

4. Promotion of Cooperation on Disaster Reduction by Identification of Needs and Resources

4-1. Papua New Guinea Tsunami Disaster Awareness Project

More than two years have passed since the 1998 Papua New Guinea tsunami disaster. During this time, the project launched jointly by the Papua New Guinea government and ADRC helped prevent disasters during the New Island earthquake tsunami in 2000. For future reference, this earthquake tsunami is outlined below as an example which demonstrates the effectiveness of disaster reduction cooperation projects.

1) Aitape tsunami

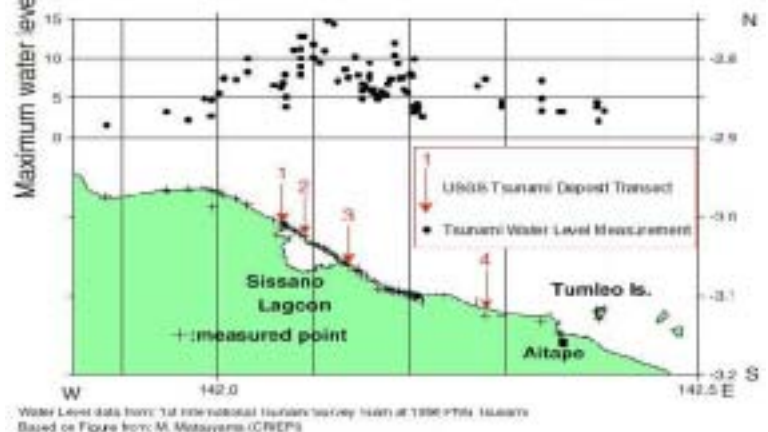
On July 17, 1998, a submarine earthquake measuring 7 on the Richter scale with the epicenter 30 km north-west off the coast of Papua New Guinea occurred, immediately followed by a massive tidal wave reaching a maximum height of 15 m, which struck the coast over an area of 40 to 50 km. The four villages which were affected, Sisano, Warap, Arop, and Marol, had a population of about 5,500 in total. Of this, at least 2,200 were either killed or reported missing, making it a catastrophic disaster in which 50% of the population was sacrificed. In addition, the earthquake incurred injuries of more than 10, 000, and was recorded as the worst disaster in the history of the country. It was named the Aitape tsunami, after the main town in the coastal area where the tsunami occurred.

Being a massive tsunami which normally does not occur with an earthquake of this scale (magnitude 7.1), experts are still conducting surveys and studies on the mechanism. The tsunami is said to have most likely been caused by the following: 1)the tsunami energy concentrated in a particular direction due to the effects of the seabed topography as the tsunami approached the coastal area, the tsunami height may have become

Area Affected by Aitape Tsunami Disaste



Results of Survey on Aitape Tsunami Height (According to International Tsunami Survey Team)



very high at the west coast of Aitape, or there may exist a tsunami source other than the shift in fault such as landslide or collapse of the seabed, but the actual cause has yet to be determined.

2) Measures by Papua New Guinea Government

Regardless of the cause of the Aitape tsunami, it was the largest tsunami disaster in Papua New Guinea, and it presented the Papua New Guinea government with the task of providing medical support to the injured, such as critical care and rehabilitation as well as support in helping affected residents to restore their lives. The Papua New Guinea government was faced with the need to scientifically analyze the circumstances surrounding the occurrence of the tsunami and devise disaster reduction measures for future tsunamis.

In the wake of the disaster, the government has schemed numerous aid policies to help residents of affected area relocate to the inland area, as well as help fishermen and farmers who were forced to discontinue their business by the disaster to restore their lives. As the disaster took place in the coastal area which is extremely vulnerable to tsunamis and caused devastating damage, it drew the considerable attention of the international community, and received enormous aid from the Papua New Guinea Red Cross and NGOs like the Salvation Army. Thanks to such support and voluntary efforts of affected residents, the affected Aitape Rumi administrative region is gradually on the road to recovery.

3) Issues in Tsunami Disaster Reduction Measures

Since Papua New Guinea is highly likely to encounter tsunami disasters in the future from its topographical conditions, the government has also reviewed disaster reduction measures to prepare for similar tsunamis in the future.

As part of measures by the government, the Papua New Guinea Government National Disaster Reduction Awareness Committee (chaired by Professor Hugh Davies, Papua New Guinea University Geology Laboratory) decided to hold tsunami disaster prevention conferences (described later) to understand the actual situation of the Aitape tsunami, verify appropriate knowledge of the mechanism of tsunamis and tsunami disaster reduction measures, as well as verify the effectiveness of the various measures which have been implemented after Aitape tsunami disaster.

The most important tsunami disaster reduction measure in Papua New Guinea would be to ensure that the people and residents have sufficient knowledge of tsunamis and are able to take the appropriate disaster reduction action should a tsunami actually occur. Some residents believed that the Aitape tsunami resulted from God's anger or suspected that it was a result of an attack by a foreign country. The lessons learnt from the previous tsunami disaster in 1907 were not passed on due to generation change, and most of the local residents had not knowledge of tsunamis. Based on these lessons, the implementation of a program to spread knowledge on tsunami disaster reduction was set down as an urgent task. Professor Hugh Davies, the chairman of the National Disaster Reduction Awareness Committee thus turned to the ADRC for support in compiling materials to spread knowledge on tsunami disaster reduction in Papua New Guinea. (Details are provided in Chapter 6: Planning of Materials for the Dissemination of Knowledge on Disaster Reduction, and Increased of Awareness.)

4) Solutions for tsunami disaster reduction measures (No . 1)

(1) The Papua New Guinea and Region Tsunami International Conference

The Papua New Guinea and Region Tsunami International Conference (PARTIC in short) was held in the city of Madan in the northern coast of Papua New Guinea from September 19 to 24, 2001. Based on the policy "the scientific survey of the Aitape tsunami and dissemination of disaster reduction knowledge about tsunamis to the people should be done together", the conference was an enormous effort aiming to bring together, for the first time in Papua New Guinea, scientists from both within the country and abroad, such as tsunami researchers and geologists including experts from Japan and the US, residents representing affected areas, representatives from the Papua New Guinea government, Sandaun Province government, Aitape Rumi administrative area, representatives of NGOs such as Red Cross and Salvation Army, and representatives from related organizations such as the UN, Australia International Development Agency, and ADRC to exchange opinions on future tsunami disaster reduction plans.

Dialogue with local residents

Prior to the conference, tsunami researcher from Papua New Guinea, Japan and the US involved in the scientific studies of the Aitape tsunami visited affected villages, talked directly with the residents about ways of preventing disasters, telling them that the tsunamis are natural phenomena and are not caused by God's anger or attacks by foreign countries, and taught them that damages can be prevented by taking the appropriate actions when earthquakes are felt, such as evacuating immediately to higher land.

Conference of scientists on tsunamis

Upon returning from the affected areas, the tsunami researchers and Papua New Guinea researchers held a Tsunami Expert Conference in Madan for exchanging opinions on research results, mainly to clarify the causes of tsunamis as well as exchange the latest information obtained surveys and studies. As a result, it was pointed out that Papua New Guinea lies on an Australian plate which moves 11 cm every year, that earthquakes and tsunamis are highly likely to occur in the future, the Aitape tsunami was due not only to the movement of faults by the submarine earthquake, but because a submarine landslide also occurred, the destructive force of the tsunami may have been abnormally high. Therefore the seabed topography of the west coast of Aitape may have affected the course of the tsunami and concentrated the energy of the tsunami in a certain area. These survey and research results were shared with the Papua New Guinea Geological Survey Bureau and geological experts of the University of Papua New Guinea.

Tsunami Disaster Reduction Conference

Finally, lessons learned from the Aitape Tsunami disaster and future tsunami disaster reduction measures were discussed with the central and local governments of Papua New Guinea, NGOs which provided relief, residents representing affected areas, and representatives of related international organizations. The following Recommendation (excerpt) summarizes the results.

Report on Past Tsunami Disasters in Japan and the World Outlined at PARTIC



This was the first time in the history of Papua New Guinea that researchers (scientists, etc.), disaster reduction administrative officers, and representatives of local residents gathered together after a disaster to exchange opinions on measures to be taken after a disaster, and agreed on future disaster reduction measures. In this sense, it can be called a great achievement. It was very fortunate that the ADRC was able to contribute to the success of this meeting in the following way.

PARTIC Recommendations (Excerpt)

- Continue spreading tsunami disaster reduction knowledge to the inhabitants (through Media, education, and educational materials)
- Reinforce voluntary efforts to protect oneself in disaster reduction training in various regions
- Secure disaster management ability of emergency communication systems, and establish backup system
- Clarify and secure tsunami evacuation sites
- 24-hour system emergency wireless communication system
- 24-hour geological observatories at both Port Moresbi and Rabaul
- Save lives within 24 hours when disasters occur and ensure rescue within 72 hours
- Enhance emergency evaluation system of disaster scale
- Enhance national disaster management bureau staff and reinforce 24-hour communication function
- Reinforce support system by airplane and helicopter
- Reinforce cooperation between national disaster management bureau, provinces, and administrative regions
- Establish emergency disaster management troops within the national Papua New Guinea army
- Improve epidemic control and train specialists in handling the bodies of victims and animals
- Reinforce disaster management ability of the police and security system of affected areas
- Appoint persons in charge of supporting and coordinating NGO activities
- National layout of civilian level emergency disaster management organizations
- Clarify standards of medical and health activities and ensure medical supplies and transportation means
- Enhance mental care programs such as counseling
- Need for orderly feedback of scientific survey activities and results
- Use results of scientific survey activities for activities to increase awareness
- Appoint persons in charge of arranging activities with mass-media
- Improve disaster management ability in various administrative regions until arrival of external aid
- Scheme disaster reduction plans in country, province, and administration
- Clarify instructional system in region announcing emergency situation
- Reinforce dialogue, discussion, and other cooperation between administration and local residents
- The best form of disaster aid is contributions. Support in the form of material supplies should be implemented upon careful consideration of necessity at the affected site
- Need for preparation of emergency aid funds by the state and people and financial management
- Train specialists in disaster reduction measures and disaster countermeasures
- Enhance specialized management of acceptance and provision of emergency supplies
- Plan disaster reduction bases such as layout of schools (distance more than 800 m from coasts in tsunami-prone areas)
- Reinforce disaster reduction management ability of teachers

(2) Transfer of Japanese tsunami culture

The ADRC participated in the PARTIC meeting, observed details of the meeting, and reported briefly on tsunami disasters which have occurred in the past in Japan and the world.

Believing that it is our duty to transfer to Papua New Guinea the knowledge obtained from experiencing tsunami disasters in the past in Japan and tsunami disaster reduction measures, we conducted a field survey in Okushiri Island, Hokkaido one week prior to our visit to Papua New Guinea, and also reported at the PARTIC meeting the lessons learnt from the Okushiri Island tsunami disaster during the Hokkaido South-West Coast earthquake in 1993 and the tsunami disaster reduction measures that followed. We

believe that we were able to transfer the experience from Okushiri Island which can be applied to Papua New Guinea, as well as the Japanese tsunami culture. One example is introduced below.

Actual situation of Okushiri Tsunami Disaster

At 10:17p.m on July 12, 1993, Okushiri Island was hit by a tremendous disaster from an earthquake (Hokkaido Southwest Offshore Earthquake) with the epicenter at the depth of 34km off the southwest coast of Hokkaido. This earthquake was measured at a magnitude of 7.8, the largest so far on the observation record; the total damage caused by the earthquake to this island soared to 66.4 billion yen, with human casualties alone mounting to 172 fatalities, 26 missing and 143 injured. Being an island with a population of approximately 4,000 and in the scale of the annual budget at approximately 5 billion Yen, the magnitude of this disaster for the town of Okushiri surpasses comprehension.

The earthquake first brought disaster to Okushiri Island. In the Okushiri District, immediately after the earthquake, the Hotel “YOYOSO”, restaurant and kerosene storage tanks exploded due to a major collapse of a bluff at Mt. Kannonzan, with 29 victims including hotel guests.

The tsunami followed, regarding the earthquake, the Sapporo District Meteorological Observatory issued a warning for a major tsunami on the coast of the Japan Sea in Hokkaido at 10:22 p.m. Although this alarm had been issued only 5 minutes after the earthquake, it was too late for most areas as Okushiri Island was too close to the epicenter.

In the Inaho District at the northernmost point of the island, the first tidal waves hit 2~3 minutes after the earthquake, continuing

on to the western coast, annihilating the communities including Monai District. In Aonae and Hatumatsumae districts at the southernmost tip, the first tidal wave hit 5 minutes after the earthquake.

Adding to the damage caused by the earthquake and tsunami, fire heavily increased the damages. Immediately after the earthquake, two cases of fire on board a ship and in one building had occurred. The causes for the fire were not specified, but were surmised as being triggered by the earthquake or tsunami. In the Aonae District, the township was almost totally demolished by the spreading fire that continued to 9:20 a.m. the following morning from immediately after the earthquake.

On the importance of knowledge on disasters

Lesson from Aonae District

This 3-forked road (photo below) surrounds the lighthouse located to the north of Aonae promontory. Immediately after the Hokkaido Southwest Offshore Earthquake, some of the residents of the Aonae District escaped to the central road that lead straight to the high ground where the lighthouse was standing, and these people were saved. On the other hand, those residents who tried to escape by

Damage caused by the tsunami disaster in Okushiri Island and the Aonae District, Hokkaido



the following morning from immediately after the

The junction of three streets that separated dead and alive



cars tried to escape on the right or left motorway, but were caught in a traffic jam and hit by the tsunami, so that many lost their lives. From these facts, it was made known that, “escape to high ground should be made immediately, as tsunami will strike after an earthquake”. This disaster also made it evident that one should, “avoid escapes by car”. These seem to be trifling matters, but they reveal extremely important truths in the countermeasures against tsunami disasters. This point was also stressed in Papua New Guinea.

Residence in Inaho District that divided the fates of those on the first and second floors



Lesson from Inaho District

The second example is from the house (photo below) in the Inaho District. This house endured the tsunami, but the first and second floors divided the fates of the family members. The grandmother and eldest daughter on the second floor evaded the disaster, but the mother and younger daughter on the first floor were swept away by the tsunami. From this experience, the important lesson that should be told in Papua New Guinea is, “escape to high areas before the tsunami arrives”. If you were to escape into a building, run to the upper floors, but if there is a palm tree instead of a building, it is important to climb it.

Other countermeasures against disasters – No.1 (Indicating height of tsunami)

Other than the above, Okushiri Island has handed down valuable experiences. Some examples are introduced here. The indication for tsunami danger zones has an important role informing people that the site is dangerous when disasters occur. As examples, the heights of tsunami are indicated at fishing harbors, seawalls, or above cliffs. Here are some of them:

Left Tsunami height indication near Aonae Fishing Harbor – 11.7m

Right Tsunami height indication on a seawall – 11.0m



Other countermeasures against disasters – No.2 (Indicating evacuation site)

It is also important to indicate shelters. They should be immediately recognizable all times to the neighborhood residents.

The indication of evacuation route is next. Here (in this photo), the steps to the shrines are the evacuation routes. As the hills are close to the sea in Japan, evacuation routes are easier to be drawn up,

but in the case of the Papua New Guinea coastal area where the topography is flat, the facilities should be constructed inland as far away from the coast as possible. According to expert opinion, it should be at least 800m away from the coast. Of course, it would be advantageous to plant a grove of trees on the coast to absorb the tsunami energy.

Indication of evacuation site



Indication of evacuation route



Other countermeasures against disasters – No.3 (Disaster reduction development data)

Data to devise the popularization / illuminating of disaster reduction knowledge is also important. In Okushiri-cho town, a “Okushiri Island disaster prevention handbook” was printed and distributed to the entire town. In this handbook, everyday preparations regarding wind / water disasters in addition to earthquakes and tsunami are explained in a form that is easy to understand. The “Hokkaido Southwest Offshore Earthquake / Okushiri-cho Record” explains in detail the facts of tsunami disasters and the progress of Okushiri-cho as a result of the disaster. It is also important to share experiences and lessons from the disaster with such material.

Furthermore, there is the “Okushiri Tsunami-kan”(Tsunami-center) that opened in autumn of 2000. It is believed that such material preserving facilities should hand down the valuable experiences and lessons from the tsunami disaster for years to come. In Papua New Guinea, it is also important to hand down disaster experience in some form as reminder in addition to building the memorial and indicating the tsunami danger zones. By doing so, we may be able to avoid the loss of lives in the future to similar disasters. It is extremely important to record the history of disasters and preserve them in such a manner.

5) Solutions to countermeasures against tsunami disasters (No.2) – Papua New Guinea Tsunami Disaster reduction development / illuminative data)

It has been mentioned earlier that Professor Hugh Davies, Chairman of Papua New Guinea Government / National Disaster Reduction Development Committee, requested the Asian Disaster Reduction Center’s (ADRC) cooperation in creating the development / illuminative data against tsunami reduction in Papua New Guinea. Details are provided in Chapter 6. Here only the following points are discussed:

The Papua New Guinea Government / National Disaster Reduction Development Committee is planning on the production of a disaster reduction video, tsunami reduction poster, and tsunami reduction pamphlet based on the experience of the Aitape tsunami and is carrying these projects out as possible. The tsunami reduction poster and pamphlet have already been produced based on this policy. Production / distribution / utilization of such illuminating materials are considered important for intensification of a tsunami reduction system in this country and future preparations for tsunami reduction systems by related nations. The ADRC hopes to cooperate as much as possible, and continue to provide its support in improving tsunami reduction systems in every nation.

4-2. Identification of Needs and Resources

The ADRC has dedicated its efforts to identifying the needs and resources of member countries by sharing disaster reduction information through the establishment of databases with the aim of promoting disaster reduction cooperation in the Asian region. In FY2000, in addition to the above Papua New Guinea Tsunami Disaster Reduction Awareness Project, the ADRC launched new Asian region cooperation projects to produce specific results for reducing the damage from natural disasters.

4-2-1. Proposals of Disaster Reduction Joint Projects from Member Countries

The 2nd ADRC International Meeting in December 1999 adopted the resolution of implementing a small project to promote disaster reduction cooperation in the Asian region, for the purpose of promoting cooperation to resolve the individual issues of Asian countries as the common issues of the member countries of the ADRC.

To embody this resolution, in FY2000, the ADRC decided to provide support mainly in the form of technology and funds to disaster reduction projects applied by member countries, in an effort to contribute to the reduction of disaster damage in the countries which applied, as well throughout over the Asian region. In response to the invitation by the ADRC, there were 14 applications from amongst the eight member countries. Details are as follows.

ADRC plans to examine whether these proposals can be implemented.

Table 4-1-1-1 Lists of Applications from Member Countries for Disaster Reduction Cooperation Project

Country	Name of Project	Contents of Project	Duration	Cost (Estimated)
Cambodia	Human Resource Development on Disaster Management	<ul style="list-style-type: none"> Requested training for staff managing regional disaster reduction in 3 provinces. Trainer teams available. Requested dispatch of specialists for implementation of the dissemination program, strengthening disaster reduction system and its training 	1year	US\$ 10,000
Indonesia	Research on Indonesian Decentralization and Disaster Management System	Holding national conferences by people in charge of disaster reduction in nation, province, region to strengthen disaster reduction management	1year	US\$90,000
	Community-based Flood Mitigation in Bandung City	Training for disaster reduction at the community level of Bandung City seriously damaged by floods because of increasing population	14months	US\$ 18,000
	Developing Disaster Management Cooperation between the two Districts: Amagasaki City and Malang City	Disaster reduction cooperation including information and personnel exchange between Amagasaki City and Malang City -Aiming to be a model of cooperation in the future-	1year	US\$ 16,500
Kazakhstan	Development of an Emergency Management Information System for Almaty based on GIS-technology	Development of emergency management system of GIS base which covers Almaty industrial area, and fostering personnel regarding this project	2years and 6months	US\$ 1,200,000
Mongolia	Public Awareness Raising Against Frequent Wild Fires and Other Natural Disasters in Mongolia	<ul style="list-style-type: none"> Promotion of disaster reduction education Implementation of dissemination activities 	4months	US\$ 10,000

Country	Name of Project	Contents of Project	Duration	Cost (Estimated)
Nepal	Enhancing Disaster Management Capabilities of the Disaster Relief Section of the Ministry of Home Affairs	To strengthen the capability of the disaster relief section, Ministry of Home Affairs: establish a disaster reduction information center, develop a system, train the staff in charge, and invite specialists	1year	US\$ 100,000
	Raising Public Awareness for Disaster Reduction	<ul style="list-style-type: none"> • Disaster reduction education (for teachers, social workers, women leaders, scout and health workers) • Planning and preparing posters and putting them up • Planning and implementation of public relations by radio 	6months	US\$ 10,000
Singapore	Specialized Collapsed Building Rescue Course	Provision of technical training for rescue operations in collapsed buildings and receiving the participants from member countries into this training	2weeks	US\$ 1,000 per person
Vietnam	Headquarter Control Room for Disaster Management of Vietnam	Establishment of the headquarter control room to accumulate and analyze the information concernig disaster reduction, which could help effective support for disastrous areas	2years	US\$ 570,000
	Use of NOAA Data for Flood Disaster Monitoring in the Mekong River Delta of Southern Vietnam in Near Real Time	Development of the flood monitoring system of Mekong River Delta by making good use of NOAA information	1year	US\$ 100,000
	Training Course on Natural Disaster Management	Special training for staff who work in natural disaster control	1month	US\$ 10,000
	Material for Training Course on Natural Disaster Management	Making sets of training material for staff who work in natural disaster control	3months	US\$ 9,000
SriLanka	Human Resource Development on Disaster Management	Training courses to develop personnel resources on disaster management in local governments	10 months	US\$ 10,000

As a result, the following were clarified. First it was found that there are more needs than resources except for the “Disaster Reduction Training” in Singapore.

These needs can be grouped into those that involve comparatively small application expenses (about 10,000 dollars) and those that do not. For large scale projects like Indonesia’s “Research on Indonesian Decentralization and Disaster Management System”, Kazakhstan’s “Development of an Emergency Management Information System for Almaty based on GIS-technology”, Nepal’s “Enhancing Disaster Management Capabilities of the Disaster Relief Section of the Ministry of Home Affairs” and Vietnam’s “Headquarter Control Room for Disaster Management of Vietnam”, the strong needs for the development of systems to enhance disaster management of member country government organizations was clarified. These projects will be supported while cooperating with the World Bank and international cooperation organizations like JICA. On the other hand, small projects costing about 10,000 dollars indicated the strong need for educational and training programs and awareness programs to develop human resources.

4-2-2. Policies on Joint Projects

The ADRC reviewed the possibilities of cooperation with the main aim of satisfying the following needs through regional joint projects:

1) Enhancement of disaster reduction ability in countries proposing projects

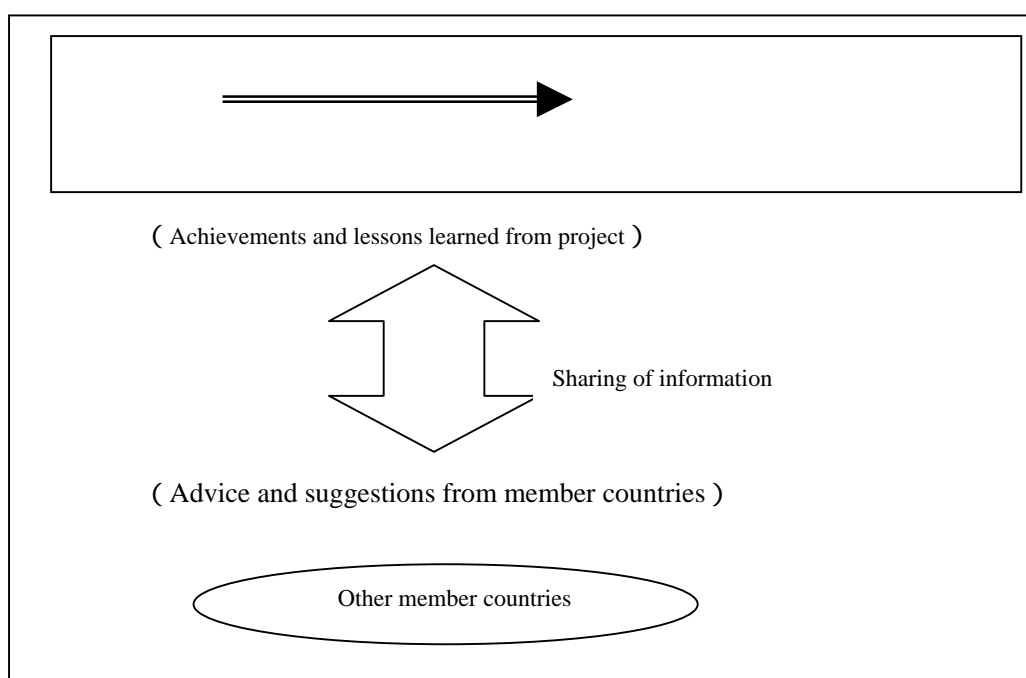
The proposing country is required to resolve its own disaster reduction problems through the project or enhance its disaster reduction ability.

The ADRC will contribute to enhancing the country’s disaster reduction ability through technical and financial support.

2) Sharing of achievements and lessons from individual projects

The achievements and lessons learned by the country concerned shall be provided to member countries and countries facing similar problems by sharing reports and through the Internet.

Concept of Asian Region Joint Projects



4-2-3. Details of Projects

The ADRC reviewed the 14 projects submitted as well as importance of individual needs and whether the projects were applicable to other member countries in accordance with the above policies, and decided to implement the following four projects

Table 4-2-1-1 Joint Projects in the Asian Region Selected

Country Implementing Project	Project Name
Cambodia	Human Resource Development on Disaster Management
Indonesia	Community-based Flood Mitigation in Bandung City
Nepal	Raising Public Awareness for Disaster Reduction
Sri Lanka	Human Resource Development on Disaster Management

Each project is described below.

