Central America

Ex-Post Evaluation of Japanese Technical Cooperation Project

The Project on Capacity Development for Disaster Risk Management in Central America "BOSAI"

External evaluator: Hajime Sonoda, Global Group21 Japan, Inc.

0. Summary

The Project on Capacity Development for Disaster Risk Management in Central America (hereinafter referred to as "the Project") was implemented with the objective of conducting local disaster management activities in six Central American countries (El Salvador, Costa Rica, Guatemala, Honduras, Nicaragua, Panama), thereby enhancing the disaster risk management capacity of the selected communities (hereinafter referred to as "target communities") and the municipal authorities with jurisdiction (hereinafter referred to as "target municipalities"), and through the experience and knowledge acquired in this process, improving the capacity of the respective national disaster risk management agencies and the Executive Secretariat of the Center of Coordination for the Prevention of Natural Disaster in Central America (SE-CEPREDENAC) to promote local disaster management. Although the Project had some issues concerning planning and approach, its relevance is deemed to be high because it was highly relevant to policies, development policy and needs in Central America at the time of both planning and ex-post evaluation and it was consistent with the Government of Japan's aid policies and plans in Central America. Capacity development for disaster risk management was achieved in the target municipal authorities, however, it was only partially realized in the target communities. Also, capacity development for implementing local disaster management was only partially achieved in the respective national disaster risk management agencies and SE-CEPREDENAC; moreover, because development of counterpart personnel in national disaster risk management agencies was not adequately realized in some of the countries, some of the Project objectives were not achieved. Moreover, considering that little progress was made in terms of sharing and utilizing local disaster management information, experience, techniques, etc. across national boundaries, the Project's effectiveness and impact were moderate. The Project period was within the planned term, however, because the cost was higher than planned, the Project efficiency was moderate. While sustainability in terms of policies and systems is high, as the national agencies and municipalities and communities are faced with institutional, technical and financial constraints, the sustainability of effects generated by the Project is moderate. To sum up, the Project is judged to be partially satisfactory.

1. Project Description

Project Location

Sign for a tsunami evacuation route (Nicaragua)

1.1 Background

Central America experiences a variety of natural disasters, such as storm and wind, flood damage, sediment disasters, earthquakes, volcanic eruptions and so forth, and the human and economic costs of these disasters are a major impediment to the region's development. Accordingly, in 1993, six countries in Central America established CEPREDENAC under the auspices of the Central American Integration System (SICA) with the aim of building a disaster-resistant society[1]. Following the occurrence of Hurricane Mitch, which caused extensive damage across Central America in 1998, the leaders of the six Central American nations announced the Guatemala Declaration (1999) renewing their resolve to build a disaster-resistant society, and CEPREDENAC took the initiative in compiling the 5-year Plan for Disaster Risk Management in Central America (2000~2004). In the subsequent 10-year Plan for Disaster Risk Management in Central America (2006~2015), capacity building for disaster risk management in communities, promotion of human resources development in the disaster risk management field, consideration to disaster risk management in development planning by local municipal authorities and so forth were identified as priority issues.

It was against such a background that the governments of Central American countries in 2005 requested the Government of Japan to provide technical assistance with emphasis on disaster risk management capacity building on the community and local levels. In response, the Government consigned JICA to implement a preparatory study in 2006, and following the signing of the Record of Discussions with the respective national disaster risk management agencies and the SE-CEPREDENAC, it commenced the Project as a five-year undertaking from May 2007[2].

---

[1] CEPREDENAC, a specialist agency under the jurisdiction of SICA, implements activities, projects and programs aimed at mitigating the risks of disasters that cause human and economic losses under the guidance of a representative conference composed of the directors of the respective national disaster risk management agencies. Its operations are financed by contributions from the member states and assistance from donors.

[2] The Project was planned to target six countries, however, because signing of the Record of Discussions with was

1.2 Project Outline

Overall goal		Information, knowledge, and methodologies on local disaster risk management in Central America are commonly utilized in different areas in the region.
Project goal		Communities' and municipal authorities' capacity for disaster risk management is strengthened in the target areas, and the capacity of CEPREDENAC members for promoting local disaster risk management is strengthened.
Output	Output 1	The mechanism for disaster risk management is strengthened in target communities in collaboration with municipal authorities
	Output 2	Knowledge of disaster risk management is promoted in target communities.
	Output 3	Disaster response and risk reduction goals, tools, and activities are included in municipal plans in the target areas.
	Output 4	Capacity for promoting local disaster risk management is enhanced in the respective national disaster risk management agencies and SE-CEPREDENAC.
	Output 5	Mechanism for disseminating information, experience and methodologies about local disaster risk management is established.
Grant from the Japanese side		495 million yen
Period of cooperation		May 2007 ~ May 2012
Implementation agency		Executive Secretariat of CEPREDENAC (SE-CEPREDENAC) Each country's disaster risk management agency: El Salvador, Director General for Civil Protection (Civil Protection) Costa Rica, Nacional Commission for Emergency (CNE) Guatemala, National Coordination for Disaster Reduction (CONRED) Honduras, Permanent Contingency Commission (COPECO) Nicaragua, National System for Disaster Prevention, Mitigation and Relief (SINAPRED) Panama, National System for Civil Protection (SINAPROC)
Other cooperating agencies in the recipient country		El Salvador National Land Research Institute (SNET) Nicaragua Land Research Institute (INETER)
Cooperating agency in Japan		Cabinet Office, Ministry of Land, Infrastructure and Transport, Asian Disaster Reduction Center, Disaster Reduction and Human Renovation Institution
Related projects		Training in Japan "Disaster Risk Management Measures in Central America" (2007~, North America, Central and South America), Third country training in Mexico "Civilian Safety and Disaster Risk Management" (2007~2012, Argentina, Belize, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, others), Japan Overseas Cooperation Volunteers (Costa Rica, El Salvador, Panama, Honduras, Nicaragua)

Note) Because the indicators and means for acquiring the data for the said indicators were not established in the Project Design Matrix (PDM) that was compiled at the time of the ex-ante evaluation, a new PDM containing this information was compiled at the time of the interim evaluation. In the ex-post evaluation here, evaluation is conducted based on the indicators established in the interim evaluation.

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the time of the Terminal Evaluation

Concerning the project purpose, i.e. "communities' and municipal authorities' capacity for disaster risk management is strengthened in the target areas, and the capacity of CEPREDENAC members

slower than with the other countries, the actual cooperation was commenced with five countries (omitting Nicaragua) in May 2007. Nicaragua was added to the target countries in December 2008.

for promoting local disaster risk management is strengthened" in the PDM, indicators were established based on evaluation sheet on three levels, i.e. communities, municipal authorities, and countries/Central America[3]. Regarding the target level of 80%, the achievement was 68% on the community level, and 90% on the level of municipal authorities. In terms of countries / Central America, three out of the six target disaster risk management agencies and SE-CEPREDENAC attained the target indicator. Even in the communities that didn't attain the target level, considering the possibility that the target level could be achieved in the remaining term (six months) of the Project, it was deemed that the Project purpose was "mostly achieved."

1.3.2 Achievement Status of Overall Goal at the time of the Terminal Evaluation

Concerning the overall goal, i.e. "information, knowledge, and methodologies on local disaster risk management in Central America are commonly utilized in different areas in the region", although there were already a number of derivative cases, it was deemed that progress towards achievement was slow. In view of the Central American characteristic of having to deal with frequent personnel turnover due to changes of government, the issue of work continuity in government organizations was identified as a major stumbling block to achievement of the overall goal.

1.3.3 Recommendations at the time of the Terminal Evaluation

- The national disaster risk management agencies and SE-CEPREDENAC should establish goals for local disaster management activities and conduct continuous monitoring geared to their achievement.
- The training course in Japan on "disaster risk management measures in Central America" was highly effective and should be continued.
- In the future, third country training should be proposed, coordinated and administrated by the national disaster risk management agencies and JICA.
- The tools and methodologies that were prepared in the Project should be actively shared with and distributed to other agencies through a website, etc.
- The disaster risk management personnel of national and local municipal authorities should conduct ongoing support to ensure that the risk and resources maps and disaster risk management plans prepared by the communities are regularly updated[4].

---

[3] For the purposes of the Project, municipal authorities refer to the authorities that have direct jurisdiction over communities (equivalent to municipalities in Japan). These are usually called "municipalities" in Central America, however, they are called municipal authorities here. On the evaluation sheet, check items are set corresponding to the contents of the capacity development intended by the Project on each level (6 items for countries and CEPREDENAC, 10 items for municipal authorities, and 11 items for communities), and the degree of achievement of each item is scored according to three levels (0 points, 0.5 points, 1 point).

[4] Risk and resources maps give a visual diagnosis of natural disaster risks and risk management resources

- Changes in the awareness and behavior of community inhabitants concerning disaster risk management should be monitored through appropriate methods, and the evaluation sheets need to be improved upon taking the Project experience into account.
- The national disaster risk management agencies should assign coordinators to take the place of the coordinators who were assigned by JICA in the Project

2. Outline of the Evaluation Study

2.1 External Evaluator

Hajime Sonoda (Global Group 21 Japan)

2.2 Duration of Evaluation Study

The ex-post evaluation study for the Project was conducted over the following period.

Duration of the Study: November 2014 ~ October 2015

Duration of the Field Survey: January 25~March 5, 2015, May 17~June 5, 2015

2.3 Constraints on the Evaluation

There were seven implementing agencies for the project, i.e. SE-CEPREDENAC and the disaster risk management agencies of the six target countries in Central America. Due to the confidential nature of some information concerned, it was not possible to obtain adequate information concerning budget makeup and trends, etc. of some of the disaster risk management agencies, making it difficult to conduct detailed analysis on financial aspect.

3. Results of the Evaluation (Overall Rating: C[5])

3.1 Relevance (Rating: ③[6])

3.1.1 Relevance to Development Plans of Central America

As mentioned in 1.1 Background, at the time of the ex-ante evaluation, the 10-year Plan for Disaster Risk Management in Central America (2006~2015) had been compiled and local disaster management, i.e. disaster risk management in municipal authorities on the level of communities and municipalities, was viewed as an important issue.

In June 2010, the Central American Integration System (SICA) approved the Central America

(telecommunications facilities, evacuation routes and centers, emergency relief facilities, etc.) in target areas. It should be noted that "a risk map" mentioned in the terminal evaluation report of the Project is same as "a risk and resources map" in this report.

5 A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

6 ③: High, ② Fair, ① Low

Integrated Disaster Risk Management Policy (PCGIR) and updated the abovementioned plan, and within this it earmarked local disaster management as a means of realizing the priority policy field of "land management and rule." Therefore, by the time the Project was completed, it had become an important element of the said Policy. Moreover, within the comprehensive disaster risk management policies and systems being adopted by each country, for example, the National Plan for Civil Protection of El Salvador (2009), the National Plan for Comprehensive Risk Management of Panama, and the National Risk Management Plan of Costa Rica (2010~2015), the promotion of local disaster management had become an important and ongoing policy issue.

Accordingly, the Project had high relevance to development policies both at the time of the ex-ante evaluation and on completion of the Project.

3.1.2 Relevance to the Development Needs of Central America

As mentioned in 1.1 Background, at the time of the ex-ante evaluation, various kinds of natural disaster were greatly impeding development in Central America. Over the seven years between 2006~2012, Central America witnessed increased fatalities, affected persons and economic losses due to disasters[7], and such damage accounted for between 22~40% of GDP depending on the country[8]. Moreover, Honduras, Nicaragua, and Guatemala are ranked as the first, fourth and ninth most vulnerable countries in the world to weather-related disasters[9].

Thus, it can be seen that disaster risk management is an important issue for development in Central America, and the Project was highly relevant to the area's development needs both at the time of ex-ante evaluation and completion.

3.1.3 Relevance to Japan's ODA Policies

The Initiative for Disaster Reduction through ODA (January 2005), which indicates the Government of Japan's cooperation policies in the field of disaster risk management describes such topics as: "enhancing the priority of disaster risk management," "the importance of "soft" support (non-structural measures)", "utilization of Japan's experience, knowledge and technology" and so on. It also mentions assisting improved awareness about the importance of disaster risk management in developing nations through policy discussions, seminars and educational activities, the need to

---

[7] According to the database of CRED (Center for Research on the Epidemiology of Disasters), which records major disasters all over the world, Central America had 526 fatalities and 2.25 million affected persons every year during this period. Looking at records from 1970 onwards according to this database, weather-related disasters was the most common form of damage in Central America accounting for 70%, and this was followed by earthquakes at 10% and eruptions at 5%. Also, biological disasters such as epidemics and pest outbreaks accounted for 9%.

[8] Report on Natural Disaster Risk Vulnerability in Central America (February 2014)

[9] Global Climate Risk Index 2015 (Germanwatch)

disseminate and establish disaster risk management, and the need to compile disaster prevention plans and strengthen organizational capacity in regional municipal authorities. In addition, the JICA country-based project implementation plans for each country mention improving disaster risk management awareness among local inhabitants, strengthening the local disaster management capacity, strengthening the disaster risk management setup of government and community organizations, strengthening the development plans based on the perspective of disaster risk management and so on. Accordingly, the Project had a high degree of relevance to Japan's ODA policies.

3.1.4 Appropriateness of Project Plan and Approach

The basic concept of the Project entailed identifying and systemizing model good practices for Central America within the experiences of tackling disaster risk management in the pilot sites (target municipalities and communities), and promoting the accumulation and sharing of information primarily among the national disaster risk management agencies and SE-CEPREDENAC. The following points can be mentioned regarding the Project approach in terms of realizing this concept.

- Because the criteria for selecting the target municipalities and communities were not clearly specified, the target areas and types of disasters were not appropriately narrowed down in some countries, making it difficult to obtain clear outputs. Also, no particular consideration was shown to avoiding extreme areas with a view to realizing dissemination within countries and to other countries in the region.

- The activities in the target municipalities and communities were not properly recorded. Also, activities for verifying and evaluating the acquired results were not included in the plans. As a result, the systematization of the various experiences and knowledge acquired in the municipalities and communities was inadequate, and this was one of the reasons why the dissemination of good practices did not proceed well.

- The basic concept of the Project to prepare models for future dissemination via the activities in pilot sites was not sufficiently demonstrated in the PDM and other documented plans. As a result, the municipalities and communities were selected without clarifying the selection criteria or specifying whether or not sites were pilot sites, and the focus was directed solely to activities for strengthening disaster risk management capacity ta the selected sites.

- The PDM did not specify the importance of training core employees (counterparts) in

enhancing the capacity of national disaster risk management agencies to conduct local disaster management, and activities for this purpose were not sufficiently conducted.

As is described later, this had an impact on the Project's effectiveness, impact and sustainability. However, since there were other factors that greatly impacted the Project, for example, the low recognition about the need for disaster prevention in the municipalities and communities and the financial constraints and personnel turnover in the municipal authorities, it cannot be said that the abovementioned issues greatly harmed the Project's appropriateness.

Meanwhile, because the Project was a regional undertaking targeting six countries in Central America, its implementing agencies included the respective national disaster risk management agencies and the regional specialist agency of CEPREDENAC. One of the advantages of the Project being a regional undertaking was that, because the same experts could visit multiple countries and there was active involvement by the regional specialist agency, it was possible to stage frequent regional seminars, study tours and the like and thereby expedite information sharing between countries. Also, because the experts were in charge of multiple countries at the same time and were able to make repeated short-term visits at appropriate times, it was possible to efficiently utilize the input of experts[10]. Moreover, the involvement of CEPREDENAC, which is made up of representatives from the national disaster risk management agencies, was effective for ensuring smooth communications and coordination within the region and securing sustainability following completion of the Project.

On the other hand, being a regional project brought its own unique difficulties. First, the sheer number of related agencies meant that a lot of time and money were spent on coordination and procedural affairs. Also, although the same PDM was used to manage the Project activities in each country, because the activities and specific indicators of outputs were modified according to each country's situation, there were differences between countries. The counterparts had a shared recognition of such modifications, however, the adopted PDM was not intended to state different country-based goals and remained unchanged. As a result, disparities arose between the contents of the PDM and the conditions on the ground[11]. Adoption of a common PDM

[10] Since there are few Japanese experts in the field of disaster risk management who can function in Hispanic countries, the experts were consolidated into one country and there was difficulty in implementing the project activities in one country at a time.

[11] Differences in the types of disasters (earthquakes, volcanoes, tsunami, flooding, landslides, etc.) that are emphasized in each country, disaster risk management policies and plans, organizational setup for disaster risk management agencies, and local administrative systems were reflected in the activities in each country. For example, in Panama where municipalities have limited capacity, local offices of the national disaster management agency directly intervened to the target communities, and in Costa Rica, where municipalities also have limited capacity, the national agency intervened to the target communities in close collaboration with some of the target municipalities. In El Salvador, the Project activities were started with the focus on municipal authorities, and activities were weighted more towards schools rather than the communities. In Honduras, the national disaster risk management agency had extremely limited involvement.

meant that the differences in conditions between each country were overlooked and made it difficult for the differences in conditions and goals to be appropriately taken into account[12].

Summing up, the Project had high relevance to policies and the development policies and needs of Central America both at the time of the ex-ante evaluation and the ex-post evaluation. It was also relevant to the Government of Japan's ODA policies and plans in Central America. Concerning the appropriateness of project plans and approach, a number of issues could be pointed to, however, there were other major factors that also impacted the Project's effectiveness, impact and sustainability. Generally speaking, it is deemed that the Project's relevance is high.

3.2 Effectiveness and Impact[13] (Rating: ②)

3.2.1 Effectiveness

In the Project, the plan was for 62 target communities selected in each country to compile local disaster management systems in collaboration with municipal authorities (Output 1, Output 2), to utilize those outputs so that the target municipal authorities could compile disaster risk management plans and disaster risk management action plans, and to introduce consideration of disaster risk management into the development plans of municipal authorities (Output 3), with a view to realizing the first part of the Project purpose, i.e. "communities' and municipal authorities' capacity for disaster risk management is strengthened in the target areas." Furthermore, it was planned for the respective national disaster risk management agencies and CEPREDENAC to organize and accumulate local disaster management promotion techniques based on these experiences (Output 4) and build systems for sharing these (Output 5), with a view to realizing the second part of the Project purpose, i.e. "the capacity of CEPREDENAC members for promoting local disaster risk management is strengthened."

Disaster risk management activities can be categorized according to timing (before, during and after disaster occurrence) and the implementing entity (national government, regional municipal authorities, communities, etc.)[14]. The Project focused on the communities, however,

---

[12] For example, in El Salvador, where effort was devoted to disaster risk management in schools, and Costa Rica, where techniques such as home visits and school disaster risk management were partially introduced, it was not possible to appropriately evaluate the obtained important outputs by means of the PDM objectively verifiable indicators alone. In the field surveys, some disaster management agencies said that it was "hard to understand why a common PDM is used despite the differing conditions and needs in each country."

[13] When assessing effectiveness, rating is given upon also taking impact into account.

[14] Activities before the occurrence of disasters include: preparation of risk and resources maps based on diagnosis of disaster risks and risk management resources; establishment and capacity building (equipment, materials, training, etc.) of disaster risk management organizations; preparation and update of emergency response plans; establishment of forecast and warning setups; implementation of disaster risk management training (evacuation and emergency response drills), preparation of evacuation shelters and routes; structural measures to protect embankments and slopes, etc.; land use regulations, etc. in consideration of disaster risk management, and so on. These pre-disaster activities are referred to as "disaster prevention and mitigation" in this ex-post evaluation, and

since it is important to collaborate with municipal authorities that have jurisdiction over communities when conducting disaster risk management in communities, “local disaster management” in the Project is defined as “initiatives for disaster prevention, emergency response, and recovery by communities and municipal authorities on the city, town and village levels.” In the Project, the respective national disaster risk management agencies and CEPREDENAC are regarded as supporters for promoting local disaster management.

The following sections summarize the activities and achievements of outputs on the respective levels of communities, municipal authorities, respective national disaster risk management agencies, and SE-CEPREDENAC, analyze the degree of achievement of the Project purpose, and review the factors that expedited the achievement of the outputs and the Project purpose[15]. Moreover, in the absence of performance of objectively verifiable indicators at the time of Project completion, here analysis was carried out based on performance at the time of the terminal evaluation[16].

3.2.1.1 Attainment of the Outputs

(1) Outputs in the target communities

In the target communities, it was planned to strengthen the disaster risk management setup through advancing the preparation of disaster risk management organizations, risk and resources maps, warning systems and disaster risk management plans (emergency response plans) in collaboration with the regional municipal authorities (Output 1), and to improve disaster risk management knowledge through conducting disaster risk management education activities, evacuation drill, etc. (Output 2).

By the time of the terminal evaluation, disaster risk management organizations, risk and resources maps, warning systems and disaster risk management plans had been established and prepared in roughly 90% of the target communities. However, in some areas, due to weak financial and personnel setups of the municipal authorities or lack of interest from the municipal leaders, it was not possible to get the municipal authorities

---

are distinguished from disaster management/disaster risk management activities which include emergency responses during disasters and relief/recovery activities after disasters. Disaster prevention aims to prevent or mitigate damage by reducing vulnerability to disasters, but it also includes activities aimed at enhancing emergency responses during disasters and building preparedness for relief/recovery activities after disasters.

15 In the field surveys, interviews were conducted with SE-CEPREDENAC, disaster risk management agencies in each country, all target municipal authorities (22 municipal authorities), and approximately 60% of the target communities (35communities). With respect to beneficiaries, interview surveys using questionnaires were conducted with 332 households in 22 communities in the six target countries. The number of sample households in each country was allocated according to the number of target communities, and the target households were randomly selected in each community.

16 It is possible that the degree of achievement was enhanced due to the activities conducted after the terminal evaluation, however, no concrete documented information for confirming this was obtained in the ex-post evaluation.

very involved, so interventions were made directly to the communities. Moreover, the recording and documentation of activities was hardly implemented at all even though this was included in the plan of activities[17].

In the communities, workshops and seminars were staged mainly for members of the disaster risk management organizations. The said members ascertained hazardous spots and evacuation routes, etc. through preparing risk and resources maps, etc. and acquired knowledge about natural disasters, disaster risk management and emergency measures via the seminars and training. Furthermore, evacuation drills for other inhabitants apart from the members was implemented in 60% of the target communities.

According to the beneficiary survey, 40% of inhabitants knew about the Project, and 30% had experienced participation in the Project activities. Of the inhabitants who participated in the Project, 90% said that the experience had been extremely useful, mainly because it taught them how to prepare for disasters and how to respond when disasters occur. Of the inhabitants who knew about the Project, 85% responded that they were better prepared than before, which was more than those who didn't know about the Project of which only 55% responded the same, and this was another beneficial effect of the Project.

Roughly 70% of inhabitants had correct understanding of disaster risks and preparedness for disasters in the target communities (Table 1). The remaining inhabitants had correct understanding in part, however, 15% of inhabitants could not indicate the correct method of evacuation. Moreover, the members of disaster risk management community organizations displayed a roughly 20% higher correct response rate than ordinary inhabitants for all questions. There are many communities where risk and resources maps and disaster risk management plans are not widely informed to inhabitants, and not even half of the inhabitants directly obtain disaster risk management information from the disaster risk management organizations[18], indicating there is room for improvement concerning methods for giving information to the general public.

[17] According to the JICA experts, because so much energy was devoted to enhancing activities in each community towards the end of the Project, not enough time could be spent on compiling records and documents.

[18] According to the beneficiary survey, 42% of inhabitants replied that they obtain disaster risk management information from community organizations and community leaders. Other sources of information were given as mass media (TV, radio, newspapers: 59%), schoolteachers (17%, of which 7% of respondents were children), and neighbors (16%).

Table 1 Knowledge concerning Disasters and Disaster Risk Management in Communities

(Unit: %)

	Overall			Organization members			Non-members		
	A	B	C	A	B	C	A	B	C
What kinds of disasters occur in communities?	72	24	4	83	15	2	66	28	6
Where is the most dangerous parts of communities?	71	24	5	86	12	2	66	27	7
How do you know about approaching disasters, and how do you prepare for them?	67	28	5	79	21	0	63	31	6
When and where do you evacuate?	64	22	14	82	17	1	60	26	14

Source: Beneficiary survey

(Note) The figures show the ratios of inhabitants who gave the (A) Correct response, (B) Partially correct response, and (C) Incorrect response to the indicated questions. The correctness of responses was determined by the surveyors who had the correct information.

In approximately 70% of the target communities, school disaster risk management was reinforced through the strengthening of school disaster risk management organizations composed of teachers and students, preparation of in-school risk and resources maps and emergency response plans, implementation of evacuation drill by teachers and students and so on. In El Salvador and Costa Rica, school disaster risk management is becoming extremely active in some cases. Having said that, the contribution of school disaster risk management to local disaster management is limited, with such efforts being almost totally confined to school premises and there being hardly any participation by parents or concrete cooperation with disaster risk management organizations.

On the other hand, according to the beneficiary survey, 85% of inhabitants responded that they discuss disaster risk management in their homes[19]. In view of this, if the disaster risk management education conducted in schools can be extended beyond schools to facilitate communication about disaster risk management in homes based on collaboration with disaster risk management organizations, it is possible that knowledge on local disaster management can be effectively conveyed to a broad section of the population.

Some schools were found to conduct disaster risk management education for lower grade children and for older children via special card games (“BOSAI Duck”) and seminars (“Frog Caravans”). The Frog Caravan is mainly intended to teach children about first aid they can perform in the event of earthquakes and fires, while the technique of learning through playing card games grabs the interest of children and is welcomed in many countries (see the Box).

Summing up the above, strengthening of the disaster risk management setup in communities and enhancement of disaster risk management knowledge were realized to a certain extent, however, the involvement of national and municipal authorities was

[19] 52% of people responded that they discuss it regularly and 33% said they did sometimes.

limited in some communities. Also, the recording and documentation of activity processes wasn't adequately implemented, while there was room for improvement regarding the dissemination of information to ordinary citizens and collaboration with disaster risk management education in schools. Accordingly, it is deemed that the achievement of outputs in communities was moderate.

(2) Outputs in target municipal authorities

In the target municipal authorities, in addition to involvement in the above activities targeting communities, it was planned for personnel in charge of disaster risk management to participate in the training in Japan ("Disaster Management in Central America") and to pass information on to the employees of municipal authorities via seminars, etc., and for disaster risk management goals, measures and concrete activities to be included in the development plans of the target municipal authorities (Output 3).

In the target municipal authorities, workshops and seminars targeting personnel in charge of disaster risk management and members of disaster risk management committees were conducted. The personnel who took part in the training in Japan implemented seminars and other dissemination activities in the municipal authorities after they returned home. Thanks to the enthusiastic efforts of the returning trainees, many municipal authorities witnessed progress in terms of the organizing of disaster risk management, compilation of emergency plans, implementation of evacuation drill and so on. Although it was intended for personnel from all the target municipal authorities to take part in the training in Japan, due to reasons such as being too busy with regular work to obtain permission to go to the training in Japan, personnel participated in the training in Japan and conducted activities after returning home in only 10 out of 23 municipal authorities.

At the time of the terminal evaluation, disaster risk management goals, measures and concrete activities had been included in development plans in approximately 90% of the target municipal authorities, while emergency response plans for disasters were prepared during the Project period at roughly two-thirds of the municipalities. However, considering that less than half the target municipal authorities took part in the training in Japan and there were some communities where the municipal authorities did not take an active involvement, not all of these outputs could be said to have been the result of the Project. Accordingly, it is deemed that the achievement of outputs targeting the municipal authorities was moderate.

(3) Outputs in national disaster risk management agencies and SE-CEPREDENAC

In the respective national disaster risk management agencies and SE-CEPREDENAC,

through accumulating and utilizing the knowledge acquired in the activities in the target communities, it was planned to systemize and share useful techniques, tools and technologies for local disaster management (Output 4)[20]. Moreover, with a view to realizing dissemination following completion of the Project, it was planned to construct a setup for widely disseminating the outputs of the Project and local disaster management information, experience, techniques, etc. via a network of the returning trainees, printed materials and so on (Output 5).

Over the course of the Project, three members from SE-CEPREDENAC and 54 members from the respective national disaster risk management agencies took part in the training in Japan or third country training. Although not all of these members were directly involved in the Project, many of the respective national disaster risk management agencies aired the opinion that these trainings were useful and contributed to improving knowledge and awareness concerning local disaster management in the said agencies.

Concerning teaching materials for promoting local disaster management, 12 types of teaching materials, manuals, etc. were prepared according to the contents of activities in each country (see the Box). Information concerning utilization of the techniques, tools and technologies was introduced to each country via workshops attended by representatives from each of the six target countries. However, these teaching materials were mainly prepared with the aim of initiating activities in the target communities; and they were not reflective of the lessons obtained upon verifying the eventual results of the activities. Moreover, because no practical guidelines were indicated for determining which techniques to combine and in what order according to characteristics of the community, disaster characteristics at the community, disaster risk management policies, plans and systems and local government systems in the target communities, it cannot be said that the materials were adequately systemized. In this way, although teaching materials were shared, there was still room for improvement concerning the contents and systemization.

Concerning the building of a dissemination system, the following activities were implemented: staging of annual conferences and networking of returning trainees, staging of a Central America regional disaster risk management conference for sharing information in line with field trips, and activities geared to sharing Project experiences

[20] Output 4 (Capacity for promoting local disaster risk management is enhanced in the respective national disaster risk management agencies and SE-CEPREDENAC) in the PDM overlaps with the second part of the Project purpose (…and the capacity of CEPREDENAC members for promoting local disaster risk management is strengthened), however, judging from the configured indicators, the actual content of Output 4 is deemed to be "useful techniques, tools and technologies for local disaster management are systemized and shared in these agencies."

between countries. However, because the returning trainees did not take part in any organized exchanges after completion of the Project, it is deemed that a sustainable dissemination setup based on the returning trainees couldn't be constructed. According to the experts, it was unclear who would take responsibility for the management of the returning trainees' network, and this is deemed to be the reason behind. It was planned to prepare pamphlets for introducing effective cases and to distribute these to nearby municipalities and communities, however, preparation of pamphlets was only confirmed in Costa Rica, while there were no confirmed cases of pamphlets being distributed to nearby municipalities and communities. Accordingly, it is deemed that the dissemination setup was not adequately built.

Accordingly, it is deemed that the achievement of outputs targeting national disaster risk management agencies and SE-CEPREDENAC was medium.

BOX: Local Disaster Management Techniques Introduced in the Project

DIG (Disaster Imagination Game)

Inhabitants prepare risk and resources maps while analyzing disaster risks and resources for disaster risk management in communities, establishing disaster risk management organizations aimed at realizing the self-efforts of communities, preparing emergency response plans and reviewing necessary external assistance. (Photograph: risk and resources map in Honduras)

Frog Caravan

Based on the premise of rescuing a frog that has met with an earthquake or fire, children learn about disaster risk management while playing various games aimed at showing them various disaster risk management activities such as firefighting, rescue, first aid, storing supplies and so on. (This approach was conceived in Japan based on the experience of the Hanshin-Awaji Earthquake). (Photograph; A frog used in a firefighting game. When water hits the flame, the frog rises up. El Salvador).

BOSAI Duck

This method, in which large-sized picture cards based around a duck character are used, is intended to teach young children about natural disasters and disaster risk management.

Dyke and slope protection using old tires

Useful structures for disaster risk management are built by inhabitants using old tires and cement. (Photograph: used-tire dyke, Costa Rica)

Simple observation methods for early warning

Basic rain gauges, water level gauges, and monitoring of landslide risks based on simple methods. (Photograph: Basic rain gauge; Panama)

Other teaching materials, etc.

Manuals on making sandbags and implementing evacuation drill, manuals for implementing “disaster risk management schools,” tsunami and volcano disaster learning materials.

Source: Prepared by the evaluator based on materials provided by JICA

3.2.1.2 Degree of Achievement of Project Goals

Three evaluation sheets – Evaluation Sheet 1, Evaluation Sheet 2, and Evaluation Sheet 3 – were prepared in order to measure the degree of achievement of Project purpose on the three levels of communities, municipal authorities, and respective national disaster risk management agencies and SE-CEPREDENAC, and objectively verifiable indicators were set based on the results[21]. As is shown in Table 2, at the time of the terminal evaluation, the goal "strengthening the disaster risk management capacity of the target municipal authorities" (Indicator ②) was achieved, however, "reduction of vulnerability to disasters in the target communities" (Indicator ①) and "improvement of knowledge and ownership about local disaster risk management of national disaster risk management agencies and SE-CEPREDENAC" (Indicator ③) were only partially achieved[22]. Table 3 shows the country-separate evaluation sheet mean scores (at the time of terminal evaluation), the numbers of target municipalities and communities, and the features of activities and outputs.

Table 2 Degree of Achievement of Project Purpose

Project Purpose	Communities' and municipal authorities' capacity for disaster risk management is strengthened in the target areas, and the capacity of CEPREDENAC members for promoting local disaster risk management is strengthened.
Indicator	Performance
① Reduction of vulnerability to disasters in the target communities (Target value: 80% of the target communities achieve at least 6 out of 11 points on Evaluation Sheet 1).	(Partially achieved) 68% of the target communities achieved 6 or more points out of the 11 indicated on Evaluation Sheet 1).
② Strengthening the disaster risk management capacity of the target municipal authorities (Target value: 80% of the target communities achieve at least 6 out of 10 points on Evaluation Sheet 2).	(Achieved) 90% of the target communities achieved 6 or more points out of the 10 indicated on Evaluation Sheet 2.
③ Improvement of knowledge and ownership about local disaster risk management of national disaster risk management agencies and SE-CEPREDENAC (Target value: They achieve at least 4 out of 6 points on Evaluation Sheet 3).	(Partially achieved) 3 out of 6 national disaster risk management agencies and SE-CEPREDENAC achieved 4 or more points out of the 6 indicated on Evaluation Sheet 3.

Source: Materials provided by JICA

[21] See footnote 3 concerning the evaluation sheets.

[22] Because the actual performance regarding objectively verifiable indicators was not investigated using the evaluation sheets at the time of Project completion, the judgment here is based on performance at the time of terminal evaluation. Moreover, in the terminal evaluation, the communities that couldn't attain the standard of indicator ① (6 points or more) were deemed to have the possibility of reaching this standard in the remaining period (6 months) of the Project, however, no such communities were found to reach this target in the remaining time.

Table 3 Evaluation Sheet Mean Scores, Numbers of Target Municipalities and Communities, and Features of Activities and Outputs by Countries

Country	Evaluation Sheet Mean Score			Numbers of target municipal authorities and communities; activities, and results
	Country (Out of 6)	Municipal authorities (Out of 10)	Communities (Out of 11)	
El Salvador	3.0	9.5	5.7	The targets comprising 5 municipal authorities and 17 communities were dispersed, and multiple types of disasters were targeted. Activities have mainly been conducted in the municipal authorities, but they have been delayed in the communities. The disaster risk management agency dispatches personnel all over the country to support the municipal authorities.
Nicaragua	6.0	9.5	8.8	Activities focusing on tsunami disaster were conducted in 1 municipal authority and 3 communities selected on the ground of a baseline survey. The disaster experience was relatively new, and the intensive, continuous activities produced results.
Guatemala	5.5	8.9	7.3	Volcanic disaster was targeted in 4 municipal authorities and 20 communities located around a volcano. The municipal authorities had little interest and required to be involved through the direct intervention of the central government. Due to the frequent occurrence of small-scale eruptions, the local villages have strong interest.
Costa Rica	5.5	8.6	6.0	The targets comprising 4 municipal authorities and 7 communities were dispersed, and multiple types of disasters were targeted. The anticipated organization did not progress in the municipal authorities and civilian groups, so unique methods such as conducting school education and making door to door visits were adopted.
Honduras	3.0	8.0	7.9	5 municipal authorities and 9 communities. Wind, flood damage and sediment disasters were targeted. The disaster risk management agency had little involvement and the municipal authorities were also fragile, however, outputs were achieved in numerous communities thanks to the efforts of the coordinators employed by JICA.
Panama	3.5	4.7	6.0	The targets comprising 3 municipal authorities and 6 communities were dispersed. Wind, flood damage and sediment disasters were targeted. Since the municipal authorities had very little involvement, the central government directly intervened in villages. Because remote municipalities and communities were included among the targets, the activities could not be conducted efficiently.

Source: Prepared by the evaluator based on materials provided by JICA and information obtained in the field surveys.

Judging from the findings of hearings at the target municipal authorities, target communities, respective national disaster risk management agencies, and SE-CEPREDENAC, it is deemed that the following factors aided achievement of the outputs and Project purpose.

Selection of target municipal authorities and target communities

- Ø The target areas and types of disasters are appropriately narrowed down (Guatemala, Nicaragua, etc.). It was easier to generate concrete results through making efficient inputs and having clear targets of activities.

- Ø Municipalities and communities that have recently experienced major disasters are targeted. The more experience of disasters there is, the order of priority of disaster risk management is higher and it is easier to obtain the active involvement of the municipal authorities and inhabitants.

- Ø The human and financial capacity of municipal authorities and capacity of existing civilian groups and leaders are high.

- Ø The leaders of municipal authorities have a strong interest in disaster prevention. It is difficult to obtain actively involvement in project activities when the local leaders are more interested in putting on a political performance through conducting emergency response measures only.

National disaster risk management policies and disaster risk management setup

- Ø The national governments have clear policies for supporting the municipal authorities and communities, and the national disaster risk management agencies had concrete support structures. (El Salvador, Nicaragua, etc.)

Activities of counterparts and returning trainees

- Ø The counterparts and returning trainees became established and took an active and direct involvement.

Construction of facilities based on participation of communities

- Ø Inhabitants provide labor and take an active involvement in the construction of facilities such as embankments, slope protection, evacuation shelters, evacuation routes and so on. Being able to visibly see the results of their efforts, this further enhances the motivation of inhabitants.

In order to attain the project purpose, it was essential for core counterparts for advancing local disaster management to be trained in the respective national disaster risk management agencies, however, Evaluation Sheet 3, which was intended to adjudicate the capacity of the respective national disaster risk management agencies, included no items for directly assessing

this item[23].

In El Salvador and Guatemala, numerous counterparts are continuing to make use of the project experiences in their current activities, and it is thought that substantial technology transfer was realized and contributed to the development of human resources. On the other hand, in Honduras, where the national disaster risk management agency only had limited involvement in the Project, hardly any progress was made in the development of counterparts. In other countries, the development of counterparts did not proceed as planned for reasons such as the numbers of assigned counterparts were too small (Costa Rica, Nicaragua) or there was high turnover of counterparts during the Project (Panama). Thus, the development of counterparts on the whole was not adequate[24].

To sum up, the indicator for improvement in the disaster management capacity of target municipal authorities was achieved, however, concerning the reduction of vulnerability to natural disasters in the target communities and the improvement of knowledge and ownership about local disaster risk management of national disaster risk management agencies and SE-CEPREDENAC, the indicators were only partially achieved and development of counterparts in the national disaster risk management agencies was insufficient. Accordingly, part of the project purpose was not achieved.

3.2.2 Impacts

3.2.2.1 Achievement of the Overall Goal

Concerning the overall goal, following completion of the Project, the respective national disaster risk management agencies and SE-CEPREDENAC took the initiative in sharing and utilizing the local disaster management information, experience, methods, etc. gained through the Project within the target countries and also across national borders with the Central American region. Such dissemination was started while the Project was still in progress, however, as is shown in Table 4, since the end of the Project, dissemination has largely been confined to within each country and there has been hardly any cross-border dissemination.

In Nicaragua and Guatemala, the DIG and Frog Caravan techniques that were introduced in the Project have entirely or partially been deployed nationally by organizations. On the other hand, in El Salvador and Costa Rica, the national disaster risk management agencies have created new teaching materials on local disaster management, however, the involvement of counterparts was limited and similar opportunities couldn't be exploited. Additionally, there

[23] The establishment of returning trainees is praiseworthy, however, not all trainees become core members, and evaluation of their capacity has not been included. Moreover, not all the counterparts have received training.

[24] According to the JICA Experts, because efforts were focused on finishing activities in the target communities by the end of the Project, inputs to countries and municipal authorities were generally regarded as secondary, and efforts to foster counterparts were also inadequate.

have been cases where other donors' funds have been utilized for dissemination and cases where participants in the training in Japan that has continued following the end of the Project have promoted dissemination after returning home.

Meanwhile, concerning cross-border dissemination in Central America, although the regional exchange activities involving SE-CEPREDENAC are being actively conducted, there are few examples of the techniques of the Project being utilized in other countries. Concerning why, setups for conducting dissemination based around the returning trainees were not constructed, while the following reasons were revealed in the hearings with SE-CEPREDENAC and the respective national disaster risk management agencies.

- Although teaching materials and manuals have been shared, there are few practically useful resources for sorting and introducing local disaster management methodologies, for example, detailed records of successful case examples, analyses of factors behind successes, and guidelines for selection and effective combinations as well as implementation of activities according to conditions. The methods that need to be introduced need to be selected and combined in the proper order according to conditions in the target communities, and they cannot be used in the same way in all communities. It is thought that not enough thought went into examining what combinations of methodologies are applicable to which conditions and so on.

- In order to introduce a method that has worked well in one country to another country that has different conditions, simply sharing information is not enough; rather it is necessary to actually apply methods on the ground and adjust them through a process of trial and error. It is also important for experienced disaster risk management personnel from other countries to provide guidance on the ground. Thus, when introducing know-how that has been developed in other countries, it is necessary for the introducing country to spend time and money on trial implementation and investigation, and this was difficult to do within the scope of the Project.

Summing up, the sharing and utilization of local disaster management information, experience, methods, etc. was realized within countries, however, little progress was made in terms cross-border utilization. Reasons for this were that setups based around the returning trainees were not established, specific materials for conducting introduction were limited, and it took time and money to introduce know-how that was conceived in other countries. To sum up, the overall goal was achieved only partially[25].

[25] The national disaster risk management agencies in each country were of the opinion that the ongoing training in

Table 4　Degree of Achievement of the Overall Goal

Overall Goal	Information, knowledge, and methodologies on local disaster risk management in Central America are commonly utilized in different areas in the region.
Indicator	Performance (only cases following completion of the Project are stated)
Existence of practical examples of good utilization of the Project results in municipalities and communities in the Central American Region (No target value)	<Practical examples of common utilization in the region> Frog Caravan activities were conducted in Panama with the cooperation of the Guatemalan disaster risk management agency, and funds from other donors were utilized to create manuals for the Central America region. <Practical examples of common utilization in each country> El Salvador: Following completion of the Project, Frog Caravan and Disaster Duck activities were conducted in new schools in four out of five of the target municipal authorities. Nicaragua: DIG, which was learned from Costa Rica during implementation of the Project, was utilized local disaster management guidelines and teaching materials that were independently created by the disaster risk management agency. The Frog Caravan is being implemented in the schools nationwide. Moreover, the experience of this Project was utilized in promoting local disaster management with respect to tsunami in other areas of the country. A certain municipal authority has printed and distributed earthquake disaster risk management pamphlets. Guatemala: The disaster risk management agency intends to officially adopt and nationally deploy the Frog Caravan and Disaster Duck activities for schools and the approach to strengthening local disaster management that was adopted in DIG. It intends to make original modifications to the Frog Caravan in consultation with the Ministry of Education and adopt it as an official activity in schools. Costa Rica: (None) Honduras: The returning trainees have helped plan and implement Frog Caravans in different areas following the end of the Project. Other returning trainees have actively introduced the slope protection method using old tires, and this has also been adopted by other municipal authorities and schools. Panama: The returning trainees have helped plan and implement Frog Caravans in Panama City.

Source: Prepared by the evaluator based on the findings of hearings with SE-CEPREDENAC and the respective national disaster risk management agencies.

3.2.2.2 Other Impacts

In the target municipalities and communities, it was anticipated that the continuation of the local disaster management that was supported by the Project would help mitigate damage. The following sections introduce specific examples of damage mitigation in communities upon

---

Japan and the five-year project in the six countries “created a certain impact in terms of the social approach to disaster risk management in Central America.” It is thought that the Project helped permeate the concept of disaster prevention. The local agencies also said that they “learned about the importance of not only emergency responses but also advancing disaster prevention in a joint effort by municipalities, communities and central government.”

sorting the ongoing situation of local disaster management activities. Finally, references are made concerning the environmental and social impacts and impacts on socio-economy.

(1) Situation regarding continuation of activities in target municipal authorities

Upon re-evaluating disaster management capacity as of the ex-post evaluation using the above evaluation sheet, as is shown in Table 5, activities were in decline in a quarter of the municipal authorities. Moreover, local disaster management activities were hardly continued at all in one-third of the municipal authorities.

Table 5 Situation regarding Continuation of Activities in Target Municipal Authorities

Disaster management capacity (terminal evaluation based on evaluation sheet→changes in the ex-post evaluation)			
Improved	No change	Deteriorated	Total *
3 (15%)	2 (10%)	15 (75%)	20 (100%)
Situation regarding continuation of activities (22municipal authorities)			
(Continuing) The returning trainees and disaster risk management agency employees are sustaining and expanding the assistance to communities and schools.			2 (9%)
(Partially continuing) Municipal authority employees or school employees who received domestic training have remained and continue some of the activities.			12 (55%)
(Not continuing) The municipal authorities took no involvement in the Project; or the municipal leaders and municipal authority employees who were involved in the Project have been transferred so nobody knows about the Project now.			8 (36%)

Source: Analysis by the evaluator based on the findings of hearings with municipal authorities

(Note) * Analysis targeting only those municipal authorities where information was obtained

Following the end of the Project, six municipal authorities had updated risk and resources maps, 11 municipal authorities had updated their disaster risk management plans, and 11 municipal authorities had implemented disaster risk management drills. Such activities were conducted in those municipal authorities that have functioning disaster risk management organizations, however, in seven out of the 22 targeted municipal authorities, the municipal leaders showed little interest in disaster prevention and were only interested in emergency response measures after disasters have actually occurred[26].

(2) Situation regarding continuation of activities in target communities

Upon re-evaluating the reduction of vulnerability to disasters in the target communities at the time of the ex-post evaluation using the evaluation sheet, as is shown in Table 6, vulnerability had increased in roughly 70% of the target communities. The degree of

[26] The results of disaster prevention are not immediately apparent, however, because emergency response measures and direct material assistance to disaster-affected persons are immediately visible, some municipal leaders view such activities as good political PR.

continuation of activities in the target communities was judged to be as follows. Many communities were able to continue activities thanks to ongoing encouragement by the central government or municipal authorities, but not many communities realized independent activity. Activities are hardly continued at all in 15 out of 40 communities (38%).

None of the target communities updated risk and resources maps and disaster risk management plans following the end of the Project. Some communities took part in evacuation drill staged by municipal authorities or the central government, but no communities conducted their own independent evacuation drill. In communities that introduced early warnings and methods of advertising them, community organizations generally sustained them, however, maintenance of observation devices, wireless radios, loudspeakers, etc. was not implemented very much[27]. In isolated communities, there are high needs for first aid measures for injured persons not only in disasters but also accidents, however, first aid kits and other supplies have almost entirely been used up without being replenished. Because there is constant turnover of members in many community organizations, there were many voices that called for the repeated implementation of training.

Table 6 Situation regarding Continuation of Activities in Target Communities

Vulnerability to natural disasters (Change between the terminal evaluation→ex-post evaluation based on evaluation sheet)			
Reduced	Unchanged	Increased	Total*
5 (16%)	5 (16%)	22 (69%)	32 (100%)
Situation regarding continuation of activities (40communities*)			
(Continuing) Community organizations have strong unity and generally sustain or further activities while receiving support from municipal authorities and central government in some cases.			15 (38%)
(Partially continuing) Some members partially continue activities while receiving support from municipal authorities and central government in some cases.			10 (25%)
(Not continuing) Activities are hardly continued at all due to decline and turnover in community organizations' membership and dissolution of organizations.			15 (38%)

Source: Analysis by the evaluator based on the findings of hearings with the communities.

(Note) * Analysis targeting only those communities where information was obtained

[27] The following kinds of cases were observed. Upstream observations of river water level are reported and used for evacuating downstream areas, however, some of the observation equipment is not working (Costa Rica). Landslide risk is notified to inhabitants based on data from basic rainfall gauges (El Salvador, Panama). Flood risks are notified to inhabitants based on observations by simple water level gauges (color-coded rocks and poles) (Honduras). Tsunami warnings are given to inhabitants by sirens. However, the sirens of this project were not maintained but had to be replaced with new sirens provided through Russian aid (Nicaragua). Residents living near volcanoes report on local conditions to the disaster risk management agency, which uses such reports for issuing warnings. Thus the communities become the providers of information (Guatemala). A simplified method is used to sense indications of landslides and inform inhabitants (Panama).

(3) Examples of damage mitigation in target communities

Following completion of the Project, the following actual examples of appropriate evacuation being conducted and damage of natural disasters being mitigated were confirmed in the target municipalities and communities.

- Ø The village of El Hotel in Costa Rica has suffered flooding at intervals of every few years, and the flooding has led to fatalities in some cases. Through constructing a system for conveying upstream water level changes to the village and giving advance warnings of approaching floods, inhabitants have become able to move their household goods to higher ground and evacuate safely. This has helped to reduce economic damages. Moreover, inhabitants of the village provided labor in constructing a "training dike" using old tires, and this was extended under assistance from the municipal authorities following completion of the Project. The training dike cannot totally prevent flood infiltration, however, it has reportedly helped reduce flow velocity and delay flood arrival times.

- Ø A number of villages situated around the Fuego Volcano in Guatemala utilized the experience of the Project to evacuate safely when the volcano erupted in September 2013. The inhabitants conducted organized evacuation while looking after the vulnerable members of society. The 13-year old daughter of the community leader who accompanied her father when he visited Japan for training contacted the other members of the community organization in place of her mother who was out of the village at that time.

(4) Environmental and social impacts and other socioeconomic impacts

Slope protection works using old tires were conducted in a certain target community. Moreover, community organizations that supported the Project conduct soil preservation activities (tree planting, etc.) and periodic cleaning of channels in a number of communities. In such cases, it is thought that positive impacts were imparted on environmental preservation. This Project did not entail any relocation of inhabitants or expropriation of land.

Summing up, project implementation did not result in the total achievement of the Project purpose, i.e. "communities' and municipal authorities' capacity for disaster risk management is strengthened in the target areas, and the capacity of CEPREDENAC members for promoting local disaster risk management is strengthened." Moreover, because not much progress was made regarding the overall goal, i.e. information, knowledge, and methodologies on local

disaster risk management in Central America are commonly utilized in different areas in the region, the effectiveness and impact are fair.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Table 7 compares the Project inputs that were planned at the time of ex-ante evaluation with the actual inputs.

Table 7 Planned and Actual Inputs

Inputs	**Planned**	**Actual** (based on the terminal evaluation)
(1) Expert dispatches	Long-term experts: 2 Short-term experts: 15 (180 million yen)	Long-term experts: 3 Short-term experts: 17 (199 million yen)
(2) Acceptance of trainees	Training in Japan, third country training (Treated as "Outside of the Project" at the time of the ex-ante evaluation)	CP training: 4 persons (9 million yen) Training course in Japan "Disaster risk management measures in Central America": 56 persons Third country training in Mexico "Civilian Safety and Disaster Risk Management: 30 persons
(3) Supply of equipment	Telecommunications equipment, measuring instruments, etc. (6 million yen)	Early warning system, vehicles, office equipment (25 million yen)
(4) Overseas project strengthening costs	(110 million yen)	(213 million yen)
(5) others	(79 million yen)	(20 million yen)
Japanese assistance (Note)	Total 375 million yen	Total 466 million yen
Inputs by the local governments	Assignment of counterparts Provision of office space, facilities and equipment Operating and current expenditures	Assignment of counterparts: 106 persons Provision of office space, facilities and equipment Partial payment of vehicle fuel costs, office supplies, travel expenses, workshop staging costs, etc.

Source: Prepared by the evaluator based on materials provided by JICA.
(Note) The Japanese assistance does not include the costs of the training in Japan and the third country training.

3.3.1.1 Input Elements

The experts toured the respective countries out of their base in El Salvador, and the respective national disaster risk management agencies on the whole rated their ability highly. Coordinators for complementing experts in their absence were assigned to SE-CEPREDENAC and some of the countries, however, there were reports that things could not be decided and progress was delayed when the experts were away. Moreover, the same issues that were voiced at the time of the terminal evaluation were also heard from the respective national disaster risk management agencies in the ex-post evaluation, for example, it was difficult to liaise and coordinate and there was a lack of clear division of duties between numerous officials, the short-term experts

didn’t share their reports with the respective national disaster risk management agencies when they returned home, and there was little direct technology transfer from the experts to the disaster risk management agencies.

In some communities, civil engineering and construction works such as embankment and slope protect works using old tires, paving of drainage channels and evacuation routes, and construction of new evacuation facilities were carried out. Local inhabitants provided the labor for these works, and the fact that such recognizable structures were constructed based on the participation of community organizations contributed greatly to enhancing the motivation of inhabitants and growth of said organizations.

Numerous members from the respective national disaster risk management agencies, related agencies (meteorological agency, etc.), and target municipal authorities took part in the training in Japan and the third country training, and when these trainees returned home with newfound motivation, they displayed initiative and played a major part in promoting various activities. However, because the training in Japan was managed independently as a project of different scheme, some countries such as Costa Rica selected members from disaster risk management agencies who were not involved with the Project. The participants from the municipal authorities conducted vigorous activities at least while the Project was in progress.

3.3.1.2 Project Cost

The amount of aid was planned to be approximately 380 million yen, but in reality it amounted to 470 million yen (124%)[28]. According to the experts, the main reason for the increase was the additional dispatch of experts and supply of equipment to the target communities in order to enhance the effect of the cooperation. It can also be said that the too much expansion of the activities due to an increase in number of target municipalities / communities from the maximum 5 locations per country (maximum 30 locations for the six countries) planned by the preparatory study to the actual 62 locations for the six countries (3 – 20 locations per country) had an impact[29].

---

[28] In the comparison of the amount of aid shown in Table 7, the costs of the training in Japan and third country training, which are important and effective inputs, are not included in the amount of aid. Normally, the cost efficiency should be judged upon comparing the planned and actual costs including the costs of training, however, this wasn’t possible here due to the limited information available.

[29] According to the JICA Experts, whereas Japan intended to conduct model activities, it was persuaded by some of the national disaster risk management agencies wishing to build capacity in more communities to conduct activities in numerous areas where importance and needs were high and adequate activities had not been conducted until now. In the field survey (preliminary survey) that was conducted before the project plan was compiled, it was intended to limit the number of project sites to no more than five in each country, however, as a result of holding discussions with each country following the survey, it was decided to remove this limit and decide the number of sites according to the capacity of the implementing agencies. Meanwhile, from the viewpoint of effectiveness, since better outputs can be obtained by conducting intensive inputs upon limiting the target areas and types of disasters, it is thought that the targets should have been narrowed down upon setting appropriate selection criteria.

3.3.1.3 Period of Cooperation

The period of assistance in the Project was 60 months in planning and in reality. In the terminal evaluation, it was deemed that "judging from the current progress (as of the time of the terminal evaluation), the scheduled contents have been almost completed and there is a high possibility that the Project purpose will be achieved," and concluded that the Project would finish according to schedule. In reality, however, as was analyzed under 3.2 Effectiveness, it was deemed that some of the outputs and project purpose were not fully achieved. Therefore, completion of the Project according to schedule does not necessarily signify that the Project was implemented efficiently.

To sum up, although the period of assistance was as scheduled, because the project purpose was partially not achieved and the project cost was higher than planned, the efficiency the Project is fair.

3.4 Sustainability (Rating: ②)

In the Project, disaster risk management capacity was strengthened in the target municipalities and communities, and the capacity for advancing local disaster management was bolstered in the respective national disaster risk management agencies and SE-CEPREDENAC. Here, the sustainability of these Project effects is analyzed in terms of policy and institutional aspects, technical and financial aspects while considering the situation regarding the continuation of activities in target municipalities and communities as described in 3.2.2.2 Other Impacts.

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

As was described in 3.1.1 Relevance to Development Plans of Central America, local disaster management has come to be viewed with importance in Central America and, as is shown in Table 8, efforts are being made to establish systems in each country. In this way, the sustainability of policies and systems related to local disaster management is high.

Table 8　Local Disaster Management Initiatives in Central American Countries

El Salvador: The national plan (2010~2014) mentions local disaster management and the formation of a culture for disaster risk management. Approximately 150 disaster risk management officers were assigned to assist municipal authorities around the country in 2010. Each disaster risk management officer is in charge of one or two municipal authorities. There is a plan to increase the number of disaster risk management officers so that one officer per municipal authority can be assigned. Also, teaching materials for local disaster management have been independently prepared.
Nicaragua: The national plan (2012~2017) places emphasis on strengthening of disaster risk management in homes and communities. Since 2013, more than 20,000 facilitators have been trained in an effort to strengthen disaster risk management in homes and communities. Moreover, 130 hours of training have been provided to municipal employees with a view to establishing disaster risk management sections in all municipal authorities. New teaching materials have also been created. Also, nationwide evacuation drill has been implemented on numerous occasions.
Guatemala: The disaster risk management policy touches on the formation of community organizations and disaster prevention and disaster risk management education. There are five regional offices throughout the country, and officers are assigned to each district. Disaster risk management coordinators have been appointed in each municipal authority. Following the Project, volcano sections have been newly established.
Costa Rica: The disaster risk management agency has established a department and assigned human resources to support capacity building in selected municipalities and communities in risk areas. However, the human assignments to support communities were only started in 2015, and numbers are still small. In order to increase such personnel, it is necessary to change legislation that places limits on the number of personnel.
Honduras: The training department of the disaster risk management agency conducts training according to the clear objective of strengthening disaster risk management organizations in municipal authorities and communities. The disaster risk management agency has seven regional offices throughout the country, and these have been stockpiling supplies and preparing for emergencies since 2011. The disaster risk management organizations in the capital have a high level of capacity.
Panama: According to domestic legislation, the disaster risk management organizations of municipal authorities are supposed to support the disaster risk management organizations in communities, however, they are failing to do so. It is planned for the disaster risk management agency to conduct training for organizational strengthening in 35 selected municipal authorities that are vulnerable to natural disasters. The disaster risk management agency has numerous bases throughout the country and supervises many local volunteers.

3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

SE-CEPREDENAC has 25 employees comprising officials in charge of coordinating with the member nations and officials in charge of coordinating with donors on projects. Regular conferences of national representatives and regional workshops and seminars on disaster risk management-related topics are frequently staged, so the organizational setup seems to be established.

Table 8 explains the organizational setups for tackling local disaster management in each country. The development of organizational setups for supporting municipalities and communities has progressed further in each country since the end of the Project. There are also moves to strengthen the cooperation setups between central government and municipalities and communities in each country.

On the level of municipal authorities, at the time of the field survey, six out of 22 target municipal authorities had established disaster risk management sections and appointed full-time staff. In two of these municipal authorities, the sections were established following the start of the Project. Almost all other municipal authorities have continued to assign disaster risk management officers, however, because they also have other regular duties, they cannot devote much time to disaster prevention activities at normal times. Although it is somewhat inevitable that disaster risk management officers will have concurrent duties in small municipal authorities, such a situation is not adequate in terms of the setup for advancing local disaster management.

Community disaster risk management organizations continue to implement activities in roughly two-thirds of the target communities, however, organized activities have been suspended in a third of the communities due to the transfer of members or dissolution of organizations.

Summing up, sustainability from the institutional viewpoint is generally high in SE-CEPREDENAC and each country, but it isn't very high in the municipal authorities and communities.

3.4.3 Technical Aspects of the Implementing Agency for the Sustainability of Project Effects

SE-CEPREDENAC has staff in charge of coordinating with countries regarding technical issues in the areas of organizational strengthening, training and education, emergency response, science and technology, land use and so on.

In the respective national disaster risk management agencies, roughly 70% of the 61 Project counterparts continue to work in the organizations, however, the counterpart retention rate is low in some countries[30]. On the other hand, the Training course on "Disaster Management in Central America" continues to be attended by a total of 10~20 members from the respective national disaster risk management agencies even following completion of the Project, and thus makes a contribution to sustaining and improving the technical level for disaster risk management.

In the municipal authorities, the rotation of municipal leaders and consequent rotation of employees hinder the sustainability of technologies. At six of the 22 target municipal authorities, none of the employees who were involved in the Project remain in their positions so the activities have stagnated. The turnover of personnel is not so pronounced in the community organizations, however, there has been turnover in the community organizations that are keeping the activities going, and there are numerous requests for similar training to be

[30] In El Salvador, the retention rate of municipal disaster risk management officers is high, while in Costa Rica, the retention rate is high among disaster risk management agency employees. In Nicaragua, two counterparts are assigned and they are both still employed in the disaster risk management agency. The retention rate is low in Guatemala, Honduras, and Panama (37%, 17%, and 27% respectively).

implemented again.

In this way, the technical sustainability is generally high in countries, but not very high in the municipal authorities and communities.

3.4.4 Financial Aspects of the Implementing Agency for the Sustainability of Project Effects

CEPREDENAC and the respective national disaster risk management agencies have their own independent budgets to cover personnel expenses and administrative expenses. The size of budgets is generally the same or in a trend of gentle increase, however, many disaster risk management agencies are struggling to maintain basic infrastructure equipment such as vehicles and radios. Moreover, except for Nicaragua and El Salvador where policy backup is provided, donor assistance is relied on to finance a lot of local disaster management activities.

In many municipal authorities, disaster risk management, in particular disaster prevention, has a lower priority than other fields and its budget allocation is meager. Some countries have guidelines or rules to ensure that 3~5% of the budget of municipal authorities is put aside for disaster risk management, however, in reality, not many municipal authorities adopt such measures, and the reserved budgets tend to be also used for emergency responses. There is a pervasive attitude of depending on the central government when disasters occur. Therefore, except for around one-quarter of target municipal authorities which assign dedicated disaster risk management employees, hardly any budget is allocated to disaster prevention.

It is rare for community disaster risk management organizations to have their own funding[31]. Because the members of community organizations are unpaid volunteers, unless it is clearly indicated that disaster risk management initiatives lead to the real mitigation of damage, they cannot be expected to sustain activities without external assistance.

In municipal authorities and communities too, the existence of other priority fields apart from disaster risk management prevents the allocation of adequate resources for disaster risk management[32]. In this way, local disaster management is faced with financial constraints on the national, municipal and community levels, and its sustainability is not high.

To sum up, there are few problems in terms of policies and systems, however, central governments, municipalities and communities are faced with constraints in institutional, technical and financial terms. Considering that activities are hardly continued at all in approximately one-third of the target municipalities and communities, sustainability of the

---

[31] Out of 29 communities that were visited, only one had its own source of funds.

[32] In order to promote local disaster management in these circumstances, it is necessary to select municipalities and communities where priority should be given to disaster risk management in light of past damage and vulnerability, and to encourage appropriate awareness of the importance of disaster prevention among the municipal authorities and inhabitants.

project effects is fair.

4. Conclusion, Lessons Learned, and Recommendations

4.1 Conclusion

The Project was implemented with the objective of conducting local disaster management activities in six Central American countries, thereby enhancing the disaster risk management capacity of the target communities and the target municipalities, and through the experience and knowledge acquired in this process, improving the capacity of the respective national disaster risk management agencies and the SE-CEPREDENAC to promote local disaster management. Although the Project had some issues concerning planning and approach, its relevance is deemed to be high because it was highly relevant to policies, development policy and needs in Central America at the time of both planning and ex-post evaluation and it was consistent with the Government of Japan's aid policies and plans in Central America. Capacity development for disaster risk management was achieved in the target municipal authorities, however, it was only partially realized in the target communities. Also, capacity development for implementing local disaster management was only partially achieved in the respective national disaster risk management agencies and SE-CEPREDENAC; moreover, because development of counterpart personnel in national disaster risk management agencies was not adequately realized in some of the countries, some of the Project objectives were not achieved. Moreover, considering that little progress was made in terms of sharing and utilizing local disaster management information, experience, techniques, etc. beyond national boundaries, the Project's effectiveness and impact were moderate. The Project period was within the planned term, however, because the cost was higher than planned, the Project efficiency was moderate. While sustainability in terms of policies and systems is high, as the national agencies and municipalities and communities are faced with institutional, technical and financial constraints, the sustainability of effects generated by the Project is moderate. To sum up, the Project is judged to be partially satisfactory.

4.2 Recommendations

4.2.1 Recommendations for Respective National Disaster Risk Management Agencies

- As a part of the Phase 2 activities of the Project[33], the respective national disaster risk management agencies need to verify successful cases and good practices and analyze and document the factors that drive success concerning the various methods and tools for promoting the local disaster management that was introduced through the Project, and then seek to share those within each country and the Central American region.

[33] The Phase 2 of the Project is planned to be implemented from the second half of 2015 for five years.

- The respective national disaster risk management agencies need to recognize the necessity of repeatedly implementing training for the disaster risk management organizations in municipal authorities and communities that have high turnover of personnel, and strive to establish ongoing training systems and setups for continuously supporting the municipalities and communities upon securing the necessary funding.

4.2.2 Recommendations for JICA

- It is necessary to implement Phase 2 of the Project while paying attention to the following points.
  - Ø Together with the respective national disaster risk management agencies, verify successful cases and good practices and analyze and document the factors that drive success concerning the various methods and tools for promoting the local disaster management that was introduced through the Project, and then seek to share those within the Central American region while making use of the function of CEPREDENAC. In this regard, it should be noted that, in order to introduce a method that has worked well in one country to another country that has different conditions, it is necessary to actually apply methods on the ground and adjust them through a process of trial and error, with receiving guidance on the ground from experienced disaster risk management personnel of well worked countries.

  - Ø The implementation of disaster risk management education in schools in the long term helps foster a culture of disaster risk management and, through the participation of parents and communication in homes, creates a channel for providing disaster risk management information to entire communities. Moreover, generally speaking, turnover among school teachers is less common than among employees of municipal authorities. Therefore, in tackling disaster risk management education in schools, methods should be examined with a view to cooperating with ministries of education, etc. and actively utilizing it for local disaster management without limiting activities only to schools.

  - Ø When actualizing activity plans in each country, fully take the following lessons learned in Phase 1 into account.

4.3 Lessons Learned

- Model building and planning of technical cooperation for dissemination: In planning of technical cooperation including capacity building of municipalities and communities, it

is necessary to specify a framework for building a model and establishing a national level system for disseminating that, taking care not to limit capacity building only to the target municipalities and communities. When selecting target municipalities and communities for such technical cooperation, it is necessary to define appropriate criteria for selection, for example, avoid remote areas and areas with socio-economically extreme circumstances in order to ensure efficiency of activities and enhance the universality of the model. Also, plans should include the evaluation and overview of the results of activities in the target areas and steps to formulate a model out of them.

- Select areas where the order of priority for disaster prevention is high: Since the order of priority of disaster prevention tends to be lower than other fields of socioeconomic development, it is necessary to select and conduct activities in municipalities and communities where the order of priority is as high as possible. It is desirable to give preference to areas that experience repeated disasters or have recent experience, areas that are vulnerable to natural disasters, and areas that do not have any other pressing development needs apart from disaster risk management.

- Hardware support for communities: Equipment supply and construction of civil engineering facilities, etc. as was conducted on a small scale in the Project have the potential for motivating communities and enhancing the efficiency and sustainability of organization building through bequeathing outputs that are visible. In order to conduct such support effectively, it is important to confirm the needs and resources of communities before providing the minimum necessary hardware support that the communities cannot do for themselves, and to implement such support with careful timing aimed at imparting motivation.

- Combination of technical cooperation projects and training: As was seen in the Project, in order to permeate new concepts such as disaster prevention and local disaster management, it is effective to combine a technical cooperation project with ongoing training in Japan. However, since classroom training alone is not enough to build practical capacity, it is important for returning trainees to acquire opportunities for practical training through working as counterparts in the project. Moreover, based on the JICA system, because the participants in training in Japan are selected by the government of the recipient country, in the case where such training is viewed as an essential input for project completion, it is important to reach a prior agreement about a mechanism for prioritizing the selection of members who will be involved in the project.

- PDM in regional cooperation: A common PDM of regional cooperation was adopted for all six countries targeted in the Project, however, in reality, activities were adjusted according to the conditions in each country and there were also differences between countries in terms of the inputs and achievements. It was difficult to manage activities based on a single PDM in multiple countries having different disaster risk management policies and institutional setup, local government systems, types of disasters (tsunami, earthquake, etc.), specific capacity building needs and so on. When planning regional cooperation, it is desirable to first carefully review the different conditions in each country, specifically examine the project goals and activities in each country, and where necessary state country-based indicators and activities within a common PDM.