

MINUTES OF MEETINGS  
ON  
THE PROJECT FOR HAZARD ASSESSMENT OF LARGE EARTHQUAKES AND  
TSUNAMIS IN THE MEXICAN PACIFIC COAST FOR DISASTER MITIGATION  
BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
THE AUTHORITIES CONCERNED OF THE UNITED MEXICAN STATES

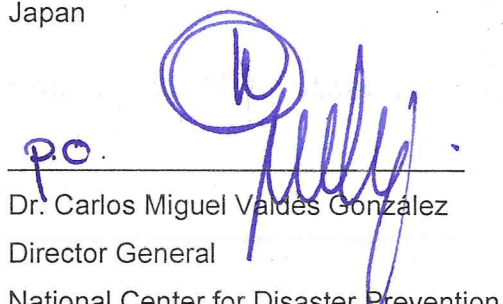
The Detailed Planning Study Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Satoru Mimura visited the United Mexican States (hereinafter referred to as "Mexico") from September 30 to October 9, 2015, for the purpose of formulating the technical cooperation project titled "The Project for Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation" (hereinafter referred to as "the Project"), in response to the request made by the Government of the United Mexican States (hereinafter referred to as "GOM") toward the Government of Japan (hereinafter referred to as "GOJ").

During its stay, the Team exchanged views and opinions with the authorities concerned of Mexico (hereinafter referred to as "Mexican Authorities") through a series of meetings and field studies. As a result, both sides have reached a mutual understanding on the matter referred to in the document attached hereto.

Mexico City, October 8, 2015



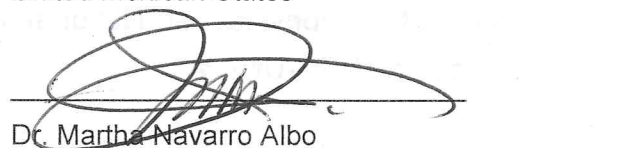
Mr. Satoru Mimura  
Team Leader, Detailed Planning Study Team,  
Japan International Cooperation Agency (JICA)  
Japan



Dr. Carlos Miguel Valdes Gonzalez  
Director General  
National Center for Disaster Prevention  
(CENAPRED)  
United Mexican States



Dr. Arturo Iglesias Mendoza  
Director, Institute of Geophysics  
National Autonomous University of Mexico  
(UNAM)  
United Mexican States



Dr. Martha Navarro Albo  
Director General for Technical and Scientific  
Cooperation  
Mexican Agency for International Development  
Cooperation (AMEXCID)  
United Mexican States

## ATTACHED DOCUMENT

### I. TITLE OF THE PROJECT

Both sides agreed that the title of the Project will be "The Project for Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation".

### II. RATIONAL OF THE PROJECT

Both sides agreed that the main purpose of the Project is to contribute to the sustainable development of Mexico by providing research output for better public measures on disaster risk reduction.

### III. RECORD OF DISCUSSIONS

The draft of Record of Discussions (hereinafter referred to as "R/D"), which stipulates the basic framework of the Project, will be finalized and signed by the representatives of Mexican Authorities and the Chief Representative of JICA Mexico Office before the commencement of the Project. Both sides agreed on the draft of R/D shown as ATTACHMENT 1. Mexican Authorities confirmed to promote the recognition of the contents of R/D before the signing of R/D for the implementation of the Project.

### IV. TENTATIVE PLAN OF OPERATION

The Tentative Plan of Operation for the period of the Project is shown as ATTACHMENT 2. The activities of the Project are subject to modifications within the scope of the R/D with mutual consultation when necessary in the course of implementation of the Project.

### V. PROJECT IMPLEMENTATION ARRANGEMENT

#### 1. Responsible Organization of the Project

Institute of Geophysics of National Autonomous University of Mexico (hereinafter referred to as "IGF-UNAM").

#### 2. Project Implementing Organization

##### (1) Mexican Side

IGF-UNAM, National Center for Disaster Prevention (hereinafter referred to as "CENAPRED") and other concerned organizations.

##### (2) Japanese Side

JICA will implement the Project with the Team of Japanese research institutions headed by Dr. Yoshihiro Ito, Associate Professor of Disaster Prevention Research Institute,

Kyoto University.

3. Collaborating Organizations and Members

Organizations and members of the Project are shown as ATTACHMENT 3.

VI. COOPERATION PERIOD OF THE PROJECT

The cooperation period of the Project will be five (5) years from the date of arrival of the first JICA expert or equipment to Mexico.

VII. OTHERS

1. Science and Technology Research Partnership for Sustainable Development

Both sides confirmed that the Project is implemented under the "Science and Technology Research Partnership for Sustainable Development (hereinafter referred to as "SATREPS") \*", promoted by JICA and Japan Science and Technology Agency (hereinafter referred to as "JST") in collaboration, as shown in the ATTACHMENT 4.

JICA will take necessary measures for the technical cooperation such as dispatch of Japanese experts, provision of equipment and training of counterpart personnel, and other supports related to the Project in Mexico. JST will support the Japanese research institutes/researchers for project activities in Japan.

\* SATREPS aims to develop new technology and its applications for tackling global issues, and aims at capacity development of researchers and research institutes in both countries.

2. Memorandum of Understanding between the Representative Research Institutes of Japan and Mexico

Both sides agreed that the research institutes in Japan and Mexico should reach an agreement to execute the collaborative research in accordance with R/D. The agreed document (e.g. Collaborative Research Agreement) should contain the following items:

- (1) Objective and Plan
- (2) Implementation
- (3) Confidentiality and Intellectual property Rights
- (4) Access to Genetic Resources
- (5) Publication
- (6) Dispute resolution
- (7) Duration of the Agreement
- (8) Compliance with Laws and Regulations

\*The items described on the document are subject to change according to the contents



and the progress of the research.

3. Utilization of the outcomes

The Project should lead to future social and economic benefits by using newly obtained technologies and knowledge to enhance government services.

4. Selection of the Project Study Areas

- (1) Both sides agreed that the Project study areas, where Project activities are undertaken, will be as follows:

Communities	Municipalities	State
Acapulco	Acapulco	Guerrero
Nuevo Amanecer	Zihuatanejo	
Ixtapa	Zihuatanejo	
El Papayo	Coyuca de Benítez	
Zihuatanejo	Zihuatanejo	
Barra Vieja	Acapulco	

- (2) Both sides agreed to pay special consideration on gender and vulnerable population such as the elderly, people with disabilities, indigenous people, etc, in the Project

5. Undertakings for the Project

- (1) Both sides agreed that, as stipulated in the draft of R/D, the running expense necessary for the implementation of the Project shall be borne by the Mexican Responsible Organization including the items below

- Domestic travel cost of the Mexican researchers,
- Handling charge for importing the equipment, and
- Running cost of the equipment including supplies and repair expenses.
- Ship time cost for the deployment of the equipment

Both sides agreed that IGF-UNAM will provide the required counterpart budget. Though the ship time cost shall be borne by the Mexican side primarily, JICA will consider the possibility to share fuel expense for the smooth implementation of research activities utilizing ocean bottom seismometer.

- (2) Both sides agreed that IGF-UNAM is responsible for the maintenance of the equipment procured by JICA.
- (3) Both sides agreed that Japanese research institutions are responsible for the maintenance of their own equipment.



- (4) Both sides agreed that 1 set of broadband seismometer and digitizer will be procured by JICA additionally for accurate observation, while a hut with security fence for its installation will be prepared by IGF-UNAM.

#### 6. Security Measures

- (1) Both sides agreed that JICA will take the security measures for Japanese experts to implement the Project as shown in the table below and that it will be subject to the decision made by GOJ.

Activities in the Project	Areas	Necessary measures
Installation of the equipment and outreach activities	Municipalities except for Zihuatanejo and Taxco in the state of Guerrero Mazatlan	Approval by JICA Mexico Office before the activities.

- (2) Both sides agreed that the activities and inputs from JICA will be subject to security risk and the measures taken by JICA, thereby affecting the progress of the Project.

#### 7. Genetic Resources

Both sides confirmed that the Project will not cope with the genetic resources including sea bottom deposits nor have anything that contravenes the "Access and Benefit Sharing" stipulated in "Convention on Biological Diversity" which was adopted by GOJ and GOM and entered into effect from 1993.

#### 8. Strengthening of measures for disaster risk reduction

Mexican Authorities confirmed their continuous effort, even after the Project, to address the current problems on the measures for disaster risk reduction through the implementation of the Project as follows:

- (1) the outputs of the Project, which is scientific and evidence-based information, will be reflected into the production of risk maps and disaster education materials to implement better public policies;
- (2) the culture on civil protection will be promoted through understanding of underlying risk by not only the public organizations in charge of disaster risk reduction but also at the community level; and
- (3) participation of various stakeholders in activities on disaster risk reduction and collaboration among them will be promoted.

The above-mentioned activities of the Project are stipulated as concrete activities for

“Understanding disaster risk” and “strengthening disaster risk governance”, as Priorities for Action of Sendai Framework for Disaster Risk Reduction adopted in March, 2015

#### 9. Others

Both sides confirmed that a meeting for sharing the concept of the Project among the Mexican stakeholders will be held in November, 2015 in Mexico.

ATTACHMENT 1: Draft of Record of Discussions

ATTACHMENT 2: Tentative Plan of Operation

ATTACHMENT 3: Collaborating Organizations and Members

ATTACHMENT 4: Framework of SATREPS

**RECORD OF DISCUSSIONS**  
**ON**  
**THE PROJECT FOR HAZARD ASSESSMENT OF LARGE**  
**EARTHQUAKES AND TSUNAMIS IN THE MEXICAN PACIFIC**  
**COAST FOR DISASTER MITIGATION**  
**IN**  
**UNITED MEXICAN STATES**  
**AGREED UPON BETWEEN**  
**THE AUTHORITIES CONCERNED OF UNITED MEXICAN STATES**  
**AND**  
**JAPAN INTERNATIONAL COOPERATION AGENCY**

Mexico City, MM DD, 2015

\_\_\_\_\_  
Mr. Kazuyoshi Shinoyama  
Chief Representative, Mexico Office  
Japan International Cooperation Agency  
(JICA)  
Japan

\_\_\_\_\_  
Dr. Arturo Iglesias Mendoza  
Director, Institute of Geophysics  
National Autonomous University of Mexico  
(UNAM)  
United Mexican States

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Dr. Carlos Miguel Valdés González  
Director General  
National Center for Disaster Prevention  
(CENAPRED)  
United Mexican States

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Dr. Martha Navarro Albo  
Director General for Technical and  
Scientific Cooperation  
Mexican Agency for International  
Development Cooperation (AMEXCID)  
United Mexican States





Based on the Minutes of Meetings on the Detailed Planning Survey on the Project for Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Coast for Disaster Mitigation (hereinafter referred to as "the Project") signed on October 8, 2015 between the authorities concerned of the United Mexican States and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA held a series of discussions with the Institute of Geophysics of the National Autonomous University of Mexico (hereinafter referred to as "IGF-UNAM") and relevant organizations to develop a detailed plan of the Project.

Both Parties agreed the details of the Project and the main points discussed as described in the Appendix 1 and the Appendix 2 respectively.

Both parties also agreed that IGF-UNAM, the main counterpart to JICA, will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project is sustained during and after the implementation period in order to contribute toward social and economic development of the United Mexican States (hereinafter referred to as "Mexico").

The Project will be implemented within the framework of the Agreement on Technical Cooperation signed on December 2, 1986 (hereinafter referred to as "the Agreement") and the Note Verbales exchanged on June 4, 2015 between the Government of Japan (hereinafter referred to as "GOJ") and the Government of Mexico (hereinafter referred to as "GOM").

Appendix 1: Project Description

Appendix 2: Main Points Discussed

Appendix 3: Minutes of Meetings on the Detailed Planning Survey

## PROJECT DESCRIPTION

Both parties confirmed that there is no change in the Project Description in the Minutes of Meetings for the Detailed Planning Survey on the Project signed on October 8, 2015 (Appendix 3).

### I. BACKGROUND

Mexico, as well as Japan is a country which suffers from various types of natural disasters such as earthquakes, tsunamis, volcanic eruptions, typhoons and so on. The Pacific coast of Mexico is an area with a high risk of disaster related to megathrust earthquakes and tsunamis that are expected to happen in the near future. In the past, for instance, the earthquake which occurred on September 19, 1985, killed about 9,500 people including the citizens of Mexico City, capital of Mexico and affected about 2.13 million people and made about 4.1 billion dollars of economic damage (EM-DAT). In particular, the research into disaster mitigation measures for these phenomena, which are expected in the Guerrero seismic gap area, and social implementation of these measures are urgently needed. This project draws up earthquake/tsunami scenarios based on the latest observation data and computational methods, develops earthquake/tsunami hazard maps and tsunami evacuation guidelines for the mitigation of damage caused by a mega earthquake in the Pacific coast of Mexico, and establishes an educational program. Furthermore, the project investigates factors that determine similarities, differences, and diversity between the subduction zones of Japan and Mexico, and by doing so, it aims to achieve a fundamental understanding of the physical mechanisms through which mega earthquakes and tsunamis occur and thus contribute to the evaluation of future earthquakes' potential. The project also engages seismology of the subduction zones and disaster science as a global challenge and contributes to the Japanese government's long-term strategy for bringing about sustainable social development that protects the lives and property of Japanese citizens.

Within five to ten years from the conclusion of the project, a semi-real-time tsunami monitoring network, drawing from the sea bottom observation technology introduced in the project, will be deployed in the coastal area of Mexico. It is expected that this will contribute to the development of the National Tsunami Warning System (SINAT) that is to be installed in Mexico in the future. In addition, the tsunami evacuation guidelines and tsunami disaster mitigation education program are to be developed by the project in both English and Spanish and are expected to be used in disaster mitigation activities and disaster mitigation education in various countries and regions in Latin America. After the conclusion of the project, Mexican researchers will continue to contribute to human resources and institutional development in Latin America by continuing to modify and revise these outputs.



## **II. OUTLINE OF THE PROJECT**

Details of the Project are described in the Logical Framework (Project Design Matrix (hereinafter referred to as "PDM")) (Annex 1) and the Plan of Operation (hereinafter referred to as "PO" (Annex 2).

### **1. Input**

#### **(1) Input by JICA**

##### **(a) Dispatch of Experts**

Installation of ocean bottom instruments, installation of onshore instruments, instruction on numerical code, instruction of development for tsunami evacuation sign and educational materials and programs

##### **(b) Training**

Ocean bottom observation, data analysis and educational materials and programs

##### **(c) Machinery and Equipment**

JICA will provide such machinery, equipment and other materials (hereinafter referred to as "Equipment") necessary for the implementation of the Project as listed in Annex 3 within its budgetary limitation. The Equipment is limited to those that are indispensable for the Project.

Input other than indicated above will be determined through mutual consultations between JICA and IGF-UNAM during the implementation of the Project, as necessary.

#### **(2) Input by IGF-UNAM and the Government of Mexico**

IGF-UNAM will take necessary measures to provide at its own expense:

- (a) Services of IGF-UNAM's counterpart personnel and administrative personnel as referred to in II-2;
- (b) Suitable office space with necessary equipment;
- (c) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the equipment provided by JICA;
- (d) Information as well as support in obtaining medical service;
- (e) Credentials or identification cards;
- (f) Available data (including maps and photographs) and information related to the Project;
- (g) Running expenses necessary for the implementation of the Project;
- (h) Expenses necessary for transportation within Mexico of the equipment referred to in Annex 3 as well as for the installation, operation and maintenance thereof; and
- (i) Necessary facilities to the JICA experts for the remittance as well as utilization of the funds introduced into Mexico from Japan in connection with the implementation of the Project



## 2. Implementation Structure

The project organization chart is given in the Annex 4. The roles and assignments of relevant organizations are as follows:

### (1) IGF-UNAM

- (a) Project Director responsible for overall administration and implementation of the Project
- (b) Principal researcher for the coordinating for the project purpose
- (c) Group leaders for each working group

### (2) JICA Experts

The JICA experts will give necessary technical guidance, advice and recommendations to IGF-UNAM, CENAPRED and other related organizations on any matters pertaining to the implementation of the Project.

### (3) Joint Coordinating Committee

Joint Coordinating Committee (hereinafter referred to as "JCC") will be established in order to facilitate inter-organizational coordination. JCC will be held at least once a year and whenever necessary. JCC will review the progress, revise the overall plan when necessary, approve an annual work plan, conduct evaluation of the Project, and exchange opinions on major issues that arise during the implementation of the Project. A list of proposed members of JCC is shown in the Annex 5.

## 3. Project Site(s) and Beneficiaries

Project Site(s): Federal District and State of Guerrero

Direct Beneficiaries: Researchers and technicians of the National Autonomous University of Mexico (hereinafter referred to as "UNAM") and CENAPRED

Indirect Beneficiaries: Those who are involved in the activities on socialization of research output in the communities of the State of Guerrero

## 4. Duration

Five (5) years from the arrival of the first Japanese expert or equipment assigned to the Project in Mexico

## 5. Reports

IGF-UNAM and JICA experts will jointly prepare the following reports in English.

- (1) Monitoring Sheet on semiannual basis until the project completion (Annex 6)
- (2) Project Completion Report at the time of the project completion (Annex 7)

## 6. Environmental and Social Considerations

UNAM will abide by 'JICA Guidelines for Environmental and Social Considerations' in order to ensure that appropriate considerations will be made for the environmental and social impacts of the Project.

### **III. UNDERTAKINGS OF IGF-UNAM AND GOM**

1. IGF-UNAM and GOM will take necessary measures to:

- (1) ensure that the technologies and knowledge acquired by the Mexican nationals as a result of Japanese technical cooperation contributes to the economic and social development of Mexico, and that the knowledge and experience acquired by the personnel of Mexico from technical training as well as the equipment provided by JICA will be utilized effectively in the implementation of the Project; and
- (2) grant privileges, exemptions and benefits to the JICA experts referred to in II-1 (1) (a) above and their families, which are no less favorable than those granted to experts and members of the missions and their families of third countries or international organizations performing similar missions in Mexico.

2. Other privileges, exemptions and benefits will be provided in accordance with the Agreement on Technical Cooperation signed on December 2, 1986 between GOJ and GOM.

### **IV. MONITORING AND EVALUATION**

JICA and IGF-UNAM will jointly and regularly monitor the progress of the Project through the Monitoring Sheets based on PDM and PO. The Monitoring Sheets will be reviewed every six (6) months.

Also, Project Completion Report will be drawn up one (1) month before the termination of the Project.

JICA will conduct the following evaluations and surveys to verify sustainability and impact of the Project and draw lessons. IGF-UNAM is required to provide necessary support for them.

1. Ex-post evaluation three (3) years after the project completion, in principle
2. Follow-up surveys on necessity basis

### **V. PROMOTION OF PUBLIC SUPPORT**

For the purpose of promoting support for the Project, IGF-UNAM and CENAPRED will take appropriate measures to make the Project widely known to the people of Mexico.

### **VI. Misconduct**

If JICA receives information related to suspected corrupt or fraudulent practices in the implementation of the Project, IGF-UNAM and relevant organizations will provide JICA with such information as JICA may reasonably request, including

information related to any concerned official of the government and/or public organizations of Mexico.

IGF-UNAM and relevant organizations will not, unfairly or unfavorably treat the person and/or company which provided the information related to suspected corrupt or fraudulent practices in the implementation of the Project.

#### **VII. MUTUAL CONSULTATION**

JICA and IGF-UNAM will consult each other whenever any major issues arise in the course of Project implementation.

#### **VIII. AMENDMENTS**

The R/D may be amended by the minutes of meetings between JICA and the authorities concerned of the GOM. However, PO may be amended in the Monitoring Sheets.




The M/M will be signed by authorized persons of each side who may be different from the signers of the R/D.

- Annex 1 Project Design Matrix
- Annex 2 Tentative Plan of Operation
- Annex 3 List of Equipment
- Annex 4 Project Organization Chart
- Annex 5 List of Proposed Members of Joint Coordinating Committee
- Annex 6 Format of Monitoring Sheet
- Annex 7 Contents of Project Completion Report



MAIN POINTS DISCUSSED

- If any



## Project Design Matrix

**Project Title:** The Project for Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation

**Version 0**

**Implementing Agency:** Institute of Geophysics, National Autonomous University of Mexico (UNAM)

**Dated: Oct 8, 2015**

**Target Group:** Institute of Geophysics, UNAM

**Period of Project:** 5 years

**Project Site:** The state of Guerrero

**Target communities:** Acapulco, Ixtapa, Zihuatanejo, Nuevo Amanecer, El Papayo and Barra Vieja

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b> Tsunami evacuation and disaster mitigation guidelines and tsunami disaster mitigation education programs are sustainably developed by UNAM and CENAPRED, and they are properly implemented to other cities in Mexico.	OG1: Risk Scenario maps on Geographical Information System  OG2: Implementation of education program for earthquake and tsunami disaster mitigation in Mexican cities  OG3: Installation of tsunami evacuation guide sign in Mexican cities  OG4: Distribution of the proposal for semi-real time tsunami observation systems in CINAT	National Risk Atlas, educational materials, National Coordination of Civil Protection reports and outlook of the tsunami monitoring system			
<b>Project Purpose</b> Hazard information and educational materials derived from the latest observation data and methods are provided to civil protection authorities for earthquakes/tsunami disaster mitigation in Guerrero.	PP1: Development of risk maps in target communities  PP2: Development of hazard maps for Guerrero State  PP3: Development of educational materials for disaster mitigation	UNAM's records, Project records and National Risk Atlas	Not change the policy of civil protection.		
<b>Outputs</b> Output A: New seismic imaging and seismic coupling and potential around the subducting interface in the Guerrero Gap are proposed based on newly deployed onshore and offshore seismic and geodetic networks.	A-1-1: Operational ocean bottom seismometers and pressure recorders A-1-2: Precise bathymetry maps and the number of piston coring off-shore margin A-1-3: Exchange program of marine seismologists and geodesists	Project Monitoring Sheet and UNAM's report	N/A		

	A-2-1: Operational seismometers and GPS stations onshore A-2-2: Database of ordinary seismicity, seismic coupling, slow earthquakes, and seismic velocity and attenuation structures	Project Monitoring Sheet and UNAM's report			
Output B: The most destructive and realistic earthquake/tsunami scenarios in the several coastal cities in Guerrero are constructed.	B-1-1: Megathrust earthquake models and its related seismic and geothermal models. B-1-2: Earthquake scenarios and ground-motion prediction maps in selected cities along the coastal region  B-2-1: Tsunami scenarios and inundation maps in selected cities B-2-2: The tsunami monitoring network and its performance to a supposed megathrust events and tsunamis	Project Monitoring Sheet and UNAM's report   Project Monitoring Sheet and UNAM's report			
Output C-1: Earthquake/Tsunami risk scenarios/maps, and tsunami evacuation sign are developed and recognized by residents and local authorities.	C-1-1: Earthquake/tsunami risk scenarios in selected cities C-1-2: GIS systems of Earthquake/Tsunami risk maps C-1-3: Tsunami evacuation signs	Project Monitoring Sheet and UNAM's report			
Output C-2: Education program for disaster mitigation, and its environment are developed, and their material and programs are sustainably implemented.	C-2-1: Educational materials and programs C-2-2: Archives and documents of historical earthquakes and tsunamis	Project Monitoring Sheet and UNAM's report			








Activities	Inputs		Important Assumption
	The Japanese Side	The Mexican Side	
<p>A-1-1: Ocean bottom seismic and geodetic networks are deployed.</p> <p>A-1-2: A 1,000-Year history of megathrust earthquakes in the Guerrero Gap are identified.</p> <p>A-1-3: Marine seismologist and geodesists are trained in Japan.</p> <p>A-2-1: Onshore seismic and geodetic networks are improved in coverage.</p> <p>A-2-2: Database for ordinary seismicity, seismic coupling, and slow earthquakes are improved</p> <p>B-1-1: Megathrust earthquake models are proposed based on the collected data.</p> <p>B-1-2: Earthquake scenario, and ground motion prediction maps along the coastal region are developed based on earthquake models.</p> <p>B-2-1: Tsunami scenario and inundation maps are developed based on the collected data.</p> <p>B-2-2: A prospective tsunami monitoring network for tsunami warning system are proposed.</p> <p>C-1-1: Earthquake/Tsunami risk scenarios along the coastal cities are developed based on the structural and socio-economical vulnerabilities and geographical information.</p> <p>C-1-2: GIS systems showing Earthquake/Tsunami risk maps are developed.</p> <p>C-1-3: Tsunami evacuation signs are developed to promote safe evacuation.</p> <p>C-2-1: Educational materials and programs are developed for Earthquake/Tsunami disaster mitigation.</p> <p>C-2-2: Past and recent records and documents of tsunami and large earthquakes in Mexico are archived.</p>	<p>1. Dispatch of Japanese Experts (Workshop, Installation of ocean bottom instruments, Installation of onshore instruments, Instructor of numerical code, Instructor of development for tsunami evacuation sign, educational materials and programs, etc.)</p> <p>2. Provision of equipment (Ocean bottom pressure recorders and seismometers, onshore GPS and seismometers site and its huts, acoustic modem for ocean bottom instruments, tsunami evacuation signs, piston corer, earthquake and tsunami education materials, etc.)</p> <p>3. Application software for tsunami evacuation and cost for local cultural tuning for Japanese expert</p> <p>4. Training for Counterpart Personnel (in Japan)</p> <p>5. Local cost for the activity of Japanese experts</p>	<p>1. Allocation of Counterpart personnel</p> <p>2. Office space for Japanese experts</p> <p>3. Local cost (Utilization of existing UNAM's machinery, maintenance/repairing cost for the existing machinery that are not covered by JICA support)</p> <p>4. Data from the permanent broadband seismometers and accelerometers around the Guerrero Gap.</p> <p>5. Portable seismometers, GPS receivers, and accelerometers</p> <p>6. Ship time of the Research Vessel "El Puma" of UNAM</p> <p>7. Outreach facilities from CENAPRED</p> <p>8. Super computing systems "POHUALLI" and "HORUS" of UNAM</p> <p>9. Infrastructure of hardware and software of the Laboratory "LUCO" of UNAM for seafloor mapping</p>	N/A

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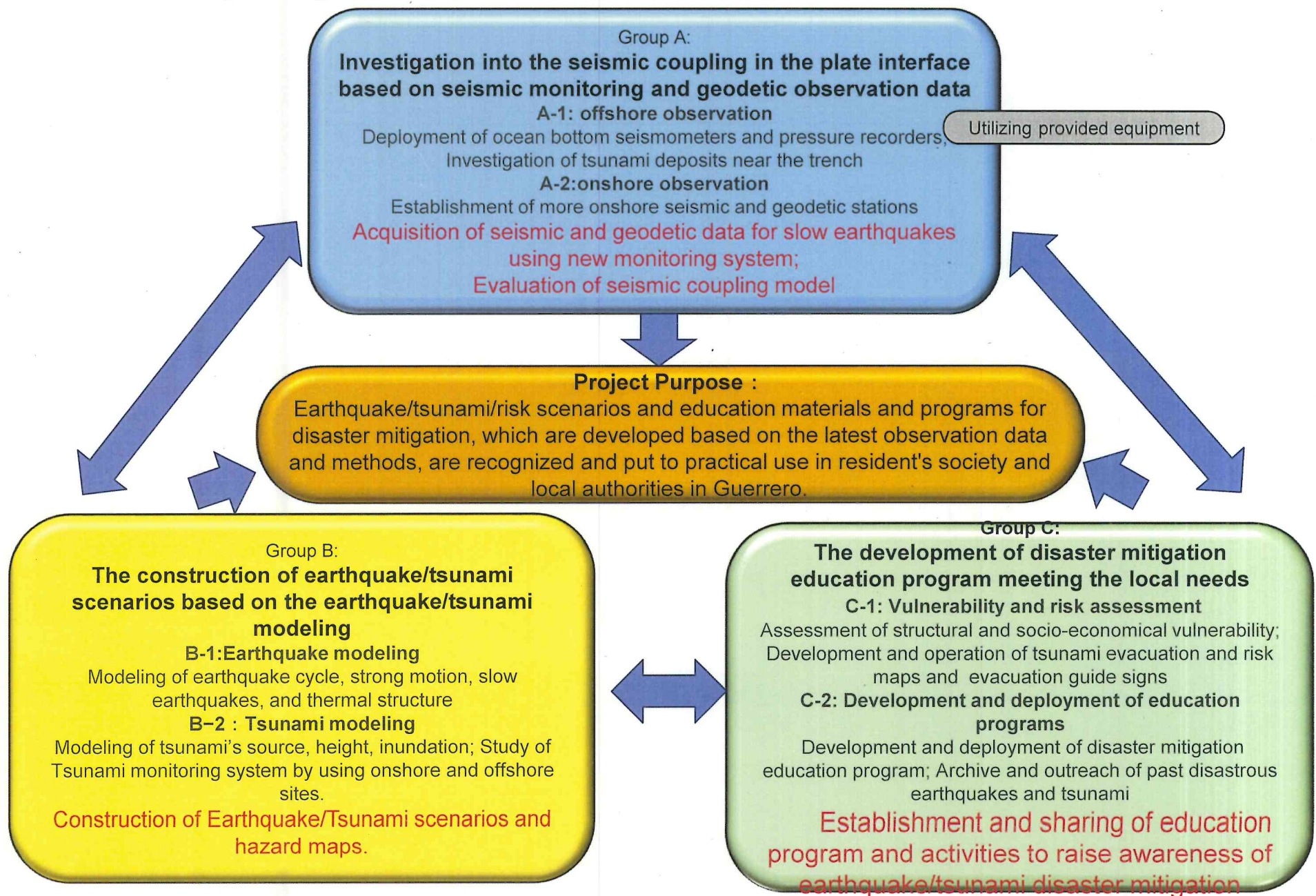


### Annex 3 List of Equipment

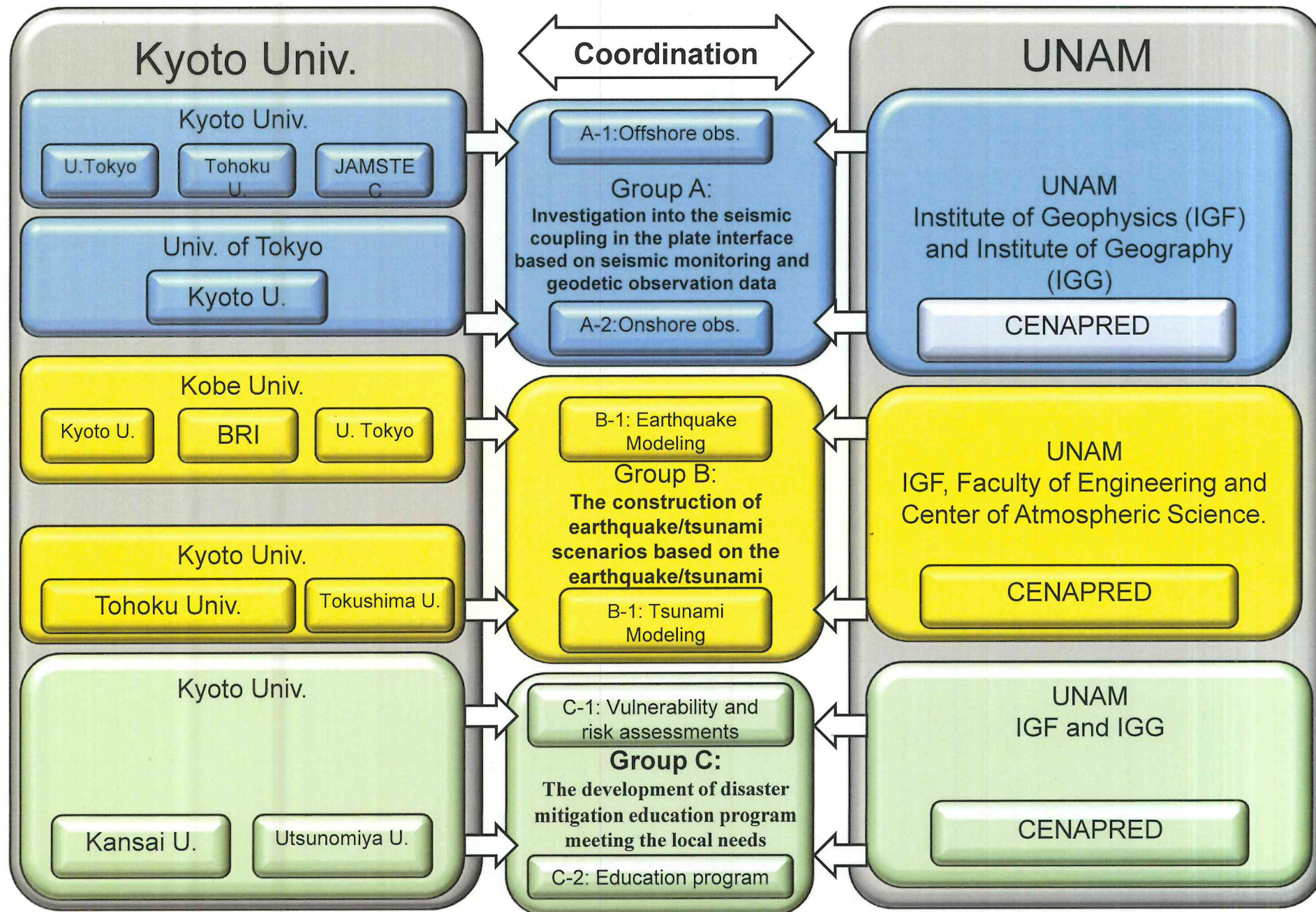
Major Equipment necessary for the research activities:

	Item	Quantity	
1	Ocean bottom pressure recorders	4 sets	To be procured by JICA/Kyoto University
2-1	Ocean bottom seismometers	5 sets	To be procured by JICA/Kyoto University
2-2	Ocean bottom seismometers	9 sets	To be sent from the University of Tokyo
3	Acoustic modem for ocean bottom instruments	1 set	To be procured by JICA/Kyoto University
4	Piston corer	1 set	To be procured by JICA/Kyoto University
5	Tsunami evacuation sign	1 set	To be procured by JICA/Kyoto University
6	GPS receivers	12 sets	To be procured by JICA/Kyoto University
7	Intermediate band seismometers	6 sets	To be procured by JICA/Kyoto University
8	Broadband seismometer and digitizer	1 set	To be procured by JICA/Kyoto University
9	Education materials and applications	1 set	To be procured by JICA/Kyoto University

## Annex 4 Project Organization Chart









## **Annex 5 List of proposed members of JCC**

The JCC will be composed of the following members:

1. Chair person: Director of Institute of Geophysics, UNAM
2. Members:
  - (1) Mexican side
    - a. Principal researcher
    - b. Representative of Direction General for Technical and Scientific Cooperation, Mexican Agency for International Development Cooperation (AMEXCID),
    - c. Representative of CENAPRED
    - d. Other personnel appointed by the Chair person
  - (2) Japanese side
    - a. Principal researcher
    - b. JICA Experts for the Project
    - c. Chief Representative of JICA Mexico Office
    - d. Other personnel appointed by the Chair person

Notes: Research group leaders, Official(s) and representative(s) from the Ministry of Interior (SEGOB), Embassy of Japan in Mexico and Japan Science and Technology Agency (JST) may attend JCC as observer(s).



group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

#### 4 Preparation of Gov. of●● toward after completion of the Project

II. Project Monitoring Sheet I & II as Attached



## Annex 6 Format of Monitoring Sheet

TO CR of JICA ●● OFFICE

### PROJECT MONITORING SHEET

Project Title : \_\_\_\_\_

Version of the Sheet: Ver.●● (Term: Month, Year - Month, Year) \_\_\_\_\_

Name: \_\_\_\_\_

Title: Chief Advisor \_\_\_\_\_

Submission Date: \_\_\_\_\_

#### I. Summary

##### 1 Progress

1-1 Progress of Inputs

1-2 Progress of Activities

1-3 Achievement of Output

1-4 Achievement of the Project Purpose

1-5 Changes of Risks and Actions for Mitigation

1-6 Progress of Actions undertaken by JICA

1-7 Progress of Actions undertaken by Gov. of ●●

1-8 Progress of Environmental and Social Considerations (if applicable)

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

##### 2 Delay of Work Schedule and/or Problems (if any)

2-1 Detail

2-2 Cause

2-3 Action to be taken

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of ●●, etc.)

##### 3 Modification of the Project Implementation Plan

3-1 PO

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target



### Project Monitoring Sheet I (Revision of Project Design Matrix)

Project Title:

Implementing Agency:

Target Group:

Period of Project:

Project Site:

**Model Site:**

## Version

**Dated** ●●,●●,●●


Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
Project Purpose					
Outputs					

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Activities	Inputs		Important Assumption
	The Japanese Side	The Cuban Side	
			Pre-Conditions
			
			<Issues and

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**Dated** ●●,●●,●●

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## Annex 7 Contents of Project Completion Report


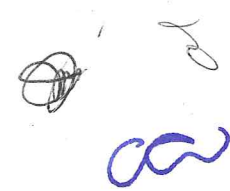
### I. Basic Information of the Project

1. Country
2. Title of the Project
3. Duration of the Project (Planned and Actual)
4. Background (from Record of Discussions(R/D))
5. Overall Goal and Project Purpose (from Record of Discussions(R/D))
6. Implementing Agency

### II. Results of the Project

1. Results of the Project
  - 1-1 Input by the Japanese side (Planned and Actual)
  - 1-2 Input by the ●● side (Planned and Actual)
  - 1-3 Activities (Planned and Actual)
2. Achievements of the Project
  - 2-1 Outputs and indicators  
(Target values and actual values achieved at completion)
  - 2-2 Project Purpose and indicators  
(Target values and actual values achieved at completion)
3. History of PDM Modification
4. Others
  - 4-1 Results of Environmental and Social Considerations (if applicable)
  - 4-2 Results of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

### III. Results of Joint Review

1. Results of Review based on DAC Evaluation Criteria
  2. Key Factors Affecting Implementation and Outcomes
  3. Evaluation on the results of the Project Risk Management
  4. Lessons Learnt
- 
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#### IV. For the Achievement of Overall Goals after the Project Completion

1. Prospects to achieve Overall Goal
2. Plan of Operation and Implementation Structure of the ●● side to achieve Overall Goal
3. Recommendations for the ●● side
4. Monitoring Plan from the end of the Project to Ex-post Evaluation

(If the Project will be continuously monitored by JICA after the completion of the Project, mention the plan of post-monitoring here.)

ANNEX 1: Results of the Project

(List of Dispatched Experts, List of Counterparts, List of Trainings, etc.)

ANNEX 2: List of Products (Report, Manuals, Handbooks, etc.) Produced by the Project


ANNEX 3: PDM (All versions of PDM)

ANNEX 4: R/D, M/M, Minutes of JCC (copy) (\*)

ANNEX 5: Monitoring Sheet (copy) (\*)

(Remarks: ANNEX 4 and 5 are internal reference only.)

Separate Volume: Copy of Products Produced by the Project





## Tentative Plan of Operation

Version 0

Dated Oct 8, 2015

## Project Title: The Project for Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation





Project Title: The Project for Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation															Monitoring																			
Inputs		Year												Remarks	Issue	Solution																		
		2016			2017			2018			2019						2020			2021			2022			2023			2024			2025		
Expert		I	II	III	IV	I	II	III	IV	I	II	III	IV				I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV		
offshore observation expert		Plan																																
onshore observation expert		Plan																																
Earthquake modeling expert		Actual																																
Tsunami modeling expert		Plan																																
Risk evaluation expert		Actual																																
Educational material expert		Plan																																
Educational material expert		Actual																																
Equipment																																		
Ocean bottom pressure recorders (OBP)		Plan																																
Ocean bottom pressure recorders (OBP)		Actual																																
Ocean bottom seismometers (OBS)		Plan																																
Ocean bottom seismometers (OBS)		Actual																																
Acoustic modem for ocean bottom instruments		Plan																																
Acoustic modem for ocean bottom instruments		Actual																																
Tsunami evacuation sign		Plan																																
Tsunami evacuation sign		Actual																																
GPS receivers		Plan																																
GPS receivers		Actual																																
Broadband seismometers		Plan																																
Broadband seismometers		Actual																																
Education material and Applications		Plan																																
Education material and Applications		Actual																																
Training in Japan		Plan																																
Training for Mexican Researchers		Actual																																
In-country/Third country Training		Plan																																
In-country/Third country Training		Actual																																
Activities		Year												Responsible Organization	Achievements	Issue & Countermeasures																		
Sub-Activities		2016			2017			2018			2019						2020			2021			2022			2023			2024			2025		
		I	II	III	IV	I	II	III	IV	I	II	III	IV				I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV		
Output A: New seismic imaging and seismic coupling and potential around the subducting interface in the Guerrero Gap are proposed based on newly deployed onshore and offshore seismic and geodetic networks.																																		
A-1-1-1: Ocean bottom seismometers and pressure recorders are prepared.		Plan																																
A-1-1-1: Ocean bottom seismometers and pressure recorders are prepared.		Actual																																
A-1-1-2: Ocean bottom seismic and geodetic networks are operated.		Plan																																
A-1-1-2: Ocean bottom seismic and geodetic networks are operated.		Actual																																
A-1-2-1: Site survey.		Plan																																
A-1-2-1: Site survey.		Actual																																
A-1-2-2: Deployment of 7 OBS/PS and/or 4 OBPs.		Plan																																
A-1-2-2: Deployment of 7 OBS/PS and/or 4 OBPs.		Actual																																
A-1-2-3: A 1 000-Year history of megathrust earthquakes in the Guerrero Gap are identified.		Plan																																
A-1-2-3: A 1 000-Year history of megathrust earthquakes in the Guerrero Gap are identified.		Actual																																
A-1-3: Marine seismologist and geodeticists are trained in Japan.		Plan																																
A-1-3: Marine seismologist and geodeticists are trained in Japan.		Actual																																
A-2-1: Onshore seismic and geodetic networks are improved in coverage.		Plan																																
A-2-1: Onshore seismic and geodetic networks are improved in coverage.		Actual																																
A-2-2: Database for ordinary seismicity, seismic coupling, and slow earthquakes are improved.		Plan																																
A-2-2: Database for ordinary seismicity, seismic coupling, and slow earthquakes are improved.		Actual																																
Output B: The most destructive and realistic earthquake/tsunami scenarios in the several coastal cities in Guerrero are constructed.																																		
B-1-1: Megathrust earthquake models are proposed based on the collected data.		Plan																																
B-1-1: Megathrust earthquake models are proposed based on the collected data.		Actual																																
B-1-2: Earthquake scenario, and ground-motion prediction maps along the coastal region are developed based on earthquake models.		Plan																																
B-1-2: Earthquake scenario, and ground-motion prediction maps along the coastal region are developed based on earthquake models.		Actual																																
B-2-1: Tsunami scenario and inundation maps are developed based on the collected data.		Plan																																
B-2-1: Tsunami scenario and inundation maps are developed based on the collected data.		Actual																																
B-2-2: A prospective tsunami monitoring network for tsunami warning system are proposed.		Plan																																
B-2-2: A prospective tsunami monitoring network for tsunami warning system are proposed.		Actual																																
Output C-1: Earthquake/Tsunami risk scenarios/maps, and tsunami evacuation sign are developed and recognized by residents and local authorities.																																		
C-1-1: Earthquake/Tsunami risk scenarios along the coastal cities are developed based on the structural and socio-economical vulnerabilities and geographical information.		Plan																																
C-1-1: Earthquake/Tsunami risk scenarios along the coastal cities are developed based on the structural and socio-economical vulnerabilities and geographical information.		Actual																																
C-1-2: GIS systems showing Earthquake/Tsunami risk maps are developed.		Plan																																
C-1-2: GIS systems showing Earthquake/Tsunami risk maps are developed.		Actual																																
C-1-3: Tsunami evacuation signs are developed to promote safe evacuation.		Plan																																
C-1-3: Tsunami evacuation signs are developed to promote safe evacuation.		Actual																																
Output C-2: Education program for disaster mitigation, and its environment are developed, and their material and programs are sustainably implemented.																																		
C-2-1: Educational materials and programs are developed for Earthquake/Tsunami disaster mitigation.		Plan																																
C-2-1: Educational materials and programs are developed for Earthquake/Tsunami disaster mitigation.		Actual																																
C-2-2: Past and recent records and documents of tsunami and large earthquakes in Mexico are archived.		Plan																																
C-2-2: Past and recent records and documents of tsunami and large earthquakes in Mexico are archived.		Actual																																
Duration / Phasing		Plan																																
Duration / Phasing		Actual																																
Monitoring Plan		Year												Remarks	Issue	Solution																		
		2016			2017			2018			2019						2020			2021			2022			2023			2024			2025		
		I	II	III	IV	I	II	III	IV	I	II	III	IV				I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV		
Monitoring																																		
Joint Coordinating Committee		Plan																																
Joint Coordinating Committee		Actual																																
Set-up the Detailed Plan of Operation		Plan																																
Set-up the Detailed Plan of Operation		Actual																																
Submission of Monitoring Sheet		Plan																																
Submission of Monitoring Sheet		Actual																																
Monitoring Mission from Japan		Plan																																
Monitoring Mission from Japan		Actual																																
Joint Monitoring		Plan																																
Joint Monitoring		Actual																																
Post Monitoring		Plan																																
Post Monitoring		Actual																																
Reports/Documents																																		

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Annex 3: Research groups

Group	Research Subjects	Leader/Member/Students Japan	Leader/Members/Students Mexico
A	An examination of seismic coupling in the plate interface based on seismic monitoring and geodetic observation		
A-1	Offshore observation	<b>Yoshihiro Ito</b> / Masanao Shinohara, Ryota Hino, Syuichi Kodaira, Toshiya Kanamatsu, Yusuke Yamashita/ Satoshi Katakami, students	<b>Vala Hjörleifsdóttir - Carlos Mortera Gutiérrez</b> / Shri Krishna Singh, Luis Antonio Domínguez, Marco Calo, Cinna Lomnitz Aronsfrau, Luis Quintanar Robles, Xyoli Pérez Campos, William Bandy, José Gilberto Castelán Pescina, Paulino Alonso Rivera / Emmanuel Caballero, students
A-2	Onshore observation	<b>Satoshi Ide</b> / Takuya Nishimura, Masatoshi Miyazawa, Julie Maury / Suguru Yabe, Tomoaki Nishikawa, Masamichi Ara, Naoto Mizuno, Junji Kikuchi, students	<b>Allen Husker</b> / Vladimir Kostoglodov, Arturo Iglesias Mendoza, Sara Ivonne Franco, Raúl Valenzuela Wong, Miguel Angel Santoyo, Jaime Yamamoto Victorio, Jorge Real Pérez, José Antonio Santiago, Osvaldo Sánchez Zamora, Jonathan Arreola Manzano / students
B	Numerical modeling of scenario earthquakes and tsunamis for hazard assessment based on physical constraints provided by observations from RG – A		
B-1	Earthquake scenarios	<b>Syoichi Yoshioka</b> / Bunichiro Shibazaki, Tomotaka Iwata, Ryosuke Ando, Eiho Ki/Nobuaki Suenaga, students	<b>Víctor M. Cruz Atienza</b> / Josué Tago Pacheco, Francisco Sánchez Sesma, Vlad Manea, Marina Manea / Carlos Villafuerte, Aron Mirwald, Hugo Sánchez Reyes, Carlos Gutiérrez Martínez, Moisés Gerardo Contreras Ruíz Esparza /

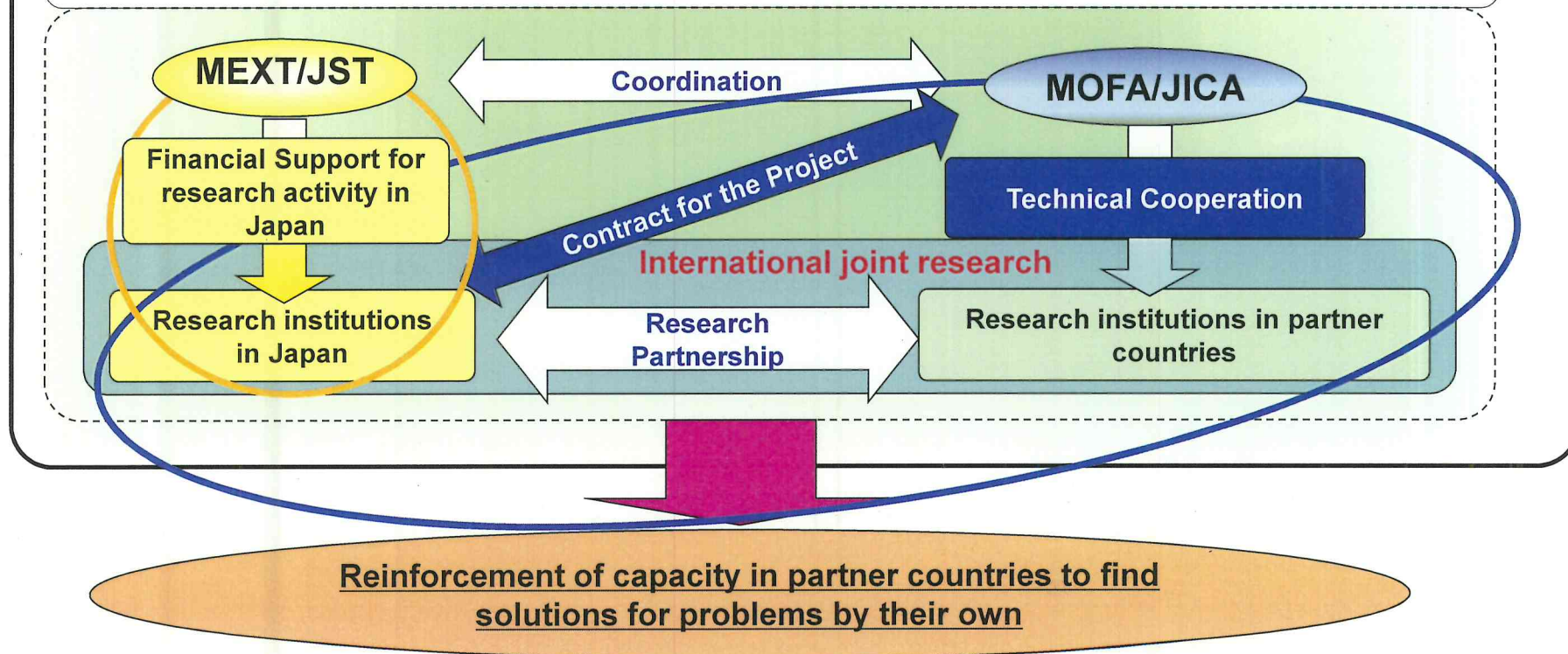
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			students
B-2	Tsunami scenarios	<b>Nobuhito Mori</b> / Tomohiro Yasuda, Syunichi Koshimura, Eric Mass, Toshitaka Baba / Bruno Adoriano, students	<b>Ángel Ruíz Angulo</b> / Jorge Zavala Hidalgo, Lucía Guadalupe Matías Ramírez / students
C	Disaster mitigation meeting local needs		
C-1	Vulnerability and risk assessments	<b>Mitsunori Hatayama</b> /Kazuyoshi Nishijima/ students	<b>David Novelo Casanova</b> / Gerardo Suárez Reynoso / Ana Bertha Ponce Pacheco, Andrea Juárez Sánchez, Carlos Valdés González, Oscar Zepeda Ramos / students
C-2	Educational programs and outreach	<b>Katsuya Yamori</b> / Akihiko Ito, Yoshinari Hayashi, Fusing Lee, Ewi-Ewi Song / Takuya Iwahori, Yasuhito Kawata, Takashi Sugiyama, students	<b>Carlos Valdés González</b> / Tomás Sánchez Pérez, María Teresa Ramírez Herrera, Cynthia Paola Estrada Cabrera, Enrique Bravo Medina, Tomás Sánchez Pérez / students



## Science and Technology Research Partnership for Sustainable Development : SATREPS

- International joint researches on global issues\*, among research institutions in partner countries and Japan are promoted by MOFA/JICA and MEXT/JST in collaboration.
- \* Environment, energy, disaster prevention, infectious disease control
- The objectives are elaboration of outcome to lead to problem solving and capacity building of institutions in partner countries.



MEXT: Ministry of Education, Culture, Sports, Science and Technology  
JST: Japan Science and Technology Agency

MOFA: Ministry of Foreign Affairs  
JICA: Japan International Cooperation Agency