

Results of CATAC Project Evaluation by JICA Mission

1. Outline of Mission

This mission was dispatched to review the project based on the DAC five (5) evaluation criteria and to extract recommendations and lessons learned for future.

This review was conducted by the following team:

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2. Project Overview

The Central America Countries (Nicaragua, El Salvador, Guatemala, Costa Rica, Panama and Honduras) are frequently impacted by earthquakes as the Cocos Plate subducts under the Caribbean Plate. Additionally, there are concerns of local or regional tsunamis since the plate boundary is close to the region. Under this situation, Nicaragua proposed the establishment of the Central American Tsunami Advisory Center (CATAC) in Nicaraguan Institute of Territorial Studies (INETER) on a meeting of the Regional Working Group for Central America of the ICG/PTWS, which is a subordinate of the UNESCO/IOC. CATAC has been coordinating towards its realization, and the Government of the republic of Nicaragua requested the Government of Japan for the technical cooperation project for capacity building of CATAC in order to enhance enough capacity to forecast tsunami in Central American Countries. The outline of this project is as follows:

Project Overall Goal:

Tsunami advisory information issued by CATAC is utilized for tsunami warning in Central American Countries.

Project Purpose:

Capacity for quantitative tsunami forecast for tsunami advisory information is improved.

Outputs:

1. Capacity for analyzing earthquake parameter with waveform data from Central American Countries is improved.
2. Capacity for quantitative tsunami forecast is improved.
3. Capacity for issuing tsunami advisory information is improved.
4. Capacity development program for Central American Countries is established in CATAC.

3. Project Achievement:

Various kinds of outputs were confirmed in this project and the project purpose is to be achieved.

Some of outstanding outputs are as follows:

- Through activities related to Output 1, the following results were obtained:
 - ✓ Seismic parameters (hypocenter, magnitude, mechanism, etc.) have been obtained accurately.
 - ✓ SOP for analysis has been revised.

The accuracy of seismic source is a very important critical factor for the accurate issuance of tsunami warning, and can contribute to gaining trust from organizations in Central American countries to achieve the overall goal.

- Through the activities related to Output 2, the following results were obtained:
 - ✓ More than five (5) C/Ps can carry out operation with tsunami simulation software through training “earthquake, earthquake engineering, tsunami disaster prevention”, “tsunami simulation”, and short-term expert dispatch.
 - ✓ Tsunami database is to be constructed by the end of this project.
 - ✓ Tsunami analysis procedure manual was created. Training based on the procedure manual was implemented. All monitoring operators were able to output tsunami information quickly and accurately.
 - ✓ CATAC trial operation has started.

The ability that multiple operators can issue tsunami information quickly and accurately greatly contributes to the stabilization of quality and is a positive factor in achieving the overall goal.

- The following results were obtained through activities related to Output 3:
 - ✓ The CATAC standard operating procedure (SOP) was formulated.
 - ✓ Tsunami advisory information issuance exercises were conducted for Central American countries.

- ✓ Workshops were held for Central American countries, and human resources who can use tsunami advisory information for tsunami forecasts were trained.

CATAC already started training for Central American countries, and this contributes to achieve the overall goal.

- The following results were obtained through activities related to Output 4
 - ✓ INTER's training implementation system has been developed.
 - ✓ Training plans and materials for Central American countries have been developed.
 - ✓ Training on CATAC service and SeisComP system were conducted for Central American Countries.

Development of training implementation system and material, and implementation of training helps the capacity building of Central American countries on utilizing tsunami advisory information.

4. Summary of Evaluation Results

The results of this project was implemented relatively successfully with countless outstanding achievements. At the same time, some recommendations and lessoned learned for future were extracted. The summary of evaluation results are described below.

Relevance : High

- This project is consistent with the Nicaraguan National Human Development Plan 2018-2021 “Chapter XVI Section A Section 2”: “Continuous monitoring for natural phenomena and enhanced early warning”.
- This project is consistent with Japan's Development Cooperation Policy towards Republic of Nicaragua Country 2017 “3. Priority Areas (3) Environmental Conservation and Disaster Risk Reduction” “cooperation for Disaster Risk Reduction and for Response in Disaster”.
- This project is also consistent with “Sendai Framework for Disaster Risk Reduction 2015-2030” (hereinafter referred to as “Sendai Framework”). This project contributes to the promotion of all priority actions in the framework.
- “improvement of understanding of disaster risk” (priority action 1) through hypocenter determination,
- “strengthening disaster risk governance” (priority action 2) through improvement of quantitative tsunami forecast capabilities,

- “Investment in DRR” (priority action 3) through the introduction of equipment and staff capacity enhancement such as earthquake / tsunami analysis software.
- “Strengthening preparations for effective emergency response” (priority action 4) through dissemination of tsunami advisory information.
- Only Nicaragua and El Salvador had scientific institutions to monitor earthquake and tsunami for 24/7 in 2015. The other countries in Central America asked Nicaragua to establish tsunami advisory center for the region.

Effectiveness : Relatively High

[Whether the project objectives have been achieved through project implementation]

- The capacity for quantitative tsunami forecast has been established, and CATAC is ready to bring benefits to beneficiaries and target societies. Specifically, the accuracy of seismic source determination was improved, and theoretically, it is possible to issue tsunami information within five (5) minutes after the earthquake.

[Whether beneficiaries have been benefited from this project]

- On the other hand, it is difficult to clarify the level of “whether have beneficiaries been benefited from this project” at this time, because the SOP was approved at the ICG/PTWS and ICG/CARIBE EWS meetings in April 2019 and the UNESCO/IOC assembly in July 2019, and the CATAC trial operation started in August 2019. This is a matter of the project design, and the effectiveness might have been higher, for example, by creating a draft version of the SOP at an earlier stage, and sharing it with the Central American countries, and conduct mock drills among 6 countries so that benefits to beneficiaries could be measured more clearly within this project period.

Efficiency : Relatively High

- Planned activities were conducted on schedule without delay even taking into account the deterioration of security and temporary evacuation of experts by setting alternative activities and alternative periods in a recovery plan.
- All planned outputs were achieved within its budget.

- INETER's positive attitude on seeking and securing financial source on attending international conferences and workshops contributed to smoother and more efficient implementation.
- There is a room for consideration regarding the number of conferences and workshops which C/Ps attended, from the view point of technical transfer, it might be better for C/Ps to be at the office and work together with Japanese long term expert, although those attendance was important to show the presence of CATAC, as well as obtaining the latest information. (It would be a good option to send a study team including technical advisors at the midpoint of the project to verify its validity. In this project, there was a situation where the above study team could not be dispatched due to the deterioration of Nicaragua's security at the midpoint of the project and the tight budget situation in JICA.)

Impact : High

- Through the activities of this project, CATAC trial operation was approved at the 28th ICG / PTWS meeting and the 14th ICG / CARIBE EWS meeting in April 2019, and the CATAC trial operation started in August 2019. The project goal is “Capacity for quantitative tsunami forecast for tsunami advisory information is improved”, and the start of CATAC trial operation can be said to be an achievement, which goes beyond the project goal. This is a great step toward achieving the overall goal (“Tsunami advisory information issued by CATAC is utilized for tsunami warning in Central America”).
- In addition to the above point, the followings are some of positive situations for achieving the overall goal:
 - ✓ An action plan towards achieving overall goal is in the process of formulation by the initiative of INETER.
 - ✓ Training plan for INETER staff has been developed, and the training began since July 2019, before the project termination.
 - ✓ INETER, by themselves, already made necessary arrangement of financial source for upcoming international conferences in 2019.
 - ✓ The number of false earthquakes keeps decreasing (48% in April 2017 to 6.6% in May 2017 to 2.1% in April 2019).
 - ✓ INETER has decided to allocate two staff for the 24 hour operation for stable, accurate and quick information delivery to the Central American countries.

- ✓ INETER plans to increase the level of English among the staff to achieve the project overall goal. This will create opportunity to participate in outside training including JICA training and communicate with other regional centers.
- ✓ CATAC's trial operation has started, and CATAC has the ability to issue accurate tsunami information in Spanish and within five (5) minutes after the earthquake. These conditions increase the possibility that CATAC information will be used in Central American countries.

Sustainability : Medium (can become high as the Action Plan is implemented)

- Towards achieving the overall goal, INETER plans to conduct training inside INETER from July 2019 in order to utilize the technology and knowledge gained from technical transfer in the project for the operation of CATAC. Specifically, INETER plans to hold training on modules on SeisComPRO on earthquakes and tsunamis continuously for all staff in the INETER Seismology Division. In this way, the internal training plan after the end of the project has been formulated by INETER, which contributes to ensuring the technical level, disseminating the technology to other staff, and greatly contributing to sustainability to achieve the overall goal.
- It contributes to achieve the project overall goal that INETER has formulated a plan with financial source for participating in international conferences in 2019 for building networking with other regional centers, obtaining the latest information, which are indispensable as a regional center.
- The equipment maintenance budget is included in the INETER Seismology Division budget, and periodic inspections are carried out.

5. Recommendations

Recommendations extracted from this review are as follows:

- Training to Central American countries should be continued after the project termination to raise the warning capacity of other Central American countries as well as to build trust with Central American countries.
- To that end, Training of Trainers (TOT) should be conducted in INETER
- It would be recommended to officially place CATAC in the organizational chart of INETER to raise the presence of CATAC in Nicaragua as well as in the Central American region. It is also important to secure independent budget of CATAC.

- Activities after project termination should be monitored regularly (at least annually) by INETER and JICA.

6. Lessons Learned

The following lessons learned was extracted from this review.

- In technical projects, an consultation survey team with technical advisor/s should be dispatched at the midpoint of the project. In the survey, the contents of PDM and PO can be examined, and necessary changes can be made for the second half of the project. It is highly important for projects with highly technical, like CATAC.
- In projects, it could be considered to set up a phase in which experts gradually fade out, C/Ps independence and rehearsal practice/adjustment for the end of the project can be performed. In this project, there was a situation of the deterioration of security in Nicaragua and the tight budget issue in JICA, and it caused a concentration of activities at the end of the project period.