

TC Document

I. Basic project data

▪ Country/Region:	Mexico
▪ TC Name:	Post-earthquake infrastructure immediate damage assessment
▪ TC Number:	ME-T1366
▪ Team Leader/Members:	Tsuneki Hori (CSD/RND), Team Leader; Cesar Bustamante (RND/CME), Alternate Team Leader; Sergio Lacambra, Ivonne Jaimes, and Yolanda Valle (CSD/RND); Juan Carlos Perez-Segnini (LEG/SGO); Rodrigo Riquelme, and Keisuke Sasaki (INE/WSA)
▪ Indicate if: Operational Support, Client Support, or Research & Dissemination.	Client Support
▪ If Operational Support TC, give number and name of Operation Supported by the TC:	N/A
▪ Date of TC Abstract:	October 12, 2017
▪ Beneficiary:	Federal Government of Mexico
▪ Executing Agency and contact name	IDB (CSD/RND)
▪ Donors providing funding (amount and Fund's name):	Japan Special Fund (JSF)
▪ IDB Funding Requested:	US\$500,000
▪ Local counterpart funding, if any:	US\$55,600 (in kind)
▪ Disbursement period (which includes execution period):	18 months
▪ Required start date:	November 16, 2018
▪ Types of consultants:	Firms and individual consultants
▪ Prepared by Unit:	CSD/RND
▪ Unit of Disbursement Responsibility:	RND
▪ TC Included in Country Strategy (y/n);	No
▪ TC included in CPD (y/n):	No
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	None

II. Objective and Justification

- 2.1 In September 2017, within a two-week period, Mexico experienced two major earthquakes. A magnitude 8.1 earthquake, the most intensive seismic event ever experienced by the country occurred off the coast of southern Mexico on September 7th. At least 61¹ people were killed in the states of Oaxaca and Chiapas and nearly 7,000 houses were damaged in Oaxaca² as a result of this event. On September 19th, another magnitude 7.1 earthquake struck Mexico City and the neighboring states (the State of Mexico, Puebla and Morelos). The latter earthquake was responsible for more than 369 casualties and 2,632 injured. More than 155,000 houses, 15,000 schools and 90 Health Centers were

¹ <http://www.preventionweb.net/news/view/54869>

² [Echo Daily Flash, September 10th. http://erccportal.jrc.ec.europa.eu/ECHO-Flash/ECHO-Flash-List/yy/2017/mm/9](http://erccportal.jrc.ec.europa.eu/ECHO-Flash/ECHO-Flash-List/yy/2017/mm/9)

damaged³. State of emergency was declared after these two earthquakes and emergency assistance was mobilized for both earthquake affected sites. The structural conditions of thousands of buildings and construction sites need to be inspected and verified after these events even though they did not collapse. Comprehensive damage and loss assessments have not been conducted yet.

- 2.2 In the year following the 1985 Mexico earthquake, a new construction code for Mexico City was enforced, together with a series of complementary technical standards, e.g. Complementary Technical Standard for Earthquake Design (*Normas Técnicas Complementarias para Diseño por Eventos Sísmicos*) and Complementary Technical Standards for the Design and Implementation of Hydraulic Works and Installations (*Normas Técnicas Complementarias para el Diseño y Ejecución de Obras e Instalaciones Hidráulicas*)⁴. The construction code and its complementary technical standards have been updated along the years. The current version of these code and standards were approved in 2004 (hereafter referred to as “2004 standards”). These 2004 standards require (i) builders and architects to take into account the soil condition, construction design and materials for earthquake resistance; and (ii) for the local authorities to fully supervise and inspect all building processes. The 2004 standards are known as one of the strictest construction standards in the world. Despite this progress, the September 2017 earthquakes resulted in significant damages. It is imperative therefore, that upcoming and future post-earthquake reconstruction processes be further improved with the incorporation of lessons learned from engineering and scientific reviews of the recent events.
- 2.3 A preliminary identification of factors behind the structural damages suggest that there was: (i) improper application and supervision of the 2004 standards – with many of the buildings, public works and housing projects ignoring them, and the local authorities not always properly supervising and inspecting construction; (ii) aged infrastructures – where no structural retrofitting was conducted in many of those constructed prior to the implementation of the 2004 standards; (iii) relevancy of the 2004 standards and a need for stricter construction codes in and outside of Mexico City. These factors should be comprehensively reviewed and analyzed based on the practical lessons derived from forensic/post (2017 earthquakes) impact structural and damage analyses. This is important to further improve and ensure structural integrity for public safety against future massive seismic events.
- 2.4 The Federal Government of Mexico has requested specific technical assistance from the Bank to assess the current physical condition and vulnerability to future seismic events of water infrastructure managed by the National Water Commission of Mexico (CONAGUA). Water Infrastructure in Mexico, especially dams and aqueducts (for drinking water networks) were affected by both September 7th and 19th earthquakes. CONAGUA conducted a preliminary and immediate visual inspection in some specific sites⁵ and detected: (i) water leaks

³ Situation Report No2 OCHA México. Evaluación de Daños y Necesidades reporte Preliminar (SEGOG) Echo Daily Flash, September 25th. <http://erccportal.jrc.ec.europa.eu/ECHO-Flash/ECHO-Flash-List/yy/2017/mm/9>

⁴ Sección 3 “Normas de Diseño para la Seguridad Estructural”, Capítulo 1.3.7 “Sismo” rules the incorporation of seismic risk in water infrastructure.

⁵ CONAGUA (Technical Sub-directorate General: SGT) carried out the two studies: (i) the structural and functional safety review of 153 dams in the states of Chiapas, Oaxaca, Morelos, Puebla, Guerrero, Estado de México, Hidalgo, Tlaxcala and Oaxaca, which detected 10 of these had longitudinal cracks

from aqueducts; and (ii) longitudinal cracks along the top and shoulders in ten dams and within their construction footprint⁶. Further detailed inspections will be necessary to determine needs, cost estimations and cost/benefit feasibilities for rehabilitation, reconstruction and retrofitting measures (or measures including improving earthquake-resistant design techniques). The integrity of some water infrastructure seemingly undamaged via visual inspection still may need to be evaluated from a structural perspective to ensure their capability for continuous operation as well as to determine whether any rehabilitative, retrofitting or reconstruction measures are required.

- 2.5 This TC will provide technical support to the Federal Government of Mexico to conduct rapid and detailed post-earthquake physical assessments for water infrastructure to: (i) evaluate current structural condition and identifying needs for rehabilitation, retrofitting and reconstruction (to inform upcoming post-earthquake rehabilitation and reconstruction planning); and (ii) extract lessons from observed damages in order to develop strategic recommendations for reducing vulnerability of water infrastructure and updating standards. The expected outcome of this TC is to ensure resilience of public water utility infrastructure and services and to improve public safety against the impact from future massive seismic hazard events.
- 2.6 **Alignment with Bank's sector priorities:** This TC is aligned with the IDB Country Strategy with Mexico 2013-2018, especially with its priority area A. Productivity – a. Public Management⁷. TC will support the process of “build back better” (or avoid rebuilding vulnerability) in the country's rehabilitation and reconstruction process. The context of this TC is aligned with the Bank's Disaster Risk Management Policy (GN-2354-5) in Directive B-2 “Reconstruction – avoiding rebuilding vulnerability”. This TC is also aligned with “Sustainable Infrastructure for Competitiveness and Inclusive Growth Strategy” (GN-2710-5), specifically with the priority area of action “Support the construction and maintenance of socially and environmentally sustainable infrastructure, thus enhancing quality of life”.
- 2.7 **Alignment with Japan Special Fund (JSF):** The objective of this TC addresses the Fund's operational guidance Section: 2(a) policy and strategy formulation/implementation activities. Although JSF prioritizes C and D countries, A and B countries are also eligible for funding.

along the crest of the dam. (ii) the September 19 earthquake damaged three of the eight water networks in Mexico City and the State of Mexico. CONAGUA carried out a review of the two priority networks: the Ramal Tláhuac – Nezahualcóyotl water network in southern Mexico City (25.4km with 20 deep wells) and Ramal Mixquic – Santa Catarina water network in the State of Mexico (9.5km with 18 wells), which detected a total of 33 water leaks in both aqueducts.

⁶ Other damages reported include: (i) 22km of the Mixquic-Tláhuac aqueduct (in Mexico City and the State of Mexico) that affected water supply for 700,000 inhabitants (Noticentros.televista.com, Oct 5, 2017); (ii) the Huachinantla dam in Jolalpan (in the state of Puebla) suffered physical damage though it remained functioning (periodicocentral.mx, Oct 30, 2017); (iii) hydraulic infrastructure in the state of Oaxaca (including Juchiatán, Tehuantepec and Salina Cruz) are completely damaged (enfoquenoticias.com.mx, Sep 12, 2017). Preliminary analysis estimates that more than 7 million Mexicans were affected by the two earthquakes as well as the supply of drinking water (eluniversal.com.mx, Oct 5, 2017).

⁷ There is a deficit in Mexico in investment in disaster prevention compared to expenditure on responding to them (See Paragraph 3.4 of the IDB Country Strategy with Mexico 2013-2018).

III. Description of activities/components and budget

- 3.1 **Component I. Post-earthquake water infrastructure vulnerability assessment.** This component will assess the water infrastructure's current physical structural conditions in (i) central region of the country - Mexico City and neighboring states (the State of Mexico, Puebla and Morelos) impacted by the September 19th earthquake; and (ii) southern region of the country (the States of Oaxaca and Chiapas) impacted by the September 8th earthquake. Target infrastructure of this assessment will include dams and aqueducts for drinking water networks to complete a detailed dynamic analysis⁸. The final product of this component will be an assessment report to: (i) detail the current physical condition of each infrastructure; (ii) identify needs for rehabilitation, retrofitting and reconstruction measures; and (iii) provide lessons learned from the observed earthquake damage. A firm will be hired for this consultancy^{9 10}.
- 3.2 The activities of the consultant firm will include (i) reviewing CONAGUA managed infrastructure inventories¹¹ (particularly dams and aqueducts for drinking water networks) and selecting with CONAGUA, in coordination with the Bank, the target infrastructure for this consultancy; (ii) conducting field surveys to assess physical and structural conditions of each target infrastructure; (iii) analyzing the current condition of vulnerability of each target infrastructure and determine its structural integrity; (iv) identifying and proposing appropriate rehabilitation, retrofitting and reconstruction measures. The proposed measures should include preliminary engineering design, cost estimation, cost/benefit analysis and a baseline for potential social and environmental compensations to inform the upcoming reconstruction phase. The proposed measures should also look at the risk of secondary hazards e.g. the measures may not increase dam break flood risk or any climate change additional risk; and (v) extracting and developing strategic lessons from the analysis of observed damages to inform future risk reduction and resilience. Coordination with, and technology transfer to CONAGUA are strongly required for these activities. Technical inception meeting with CONAGUA (especially for the activity 3.2(i)), and final dissemination workshops involving CONAGUA and other public authorities will also be implemented.

⁸ Dynamics analysis estimates the deformation behavior and seismic stability and functionality of selected embankment dams and aqueducts, using the finite element or finite difference methods, nonlinear stress-strain behavior of the materials within the body of the embankment and/or subsoil condition, seismologic parameters and geotechnical properties and the suitable earthquake time-histories representing design earthquakes. Along with visual investigation of dams, the firm consultant, in coordination with CONAGUA, will carry out instrumentations, laboratory test, field measurements and microtremor (known as ambient vibration test) at the dam sites to determine the predominant period at the site and the dynamic characteristic of target infrastructure.

⁹ The Bank will hire the consulting firm through the single-source selection method pursuant to GN-2765-1, according to which this method may apply: (a) for tasks that represent a natural continuation of previous work carried out by the firm; (b) in emergency cases; or (c) when only one firm is qualified or has experience of exceptional worth for the assignment. In fact, this consultancy requires urgent execution immediately after the earthquakes. Also, the consultancy requires advanced methodologies and technologies.

¹⁰ Given the complex nature and scope of the consultancy and need to develop an informed and balanced assessment end product, the consultant firm should include multidisciplinary expertise including but not restricted to: soil, structural, and water engineering, as well as, social impact, economics and risk reduction.

¹¹ Inventories should include type, size, age and basic structural information and maintenance record of each infrastructure.

- 3.3 Activity (v) “extracting and developing strategic lessons” is expected to include assessments¹² of the: (a) applicability and compliance with the 2004 standards (and reasons why); (b) effectiveness of the 2004 standards – comparing the impacts inside and outside Mexico City (where the 2004 standards are in force within the City); (c) effectiveness of the retrofitting works - comparing the impacts of the earthquakes between infrastructures that were retrofitted and those that were not; and (d) relevancy of the 2004 standards (assessing the need to update or strengthen the 2004 standards) in and outside of Mexico City.
- 3.4 Considering that Japan has a vast experience in frequent and intensive earthquakes and has developed advanced methodologies and technologies in this field of expertise, the Bank will actively seek to ensure that the aforementioned activities integrate applicable Japanese experience and technology in this assessment and its recommendations.
- 3.5 **Component II. Recommendation for ensuring the resilience to future earthquakes.** Based on the results from the previous component, and extracting from lessons made by the Federal Government and other donor agencies, an individual consultant will make recommendations for effective technical standards for hydraulic works and installations. This is intended to systemize their utilization and application in design, implementation, supervision and verification systems. The final product of this consultancy will be a sector dialogue between the Bank and CONAGUA to officially transfer the results of the study so that these will be used as an input for any policy revisions (e.g. to the 2004 Complementary Technical Standards for the Design and Implementation of Hydraulic Works and Installations) or new policy instruments developed for future earthquake resilience of water infrastructure. The activities of this consultancy will include (i) review of relevant documents to extract lessons and identify recommendations; (ii) interviews and meetings with the Federal and State governments, academic and private sector stakeholders to gain a consensus of the proposed lessons and recommendations; (iii) reporting; and (iv) participation in the technical dialogue of the Bank and CONAGUA.
- 3.6 The estimated total cost of the TC is US\$556,000, with US\$500,000 to be drawn from the Bank contribution (Japan Special Fund) and local counterpart contribution of US\$55,6000, in-kind¹³.

¹² This assessment could additionally focus on framing the international standard assessment evaluatively e.g., using standard OECD DAC criteria – relevance, efficiency, effectiveness/utility, impact and sustainability.

¹³ According to JSF Operational Guidance, the donor requires the minimum counterpart contribution to 10% in cash or in-kind.

Table I. Indicative Budget

Component	Description	IDB/Fund Funding (JSF)	Counterpart Funding	Total Funding
Component I	Technical inception meeting (includes travel expense of experts): US\$15,000 Vulnerability assessment: US\$420,000 (consultant service); Counterpart expense to join the study (in kind): US\$55,600; Final workshop: US\$15,000	US\$450,000	\$55,600.00	US\$505,600
Component II	Recommendations (individual consultant): US\$49,000; Technical dialogue of the Bank and CONAGUA (logistic expense only ¹⁴): US\$1,000;	US\$50,000	\$0.00	US\$50,000
Total		US\$500,000	\$55,600.00	US\$555,600

IV. Executing agency and execution structure

- 4.1 As requested formally by the beneficiaries, and given the high technology nature and with the objective of expediting execution immediately after the earthquakes, the Executing Agency for this technical cooperation will be the Bank through CSD/RND, in close coordination with INE/WSA. All administrative, technical supervision, necessary internal and external coordination, responsibility for the delivery and quality of the final products will be the responsibility of CSD/RND. In this context, the Bank will hire the services of individual consultants, consulting firms and various expert consulting institutions in accordance with the policies and procedures in the Bank.
- 4.2 The Federal Government of Mexico assigned CONAGUA as the technical counterpart for this CT. The Bank will coordinate with CONAGUA, through daily communications from the Bank Office in Mexico, to ensure appropriate collaboration while implementing this TC. CONAGUA is established under The National Water Law of 1992 (*Ley de Aguas Nacionales* -LAN) that is formally under the authority of the Ministry of Environment and Natural Resources (SEMARNAT). Its mission is to manage and preserve national water resources, with the participation of the society, to reach a sustainable use of resources. CONAGUA administrates water policy, water rights, planning, irrigation and drainage development, water supply and sanitation, and emergency and disaster management (with an emphasis on flooding).

¹⁴ Bank staff travel cost will not be included in the TC budget according to JSF operational guidance.

V. Major Risks

- 5.1 Coordination among national and international development partners: Several international, bilateral and multilateral development partner institutions are, and will be supporting the Federal Government of Mexico to carry out post-earthquake damage, loss and needs assessments. Close coordination and communication with the national authorities and international development partners including JICA and UN organizations will be necessary to ensure synergies among the institutions. CSD/RND and INE/WSA technical staff will undertake frequent communication with national authorities and international development partners.
- 5.2 Timing of the implementation of this TC: the inputs from this TC will be used as inputs for the upcoming reconstruction plan (that is expected to start, in general terms, 6-12 months after the earthquakes). A prompt contracting and executing process should be required. The single-source selection method of the Bank will reduce this risk (See footnote 7).

VI. Exceptions to Bank policy

- 6.1 None.

VII. Environmental and Social Classification

- 7.1 The TC is classified as Category “C” pursuant to the Bank’s Environment and Safeguards Compliance Policy (OP-703). No negative social and environmental impact is expected through the activities financed by this TC.

Required Annexes:

- Annex I: [Letter of Request](#)
- Annex II: [Results Matrix](#)
- Annex III: [Terms of Reference](#)
- Annex IV: [Procurement Plan](#)

POST-EARTHQUAKE INFRASTRUCTURE IMMEDIATE DAMAGE ASSESSMENT

ME-T1366

CERTIFICATION

I hereby certify that this operation was approved for financing under the **Japan Special Fund (JSF)** through a communication dated October 12, 2017 and signed by Michiko Tamashiro (ORP/GCM). Also, I certify that resources from said fund are available for up to **US\$500,000** in order to finance the activities described and budgeted in this document. This certification reserves resource for the referenced project for a period of four (4) calendar months counted from the date of eligibility from the funding source. If the project is not approved by the IDB within that period, the reserve of resources will be cancelled, except in the case a new certification is granted. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, represent a risk that will not be absorbed by the Fund.

ORIGINAL SIGNED

10/31/2017

Sonia M. Rivera
Chief
Grants and Co-Financing Management Unit
ORP/GCM

Date

ORIGINAL SIGNED

01/02/2017

Approved: _____

Pedro Martel
Division Chief
Environment, Rural Development and Risk
Management Division
CSD/RND

Date

*“2017, Año del Centenario de la Promulgación
de la Constitución Política de los Estados Unidos Mexicanos”*

Oficio No. 347. 581

Ciudad de México, a 5 de octubre de 2017

SRA. GINA MONTIEL
GERENTE DEL DEPARTAMENTO DE CENTROAMÉRICA,
MÉXICO, PANAMÁ, Y REPÚBLICA DOMINICANA.
BANCO INTERAMERICANO DE DESARROLLO
P R E S E N T E

En seguimiento al ofrecimiento realizado por la División de Gestión de Recursos Naturales y Riesgos por Desastres del Banco Interamericano de Desarrollo (BID), hago de su conocimiento que la Comisión Nacional del Agua (CONAGUA) ha manifestado a esta Secretaría de Hacienda y Crédito Público (SHCP) el interés de contar con el apoyo del BID y Japón, a través del fondo japonés que administra el BID, con el fin de realizar un análisis técnico especializado de su infraestructura, en consecuencia a los sismos ocurridos en el mes de septiembre.

En virtud de lo anterior, me permito solicitar que se lleven a cabo las gestiones conducentes a fin de que la CONAGUA esté en posibilidades de contar con el apoyo técnico ofrecido.

Sin otro particular, aprovecho la ocasión para enviarle un cordial saludo.

ATENTAMENTE
EL TITULAR



MTRO. CARLOS MÁRQUEZ PADILLA CASAR

C.C.P.- SEAN CÁZARES AHEARNE.- GERENTE DE COOPERACIÓN INTERNACIONAL. CONAGUA.- PRESENTE.

CZ/ILS/ORH

Valle Porrua, Yolanda

From: Bustamante, Cesar Tulio
Sent: Tuesday, October 17, 2017 4:09 PM
To: Grayeb Bayata, Claudia
Cc: Lacambra Ayuso, Sergio; Hori, Tsuneki; Coronado, Miguel
Subject: RE: CT Evaluación de daños a Infraestructura post sismo

Muchas gracias Claudia por tan pronta gestión.

Saludos,

From: Grayeb Bayata, Claudia
Sent: Tuesday, October 17, 2017 2:21 PM
To: Bustamante, Cesar Tulio <CESARTB@iadb.org>
Cc: Lacambra Ayuso, Sergio <SLACAMBRA@iadb.org>; Hori, Tsuneki <TSUNEKI@iadb.org>; Coronado, Miguel <MIGUELC@iadb.org>
Subject: FW: CT Evaluación de daños a Infraestructura post sismo

FYI
saludos

From: Camila Isabel Zepeda Lizama [mailto:camila_zepeda@hacienda.gob.mx]
Sent: Tuesday, October 17, 2017 2:18 PM
To: Grayeb Bayata, Claudia <cgrayeb@IADB.ORG>; Coronado, Miguel <MIGUELC@iadb.org>
Cc: Maria Isabel Lozano Santin <isabel_lozano@hacienda.gob.mx>; Oscar Alonso Ramirez Herrera <oscar_ramirez@hacienda.gob.mx>
Subject: RV: CT Evaluación de daños a Infraestructura post sismo

Estimada Claudia,

En relación a la Asistencia Técnica (AT) ofrecida por el BID y JAPÓN a través del fondo japonés que el banco administra, derivada de las eventualidades ocurridas con los sismos en el mes de septiembre pasado y derivado del oficio No. 347.581 en el que el Mtro. Carlos Márquez Padilla Casar, Titular de la Unidad de Asuntos Internacionales de Hacienda (UAIH), solicita se gestione lo conducente a efecto de que CONAGUA reciba dicha AT con el fin de realizar un análisis técnico especializado de su infraestructura. Pido nuevamente su apoyo a efecto de que sea el BID quien ejecute dicha Asistencia Técnica, esto en consecuencia a la expertise con la que cuentan dentro del sector, asimismo a la alta tecnología que proponen utilizar para la determinación de daños en la infraestructura.

Para mayor referencia, adjunto oficio en mención, así como carta respuesta por parte del BID al respecto.

Sin otro particular, quedamos atentos a sus comentarios.
Saludos,
Camila

De: Grayeb Bayata, Claudia [<mailto:cgrayeb@IADB.ORG>]
Enviado el: martes, 17 de octubre de 2017 11:43 a. m.
Para: Maria Isabel Lozano Santin <isabel_lozano@hacienda.gob.mx>

CC: Oscar Alonso Ramirez Herrera <oscar_ramirez@hacienda.gob.mx>

Asunto: FW: CT Evaluación de daños a Infraestructura post sismo

Hola!

Nos pueden enviar un alcance o correo para que el BID ejecuta la CT?

Mil gracias y saludos

From: Bustamante, Cesar Tulio

Sent: Tuesday, October 17, 2017 11:41 AM

To: Coronado, Miguel <MIGUELC@iadb.org>; Grayeb Bayata, Claudia <cgrayeb@IADB.ORG>

Cc: Lacambra Ayuso, Sergio <SLACAMBRA@iadb.org>; Hori, Tsuneki <TSUNEKIH@iadb.org>; Perez-Segnini, Juan Carlos <JUANPS@iadb.org>

Subject: CT Evaluación de daños a Infraestructura post sismo

Hola Miguel y Claudia

Buen día. Nos podrían apoyar al equipo a conseguir un alcance de Hacienda a la solicitud de CT que hicieron en semanas pasadas, en donde señalen que desean que el BID sea el ejecutor de la CT -por las razones que ellos consideren- ?

Gracias anticipadas,

Saludos,

César



Operation Number: **ME-T1366**
 TCM Cycle: **TCM Period 2017**
 Last Update: **10/19/2017**

Inter-American Development Bank - IDB

Result Matrix

Outcomes

Outcome: [1 to ensure resilience of public water utility infrastructure and services and to improve public safety](#)
[uture massive seismic hazard events.](#)



RF - Contribution

Outputs: Annual Physical and Financial Progress

1 Post-earthquake water infrastructure vulnerability assessment						Physical Progress				Financial Progress						
Outputs	Fund Indicator	Unit of Measure	Baseline	Baseline Year	Means of Verification	2017	2018	2019	EOP	2017	2018	2019	EOP	Theme	Flags	
1.1 Workshops organized	Other(JSF) Technical inception meeting with CONAGUA	Workshops (#)	0	2017	Inception meeting report	P	1	0	0	1	P	15000		15000	Disaster Prevention	
						P(a)				0	P(a)			0		
						A				A						
1.2 Diagnostics and assessments completed	Other(JSF) Post-earthquake water infrastructure vulnerability assessment	Diagnostics (#)	0	2017	Vulnerability Assessment report	P	0	1	0	1	P	420000		420000	Disaster Prevention	
						P(a)				0	P(a)			0		
						A				A						
1.3 Workshops organized	Other(JSF) Final workshop	Workshops (#)	0	2017	final workshop report	P	0	1	0	1	P	15000		15000	Disaster Prevention	
						P(a)				0	P(a)			0		
						A				A						
2 Recommendation for ensuring the resilience to future earthquakes						Physical Progress				Financial Progress						
Outputs	Fund Indicator	Unit of Measure	Baseline	Baseline Year	Means of Verification	2017	2018	2019	EOP	2017	2018	2019	EOP	Theme	Flags	
2.1 Diagnostics and assessments completed	Other(JSF) Recommendations for effective technical standards for hydraulic works and installations	Diagnostics (#)	0	2017	Recommendation report	P	0	1	0	1	P	49000		49000	Disaster Prevention	
						P(a)				0	P(a)			0		
						A				A						
2.2 Workshops organized	Other(JSF) Technical dialogue of the Bank and CONAGUA	Workshops (#)	0	2017	Technical dialogue minutes	P	0	0	1	1	P		1000	1000	Disaster Prevention	
						P(a)				0	P(a)			0		
						A				A						

Other Cost

Total Cost

	2017	2018	2019	Total Cost
P	\$15,000.00	\$484,000.00	\$1,000.00	\$500,000.00
P(a)				
A				



CRF Indicator



Standard Output Indicator

Please note that the Overall Stage represents the stage of the operation at the time of this report's publication, which might not necessarily match the stage of the operation during the PMR Cycle to which the report pertains.

MEXICO

ENVIRONMENT, RURAL DEVELOPMENT AND DISASTER RISK MANAGEMENT DIVISION (CSD/RND)

POST-EARTHQUAKE INFRASTRUCTURE IMMEDIATE DAMAGE ASSESSMENT (ME-T1366)

POST-EARTHQUAKE WATER INFRASTRUCTURE VULNERABILITY ASSESSMENT

TERMS OF REFERENCE

I. Background

- 1.1. Established in 1959, the Inter-American Development Bank (“IDB” or “Bank”) is the main source of financing for economic, social and institutional development in Latin America and the Caribbean (LAC). It provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors of its borrowing countries.
- 1.2. IDB approved the Technical Cooperation (TC) project titled: Post-earthquake infrastructure immediate damage assessment (ME-T1366). The objective of this new TC is to provide technical support to the Federal Government of Mexico to conduct rapid and detailed post-earthquake physical assessments for water infrastructure. The TC includes the following two components: (1) Post-earthquake water infrastructure vulnerability assessment; and (2) Recommendation for ensuring the resilience to future earthquakes.
- 1.3. These terms of reference (TORs) refer to the services of a consultant for the activities related to the Component 1 of the TC: Post-earthquake water infrastructure vulnerability assessment.

II. Objective and framework

- 2.1. The Specific objective of this consultancy is to assess the water infrastructure’s current physical structural conditions in (i) central region of the country - Mexico City and neighboring states (the State of Mexico, Puebla and Morelos) impacted by the September 19th earthquake; and (ii) southern region of the country (the States of Oaxaca and Chiapas) impacted by the September 8th earthquake. Target infrastructure of this assessment will include dams and aqueducts for drinking water networks.
- 2.2. The final product of this component will be an assessment report to (a) detail the current physical condition of each infrastructure, (b) identify needs for rehabilitation, retrofitting and reconstruction measures, and (c) provide lessons learned from the observed earthquake damage.
- 2.3. Coordination with, and technology transfer to CONAGUA are strongly required for these activities.

III. Main activities

3.1. Under the frameworks described in the Section II, the consultant will:

- a) Prepare a workplan to encompass concrete activities and schedule to implement these.
- b) Technical inception meeting with CONAGUA to review the CONAGUA managed infrastructure inventories¹ (particularly dams and aqueducts for drinking water networks). Selection of the target infrastructure for this consultancy with CONAGUA in coordination with the Bank.
- c) conducting field surveys to assess physical and structural conditions of each target infrastructure
- d) Conduct a baseline survey to identify challenges and opportunities to develop a general framework of coastal protection financial mechanism:
- e) analyzing the current condition of vulnerability of each target infrastructure and determine its structural integrity
- f) identifying and proposing appropriate rehabilitation, retrofitting and reconstruction measures. The proposed measures should include preliminary engineering design, cost estimation, cost/benefit analysis and a baseline for potential social and environmental compensations to inform the upcoming reconstruction phase. The proposed measures should also look at the risk of secondary hazards e.g. the measures may not increase dam break flood risk or any climate change additional risk
- g) extracting and developing strategic lessons from the analysis of observed damages to inform future risk reduction and resilience. This activity should include assessments² of the: (a) applicability and compliance with the 2004 standards (and reasons why); (b) effectiveness of the 2004 standards – comparing the impacts inside and outside Mexico City (where the 2004 standards are in force within the City); (c) effectiveness of the retrofitting works - comparing the impacts of the earthquakes between infrastructures that were retrofitted and those that were not; and (d) relevancy of the 2004 standards (assessing the need to update or strengthen the 2004 standards) in and outside of Mexico City.
- h) Final dissemination workshops involving CONAGUA and other public authorities

3.2. All the deliverables will be developed in Spanish.

IV. **Reports/Deliverables**

¹ Inventories should include type, size, age and basic structural information and maintenance record of each infrastructure.

² This assessment could additionally focus on framing the international standard assessment evaluatively e.g., using standard OECD DAC criteria – relevance, efficiency, effectiveness/utility, impact and sustainability.

- 4.1. Work plan, (activity 3.1 a));
- 4.2. Draft Assessment report (3.1 b-g));
- 4.3. Final Assessment report and workshop (3.1 f));

V. Payment Schedule

- 10% upon the delivery of the work plan (product 4.1) and approval by the Bank;
- 40% upon the delivery of the product 4.2 and approved by the Bank;
- 50% upon the delivery of the product 4.3, approved by the Bank;

VI. Qualifications

- *Firm's areas of expertise and team leader's qualifications and experience:* Given the complex nature and scope of the consultancy and need to develop an informed and balanced assessment end product, the consultant firm should include multidisciplinary expertise including but not restricted to: soil, structural, and water engineering, as well as, social impact, economics and risk reduction all of the technical members of the firm should have at least 10 years of experience. The team leader nominated by the firm/specialized institution for this consultancy should possess a doctoral degree or equivalent on physical structure, seismic science or disaster risk management with minimum 20 years of professional experience.
- *Languages:* English and Spanish.
- *Skills:* Excellent analytical, writing and communication skills and effective ability to work in interdisciplinary teams.

VII. Characteristics of the Consultancy

- *Consultancy category and modality:* Firm, Products and Services Contract.
- *Contract duration:* 4 months.
- *Travel:* three time in Mexico.
- *Place of work:* Firm/specialized institution location.
- *Coordinator:* Tsuneki Hori, Disaster Risk Management Specialist (tsunekih@iadb.org).

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

Consanguinity: Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractuels, will not be eligible to provide services for the Bank.

Diversity: The Bank is committed to diversity and inclusion and to providing equal opportunities to all candidates. We embrace diversity on the basis of gender, age, education,

national origin, ethnic origin, race, disability, sexual orientation, religion, and HIV/AIDS status. We encourage women, Afro-descendants and persons of indigenous origins to apply.

MEXICO

ENVIRONMENT, RURAL DEVELOPMENT AND DISASTER RISK MANAGEMENT DIVISION (CSD/RND)

POST-EARTHQUAKE INFRASTRUCTURE IMMEDIATE DAMAGE ASSESSMENT (ME-T1366)

RECOMMENDATION FOR ENSURING THE RESILIENCE TO FUTURE EARTHQUAKES

TERMS OF REFERENCE

I. Background

- 1.1 Established in 1959, the Inter-American Development Bank (“IDB” or “Bank”) is the main source of financing for economic, social and institutional development in Latin America and the Caribbean (LAC). It provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors of its borrowing countries.
- 1.2 IDB approved the Technical Cooperation (TC) project titled: Post-earthquake infrastructure immediate damage assessment (ME-T1366). The objective of this new TC is to provide technical support to the Federal Government of Mexico to conduct rapid and detailed post-earthquake physical assessments for water infrastructure. The TC includes the following two components: (1) Post-earthquake water infrastructure vulnerability assessment; and (2) Recommendation for ensuring the resilience to future earthquakes.
- 1.3 These terms of reference (TORs) refer to the services of a consultant for the activities related to the Component 2 of the TC: Recommendation for ensuring the resilience to future earthquakes

2 Objective and framework

- 2.1 The objective of this consultancy is to make recommendations for effective technical standards for hydraulic works and installations. The product of this consultancy is intended to systemize their utilization and application in design, implementation, supervision and verification systems.
- 2.2 The final product of this consultancy will be a recommendation report that will be an principal input for sector dialogue between the Bank and CONAGUA to officially transfer the results of the study so that these will be used as an input for any policy revisions (e.g. to the 2004 Complementary Technical Standards for the Design and Implementation of Hydraulic Works and Installations) or new policy instruments developed for future earthquake resilience of water infrastructure.

3 Main activities

- 3.1 Under the frameworks described in the Section II, the consultant will:

- a) Prepare a workplan to encompass concrete activities and schedule to implement these.

- b) Review the Vulnerability Assessment report (product of the Component 1 of this TC) and other report made by the Federal Government and other donor agencies, and extract lessons.
- c) interviews and meetings with the Federal and State governments, academic and private sector stakeholders to gain a consensus of the proposed lessons and recommendations;
- d) reporting the recommendations for ensuring the resilience to future earthquakes
- e) participation in the technical dialogue of the Bank and CONAGUA.

3.2 All the deliverables will be developed in Spanish.

4 Reports/Deliverables

4.1 Work plan, (activity 3.1 a));

4.2 Draft recommendation report (3.1 b-d));

4.3 Final recommendation report and participation in the technical dialogue (3.1 e));

5 Payment Schedule

- 10% upon the delivery of the work plan (product 4.1) and approval by the Bank;
- 40% upon the delivery of the product 4.2 and approved by the Bank;
- 50% upon the delivery of the product 4.3, approved by the Bank;

6 Qualifications

- *Areas of expertise and team leader's qualifications and experience:* the consultant should possess a doctoral degree or equivalent on disaster risk management policy including experiences in practice to elaborate norms and regulations, with minimum 10 years of professional experience.
- *Languages:* Spanish.
- *Skills:* Excellent analytical, writing and communication skills and effective ability to work in interdisciplinary teams.

7 Characteristics of the Consultancy

- *Consultancy category and modality:* Firm, Products and Services Contract.
- *Contract duration:* 3 months.
- *Travel:* three time in Mexico.

- *Place of work:* Firm/specialized institution location.
- *Coordinator:* Tsuneki Hori, Disaster Risk Management Specialist (tsunekih@iadb.org).

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

Consanguinity: Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractuels, will not be eligible to provide services for the Bank.

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PROCUREMENT PLAN FOR NON-REIMBURSABLE TECHNICAL COOPERATIONS										
Country: Mexico					Executing agency: IDB				Public or private sector: Public Sector	
Project number: ME-T1366					Project Title: Post-earthquake infrastructure immediate damage assessment					
Period covered by the plan: 18 months										
Threshold for ex-post review of procurements:				Goods and services (in US\$): 0		Consulting services(in US\$):500,000				
Item N°	Ref. AWP	Description (1)	Estimated contract cost (US\$)	Procurement Method (2)	Review of procurement (3)	Source of financing and percentage		Estimated date of the procurement notice or start of the contract	Technical review by the PTL (4)	Comments
						IDB/MIF %	Local/other %			
1		Component 1	\$450,000							
		Consulting services								
		Inception Meeting	\$15,000		N/A	100%	0%	2017B		travel and logistic expences
		Vulnerability assessment	\$420,000	SSS	N/A	100%	0%	2018A		Firm consultant. See footnote 7 of the TC document. Additional counter-part fee: US\$55,600 (in-kind)
		Final Workshop	\$15,000		N/A	100%	0%	2018B		logistic expences
2		Component 2	\$50,000							
		Consulting services								
		Recommendations for effective technical standards	\$49,000	IICQ	N/A	100%	0%	2018B		individual consultant
		Desemination Workshop	\$1,000		N/A	100%	0%	2019A		logistic expences
Total			\$500,000	Prepared by: RND			Date: 18/Oct/2017			
(1) Grouping together of similar procurement is recommended, such as computer hardware, publications, travel, etc. If there are a number of similar individual contracts to be executed at different times, they can be grouped together under a single heading, with an explanation in the comments column indicating the average individual amount and the period during which the contract would be executed. For example: an export promotion project that includes travel to participate in fairs would have an item called "airfare for fairs", an estimated total value od US\$5,000, and an explanation in the Comments column: "This is for approximately four different airfares to participate in fairs in the region in years X and X1".										
(2) <u>Goods and works</u> : CB: Competitive bidding; PC: Price comparison; DC: Direct contracting.										
(2) <u>Consulting firms</u> : CQS: Selection Based on the Consultants' Qualifications; QCBS: Quality and cost-based selection; LCS: Least Cost Selection; FBS: Selection nder a Fixed Budget; SSS: Single Source Selection; QBS: Quality Based selection.										
(2) <u>Individual consultants</u> : IICQ: International Individual Consultant Selection Based on Qualifications; SSS: Single Source Selection.										
(2) <u>Country system</u> : include selection Method										
(3) <u>Ex-ante/ex-post review</u> : In general, depending on the institutional capacity and level of risk associated with the procurement, ex-post review is the standard modality. Ex-ante review can be specified for critical or complex process.										
(4) <u>Technical review</u> : The PTL will use this column to define those procurement he/she considers "critical"or "complex"that require ex ante review of the terms of reference, technical specifications, reports, outputs, or other items.										