • Informes del Proyecto y el documento de aprobación emitido por SNGRE • Informes del Proyecto e informes de SNGRE sobre la orientación técnica	
3. Se establece en el nivel municipal la estructura de implementación de la gestión de regulación de procesos constructivos, con base en el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos[2].	• En los municipios pilotos, se incrementa en el 50%, la tasa de la inspección intermedia y la final de construcciones, comparando con el resultado del estudio de línea base. • El contenido de los informes del permiso de construcción, la inspección intermedia y la inspección final de los municipios pilotos respeta las tablas y el check list del manual. • Una ordenanza que incluye el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos es aprobada por el alcalde /el consejo municipal. • Se asignan el personal, el presupuesto y otros aspectos necesarios, según el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos. • Se emite un decreto ministerial que oficializa el Manual de Procedimientos para la Obtención de Permisos y Regulación	• Informes del Proyecto • Informes del permiso de construcción, la inspección intermedia y final, y otros documentos relacionados • Documento de aprobación emitido por el alcalde / el consejo. • El plan anual de presupuesto del año siguiente de los municipios pilotos y el informe del Proyecto • Documento de aprobación emitido por MIDUVI	

[2] El Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos corresponde a los lineamientos sobre el trámite previo a la obtención del permiso de construcción y habitabilidad en base a la evaluación y seguimiento y control. Se espera que cada municipio establezca el plan de aplicación de reglamentos de construcción, con base en este Manual.

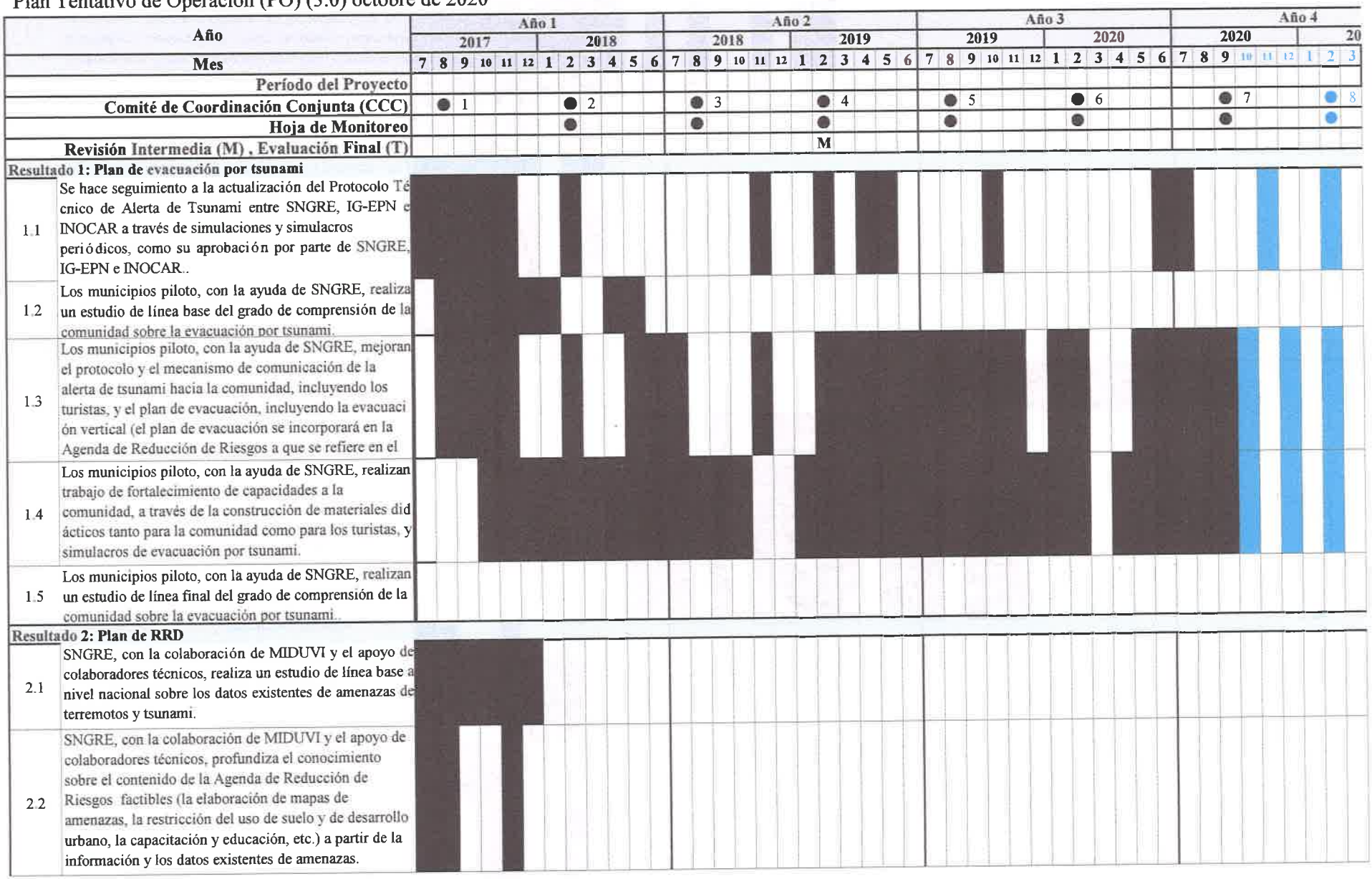
-	de Procesos Constructivos. • Se establece el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos en 3 DD municipios diferentes a los pilotos.	• Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos en otros municipios diferentes a los pilotos	

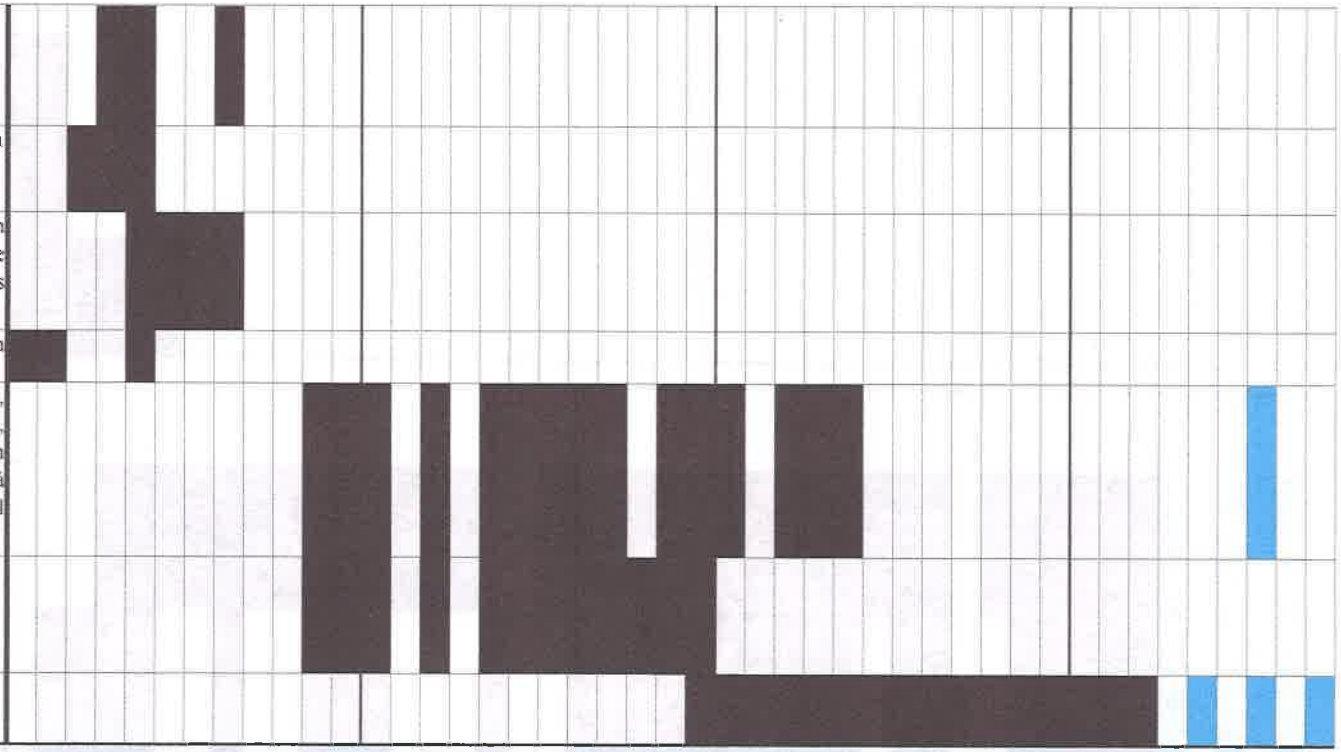
Actividades	Aportes	**Condiciones Previas**
1.1. Se hace seguimiento a la actualización del Protocolo Técnico de Alerta de Tsunami entre SNGRE, IG-EPN e INOCAR a través de simulaciones y simulacros periódicos, como su aprobación por parte de SNGRE, IG-EPN e INOCAR. 1.2. Los municipios pilotos, con la ayuda de SNGRE, realiza un estudio de línea base del grado de comprensión de la comunidad sobre la evacuación por tsunami. 1.3. Los municipios pilotos, con la ayuda de SNGRE, mejoran el protocolo y el mecanismo de comunicación de la alerta de tsunami hacia la comunidad, incluyendo los turistas, y el plan de evacuación, incluyendo la evacuación vertical (el plan de evacuación se incorporará en la Agenda de Reducción de Riesgos referida en el Resultado 2). 1.4. Los municipios pilotos, con la ayuda de SNGRE, realizan trabajo de fortalecimiento de capacidades a la comunidad, a través de la construcción de materiales didácticos tanto para la comunidad como para los turistas, y simulacros de evacuación por tsunami. 1.5. Los municipios pilotos, con la ayuda de SNGRE, realizan un estudio de línea final del grado de comprensión de la comunidad sobre la evacuación por tsunami.	<u>Aportes: Parte Japonesa</u> 1. Envío de expertos De largo plazo: plan de RRD / Coordinación del Proyecto De corto plazo: • Asesor Jefe • Expertos en el plan de evacuación por tsunami • Expertos en el Plan de RRD (Respuesta, Rehabilitación/Reconstrucción, Mitigación/Prevención y Preparación) • Expertos en la gestión de la operación de sistemas constructivos 2. Capacitación (en Japón, **en Ecuador** y tercer país) - Capacitación sobre el plan de evacuación por tsunami y la reducción de riesgos de desastres en Japón **y Ecuador**: Para el nivel directivo Para el nivel técnico - Capacitación sobre la operación de sistemas constructivos en Japón/ tercer país: Para el nivel directivo y técnico 3. Equipos y materiales • Equipos y materiales relacionados con el plan de evacuación por tsunami • Equipos y materiales relacionados con la Agenda de Reducción de Riesgos. • Equipos y materiales relacionados con la gestión de la operación de sistemas	Asegurar la participación de, por lo menos, un funcionario técnico, por resultado del Proyecto, de cada uno de los municipios piloto.
2.1. SNGRE, con la colaboración de MIDUVI y el apoyo de colaboradores técnicos, realiza un estudio de línea base a nivel nacional sobre los datos existentes de amenazas de terremotos y tsunami. 2.2. SNGRE, con la colaboración de MIDUVI y el apoyo de colaboradores técnicos, profundiza el conocimiento sobre el contenido de la Agenda de Reducción de Riesgos[3] factibles (la elaboración de mapas de amenazas, la restricción del uso de suelo y de desarrollo urbano, la capacitación y educación, etc.) a partir de la información y los datos existentes de amenazas. 2.3. SNGRE y los municipios pilotos estudian tecnologías y know-how aplicados en otros proyectos de JICA (CISMID de Perú, etc.) con el fin de actualizar la Agenda de Reducción de Riesgos. 2.4. Los municipios pilotos, con la ayuda de SNGRE, realizan un estudio de línea base sobre los datos existentes de amenazas de terremotos y tsunami. 2.5. Los municipios pilotos, con la ayuda de SNGRE, definen los lineamientos básicos de la Agenda de Reducción de Riesgos donde se muestran prioridades y medidas importantes para la reducción de Riesgos. 2.6. Los municipios pilotos, con la ayuda de SNGRE, revisan planes existentes como el plan de contingencia. 2.7. Los municipios pilotos, con la ayuda de SNGRE, actualizan la Agenda de Reducción de Riesgos, enfocando en la mitigación, prevención y preparación (La Agenda de Reducción de Riesgos actualizada será consultada en la implementación de las actividades del Resultado 1 y Resultado 3). 2.8. SNGRE fortalece las Directrices para la Actualización de la Agenda de Reducción de Riesgos enfocadas en Terremotos y Tsunami, las cuales serán utilizadas por otros municipios diferentes a los pilotos. 2.9. SNGRE apoya a otros municipios diferentes a los pilotos en la actualización de la Agenda de Reducción de Riesgos.		

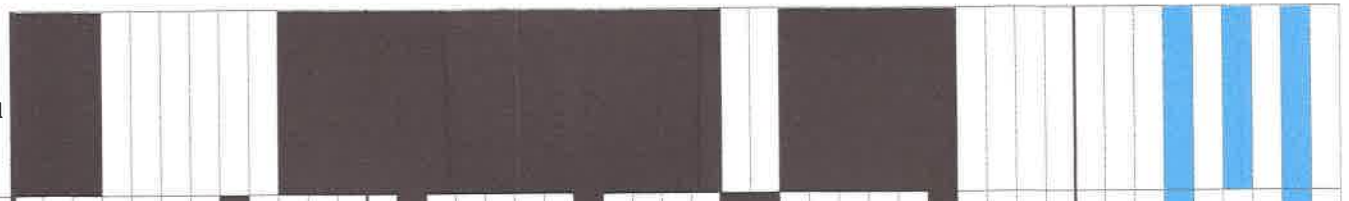
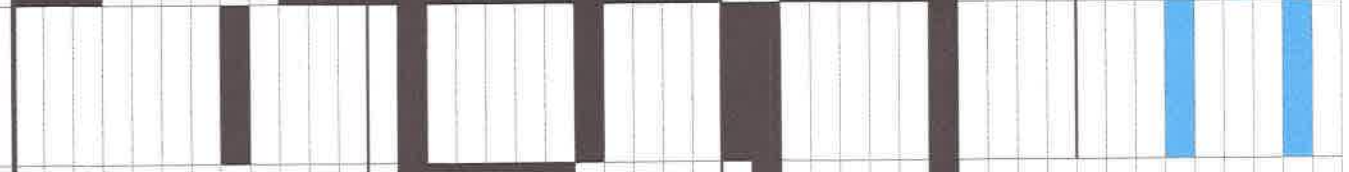
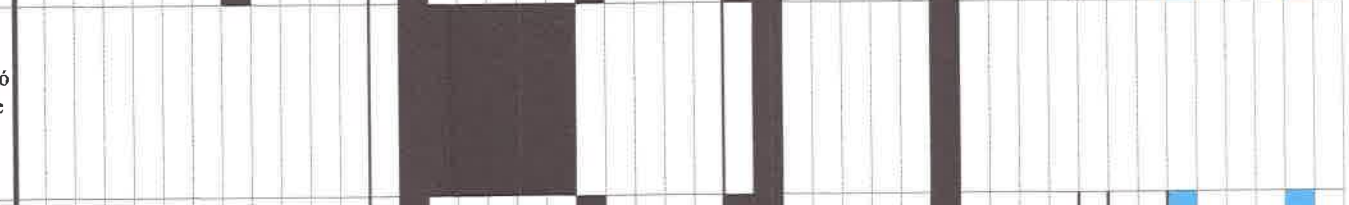
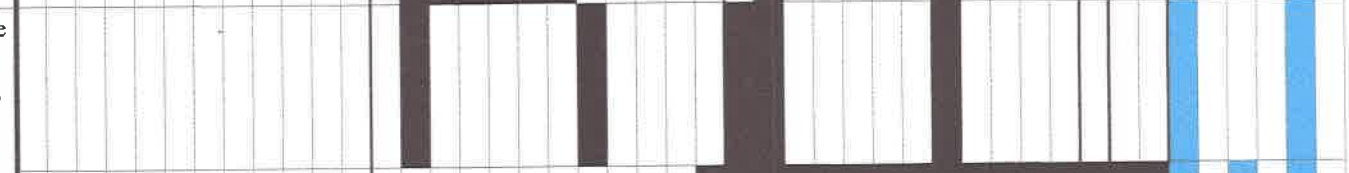
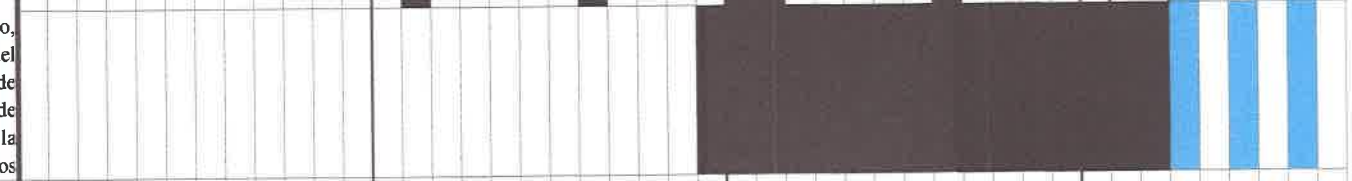
[3] La Agenda de Reducción de Riesgos es un documento que debe establecer un GAD según la orientación de SNGRE y tiene una estructura similar al plan de gestión de riesgos que la parte japonesa plantea para el Proyecto.

3.1. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, realizan un estudio de línea base sobre la situación actual de permisos de construcción y habitabilidad e inspecciones. 3.2. MIDUVI y los municipios pilotos revisan leyes y normas relacionadas con la administración de la construcción en otros países (Ley de Arquitectos, Ley de Empresas Constructoras, etc.) y resultados de otros proyectos de JICA (KIZUNA en Chile, TAISHIN en El Salvador, etc.) con el fin de definir el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador). 3.3. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, teniendo en cuenta opiniones de diseñadores, constructores y asociaciones relacionadas con el tema, elabora el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos[4] (borrador). 3.4. Los municipios pilotos, con la ayuda de MIDUVI, establecen, implementan y actualizan el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos, según el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador). 3.5. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, realizan seminarios sobre tecnologías de sismoresistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos para trabajadores, profesionales, y ejecutores de la construcción, y asociaciones relacionadas con el tema. 3.6. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, elaboran materiales didácticos para la comunidad, con el fin de fomentar la comprensión sobre tecnologías de sismoresistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos (se pueden aprovechar materiales elaborados en El Salvador). 3.7. MIDUVI y los municipios pilotos, con el apoyo de colaboradores técnicos, realizarán actividades de capacitación y sensibilización para la comunidad, utilizando materiales didácticos desarrollados en la Actividad 3.6. 3.8. MIDUVI, con la colaboración de los municipios pilotos, apoya a otros 3 municipios en el establecimiento del Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos, de acuerdo con el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos. 3.9. MIDUVI y los municipios pilotos realizan un estudio de línea final sobre la situación de permisos de construcción y habitabilidad e inspecciones.	constructivos Aportes: Parte Ecuatoriana 1. Personal de la contraparte - Director del Proyecto (SNGRE) - Director del Proyecto (MIDUVI) - Coordinadores del Proyecto (uno por resultado) - Miembros del Grupo de Trabajo del Resultado 1 - Miembros del Grupo de Trabajo del Resultado 2 - Miembros del Grupo de Trabajo del Resultado 3 2. Provisión del espacio de oficina y facilidades necesarias para expertos japoneses - SNGRE - MIDUVI 3. Asignación del presupuesto para el Proyecto: - Costo personal de la contraparte ecuatoriana - Viático y costo de transporte de viajes domésticos para el personal de la contraparte ecuatoriana	**Temas y Contramedidas**

Plan Tentativo de Operación (PO) (3.0) octubre de 2020



2.3	SNGRE y los municipios piloto estudian tecnologías y know-how aplicados en otros proyectos de JICA (CISMID de Perú, etc.) con el fin de actualizar la Agenda de Reducción de Riesgos.	
2.4	Los municipios piloto, con la ayuda de SNGRE, realizan un estudio de línea base sobre los datos existentes de amenazas de terremotos y tsunami.	
2.5	Los municipios piloto, con la ayuda de SNGRE, definen los lineamientos básicos de la Agenda de Reducción de Riesgos donde se muestran prioridades y medidas importantes para la reducción de Riesgos.	
2.6	Los municipios piloto, con la ayuda de SNGRE, revisan planes existentes como el plan de contingencia.	
2.7	Los municipios piloto, con la ayuda de SNGRE, actualizan la Agenda de Reducción de Riesgos, enfocando en la mitigación, prevención y preparación (La Agenda de Reducción de Riesgos actualizada será consultada en la implementación de las actividades del Resultado 1 y Resultado 3).	
2.8	SNGRE fortalece las Directrices para la Actualización de la Agenda de Reducción de Riesgos enfocadas en Terremotos y Tsunami, las cuales serán utilizadas por otros municipios diferentes a los piloto.	
2.9	SNGRE apoya a otros municipios diferentes a los piloto en la actualización de la Agenda de Reducción de Riesgos	
Resultado 3: Operación de sistemas constructivos		
3.1	MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, realizan un estudio de línea base sobre la situación actual de permisos de construcción y habitabilidad e inspecciones.	
3.2	MIDUVI y los municipios piloto revisan leyes y normas relacionadas con la administración de la construcción en otros países (Ley de Arquitectos, Ley de Empresas Constructoras, etc.) y resultados de otros proyectos de JICA (KIZUNA en Chile, TAISHIN en El Salvador, etc.) con el fin de definir el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador).	
3.3	MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, teniendo en cuenta opiniones de diseñadores, constructores y asociaciones relacionadas con el tema, elabora el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador).	

3.4	Los municipios piloto, con la ayuda de MIDUVI, establecen, implementan y actualizan el Plan Municipal de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos, según el Manual de Procedimientos para la Obtención de Permisos y Regulación de Procesos Constructivos (borrador).	
3.5	MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, realizan seminarios sobre tecnologías de sismoresistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos para trabajadores, profesionales, y ejecutores de la construcción, y asociaciones.	
3.6	MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, elaboran materiales didácticos para la comunidad, con el fin de fomentar la comprensió n sobre tecnologías de sismoresistencia, la ingeniería de resiliencia sísmica, y la operación de sistemas constructivos (se pueden aprovechar materiales elaborados en El Salvador).	
3.7	MIDUVI y los municipios piloto, con el apoyo de colaboradores técnicos, realizarán actividades de capacitación y sensibilización para la comunidad, utilizando materiales didácticos desarrollados en la Actividad 3.6.	
3.8	MIDUVI, con la colaboración de los municipios piloto, apoya a otros 3 municipios en el establecimiento del Plan Municipal de Procedimientos para la Obtención de Permisos y Regulaci ó n de Procesos Constructivos, de acuerdo con el Manual de Procedimientos para la Obtenci ó n de Permisos y Regulaci ó n de Procesos	
3.8	MIDUVI y los municipios piloto realizan un estudio de l ínea final sobre la situación de permisos de construcción y habitabilidad e inspecciones.