Final report

Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia

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May 2012

Contents

Group Table

Group #	Proposed research subjects	**Leader,** Members **Japan**	**Leader,** Members **Indonesia**
G1	Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations	**Teruyuki Kato** (ERI, Tokyo U.)	**Hasanuddin Z. Abidin** (ITB)
G1-1	Study of historical earthquakes based on active fault surveys	**Yasuo Awata** , Hisao Kondo (AIST)	**Danny H. Natawidjaja,** Eko Yulianto, Mudrik Rahmawan Daryono (LIPI)
G1-2	Study of historical earthquakes based on tsunami deposit and coastal geology	**Yuichi Nishimura**, Yugo Nakamura, Kazuomi Hirakawa, Tsuyoshi Watanabe, Teddy Eka Putra, Atsuko Yamazaki , Purna Putra (Hokkaido U.), Shigehiro Fujino (Tsukuba Univ.)	**Eko Yulianto**, Purna Sulastya Putra, Danny H. Natawidjaja (LIPI),
G1-3	Crustal deformation monitoring using space geodesy and gravity	**Teruyuki Kato,** Yosuke Aoki (ERI), Fumiaki Kimata, Takeo Ito, Endra Gunawan (Nagoya U.), Takao Tabei, Atsuki Kubo (Kochi U.), Hiroyuki Tsutusmi, Yoichi Fukuda, Shinichi Miyazaki, Takahito Kazama (Kyoto U.), Manabu Hashimoto (DPRI, Kyoto U.), Tetsuro Imakiire, Morito Machida, Katsuki Sumiya, Atsuko Owaki, TakuyaNishimura, Akira Suzuki (GSI), TakashiNakata(Hiroshima U), Jun Nishijima (Kyushu Univ.), Teguh Purnama Sidiq (ITB)	**Hasanuddin Z. Abidin** , Irwan Meilano, Heri Andreas, Dina Sarsito, Irwan Gumilar, Teguh P. Sidiq (ITB), C. Subarya (BAKOSURTANAL), Didik Sugianto (Unsyiah)

Group #	Proposed research subjects	**Leader,** Members **Japan**	**Leader,** Members **Indonesia**
G1-4	Study on strong ground motion prediction	**Kazuki Koketsu**, Hiroe Miyake, Minoru Sakaue (ERI, Tokyo U.) Hiroaki Yamanaka, Kosuke Chimoto, Mariko Oishi (Titech), Reiji Kobayashi (Kagoshima U.)	**Afnimar,** I Wayan Sengara, Imam Sadisun (ITB), Wandono, I Nyoman Sukanta (BMKG), Devi Kamil Syahbana (ESDM)
G1-5	Investigation of submarine active faults	**Kenji Hirata**, Akira Yamazaki (MRI), Ken Ikehara, Kosaku Arai (AIST), Hidekazu Tokuyama, Juichiro Ashi (U. Tokyo), Akira Takeuchi (Toyama U.), Hisatoshi Baba (Tokai U.), Masataka Kinoshita, Toshiya Fujiwara, Toshiya Kanamatsu, Yasuyuki Nakamura (JAMSTEC)	**Yusuf Surahman Djajadiharja,** Udrekh (BPPT), Haryadi Permana, Eddy Z Gaffar, Nugroho D. Hananto (LIPI), Agus Laesanpura (ITB), Riza Rahardiawan (KESDM)
G1-6	Prediction of tsunami using numerical simulations	**Yuichiro Tanioka** , Aditya Gusman (Hokkaido U.), Kenji Satake (ERI, Tokyo U.), Shunichi Koshimura (Tohoku U.), Yushiro Fujii (BRI)	**Hamzah Latief,** Haris Sunendar , Brian Sulaiman(ITB), Budianto Ontowiryo (BPPT)
G2	Short-term and long-term predictions of volcanic eruptions and development of their evaluation method	**Masato Iguchi** (DPRI, Kyoto U.)	**Surono** (KESDM)
G2-1	Research on mechanism of explosive eruption and its prediction – case study in Semeru	**Takeshi Nishimura** (Tohoku U.), Masato Iguchi, Takeshi Tamekuri (Kyoto U.), Haruhisa Makanichi (Nagoya U.)	**Muhamad Hendrasto,** Umar Rosadi, Iyan Mulyana, Kushendratno (KESDM) Sukir Maryanto (UNIBRAW.)

Group #	Proposed research subjects	**Leader,** Members **Japan**	**Leader,** Members **Indonesia**
G2-2	Research on mid- and long-term forecasts of volcanic eruption and tectonic environments – in Guntur	**Masato Iguchi,** Takahiro Ohkura, Narumi Sugimoto, Ayako Shimaki (DPRI, Kyoto U.)	**Hetty Triastuty,** Sri Hidayati, Ahmad Basuki, Agoes Loeqman, Yasa Suparman, Agus Budianto (KESDM)
G2-3	Geological evaluation of frequency and process of caldera-forming eruption	**Akira Takada**, Ryuta Furukawa (AIST) Kiyoshi Toshida (CRIEPI)	**Supriyati D. Andreastuti,** Nugraha Kartadinata, Anjar Heriwaseso, Yudhi Wahyudi, Oktory Prambada (KESDM)
G2-4	Proposal of evaluation method of volcanic activity -Kelud	**Kazuhiro Ishihara** (DPRI, Kyoto U.) Setsuya Nakada, Yuichi Morita, Takayuki Kaneko, Natsumi Hokanishi (ERI, Tokyo U.) Mitsuhiro Yoshimoto (Hokkaido U.) Kenji Nogami (TITEC) Yasuaki Sudo (Aso Volcano Museum)	**Surono,** Kristianto, Nia Haerani, Nizar Firmansyah, Aditya S Andreas, Agus Budianto (KESDM)
G3	Establishment of social infrastructure based on engineering developments	**Fumihiko Imamura** (Tohoku U.)	**Mulyo Harris Pradono** (BPPT)
G3-1	Effective use of tsunami hazard map	**Fumihiko Imamura**, Toshiaki Muramoto, Abdul Muhari (Tohoku U.) Megumi Sugimoto (Tokyo U.)	**Febrin Anas** (Andalas Univ.), Herryal Z. Anwar (LIPI), Supartoyo (KESDM)
G3-2	Reduction of tsunami damage through the practical use of vegetation	**Hideo Matsutomi** (Akita U.), Hideaki Yanagisawa (Tohoku U.), Kenji Harada (Saitama Univ)	**Subandono Diposaptono** (DKP), A. Bagyo Widagdo (BPPT)

Group #	Proposed research subjects	**Leader,** Members **Japan**	**Leader,** Members **Indonesia**
G3-3	Technology development for mitigating hazards due to liquefaction	**Koji Tokimatsu**, Hiroko Suzuki, Kota Katsumata, Yuki Takeda (Titech), Shuji Tamura (Kyoto Univ.), Hiroshi Arai (BRI/NILIM)	**Adrin Tohari,** Khori Sugianti, Eko Soebowo, Arifan J. Syahbana (LIPI), Imam Sadisun (ITB)
G3-4	**Investigation of design ground motion and implementation of earthquake safer housing by both technological and social approaches**	**Junji Kiyono**, Aiko Furukawa (Kyoto U.), Yusuke Ono, Tatsuya Noguchi (Tottori U.) Kimiro Meguro, Navarantnarajah Sathiparan, Kawin Warakanchana, Muneyoshi Numada, Rahman Hidayat, Masayuki Watanabe (IIS, Tokyo U.)	**M. Harris Pradono** (BPPT), Pariatmono (RISTEK), Anita Firmanti (PU), Masyhur Irsyam, I Wayan Sengara (ITB), Iman Styarno(UGM),Abdullah (Syiah Kuala U), Revian Body(Negeri Padang U), Johny Subrata (PU)
G4	Mitigation of social vulnerability against geohazards	**Shigeyoshi Tanaka** (Nagoya U.)	**Deni Hidayati** (LIPI)
G4-1	To strengthen community-based disaster preparedness mechanism	**Makoto Takahashi,** Shigeyoshi Tanaka, Yuzuru Shimada, Koji Kawasaki, Yasuhiro Kamimura, Tsugio Nakaseko (Nagoya U.) Masatomo Umitsu (Nagoya U./Nara U.)	**Deny Hidayati**, Haryadi Permana, Widayatun (LIPI), Junun Saptohadi, Djati Mardiatno, Syarifah Aini Dalimunthe (UGM)
G4-2	Investigation of community based disaster prevention and restoration based on cultural background	**Hiroyuki Yamamoto,** Yoshimi Nishi, Yukio Hayashi, Shoichiro Hara, Masayuki Yanagisawa, Keisuke Hoshikawa, Masahiro Terada (Kyoto U.), Naohiko Yamamoto	**Makmuri Sukarno**, Eko Yulianto (LIPI), Muzailin Affan (Syiah Kuala U.)

Group #	Proposed research subjects	**Leader,** Members **Japan**	**Leader,** Members **Indonesia**
		(Nara Women's Univ.), Eriko Kameyama (Nara Prefectural Univ.)	
G4-3	Development of long term recovery framework from natural disasters	**Norio Maki** (Kyoto U.), Yuka Karatani (Meijyo U.), Yasuko Kuwata, Masaharu Nagasawa (Kobe U.)	**Muhammad Dirhamsyah** (TDMRC, Syiah Kuala U.), Krishna S Pribadi, Harkunti P. Rahayu (ITB)
G4-4	Study on warning dissemination and residents' psychological process under natural disasters	**Atsushi Tanaka**, Yasuhito Jibiki (CIDIR, Tokyo U.) Naoya Sekiya (Toyo U.)	**Dicky Pelupessy** (UI),
G5	Education and outreach for disaster reduction	**Yujiro Ogawa** (Fuji-Tokoha U./Tokyo U.)	**Irina Rafliana** (LIPI)
G5-1	Development of effective disaster education program at school and effective disaster awareness raising program and collaborations with local governments and teachers	**Yujiro Ogawa**, (Fuji-Tokoha U. /Tokyo U.) Yozo Goto, Megumi Sugimoto (ERI, Tokyo U.) Takashi Komura (Fuji-Tokoha U.) Bambang Rudyanto (Wako U.) Itsuki Noda (AIST), Makoto Ikeda (ADRC),	**Irina Rafliana**, Del Afriadi Bustami, Triyono, Juriono (LIPI), M. Ridha, Agussabti, Muzailin Affan, Khairuddin, Khairul Munadi, Mukhils, Yudha Nurdin (Syiah Kuala U.) , Febrin Anas Ismail (Andalas U.), Diyah Krisna Yuliana (BPPT)
G5-2	Research on effective methodology for collecting and diffusing of disaster lessons	**Yoshinari Hayashi** (Kansai U.), Mamoru Nakamura (U. Ryukyuus), Reo Kimura (Fuji-Tokoha U.), Mizuho Ishida (JAMSTEC)	**Didik Sugiyanto,** Munasri, Eko Yulianto (LIPI)

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G5-3	Experiment and deployment of disaster management education over the internet	**Keiko Okawa**, Achmad Husni Thamrin, Sayaka Fukuda, Haruhito Watanabe, Patcharee Basu, Mohammad Dikshie, Achmad Basuki (Keio U.)	**Basuki Suhardiman** (ITB), Lilil Gani, Jaka Sembiring (DIKNAS), Nazarudin (Syiah Kuala U.)
G6	Application of the research and establishment of collaboration mechanism between researchers and the government officials	**Kiyoshi Natori, Atsushi Koresawa,** Koji Suzuki, Makoto Ikeda (ADRC) Teruyuki Kato (ERI, Tokyo U.), Masato Iguchi (DPRI, Kyoto U.), Fumihiko Imamura (Tohoku U.), Shigeyoshi Tanaka (Nagoya U.), Yujiro Ogawa (Tokyo U.), Keiko Okawa (Keio U.)	**Pariatmono (RISTEK),** Irina Rafliana, Deny Hidayati (LIPI), Mulyo Harris Pradono (BPPT), Surono (KESDM), Hasanuddin Z. Abidin (ITB), Teddy W. Sudinda, Suci Wulandari, Budianto Ontowirjo (RISTEK), B. Wisnu Widjaja, Lilik Kurniawan (BNPB), Basuki Suhardiman (ITB)

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1. Project Summary

This project "Multi-disciplinary Hazard Reduction from Earthquake and Volcanoes in Indonesia" officially started in June 2009, as a part of "Science and Technology Research Partnership for Sustainable Development" (SATREPS) supported jointly by JST (Japan Science and Technology Agency) and JICA (Japan International Cooperation Agency). On the Indonesian side, support of funding is provided by Ristek (Ministry of Research and Technology), LIPI (Indonesian Institute of Science), ESDM (Ministry of Energy and Mineral Resources), Diknas (Ministry of National Education), and KKP (Ministry of Marine Affairs). The ultimate goal of this project is to reduce disaster from earthquakes and volcanoes by enhancing capability of forecasting hazards, by reducing social vulnerability, and by promoting education and outreach activity of research outcomes. We also plan to provide platform of collaboration among researchers in natural science, engineering and social sciences, as well as officials in national and local governments.

The research activities consist of six groups. For hazards, natural science approaches are taken for: (1) Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations, and (2) Short-term and long-term prediction of volcanic eruptions and development of their evaluation method. For the vulnerability, engineering and social/human science approaches to: (3) Establishment of social infrastructure based on engineering developments, and (4) Mitigation of social vulnerability against geohazards. On the basis of these, the last research group is (5) Education and outreach for disaster reduction. Each group has several sub-groups, and in total more than 20 subgroups are conducting joint field surveys and workshops. In addition, to coordinate these research activities and to utilize the research results, we conduct: (6) Application of the research and establishment of collaboration mechanism between researchers and the government officials. The Joint Coordinating Committee, consists of the group leaders and government officials of related agencies in Indonesia, is organized and meets regularly to supervise the project activities. The project not only reports research activities to JCC but also plans to make policy recommendations to utilize the research finding to disaster reduction activities of the governments.

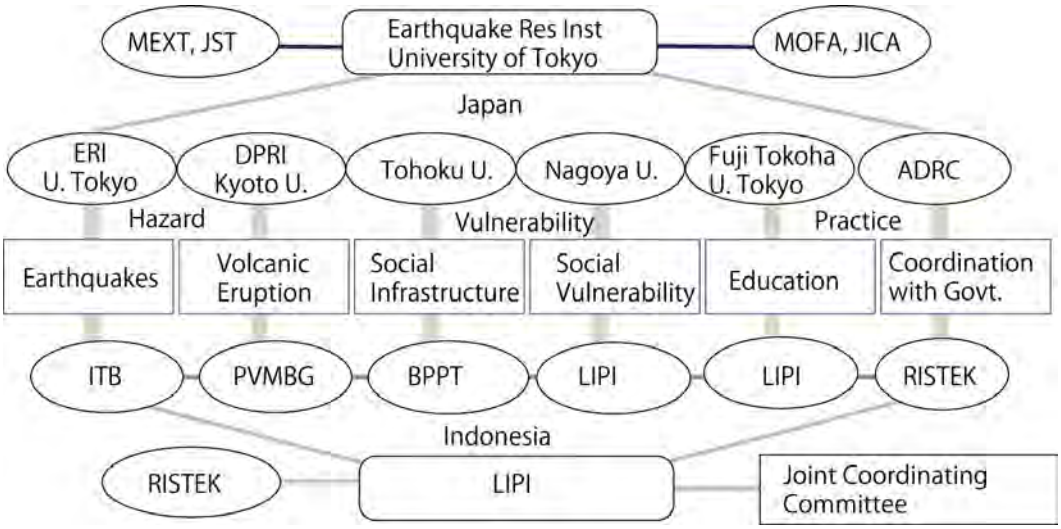

Figure 1. Overall structure of the project, with the leading agencies for each group.

Table 1 Number of subgroups and members

	subgroups	Japan	Indonesia
1. Earthquakes	6	55	29
2. Volcanoes	4	19	21
3. Engineering	4	23	15
4. Social sciences	4	24	13
5. Education	3	22	27
Total	21	143	105

In 2009, the first group leader meeting and JCC were held in Jakarta on April 20, then the kick-off workshop was held in Bandung on April 21. Twenty seven people, including 16 from this project, participated to the JCC meeting. The workshop in Bandung was connected to Tokyo and Banda Aceh through internet, and 51 participants from both Japan and Indonesia attended. In June, the project office was open in LIPI Coremap building, and two JICA staffs (Mr. Kubokiand Mr. Endo) started their activities with support of local staff. They meet weekly with LIPI staff on our project. Each group started their activities, and many field works and workshops have been conducted.

In September, earthquakes occurred off Java and near Pandang. In addition, a large earthquake in Samoa generated tsunamis. The above Indonesian earthquakes seem to activate nearby volcanoes. The Sinabung volcano started erupting in 2009 after lying dormant for several centuries. We therefore conducted emergency surveys of the above earthquakes, tsunami, and volcanic activities.

The first international workshop was held in Banda Aceh from October 11 to 13. The technical sessions on October 12 and 13, held at University of Syiah Kuala (Unsyiah), were broadcasted through internet to Bandung and Tokyo. In addition to our project members, foreign researchers from Philippines and Germany, as well as local researchers and students in Aceh attended the workshop. The workshop was followed by observation of Indian Ocean Wave, a tsunami warning information transmission drill for all Indian Ocean countries. The participants observed the transmission process of tsunami warning messages from BMKG to provincial governments, then to district and sub-district communities, and finally the evacuation drills by the local residents. The project and the activities were also introduced at scientific meetings in Singapore (AOGS meeting) and Japan (Seismological Society of Japan meeting).

2009 International Workshop in Aceh

At Tsunami museum during the Indian Ocean Wave

In 2010, the second JCC meeting was held in Jakarta on March 22, and the activities of the first year and plan for the second year were reported. On May 28th, at the JPGU (Japan Geoscience Union Meeting) in Chiba City, an international session titled "Multi-disciplinary Studies on Natural Hazards in Asia" was held, and about twenty papers from this project were presented. Following the JpGU meeting, the group leader meeting in Tokyo was held. In addition, a few topical meeting across subgroups were held. An international workshop on Geodynamic and Disaster Mitigation of West Java was held in Bandung in July 12-14 with about 70 participants, not only from our project but also from U.S., Australia and Singapore. Group 5 has held workshops in September and December 2009 and August 2010 in Banda Aceh, inviting many school teachers from the region.

The second annual workshop was held from November 22–25, 2010 in Kobe, Japan. There were 84 participants in total, with 36 from Indonesia. In addition to the project workshop, there was an open session which included presentations on disaster management in Bantul regency, West Sumatra province, and Hyogo prefecture, Japan. A study trip to the Nojima fault museum and E-defense, the large 3-dimensional shaking table facility, was conducted. For the unexpected eruptions of Sinabung and Merapi volcanoes and Mentawai earthquake tsunami in 2010, we dispatched emergency survey teams to collect data on natural hazards and human behaviors.

Field trip to Lembang fault trench site

Field trip to Nojima fault museum near Kobe

In 2011, the group leader and JCC meetings were held on May 6. They were originally scheduled in March but were postponed because of the Tohoku earthquake and tsunami on March 11. On May 27, another international session was held at the JpGU meeting, and about 20 papers were presented from the project. There was another group leader meeting, and a visit was made to Sendai, the area affected by the Tohoku earthquake and tsunami, to learn from this disaster.

During these meetings and the visit, urgent joint research topics about the Tohoku earthquake and tsunami were discussed, and an additional joint research which focused on the people's evacuation from the giant tsunami was proposed to set up. This additional joint research was accepted as one of the cooperative research projects of J-RAPID (Strategic International Research Cooperative Program) funded by JST (http://www.jst.go.jp/inter/english/project/country/j-rapid.html). Many of the researchers in this SATREPS project as well as the both principal investigators have been involved in this additional joint research (Appendix 9).

On September 29, the Project leader and a few members of the project were invited to the meeting entitled “Similar characters of earthquake and tsunami of East coast of Tohoku (Sendai) and Sunda Strait

and Krakatau area" held at the President's Place in Jakarta, and made presentations on the 2011 Tohoku earthquake tsunami and the SATREPS project.

The third workshop was held October 27-29, 2011, in Jakarta, to coincide with Indonesia Disaster Preparedness, Response, and Recovery Exhibition & Conference (IDEC) 2011. On the first day, the project joined the Conference and made three presentations at the Disaster Management and Climate Change Conference, which was organized by the Coordinating Ministry for People's Welfare. A total of 219 people participated, including 37 from our project. On the second and third days, in addition to the activity reports from all subgroups, there was discussion on "Science to Society." Based on the discussion, the participants (about 70, including 10 from outside the project) made following recommendations.

(1) The Joint Coordination Committee (JCC), established to monitor the progress of the SATREPS project and composed of all disaster-related institutions in Indonesia, namely, RISTEK, LIPI, DIKNAS, ESDM, DKP, KOMINFO, PU, DEPDAGRI, BPPT, and BNPB, can be promoted to Indonesian key stakeholder as a platform to pursue such objectives.
(2) The function of the JCC should be continued or expanded in any format to continue the collaboration between Indonesia and Japan for research activities in relevant fields and enhance the use of research outcomes for policy development aimed at natural disaster reduction in Indonesia.
(3) BNPB, the National Disaster Management Agency of the Government of Indonesia responsible for overall disaster management, needs to take the lead and thus should be further involved in such activities. Hence, such a request will be made to BNPB so as to discuss how international collaboration between Indonesia and Japan in these fields should be continued and further enhanced along this line.

In December 2011, Terminal Evaluation team was dispatched from JICA, and conducted Joint Terminal Evaluation with Indonesian members (Mr. Bogie S.E. Tjahjono from LIPI and Ms. Nada D.S. Marsudi from RISTEK) from December 4 to 22. The team conducted interviews to participants from each group, reviewed their activities, and made evaluation based on the five criteria: relevance, effectiveness, efficiency, impact and sustainability. The team evaluated that relevancy was very high, effectiveness and efficiency were relatively high, and sustainability was fairly high. The team also pointed several positive impacts, and concluded that the project made significant achievements.

Lecture at the President' s office

Third international workshop at IDEC

In January, 2012, a special issue of Journal of Disaster Research, consisted of ten original research papers and two review articles from the project was published. While this journal is open access, i.e., peer-reviewed papers can be downloaded by anybody in the world, 1000 copies were printed and distributed to members and non-members of the project.

On February 2, 2012, final evaluation of the SATREPS project was made by JST. The group leaders

participated to the final hearing, and participated to the discussion.

In March, 2012, about 15 JCC members and group leaders visited Japan. On March 12, they visited Japan Meteorological Agency, Ministry of Education, Sports, Culture, Science and Technology, and Cabinet Office, to learn and discuss on the Japanese coordination activities across ministries. On March 13, a joint workshop between Philippine and Indonesian SATREPS projects was held in Ichigaya, where possible future collaboration among Indonesian, Philippine and Japan was discussed. On March 14 and 15, an international symposium was held in Sendai with participants of four SATREPS projects, Indonesia, Philippine, Peru and Chile.

Meeting and discussion at Cabinet office.

Joint workshop between Indonesia and Philippine

The Final JCC was held on May 1, 2012 in Jakarta. On the previous evening (April 30), RISTEK held reception to host the participants. It was attended by the minister of RISTEK (Prof. Gusti Muhammad Hatta), the Ambassador of Japan (Mr. Yoshinori Katori), the chairman of BPPT (Dr. Marzan Azis Iskandar), Director General of Geological Agency (Dr. Sukhyar), the deputy chairman of BNPB (Dr. Sugeng), Chief representative of JICA Indonesia Office (Mr. Kohara), Program Officer of JST (Prof. Honkura), as well as JCC and project members. During the reception, the project accomplishment was reported by JCC chair (Dr. Idwan Suhardi) and PI's (Profs. Harojono and Satake). Following speeches by Ambassador Katori and Minister Hatta, appreciation certificates were given to the two PI's by the minster.

The final JCC was held in the Cikini project office. After the introduction, and opening addresses from JICA and JST, research results were presented by PI's and each group leader. Comments were provided by Dr. Prih (BMKG), Dr. Anita Firmanti (PU), Dr. Teuku Alvisyahkrin (UNSYAH), Isman Justanto (BPPT), Togan (Welfare), Laksito (Home Affairs). Importance of bringing research results to public policy was again recognized. The equipment acquired during this meeting was handed over from JICA to RISTEK, then RISTK to Indonesian institutes (BPTT, ITB, LIP, tsunami museum Aceh, UGM, Unsyah, and ESDM). As a token of appreciation, gifts were presented to the JCC chairman and group leaders. The JCC was followed by press conference.

Reception attended by Ministaer and Ambasadar

Final JCC at LIPI

The total number of mutual visit, from Japan to Indonesia and Indonesia to Japan, are summarized in Table 2. In total, 281 Japanese members visited Indonesia to stay 2,642 days, and 107 Indonesians visited Japan to stay 1,081 days.

Table 2. Number of visits from both countries supported by this project

Fiscal Year (April–March)	Japan to Indonesia		Indonesia to Japan		
	Persons	Days	Persons	Days	Students
2009	90	905	14	187	2
2010	100	959	56	558	2
2011	91	778	37	336	2

2. Progress report

Group 1: Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations

(1) Purposes and goals of the project

Indonesia and Japan shares the similar tectonic background where many devastating earthquakes of interplate thrust type earthquakes along trenches and inland earthquakes along active faults occur. The researchers belonging to the group conduct synthetic researches using geophysical techniques to help basic understanding of mechanism of those earthquakes and tsunamis and their prediction. The knowledge obtained through the project may be applied to other earthquakes and tsunamis at any other areas, so that the impact of outcome obtained through the project will be large. Moreover, collaboration of researchers between two countries is very important to accelerate the progress of the related researches in the field.

(2) Methods and organizations of the project

The group is divided into six subgroups according to their methods to be used: (1) Study of historical earthquakes based on active fault surveys, (2) Study of historical earthquakes based on tsunami deposit and coastal geology, (3) Crustal deformation monitoring using space geodesy and gravity, (4) Study on strong ground motion prediction, (5) Investigation of submarine active faults, and (6) Prediction of tsunami using numerical simulations. These researches use various techniques such as active fault studies, paleo-seismological techniques, geodetic techniques, strong motions studies, submarine surveys and numerical simulation of tsunamis, etc. Integration of these techniques are tried within the group. These studies are carried out by strong collaboration of researchers of the two countries through workshops and meetings.

(3) Status of project in view of achievements of international cooperative research project and recent development of science and technology and outlook

The researches in the group have been carried out smoothly according to the initial plans. At least 13 reviewed/non-reviewed articles have been published and more than 56 oral and poster presentations have been made at various meetings. The group held a workshop in July 2010 in Bandung for targeting the west Java region aiming at mutual understanding among the sub-theme. The workshop was attended also from USA, Australia and Singapore as well as Indonesia and Japan. Participants discussed active fault surveys in Bandung Basin, possible earthquake generation in the area, prediction of strong motion etc. in the workshop. Inter-group integration of researches are also pursued; for example, strong motion prediction model was investigated by G1-4 based on the geological outcome of G1-1 and slip estimation by G1-3.

(4)Technology transfer to the counterpart members

G1-2 accepted an international student from Indonesian counterpart to Hokkaido University. Moreover, G1-3 invited a graduate student from ITB to ERI, the University of Tokyo, twice to transfer the method of InSAR technique successfully.

(5) Any unexpected developments or activities that were not implemented in the original plan

There occurred a couple of large earthquakes since the initiation of the project: September 2nd 2009 South Off Java Island (M7.0), September 30th 2009 Samoa Island (M8.1), September 2009 Central Sumatra (M7.5) and October 1st 2009 Central Sumatra (M6.6), and October 25th 2010 earthquake Off Central Sumatra Island (M7.7). The group deployed imminent research teams to these earthquakes.

Group 2: Short-term and long-term predictions of volcanic eruptions and development of their evaluation method

(1) Purposes and goals of the project

The Group 2 aims to conduct three types of volcanological studies of three different time scales of activities; (1) mechanism of volcanic explosion and short-term prediction at Semeru volcano, (2) long and mid-term prediction of volcanic eruption and tectonics at Guntur, Talang and Sinabung volcanoes, and (3) geological evaluation of frequency and process of caldera-forming eruption at Bali Island and East Java. Based on these researches, the group tries to make a proposal of evaluation method of volcanic activity at Kelud, Sinabung and Merapi volcanoes.

(2) Methods and organizations of the project

The research groups conduct tilt observations at Semeru, seismic and continuous GPS observations at Guntur, Talang, Sinabung and Merapi, geological surveys and datings at Rinjani, Batur, Bromo calderas and Sinabung volcanoes, and interview surveys for evaluation method at Kelud, Sinabung and Merapi volcanoes.

(3) Status of project in view of achievements of international cooperative research project and recent development of science and technology and outlook

The group succeeded to obtain precursory upward tilt toward the summit just before the gas emission at Semeru volcano. Detection of precursory deformation is possible even for a small-scale eruption by high-precision observations, durations from the initiation of tilt to the onset time of eruption are constant, and deformation patterns are distinct due to different eruption modes. These lines of evidence seem enable us to predict volcanic eruptions. The prediction research is in internationally high level. As for the mid- and long-term prediction in Guntur volcano, the group has been able to clarify the seismic activity around the volcano and seismicity map has been made. Repeat of inflation of the ground and following increase in seismicity is clearly a long-term precursor, suggesting intrusion of magma. The group clarified the age of caldera formation. Although the process of formation is yet to be examined, clarification of its formation mechanism is advantageous even for studies in Japan as such study is rare in Japan. Finally, there are mutual benefit for our collaborative works; studies on evaluation of volcanic activity in Japan provides a helpful perspective to the evaluation study for Kelud volcano, and examination of eruption of Mt. Sinabung, after long time of quiescence is informative for considering similar cases in Japan.

(4) Technology transfer to the counterpart members

Disaster Prevention Research Institute, Kyoto University, and Center for Volcanology & Geological Hazard Mitigation (PVMBG) of Indonesia exchanged MOU in 1993 and exchange of research staff between the institutes have been frequently conducted under the MOU. The present project accelerated such exchange visits and an international student from Indonesia successfully received Ph.D. from Kyoto University. Urgent development of observation network and evaluation of activity at the eruption of Mt. Sinabung in August 2010, and appropriate warning before the eruption at Merapi in October 2010 are some samples of manifestation of successful technology transfer.

(5) Any unexpected developments or activities that were not implemented in the original plan.

Volcanic earthquakes and white fume activities increased at Talang volcano, central Indonesia, soon after the September 2009 Padan earthquake occurred. A part of the group members made an urgent survey by establishing some temporal seismic sites. The Mt. Sinabung erupted in August 2010 after the quiescence of >400 years, and Mt Merapi erupted in October 2010. The group deployed urgent survey teams for these eruptions and conducting researches based on seismological, geological and geodetic observations.

Group 3: Establishment of social infrastructure based on engineering developments

(1) Purposes and goals of the project

The purpose of researches of Group 3 is to establish an idea of social infrastructure based of the hazard evaluation on a map that is support to build resilient society against natural disasters. Although there are significant differences in preparation of social infrastructure between Japan and Indonesia, the common countermeasures of disaster mitigation against natural disaster may be applicable for both countries by the clarification and elimination of social vulnerability. The group 3 aims to develop the models of social infrastructure that implementation oriented with viewpoint of recovery and reconstruction, based on the recognition of localities of status of disasters in Indonesia. In particular, the group examines indigenous land use and regulation, shelters for disaster prevention and system of evacuation

(2) Methods and organizations of the project,

The group plans plenary meeting and sub-group meeting within the plenary meeting, by which collaboration of activities and sharing of outcomes are promoted. In particular, the group tries to work together in Padan city in central Sumatra and in the area of central Java as the areas are commonly studied areas among sub-theme of the group.

(3) Status of project in view of achievements of international cooperative research project and recent development of science and technology and outlook

The group is helping and cooperating of developing official hazard map, sharing problems in making such a map including local government, and providing observation data of micro tremors and its analyzed data in Padan City. After a large earthquake off Padan city in September 2009, which caused a big disaster in the city, the group deployed an urgent survey team to the city and investigated the disaster. The results was summarized in a report document. Moreover, the team was able to obtain invaluable scientific results such as estimation of hazard curve to the basement level, delineation of uniform risk spectrum of a city, estimation of ground structure to the depth of 80m at the site, etc. Research team examined an inexpensive and simple method of reinforcement of a building that is adaptable in indigenous lifestyle based on local culture and religion. As results of these studies, the group published

(4) Technology transfer to the counterpart members

The group is promoting the personal exchange through participation to meetings, inviting international students to Japanese universities as well as conducting collaborative works. Moreover, a part of group members participated to the one year memorial flower ceremony for the 2009 Padan earthquake, by sponsoring together with Andalas University. Outcome of the activity and collaborative works of the project was presented at the international conference attached to the event. In addition, the ceremony in the Pariaman Prefecture of Padan city, welcomed about 800 participants including governmental officials and local people. About 700 people attended to the ceremony in Padan City, including governmental officials and students from 17 high schools. The group members supported local activities of raising people's awareness toward disaster prevention and establishing human network among affected people by opening a forum between people of Padan City and Kobe City.

(5) Any unexpected developments or activities that were not implemented in the original plan.

Group 4: Mitigation of social vulnerability against geohazards

(1) Purposes and goals of the project

In order to promote countermeasures against natural disasters, it is crucial not only to understand a natural hazard in terms of physical sciences, but also to understand vulnerability of its affected society, as well as setting out measures to reduce it, from the perspectives of human and social sciences. Based on this basic conception, the group 4 aims to propose a comprehensive disaster management involving various formal and informal initiatives, through first identifying institutional problems in the national and local governments, second understanding socio-cultural and geographical background of the society, and third evaluating various efforts at the locality level in the processes from response, reconstruction, to preparedness, with each sub-group's key concepts being community-based preparedness, local knowledge, long-term recovery process, behavioral mechanism, respectively.

(2) Methods and organizations of the project

The group investigates the experiences of inhabitants, local communities, governments and non-governmental organizations in the past disasters in order to have insights for preparing for the future disasters. The information is obtained mainly from the governmental documents, historical records, and/or field surveys, in particular using social research methods such as semi-structured interviews, group interviews and questionnaire surveys. In addition, the group collects statistical data, maps, satellite images, newspapers, etc., and utilizes the integrated GIS, remote sensing analysis and social statistics, especially focusing on Aceh, Yogyakarta and East Java focusing the 2004 Indian Ocean tsunami, the 2006 central Java earthquake and the 2007 Mt. Kelud eruption disaster, respectively, and on comparative studies with Japanese cases such as the 1995 Great Hanshin-Awaji and the 2011 Tohoku earthquakes.

(3) Status of project in view of achievements of international cooperative research project and recent development of science and technology and outlook

Each sub-group members of Indonesia and Japan-sides finished sharing the views of problems, basic concepts, methodologies, framework, obtaining the main information and data, and conducting collaborative field surveys at the target regions. They have accumulated the research results especially about how local people responded to disasters, published working papers, articles, and chapters in research reports, academic journals and books, while some being in press, and disseminated the results to local governments, students and residents at the local workshops in Aceh and Yogyakarta as well as advised the policy planning for emergency evacuation to the East Java government in collaboration with the group 2.

(4) Technology transfer to the counterpart members

There are not so many state-of-art technologies to be transferred to Indonesia, in the nature of human and social sciences. It is noteworthy, however, to mention the Information Mapping System on Disaster and Society that integrates a variety of disaster-related information on the platform of web-GIS useful for education and emergency response, put into operation in Aceh in December 2011 as well as an educational book, *Orang Orang yang Bertahan dari Tsunami* that collects victims' narrative, distributed to schools in Aceh, Bandung, Yogyakarta and so on in March 2011. Overall, the group members including graduate students have useful experiences for developing techniques/skills of social survey and analysis by conducting joint field works, sharing the framework for analysis.

(5) Any unexpected developments or activities that were not implemented in the original plan.

A part of group members participated in the urgent surveys after the 2006 West Java and the September 2009 Central Sumatra earthquakes, and successfully obtained information/data on the emergency response of the national and local governments, non-governmental organizations, local communities and residents, the results being included into the Information Mapping System mentioned above.

Group 5: Promoting disaster education and upgrading disaster awareness

(1) Purposes and goals of the project

The aims of the group are examining effectiveness of the following three methods through practices and tries to spreads among people: (1) Development of effective disaster education program at school and effective disaster awareness raising program and collaborations with local governments and teachers, (2) Collection and Transfer of Disaster lessons, and (3) Test and development of disaster education using internet. Among these, the sub-theme (1) consists of four sub-sub-theme: school education for disaster prevention, community education for disaster prevention, development of education tool of disaster prevention using tsunami evacuation simulation, development of raising awareness through tsunami memorial poles.

(2) Methods and organizations of the project

The group consists of six sub and sub-sub groups. In order to share the information and keep communications, the group held the group's plenary meetings in August and December 2009, and August 2010 in Banda Aceh, through which the group is promoting the collaborative researches between two countries, together with JCC and the project's plenary workshops in 2009 and 2010.

(3) Status of project in view of achievements of international cooperative research project and recent development of science and technology and outlook

It is seen that the group activity is increasingly strengthened and proactive, as the new members have been added while the collaborative researches progresses.

Sub-group 5-1: Development of effective disaster education program at school and effective disaster awareness raising program and collaborations with local governments and teachers

The study of school education, based on recognitions of present status and problems, proceeds to the specific problems such as the role of school teachers at the disasters and coping techniques at the time of disasters, through workshops with teachers. In 2011 School Disaster Education Guideline was published.

Development of education tools using people's evacuation simulation from tsunami by multi-agent method was completed cooperatively modifying Japanese technology to fit to Indonesia. The tools were used at model school lectures at some schools and improved to be more effective by using an unique on demand simulation technology. The simulation software interactively operable by students and teachers using an average PC was burned into DVD and distributed. Young Indonesian researchers were invited to Japan for the training of development of the evacuation simulation.

As for the education to the local community, a technology of resident participating type education program named "Disaster Town Watching Method" which was proposed by the Japanese CP, has been transferred to Indonesia, and three times of social implementation have been conducted by Indonesian CP in Aceh and in Jakarta. In addition, a guide book of education program was printed in Japanese, English and Indonesian and was distributed in 2010. Also tutorial DVD of "Disaster Town Watching" in 2011.

A member of the project started activities of awareness raising and enlightenment using tools such as tsunami memorial tools.

Sub-group 5-2: Collection and Transfer of Disaster lessons

The group members are (1) collecting narrative of personal tsunami experiences and their translation to Japanese, (2) test production of education tool using collected narratives and reproduced paints, (3) evaluation of illustrations and texts that are used in scientific readings and was used at some model school lectures in elementary and in junior high schools in Aceh.

Sub-group 5-3: Test and development of disaster education using internet

The group utilized remote education tool using internet developed in Keio University to broadcasting workshops in April and October 2009 and in February and July 2010. Also in 2011 we provided remote participation environment and real-time streaming for: "Disaster Management and Climate Change Conference (Coordinating Ministry for People's Welfare) and Indonesia-Japan Workshop on

Multi-disciplinary Hazard Reduction From Earthquakes and Volcanoes in Indonesia", 27-29 October 2011. The group is contributing to the communication and information sharing on international disaster prevention cooperation through this communication link using internet. In 2011 Disaster reduction lectures: record 8 lectures by Group 5 members to be uploaded on the web http://soi.asia/.

(4) Technology transfer to the counterpart members

The technologies that have been transferred to the Indonesian CP are as follows:

(1) A technique of resident participating type education program was transferred to staffs of TDMRC of Syiah Kuala University, school teachers and local governments.

(2) A guideline for Disaster School Education was published and distributed in English.

(2) A guidebook and tutorial DVD of resident participating type enlightenment program was published and distributed in Japanese, English and Indonesian.

(3) The developing method of tsunami evacuation simulation tool was taught to two Indonesian young staffs by inviting them to Japan for six weeks.

Group 6: Application of the research and establishment of collaboration mechanism between researchers and the government officials

(1) Purposes and goals of the project

Activities of Group 6 aimed to propose a system to apply the research results to policy making by building up synergy among governmental organizations, universities and research institutes. To this end, the role of the Joint Coordination Committee (JCC) of this project, composed of researchers participating in this project and the high-ranking officials of Indonesia's government organizations, was enhanced so as to strengthen the linkage between research activities and policy making while promoting outreach activities.

(2) Methods and organizations of the project

As for the role of the JCC, the linkage between research activities and policy making was discussed and examined by using the Japan's Central Disaster Management Council (CDMC), the Headquarters for Earthquake Research Promotion (HERM) and other institutions in Japan as models. In parallel, Japanese participants also enhanced their understanding about Indonesian institutions and their activities.

(3) Status of project in view of achievements of international cooperative research project and recent development of science and technology and outlook

Mechanisms and relevant activities of the CDMC and the HERM were explained in details to Indonesian participants in 2010 thereby enhancing their understanding about ways to apply research results to policy making in Japan. In the wake of the 2011 Great East Japan Earthquake in March, experiences of the said disaster were shared among Japanese and Indonesian participants through various means which included an overview of Japanese Government's response to the Great Eat japan Earthquake, centering on the role the CDMC and HERM.

These activities culminated at the panel discussion titled "From Science to Society", organized as part of Group 6 activities, in Jakarta in October 2011 where the project members agreed on, among others: i) the function of the JCC should be continued or expanded to continue the collaboration between Indonesia and Japan in relevant fields and to enhance the use of research outcomes for policy making in Indonesia, and; ii) the National Disaster Management Agency (BNPB) of the Indonesian Government needs to take the lead and thus should be further involved.

Moreover, outreach activities were implemented through three issues of Newsletter published in both English and Indonesian and a series of TV interviews "IPTEK Talk" broadcast in Indonesia.

Lastly, the high-ranking officials of the Indonesian government organizations, namely, RISTEK, BPPT, BNPB and LIPI, visited various Japanese Government organizations, namely, Japan Metrological Agency (JMA), the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Cabinet Office, and gained further understanding of their activities in March 2012.

(4) Technology transfer to the counterpart members

As described before, the understanding of activities of the Japan's Central Disaster Management Council and the Earthquake Research Promotion Headquarters was greatly enhanced among Indonesian participants of this project. Moreover, through outreach activities such as Newsletters and TV interviews, the results of this project were widely disseminated. These activities certainly had a significant impact on the ways that Indonesian institutions approach issues of disaster risk reduction by enhancing synergy among governmental organizations, universities and research institutes.

3. Results of cooperative researches

Group 1: Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations

G1-1: Study of historical earthquakes based on active fault surveys

In order to contribute to the long-term forecasting of large earthquakes on active faults based on geomorphological and paleoseismological studies, we conducted the detail mapping of active faults in the scientifically and socially important active tectonic regions in Java and Sumatra Islands. Long-term probabilities of earthquake occurrence on selected two fault segments were evaluated by paleoseismological data. Through the study on active faults and compilation of active fault data in the regions, we advanced the development of paleoseismologists in Indonesia.

In Java Island, we conducted field researches on tectonic geomorphology and paleoseismology of the Lembang fault north on the downtown of Bandung, West Java, We made an active fault map of the Lembang fault based on the interpretation of aerial photographs and ALOS-PRISM satellite imagery, and field investigations, to reveal the distribution, geometry and long-term slip-late of the fault. Then, we conducted paleoseismological surveys by boring arrays and trench excavations in a small sedimentary basin dammed by faulting to estimate the recurrence interval and the timing of recent faulting events. The result of our studies reveals that the fault is a 27-km-long segment with predominant normal and subsidiary left-lateral components of faulting, and speculates the amount of slip and timing of the recent three paleoearthquakes on the faults. Three possible faulting-events have occurred since about 13 ka with 3 to 4 meter of vertical slip per event and 3.5 to 5.5 ky of recurrence interval. The most recent event of the fault possibly occurred between 3 and 5 ka. Long-term slip rate of the fault is about 1 m/ka (mm/y). These paleoseismological data estimate that 30-years probabilities of a magnitude 7 earthquake from the Lembang fault is smaller than a 5 percent base on the BPT probability density function and a deviation of $\alpha = 0.24$.

In Sumatra Island, re-evaluation of the existing trench log and the result of radiocarbon dating reveal that two major faulting events of the Sumani section of the Sumatran fault occurred since A.D. 1460. The latest event, which was after A.D. 1690, is correlated with the 1943 earthquake of Ms 7.3. The recurrence interval of recent two major events of the segment was about 250 to 500 years.

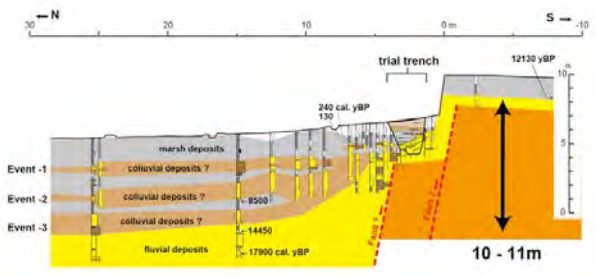

Fig.3.1.1.1: Geologic section across the Lembang fault. A series of colluvial and marsh sediments, which overlay fauted fluvial depasits, suggest that three paleoseismic event have occurred in this site since 13ka.

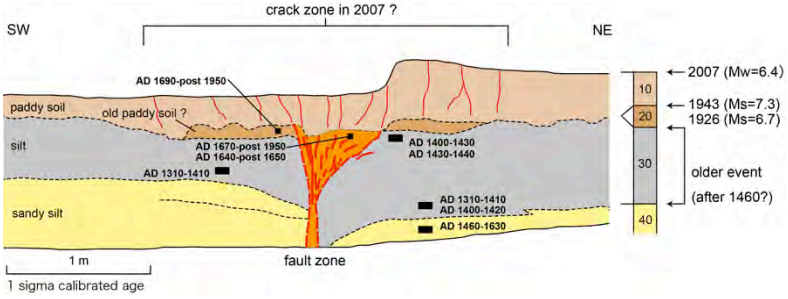

Fig.3.1.1.2: Trench log across the Sumani section of the Sumatran fault. Two major faulting events have occurred since A.D.1460. The latest major event is correlated with the 1943 earthquake of Ms 7.3.

G1-2: Study of historical earthquakes based on tsunami deposit and coastal geology

In order to study the history of tsunamis and crustal deformations along the west coast of the Sumatra Island, sub-group 1-2 performed coral drilling at Pagai Island, Mentawai Islands, Sumatra, in July 2009, and Simellue Island, Sumatra, in May 2010, and tsunami deposit survey along the north-western coast of Aceh Province, Sumatra Island in December 2009, March 2010, and February 2011. We also investigated complicated volcanogenic tsunami deposits composed by sand and pumice along the northmost coast of the Java Island. The deposits were caused by the 1883 historical eruption of Kurakartau Volcano located between Java and Sumatra Islands.

Tsunami deposit surveys were carried out aroubd Calang and Aceh, both are located at the northwestern coast of the Sumatra Island. In Calang, we found a clear sand layer at about 1 m beneath the present surface. We also found a sand layer at the similar depth in Meulaboh, located about 45 km south from Calang, and this layer was dated to be 1000 years BP. Monecke et al. (2008, Nature) also reported a tsunami deposit of the same age in Meulaboh. If these sand layers are all tsunami deposits produced by one event of 1000 years BP, the tsunami has to be large enough to affect more than 40 km wide area along the coast. The 2004 tsunami deposits were studied in Lampuuk, Aceh. The deposits were covered by new soil and still clearly identified in the tsunami inundation area. In Aceh, though no historical evidences for past mega-tsunami were reported, two possible tsunami deposits caused by smaller but large enough tsunamis were found. These deposits lied between the 1839 and 1510 Seulawah tephra (Fig. 3.1.2.1).

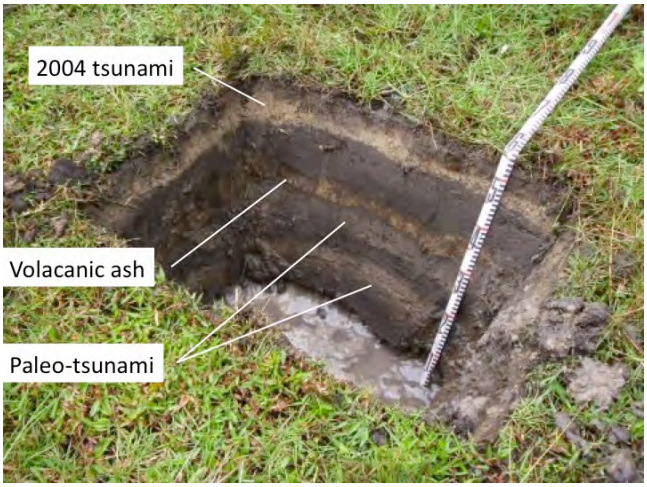

Fig. 3.1.2.1: The 2004 and paleo-tsunami deposits in Lampuuk, Aceh, Sumatra Island. The deposits lied between the 1839 and 1510 Seulawah tephra.

Reef corals record various environmental changes and events in their carbonate skeletons with annual bands for a few years. Geochemical analysis along growth axis of coral skeletons has been used as reconstruction of paleo-environments in high resolution weekly to monthly. In order to reconstruct past records of earthquake and tsunami, we collected 15 modern and fossil coral cores using underwater and land-based drilling from southern part of Pagai Island, Mentawai islands, Sumatra, Indonesia. Coral cores were slabbed 5 mm thickness and taken soft x-ray images to observed density bands (annual bands). The longest core was 250 years old. The growth disturbances corresponding with recent earthquakes were observed in annual bands of modern corals. Then, we analyzed concentration of trace elements, oxygen and carbon isotopes in coral skeletons. Trace element concentrations varied with sediment disturbance and terrestrial inputs due to tsunami. In addition, carbon isotopes in coral skeletons had a possibility as a quantitative proxy of coral living depth (solar irradiance) changes due to uplift/ subsidence with earthquakes because carbon isotopes change with photosynthetic activity of symbiotic algae. These results suggested that coral skeletal structures and geochemical composition can reconstruction of environmental

changes with earthquakes (Fig. 3.1.2.2).

During the paroxysmal stage of 1883 Krakatau event, a series of eruption and tsunami occurred and destroyed more than 250 coastal villages along the Sunda Strait. We will report the result of our field works in Java coastline located to the east of Krakatau volcano. Around 30 cores and pits were observed and samples were collected. We described and examined the cores and pits of tsunami-related deposits and primary tephra deposits (Fig. 3.1.2.3). In general the stratigraphy of the 1883 eruption and tsunami in coastal Java composed of intercalation of sand, pumiceous sand and tephra. The stratigraphic record is unique and very complex and was formed by successive deposition of tephra and tsunami deposit and also erosion by tsunamis. The tsunami layers sometimes contain pumice and/or ash. These pumice and/or ash had been carried up inland together with the beach sand from their original position by the tsunami run-up. To understand the sedimentation processes and chronology of eruption and tsunami during the 1883 paroxysmal stage, we used the stratigraphy characteristics in conjunction with historical record account. At some locations, the stratigraphic records observed in the field and historical accounts are correlated.

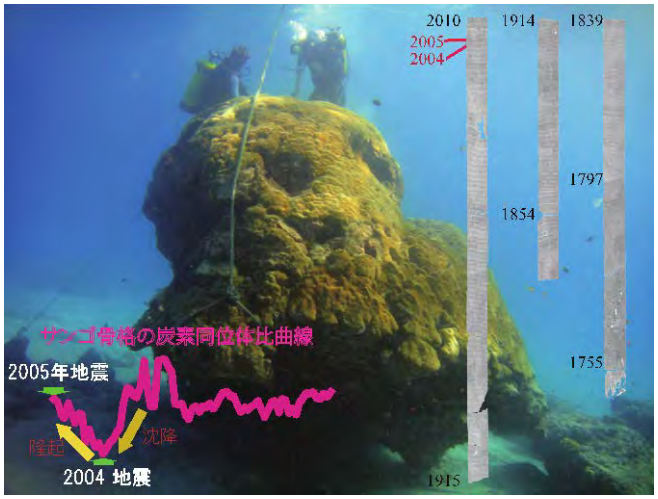

Fig. 3.1.2.2: Underwater drilling of a coral, x-radiographs, and time series of carbon isotope. The coral skeletal structures and geochemical composition can reconstruction of environmental changes with earthquakes.

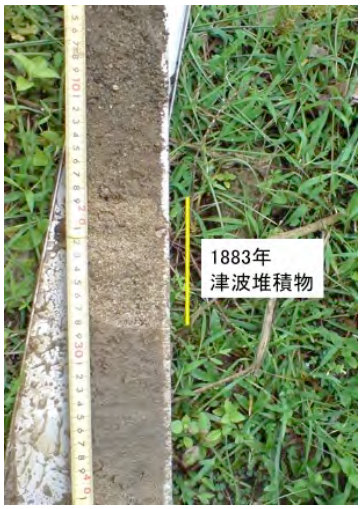

Fig.3.1.2.3:An example of the 1883 Krakatau tsunami deposit (Carita, Java Island), composed by sand, ash and pumice.

G1-3: Crustal deformation monitoring using space geodesy and gravity

The purpose of this research is to conduct geodetic investigations in Sumatra and Java Islands using GPS, gravity observations and SAR data analysis for delineating detailed crustal deformations in some seismically active areas in Indonesia.

GPS: GPS teams repeated campaign observations in 2009 and in 2010 at the networks along the Cimandiri-Lembang-Baribis faults in west Java and at the AGNeSS network in the northern Sumatra region that was established in 2005 (Fig. 3.1.3.1). In addition, a team established a new continuous GPS site at TDMRC in Aceh and four sites in west Java network in October 2010 and started observations.

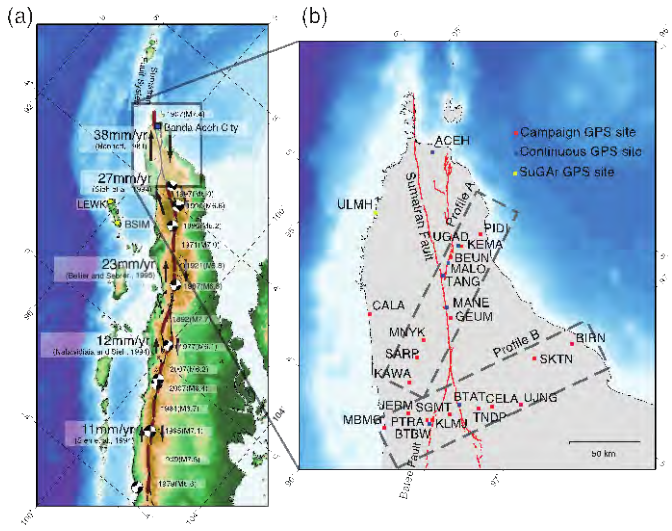

Figure 3.1.3.1: (a) Overview of the GSF system. Source regions of large earthquake from historical records are shown in bold red lines. Also show the long-term offset rates along the GSF system. (b) Zoom into gray rectangle of (a). Observation map of AGNeSS.

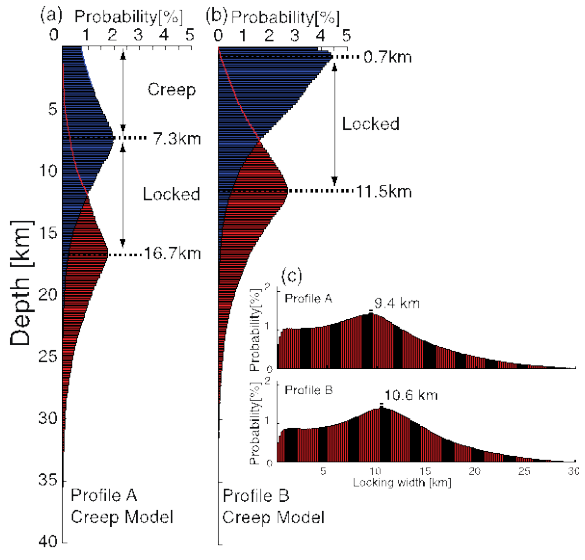

Figure 3.1.3.2: Marginal posterior PDF of locking, creeping depths, and slip deficit rates in the shallow-creep model. (a-b): marginal posterior PDF of the upper (blue) and lower (red) limits of the locked portion for each profile. (c): Marginal posterior PDF of the width of the locked zone. Dashed lines of all figure indicates the maximum likelihood value.

AGNeSS has observed large displacements which include significant postseismic deformation due to recent large megathrust earthquakes. Tthe displacements were parameterized due to afterslip on the megathrust using a model based on a rate- and state-dependent friction formalism. Using this approach, we were able to separate afterslip from other contributions. Then, the predicted deformations due to afterslip were removed from the observations, and thus corrected time series were used to infer the depth of shallow aseismic creep and deeper locked segments for the Great Sumatran Fault. In the northern portion of this fault segment, we infer aseismic creep down to 7.3 km depth at a rate of 2.0 cm/year (see Fig 3.1.3.2). In the southwestern portion of the segment, a locking depth of 11.5 km with a downdip slip rate of 1.6 cm/yearn was estimated. This portion of the fault is capable of producing a magnitude 7.0 earthquake.

Data analysis in west Java also showed a possible slow slip along the deeper

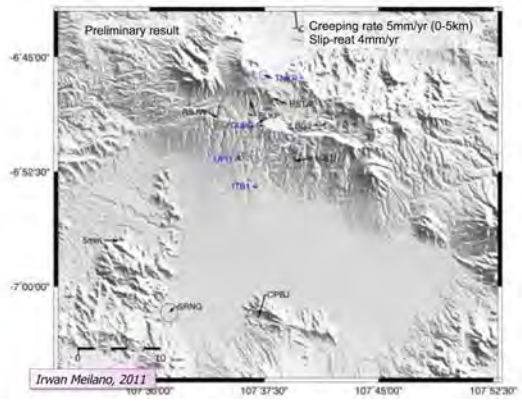

Fig 3.1.3.3 Velcity field around the Lembang fault estimated by GPS.

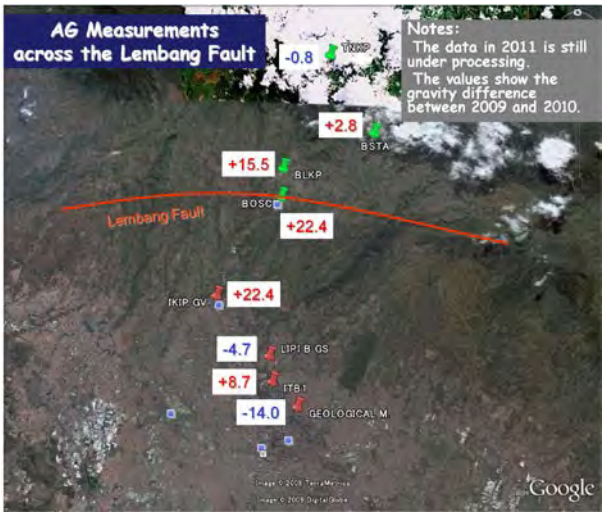

Fig.3.1.3.4 Gravity change (2009-2010) around the Bandung Basin.

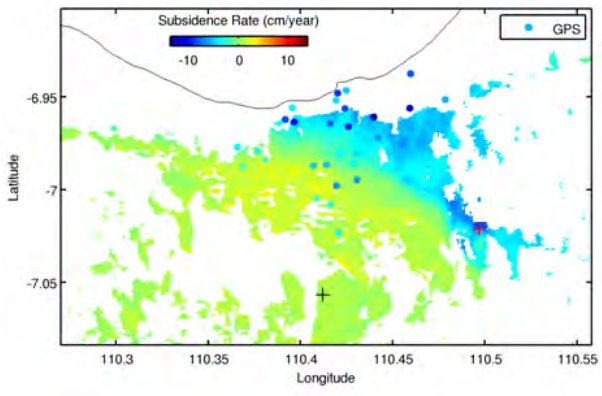

Fig.3.1.3.5 Ground subsidence observed by InSAR analysis in Semarang, central Java. Displacements by GPS are also shown by dots.

crust along the Cimandiri and the Lembang fault (Fig. 3.1.3.3). GPS continuous observations near Bandung city around the Lembang fault show slight lateral and vertical fault motion. Still longer observation is necessary to determine the fault motion in detail.

Gravity: Using a field type absolute gravimeter (A10), a gravity team repeated absolute gravity measurements in Jakarta and the Lembang fault near Bandung for three years since 2009. Although some measurement points in Jakarta were lost due to road construction and other reasons, the team detected gravity increases along the coastal line in Jakarta where the large land subsidence has been reported. The mount of gravity increases is harmonious with the height changes observed by GPS measurements. The team reoccupied all the gravity points in Bandung, and detected gravity increases at the southern points where the large land subsidence has been observed by GPS. The team also detected gravity increases at the points near the Lembang fault. However they are probably due to local hydrological effects (Fig. 3.1.3.4).

SAR: Kyoto group succeeded to detect significant crustal deformations due to earthquakes of Sept 30 off Padang and Oct 1 south of Padang using InSAR analysis. Crustal deformation due to Nov 8 Sumbawa Island earthquake was also detected. They also conducted detailed InSAR analysis in the city of Semarang, central Java, where large land subsidence was detected by GPS surveys (Fig. 3.1.3.5). ERI invited a graduate student of ITB, for a month in 2009 and in 2010. During his visits, we succeeded to detect temporal evolution of the ground deformation due to the LUSI mud volcano, Java Island, using a series of InSAR analysis.

G1-4: Study on strong ground motion prediction

In this subject, we validate the applicability of the strong ground motion prediction method to Indonesia, and apply this method to the actual prediction of strong ground motions from a future earthquake. We have (1) validated the strong ground motion prediction method for the 2006 Yogyakarta earthquake, and (2) applied this method to a future earthquake in the Bandung region. For the validation (1), we greatly improved the fault model for the Yogyakarta earthquake and obtained the reasonable inversion result, which is consistent with InSAR and seismic (Fig. 3.1.4.2). For the application (2), we constructed a velocity structure model in the Bandung region performing microtremor surveys. We then computed strong ground motions from a scenario earthquake on the Lambang fault, using the constructed model (Fig. 3.1.4.1).

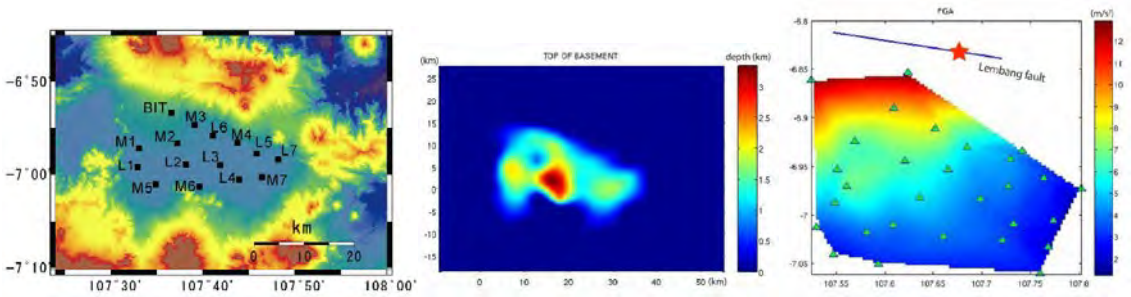

Fig. 3.1.4.1: Microtremor survey in the Bandung basin (left). Estimated 3D velocity structure (basement depth, center). Strong ground motion in the Bandung basin for a scenario earthquake on the Lembang fault (right).

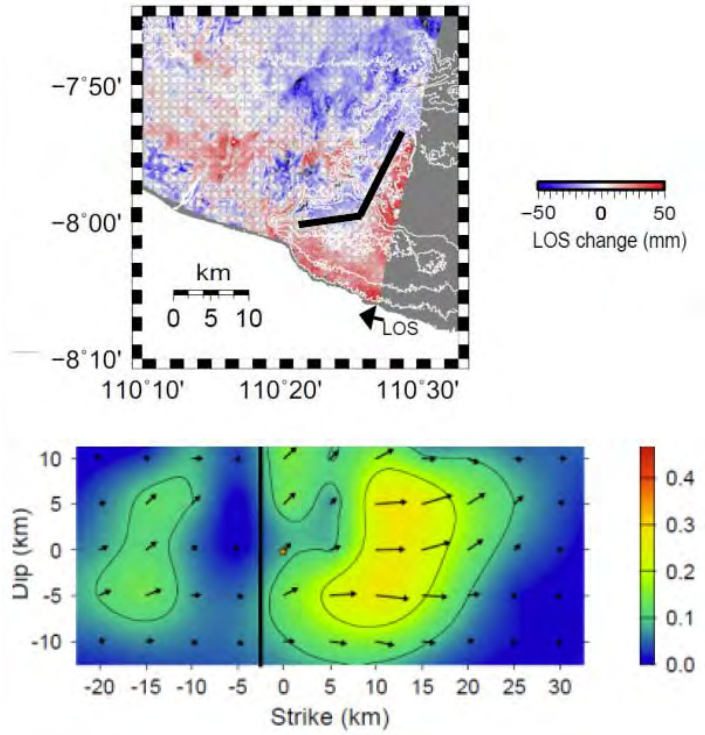

Fig. 3.1.4.2: SAR interferometry and source fault for the 2006 Yogjakarta eq.(top). The slip distribution from seismic and SAR data (bottom).

G1-5: Investigation of submarine active faults

(I) In 2009, we conducted multi-beam echo sounder (MBES) bathymetry survey using JAMSTEC R/V Kaiyo off northwest Sumatra. The detailed bathymetry data suggested that a series of ridges-and-troughs are developed well in the direction parallel to the local trench (Fig.3.1.5.1). In 2010, we conducted a high-resolution multi-channel seismic survey using R/V Hakuho-maru in the same region so that we confirmed: (a) the ridges-and-troughs series mostly consists of thrust faults or thrust fault-related folds. (b) These faults and folds basically become active as these approaches to the trench but the middle thrust was recently active. Moreover, (c) trench fill sediment layers were scraped off the oceanic plate and thrust up on the island arc crust (Fig.3.1.5.2).

(II) Turbidite correlation and age determinations for cores that were sampled by R/V Roger Revelle (RR) suggested that the turbidite recurrence intervals were estimated approximately 330 years for the past 7,500 years. Further studies for correlation and characterization of turbidites and age detrminations were done to give us much detailed information on the recurrence intervals of large earthquakes along the Sumatra forearc region during the past 10 ka. The difference on sediment fabric between turbidite mud and hemipelagic mud was clearly recognized (Fig.3.1.5.3), indicating possibility to get better identification of fine grain turbidite.

Fig.3.1.5.1. Detailed MBES bathymetry. Distribution of submarine active faults, interpreted morphologically.

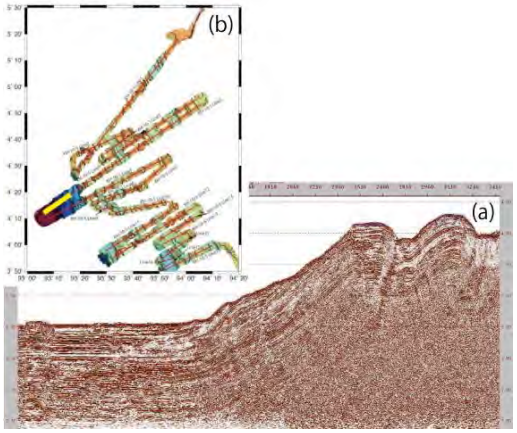

Fig.3.1.5.2 (a) A seismic profile of the trench lower slope of the Sumatra Trench. Thrust-up of thick trench fill (sediment) layers on the landward slope is clearly seen. (b) Total of 18 seismic lines were surveyed during the KH-10-05 cruise. The seismic profile of (a) was obtained along the yellow line

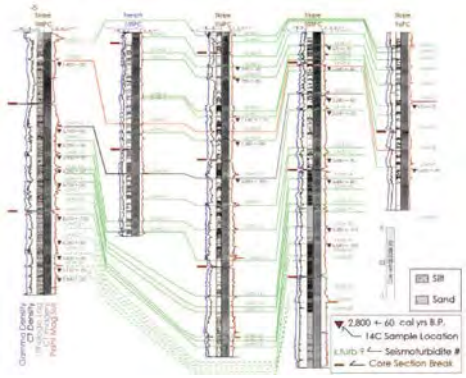

Fig.3.1.5.3 Tentative correlation of turbidites in the forearc region off Sumatra

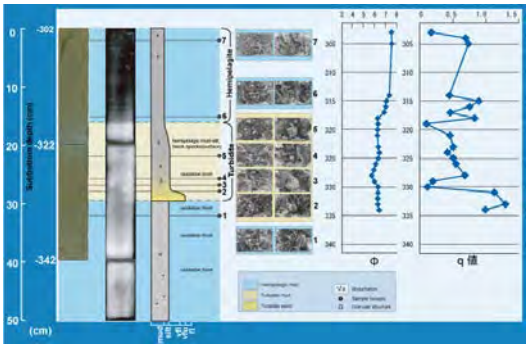

Fig.3.1.5.4 Difference on sediment fabric between turbidite mud and hemipelagic mud in a sediment core from the Sumatra forearc.

G1-6: Prediction of tsunami using numerical simulations

Pelabuhanratu is one of the most populated towns in the Indian coast of Western Java. In 2009, the tsunami inundation heights and areas are estimated at Pelabuhanratu from expected underthrust earthquake source models along the Java subduction zone. Seven domains of gridded bathymetry data were created near Pelabuhanratu. The largest grid spacing was 1853 m. The smallest grid spacing at the populated area was 2.54 m which is small enough to evaluate heights of tsunami at each house. The non-linear shallow water equations were numerically solved on a staggered grid system using a finite difference method applying a moving boundary condition. The expected source model with a moment magnitude of 8.0 generates the large tsunami with a maximum tsunami height of 5.8 m. The port of Pelabuhanratu is completely inundated and many houses near the port are also flooded by this tsunami (Fig.3.1.6.1). The tsunami disaster mitigation measure at Pelabuhanratu was discussed with a local government. They decided the evacuation area and evacuation routes (Fig.3.1.6.2).

In 2010, the field surveys were conducted to measure bathymetry depths and classify buildings at Pangandaran in West Java and Cilacap in Central Java. The depths were continuously recorded with the location by an echo sounder and GPS system installed in rented small boast. At Pangandaran, we have collected the bathymetry data in the west coast area (2 km x 2 km) along almost 10 track lines. At Cilacap, we have collected the bathymetry data in the east coast area (3 km x 3 km) along 7 track lines. Using those bathymetry survey data, tsunami run-up simulation of the 2006 West Java tsunami earthquake was carried out. The best fault model which can explain the tsunami heights was estimated. Also, At Cilacap, the tsunami inundation map from the expected source model was also made. Also, the tsunami survey of the 2010 Mentawai tsunami earthquake was conducted. The source model which explains the tsunami survey data is estimated.

In 2011, the paleo-tsunami survey of the 1883 Krakatsu eruption was conducted. The tsunami inundation area was estimated from the distribution of coral stones carried by the tsunami at Anyer and Waymuli.

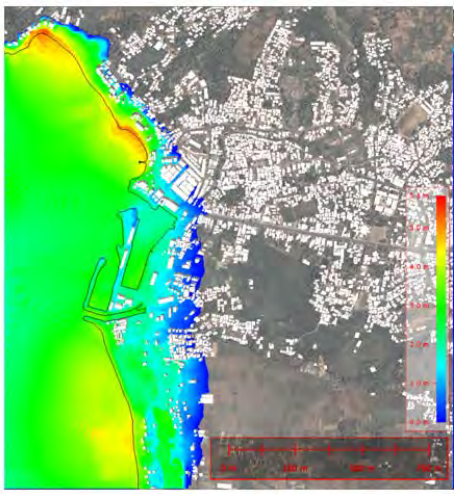

Fig.3.1.6.1: Tsunami simulation result for a earthquake of Mw 8.0 off Pelabuhanratu

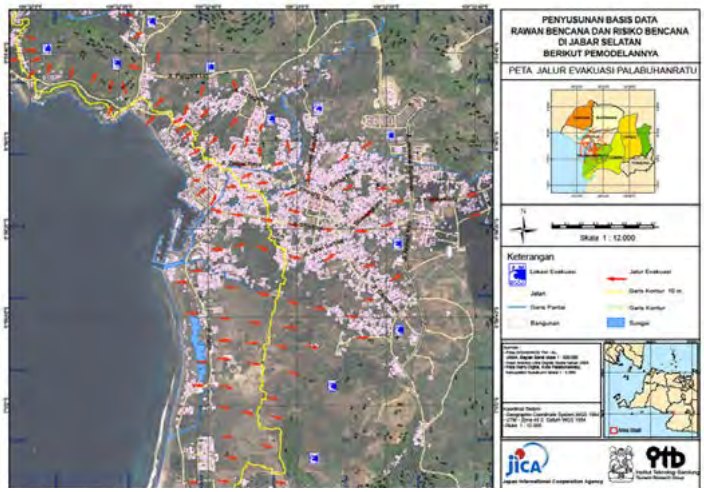

Fig.3.1.6.2: Tsunami hazard map at Pelabuhanratu shows the evacuation routes and evacuation area.

Group 2: Short-term and long-term predictions of volcanic eruptions and development of their evaluation method

G2-1: Mechanism of volcanic explosion and short-term prediction

We aim to clarify the mechanism of volcanic explosions at Semeru volcano mainly from tilt and seismic observation close to the active crater. We installed two tilt meters at a depth of about 4 m at Kalimati (about 3 km north of the active crater) and Arcopodo stations (1.7 km) in July 2009. Since the two stations were so far to record volcano inflation signals, we installed a tilt meter at the summit, Mahameru station (0.5 km) in March 2010 to record deformations associated with gas bursts that began from the beginning of 2010. In June, we further set a radio telemetry system at the summit to transfer the tilt and seismic data recorded at Mahameru station to CVGHM at Bandung.

We analyzed tilt and seismic signals associated with gas bursts in 2010 and those with vulcanian explosions in 2007. To reduce noise amplitudes, we stack tilt data by adjusting the time to the onset time of eruptions to obtain average temporal changes of the tilt signal. The stacked signals show that volcano inflation starts about 20-30 s before each gas burst and the inflation rate is almost constant. On the other hand, each vulcanian eruption is preceded about 200-300 s by inflation, and the inflation rate increases with time. These differences are attributed to the differences in the properties of erupted materials, gasses or magma. We further obtained an important empirical relation for both of gas bursts and vulcanian eruptions: large inflation accompanies large eruption. This relation may enable us to predict magnitude of eruptions from tilt amplitudes.

We estimated tilt amplitude of each eruption by fitting raw tilt record with the stacked tilt record and compare them with seismic amplitude (+ symbol in Figure 3.2.1.1). Estimated values from each eruption are roughly distributed around the averaged ones (open circles). However, it is noted that the magnitudes predicted from the raw data have errors of about 1 order. Continuous observations for more long time, which gains wide dynamic range of eruptions, could enable us to clarify the relations between tilt records and eruption magnitudes more precisely. This can improve our method for predicting the volcanic eruptions.

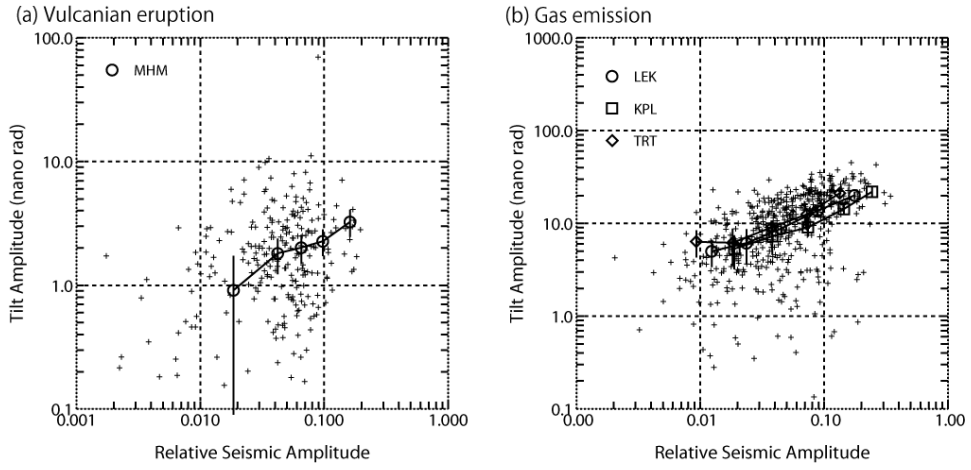

Figure 3.2.1.1. Relations of tilt amplitudes with seismic amplitude of earthquakes associated with eruptions. (a) vulcanian eruptions, (b) gas bursts. Open circles with error bards represent data obtained from stacked tilt records. Plus symbols (+) denotes the data estimated from raw tilt signals and eruption earthquakes.

G2-2: Long and Mid-term prediction of volcanic eruption and tectonics

In order to make clear the process of ascent and accumulation of magma, seismic and ground deformations are conducted at Guntur volcano, which has been dormant for more than 160 years whereas the seismicity of volcanic earthquake is active. Seismic observation around the Guntur volcano is also done to investigate relationship between volcanic activity and surrounding tectonics. Hypocenters of volcano-tectonic earthquakes are distributed beneath the summit area from Guntur crater to Mt. Masigit similarly to the seismicity before starting the project. Earthquakes are distributed at 3 regions; Kamojang, Darajat, Malabar. These are geothermal field and faults strikes in the direction of NE-SW and NW-SE. Seismicity at Darajat increased in August 2011 and then it was followed by swarm of volcanic earthquakes at northern part of the Guntur volcano during the period from September 26 to 27, including felt earthquakes (M2.5). The last occurrence of felt earthquake at the volcano was May 1999. The hypocenters of volcanic earthquakes were precisely determined at a depth of 3 km beneath Gandapura caldera by using 6 permanent stations by PVMBG and 8 temporal stations installed by the present project. This is the first hypocenter location of volcanic earthquake precisely determined by adequate number of stations not only in Indonesia but also developing countries. The mechanism of the earthquakes is normal fault type with NE-SW T-axis.

Before the earthquake swarm in September, continuous GPS observation showed inflation of the volcano from May 2011, although no remarkable inflation was detected during the period from installation in 2009 to April 2011. Precise leveling survey revealed upheaval of the ground of the summit side after increase in seismicity in 1997 and 1999, suggesting intermittent intrusion of magma. It is inferred that the seismicity increase in September 2011 was caused by release of strain accumulated by intrusion of magma from May 2011. Tensional stress field was formed by intrusion of magma and the volcanic earthquakes were generated by opening of pre-existing fracture zone (from Gandapura caldera to Guntur crater) toward the direction of NE-SW. After the earthquake swarm, high-frequency monochromatic events were frequently detected at a station near fumarole at the summit area, showing increase in hydrothermal activity.

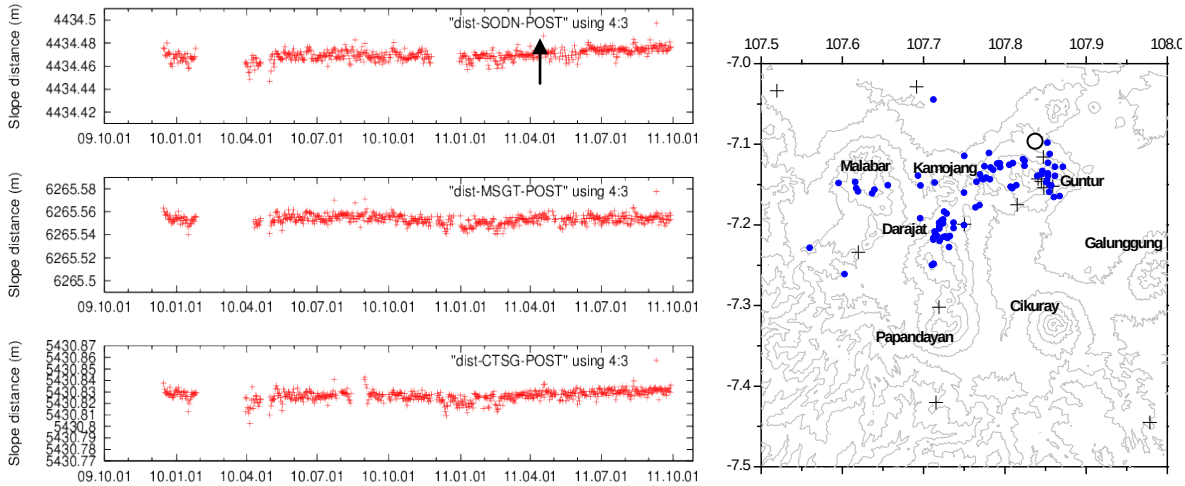

Fig. 3.2.2.1: Temporal change of slope distances at Guntur volcano (left) and location of felt earthquake on September 26, 2011 indicated by open circle (right).

G2-3: Geological evaluation of frequency and process of caldera-forming eruption.

2-3-1. Eruptive history to the caldera-forming eruption

Our geological study highlights long-term volcanic history of Bali Island (Batur, Bratan and Agung volcanoes) and offers a significant contribution towards management of hazard mitigation at the time of volcanic eruption. (1) We identified 6 and 4 extensive pyroclastic flow deposits from Batur and Bratan calderas respectively. Their radioactive carbon ages range from older than 50ka to 6 ka. (2) We also discovered relatively small phreatomagmatic activities between the large explosive eruptions from the Batur caldera suggesting frequent repetition of eruptive activities of them.

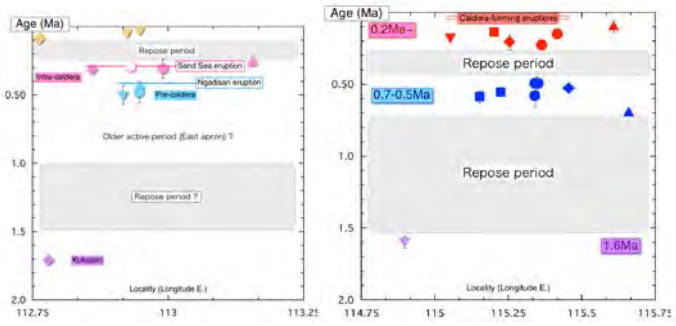

Fig. 3.2.3.1 (upperleft). View from northern wall of Batur caldera buried by post-caldera cone.
Fig. 3.2.3.2 (upperright). Distribution of K-Ar ages in Tengger and Bali regions.

2-3-2. Temporal and spatial frequency of caldera-forming eruptions

In order to find the characteristics of the long-term variation of volcanic activity, comprehensive sample collection of volcanic rocks in Bali and Tengger caldera region, East Java, is conducted, and their modal abundance, whole-rock chemistry and K-Ar ages are analyzed. The clinopyroxene phenocrysts of the two regions are light-colored in thin sections, indicating high temperature of their magma. (1) Large somma of both Batur and Bratan caldera volcanoes are constructed by the 0.2-0.1 Ma activity, and partly covers 0.6-0.5 Ma volcano to form large shield volcano. Young calderas of Batur and Bratan have formed between the aprons. There is also the old active period at 1.6 Ma. (2) The two caldera-forming eruptions (Ngadisari and Sand Sea) and the intra-caldera activity took place between 0.45-0.3 m.y. BP, and are much older than Bali. The somma was constructed by the intra-caldera activity and those older than 0.45 Ma. Temporal transition from heterogenous basaltic andesite to homogeneous, aphyric andesite occurred during the intra-caldera activity, suggesting the accumulation of andesite magma. There is also the old active period at 1.7 Ma. Andesites erupted from the active vent, Bromo, have similar whole-rock chemistry to those of intra-caldera period and caldera-forming eruptions, although they have heterogenous texture.

2-3-3. How to evaluate the next candidates geologically.

We compiled the previous examples of caldera-forming eruptions. Some cases showed the short-term signs for the caldera-forming eruption, such as increase in wide-range hydrothermal activity with small eruptions (3-4 months before). The long-term characters to evolve into the caldera-forming eruption are an decrease in eruption rate, the restriction of eruption sites, becoming more explosive, an increase in SiO2 and the ratio of explosions (5-10k years before).

G2-4: Proposal of evaluation method of volcanic activity

Evacuation of residents from volcanoes has been done by past experience of volcanic eruptions in Indonesia. We have developed method of evaluation of volcanic activity based on exchange of knowledge between researcher in Japan and Indonesia, by surveying activity of Kelud and Sinabung volcanoes and integrating the survey, the results from the other groups in this project and fruits of study in Japan.

In order to contribute to the long-term forecasting of volcanic eruption, in particular, Kelud volcano at the crater lake of which lava dome appeared unexpectedly in 2007, we develop the method of evaluation of eruption potential and propose scenario of future eruption and plan of volcano monitoring. In the 2010 FY, we evaluated the eruption potential based on data of eruptions in the past. In addition, we visited Sinabung volcano in Sumatra, which began eruptive activity after more than 400 years of dormancy to investigate the response of volcano crisis by PVMBG.

Kelud volcano repeated eruptions with the time interval of 3 to 75 years since 14th century. The average of the time interval is 26 years, similarly to Izu-Oshima and Miyakejima volcanoes in Japan. The production rate of magma since 1900 was estimated from data of PVMBG and others: approximately 5 million ton/y (2 million cubic meters per year in magma volume). This is about one fifths of Sakurajima and a few times larger than those of Izu-Oshima and Miyakejima. The volume of erupted magma was a half of the accumulated volume, which is estimated from the production rate and lapse time since 1990. The seismicity, which declined rapidly after the 2007 eruption, turned to increase in 2010, suggesting resume of accumulation of magma. It is possible following eruption will occur within 10 years and erupting location will be located out of the crater lake due to the 2007 lava dome as a cap-rock. We explained the analytical result, precursory phenomena and the factors to enable evacuation before occurrence of the eruption, mentioning monitoring and evaluation ability of PVMBG and importance of cooperation between local government and residents. Importance of long-term prediction and its limit is discussed, based on long-term prediction and difference from actual eruptions at Usu and Miyakejima volcanoes.

At the volcano crisis of Sinabung, PVMBG conducted quick operation in both volcano monitoring and social problem. In a few days, seismic, geodetic, geochemical and other observation were established, and a dozen of staff stayed at the temporary observatory and issued volcanic information every 6 hours to both the national and local governments and residents. Evacuation zone was indicated clearly based on the disaster map published in 1991 and the panic of local society was settled in a few days. PVMBG made much effort and spent much time to explain the nature of volcanic activity to more than 30,000 inhabitants who have no experience and little knowledge of volcanic eruption. This experience is valuable for Japan. The outline of volcano crisis was introduced at the meeting of Volcanological Society of Japan and the Coordinating Committee of Prediction of Volcanic Eruptions in October. Sinabung volcano is composed of old body mostly composed by lava flows (west) and new one composed of lava flows and pyroclastic deposits (east) including the summit lava dome. Carbon dating reveals the latest magma eruption occurred 1100 years BP. The most plausible magma eruption in future is dome growth at the summit. The evolution of scenarios may be tracked and judged by continuous monitoring of volcanic earthquakes and ground deformation.

Group 3: Establishment of social infrastructure based on engineering developments

G3-1: Effective use of tsunami hazard map

G3-1 group meeting was held to discuss the purpose, target, item and schedule at the JICA office in Jakarta, in 2009 August. After the meeting, we visited school of social science and engineering at Andalas University in Padang where the seismic gap is pointed out. Investigation and data collection on tsunami hazard map at the down town were carried out and meeting with the government office was held. Further more, we visited Painan in the south of Padang to look the situation on year after the tsunami hazard map was posted on the street and preparation for tsunami evacuation such as sign and shelters. The field investigation for monitoring station > was carried out off shore the Painan.

Another field investigation at Padang after the earthquake on 30 September 2009 was done to collect the data of the damage on the building and infra-structure and port facility and so on. After the strong quake, some of the people could evacuate from a tsunami because of the public awareness against the expected tsunami., which is fine however, issues for jam on the way for evacuation and damage on shelters in the city. Five buildings were damaged out of ten which we are planning to utilize as the tsunami shelters.

We also compile data and information from the existed hazard map and discuss the issues to improve them. In Higashi-matsushima, Japan, we try to apply the method of the recognition map to compare them before and after the workshop.

In the end of September 2010, we again visited Padang city and surrounding area to investigate the recovery from the last earthquake, finding less process to re-build specially governmental and hotel buildings because of economical situation and plan of relocation. We jointed the 1st year anniversary of the 2009 earthquake and international conference by UN, and introduced the activity of Shinsai flower project. As for the preparedness for future earthquake and tsunami in the gap, the information on the process of official hazard map are collected and candidates of possible tsunami evacuation place have been selected.

G3-2: Reduction of tsunami damage through the practical use of vegetation

Research plan in 2009-2011 is as follows: (1) Selection of tree species for coastal forest, and examination of failure conditions (lodging, uprooting and breaking) for the selected tree species through field tests in the case study areas, Indonesia, (2) Development of new numerical simulation method for estimating tsunami energy reduction caused by coastal forest, (3) Construction of new experimental flume in Yogyakarta, Indonesia, and implementation of hydraulic experiments to check the validity of the new numerical simulation method, grasp inundation flow phenomenon in coastal forest area and investigate the tsunami reduction effect of coastal forest, (4) Selection of case study areas, and examinations of characteristics of the selected tree species and tsunami energy reduction in the case study areas, and (5) Proposal of guidelines for the practical use of coastal forest.

In (1), Sea and Shrimp Casuarinas (coastal pines) were selected and field tests on the failure conditions of lodging, uprooting and breaking for the Casuarinas was carried out at Pariaman near Padang (**Fig. 3.3.2.1**) and Pacitan near Yogyakarta. Number of data is not enough, yet. These tests are very valuable for Indonesian side, because there are no data on the failure conditions for coastal trees in Indonesia.

In (2), plane configuration effect of coastal forest and growth effect of coastal trees upon the tsunami run-up were examined by using the developed numerical simulation method. Although another numerical simulation method was developed for the multi-storied coastal forest, there still remained a problem on its accuracy.

In (3), new experimental flume (1.0 m wide, 1.0 m high and 30.0 m long) was constructed in the BPPT experimental station in Yogyakarta, characteristics of generated tsunamis were checked, and coastal tree model was examined. The hydraulic experiments were carried out from the second half of 2010 fiscal year.

In (4), Painan and Pacitan were selected as the case study areas in this project. Fundamental data on Sea and Shrimp Casuarinas (tree height, trunk diameter at the chest height, branchless trunk height, trees interval) were collected and examined along with carrying out topographic surveying in Painan and collecting topography and bathymetry data of these towns. These data and the test data in (1) were used to determine the dimensions of experimental flume, and the reduced scale and elasticity of coastal tree model. The case study of tsunami energy reduction due to coastal forest for prospective tsunamis in Painan was conducted.

In (5), examination of tsunami energy reduction due to coastal forest was done under a simple bathymetry and topography conditions by using the developed numerical simulation method, and it was confirmed that coastal forest of five-year old trees is the most effective to reduce tsunami energy in the objective trees (Sea Casuarina). In response to these and above results, the guidelines for the practical use of coastal forest are in preparation.

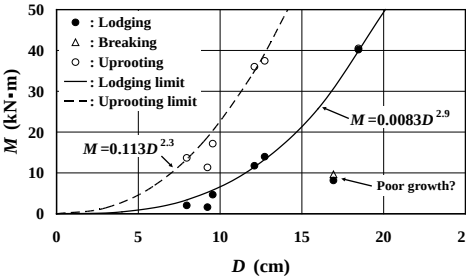

Fig. 3.3.2.1 Damage conditions to lodging and uprooting of Sea casuarina, where M is the moment, D trunk diameter at the chest height.

Field surveys of tsunami energy reduction due to coastal forest and tsunami-trace distribution around building were conducted in the 2009 Samoa and the 2011 Tohoku Earthquake tsunamis. Tsunami-trace distribution around building by field surveys is valuable because it provides information on tsunami inundation direction, inundation flow velocity, fluid force on building, and becomes important verification data on tsunami energy reduction.

G3-3: Technology development for mitigating hazards due to liquefaction

The objectives of this research are to estimate not only geological and geophysical properties of surface soils but also geohazard potential including soil liquefaction, and to demonstrate a technology for mitigating geohazards. Subsurface geotechnical investigations including microtremor surveys were made in Bantul, Jogjakarta in FY 2009 and Padang, West Sumatra in FY 2010. To evaluate soil liquefaction potential in these areas, the following research programs were conducted.

1) Microtremor measurement survey at Bantul and Padang

To determine the thicknesses of liquefiable layers and the depth of bedrock as well as the geometry of hidden valley or basin, microtremor measurements were conducted using a single station method as well as a pentagon array method, in which radii of arrays were varied from 1 m to 40 m. The single methods were conducted at 60 locations in Bantul and at 100 locations in Padang, and the array methods were conducted at 11 locations in Bantul and at 7 locations in Padang (Figures 3.3.3.1). Based on array microtremor measurement results, S-wave velocity (Vs) profiles below the soil surface in the test sites were estimated by a joint inversion using both dispersion curve and H/V spectrum of microtremors at array observation sites.

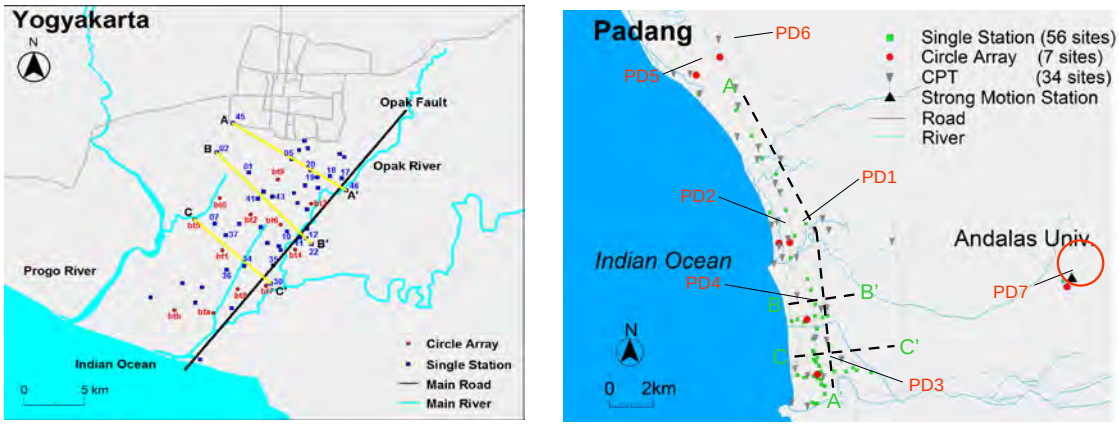

Figure 3.3.3.1. Maps showing the locations of microtremor measurement survey in Bantul and Padang.

Figures 3.3.3.2 shows the spatial variation of the H/V spectra and the estimated Vs profiles along Line B-B' in Bantul. Based on this figure, the H/V peak period increases southeastward from 0.2 to 0.8 s. The Vs profiles confirm that the engineering bedrock become shallower southeastward. The Vs structure is likely controlled by presence of a normal fault (i.e. Opak Fault) that runs NE-SW in Bantul district.

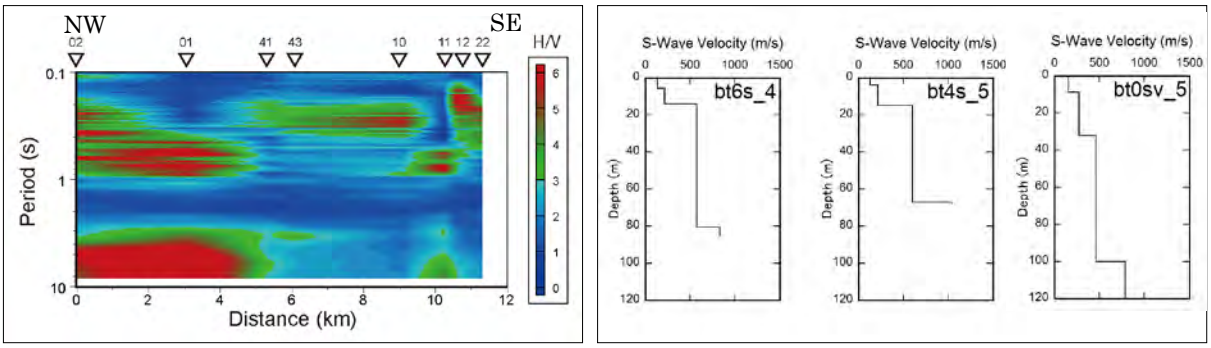

Figure 3.3.3.2. The spatial variation of H/V spectra and S-wave velocity profiles along Line B-B' in Bantul.

Figure 3.3.3.3 shows the spatial variation of the H/V spectra along Lines A-A', B-B' and C-C', and the estimated Vs profile along Line A-A'. Based on this figure, the H/V peak period decreases northward and westward from 0.6 to 2 s. Menawhile the Vs profiles indicate that the depth at which the engineering bedrock stars to appear generally decreases southward.

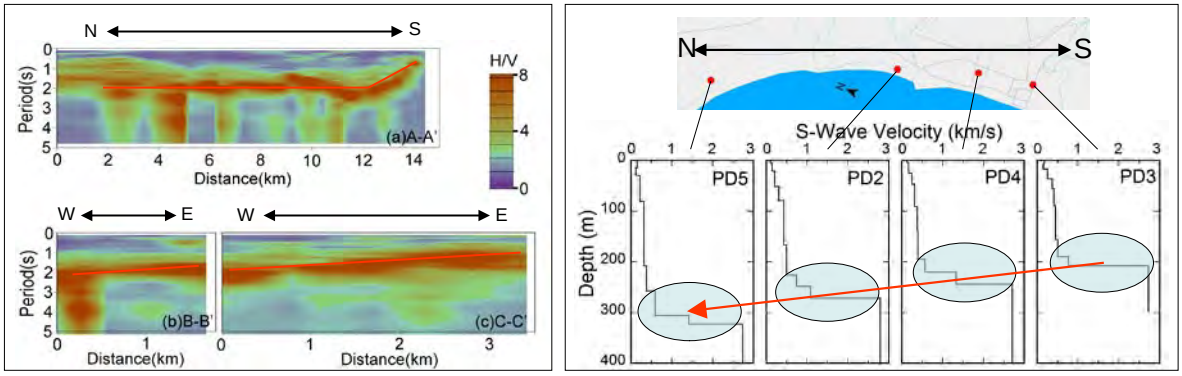

Figure 3.3.3.3 shows the spatial variation of the H/V spectra along Lines A-A', B-B' and C-C', and the estimated Vs profile along Line A-A'

2) Liquefaction Mapping due to the 2009 EQ in Padang City

The 2009 Padang earthquake induced soil liquefaction as well as damage to many buildings at Padang. Field investigation made after the earthquake provided distributions of damage to ground including liquefaction, settlement and lateral spreading as well as to buildings at Padang. Figure 3.3.3.4 shows the map of liquefaction locations in the microzonation map of liquefaction susceptibility constructed in 2008. Most of the areas where liquefaction occurred fall into the very high to high liquefaction potential risk zones.

3) Surface geotechnical investigation at Bantul and Padang

Investigations included geotechnical drilling up to 30 meters and SPT at 1.0 m intervals at 5 locations and electrical cone penetration tests at 30 locations were made. The liquefaction potential analysis based on the SPT and CPT data with PGA of 0.25g indicates that the liquefaction susceptibility becomes higher to the west of the Opak Fault (Figure 3.3.3.5). Meanwhile, under an earthquake shaking with PGA of 0.4 g, the high susceptibility zone is concentrated in the west part of the Padang City (Figure 3.3.3.4). The susceptibility becomes less to the south and northeast parts of the city. However, the zones of liquefaction potential included not only most of the liquefied sites but also non-liquefied sites, suggesting a lower PGA on the soft soil in the city due to local site effects.

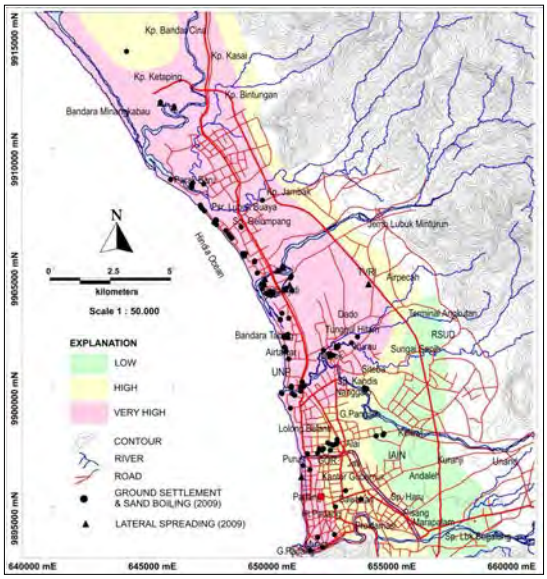

Figure 3.3.3.4. The liquefaction susceptibility map for Padang City. Black circle and triangle indicated the locations of liquefaction phenomena observed during the 2009 Padang earthquake.

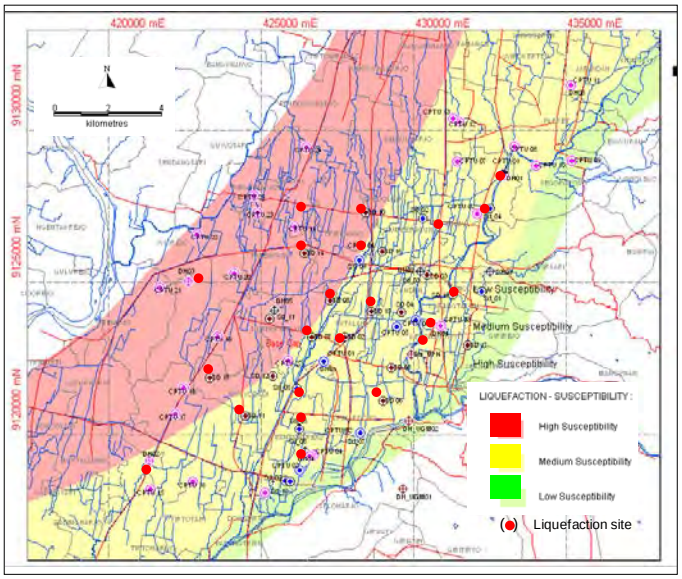

Figure 3.3.3.5. The liquefaction susceptibility map for Bantul District. Red circle indicates the locations of liquefaction phenomena observed during the 2006 Bantul eathquake.

G3-4: Investigation of design ground motion and implementation of earthquake safer housing by both technological and social approaches

Estimation of Design Ground Motion

Padang, where a large earthquake is expected in the near future, is considered to be a target area. We carried out higher density single-point observations and larger radius array observations. Based on the observed data, we calculated the distribution of the predominant and phase velocities of the Rayleigh wave. Finally, we constructed a 3-dimensional subsurface structure of the sediment in Padang. Here we align the predominant periods of the H/V spectra in the order of elevation along the two shaded lines (Fig. 3.3.4.1). A large gap appears between sites 64 and 69, for which the distance is very small (Fig. 3.3.4.1 right). The cause of the large gap in the narrow area is the existence of a fault, which can be often be found in a sedimentary plain. Seismic hazards for Padang city and Banda Aceh city are estimated (Fig. 3.3.4.2). The tendency of the curve is almost same because both cities locate under the same environment of seismic activities along the Sumatra subduction zone and the Sumatra fault. The expected acceleration for at 10% probability of exceedance in 50 years is 0.73g and 0.7g, respectively. Based on the analysis, we propose new response spectra for zone 7 (where Banda Aceh city and Padang city locate). The result is shown in Fig3.3.4.3.

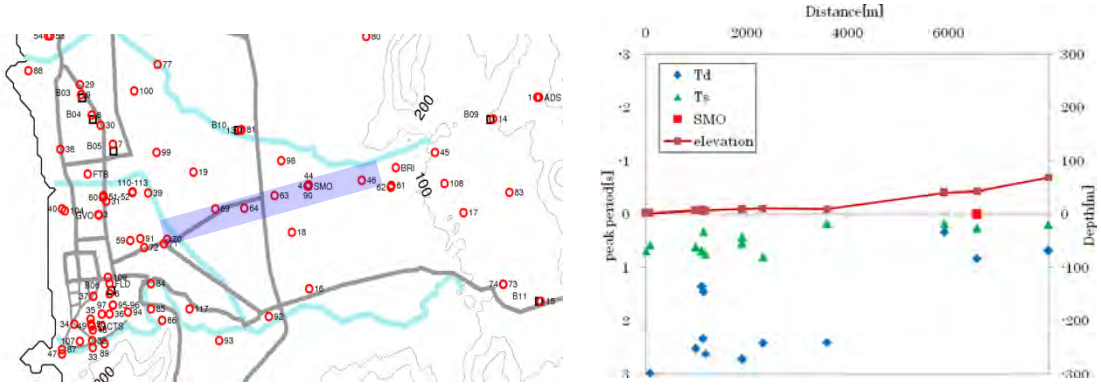

Fig. 3.3.4.1 Target line (blue line : left) and variation of peak values for the predominant period along blue lines

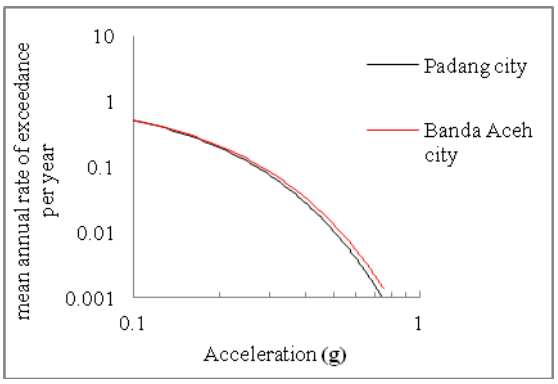

Fig. 3.3.4.2 Comparison of hazard curves for Padang and Banda Aceh (10% in 50 years)

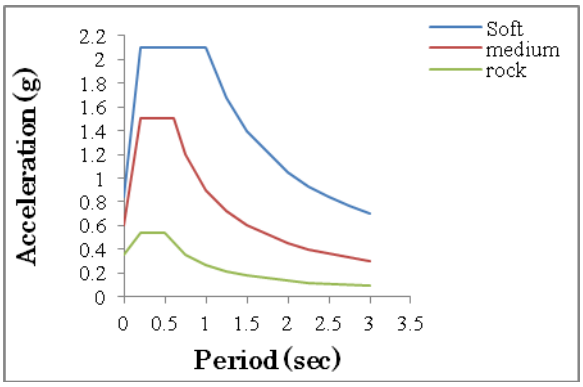

Fig. 3.3.4.3 Design response spectra for Zone 7

Implementation of earthquake safer housing by both technological and social approaches

Considering the regional characteristics of Indonesia, feasible and economical retrofit methods for earthquake vulnerable masonry houses were discussed. Based on the discussion, our proposed PP-band retrofit method was modified for Indonesian masonry houses and its effects were verified by shaking table test using typical masonry

house models in Indonesia (Fig.3.3.4.4). The PP-band (polypropylene band, normally used for packing) is worldwide available and cheap material, and strong against acid, alkali and water, durable and light material. With these PP-band characteristics and as the PP-band retrofit method doesn't change any life style of the local people, this method is considered very local acceptable.

Besides technical study mentioned above, we also, surveyed environmental conditions around construction of local houses for future planned study. This study is for proposal of some social systems which can promote retrofitting of masonry houses by PP-band retrofit method. In addition to great contribution for reduction of earthquake damage due to future earthquakes, the systems will give great incentives to the stakeholders around local house construction, such as house owners, masons, local governments and national government.

Fig.3.3.4.4 Comparison of shake table test results using non-retrofitted and retrofitted masonry houses by PP-band method.

Group 4: Mitigation of social vulnerability against geohazards

G4-1: To strengthen community-based disaster preparedness mechanism

To forge a comprehensive disaster management, it is crucial to reduce vulnerability of the society and enhance its resilience. Based on this basic conception, the purpose of the group 4-1 is first to investigate roles of various actors of governmental and voluntary sectors in the processes during emergency response to reconstruction at the local level, second to analyze affected people's experiences in these processes, third to incorporate the informal social mechanisms, in which the disaster subculture is embedded based on embodied knowledge and collective memories of the past disasters, into the national level of disaster prevention institutions that have been amended after the 2004 tsunami, and then to condition the community-based disaster preparedness mechanism from the grassroots approach. The 2004 tsunami in Aceh and the 2006 earthquake in Central Java are taken as cases for the comparative study, taking account of underdevelopment and socio-spatially diversity in the Indonesian context, especially the locality's geographical and social nature.

According to a preliminary research of the group 4-1 (Nagoya University Team) on changing institutional frameworks of the disaster management at the central and/or local governments and the informal initiatives clearly shows differentiated degrees of their localization and embodiment at the implementation level, depending on local resilience which is conditioned by the socio-cultural and political-economic structures of the community, as well as providing the theoretical framework for analysis. Further, based on these field surveys, the team published *Orang Orang yang Bertahan dari Tsunami* by collecting the tsunami-victims' narratives.

The LIPI Team of the group 4-1, in the same line, first evaluates the varying degrees of preparedness of different stakeholders by using the index of vulnerability, and points out the key roles of women for the post-disaster reconstruction from gender perspectives, based on its investigation in Aceh, , publishing *Pengelolaan Bencana Berbasis Gender* in 2012. The UGM Team of the group 4-1 also questions how and why the housing/settlement reconstruction processes are differentiated between different locations in Province DIY, and points out their relationships with local socio-spatial nature and the governmental function.

To obtain quantitative information about these issues, therefore, three teams of the group 4-1 collaboratively conducted two sets of questionnaire surveys in Bantul villages, Province DIY, focusing on the role of Dusun community and on the recovered functions of household, respectively. The group 4-1 had completed the database and base-maps on the platforms of SPSS and ArcGIS, respectively, then conducting detail analysis, before the workshop dissemination of fieldwork results at UGM in March 2011. Three volumes of working papers were published from Nagoya University, to which two other teams also contributed based on the results of the collaborative researches. Finally, the group 4-1 edits an academic book, entitled *Community Approach to Disaster*, inviting other related subgroups, which will be published by UGM Press in the near future.

As concluding remarks, it is crucial to evaluate and empower community functions for bridging locals and governmental/non-governmental organizations, and for this, Indonesia-side research institutes of LIPI and UGM have key roles for networking between the community and the government. Social sciences on natural disaster are still new in Indonesia, and therefore should be supported by continuing international academic exchange.

G4-2: Investigation of community based disaster prevention and restoration based on cultural background

The purpose of the group 4-2 is to study the process of disaster management through social aspects, as well as to develop the disaster area information mapping system which gathers online information in the local language and locate them on a map so that the situation can be grasped at a glance. It is important to monitor the social process of relief and reconstruction/rehabilitation after disaster, but the Indonesian society lacks experts on disaster management from social perspective.

Group 4-2, created a prototype of a disaster area information mapping system and made it available in public. The group organized meetings with local newspaper companies and local state agencies to make use of the system. The system is to gather online articles on disaster from the local newspapers in Indonesia and categorize the articles along the keywords, then place them on related sites in a map so that the general picture of damage and relief in the disaster afflicted area can be grasped at a glance. The system can also include various types of information such as photographic images, field notes, related literatures on the region and many other forms of information.

The group organized a series of international symposium and workshops on disaster heritage and creative economy in Banda Aceh from 21 December to 26 December, 2011. The symposium/workshop was organized by Group 4-2 with help of Tsunami Disaster Management Research Center (TDMRC), University of Syiah Kuala and the Center for Integrated Area Studies (CIAS), Kyoto University. The symposium/workshop was attended by local state agencies, local media, and local teachers who discussed about application of the system to the tourism and on social security. The symposium/workshop also discussed the possibilities of creative economy through developing disaster tourism.

These findings of the group were also shared to the local community through radio and TV programs in which the group members elaborated on the social aspects of the disaster management in Indonesia and Japan.

Figure3.4.2.1: The 2009 West Sumatra Earthquake Archives
(http://disaster.net.cias.kyoto-u.ac.jp/indonesia)

G4-3: Development of long term recovery framework from natural disasters

The 1995 Kobe earthquake was the kick off of systematic research on a long term recovery in Japan. Since the Kobe earthquake disaster, Japan has many stocks on a long term recovery research. About the recovery of life line systems, there exists much longer history of research in Japan. Based on the research results, now we can make recovery period estimation and loss estimation from the disruption of lifeline systems. Those results are implemented into disaster reduction planning and effective lifeline recovery, with indexes to monitor recovery process being developed using various census data. In Indonesia, however, the 2004 Indian Ocean Tsunami Disaster is the kick off of a long term recovery research, especially in the field of social science. There are few coordinated researches on the long term recovery and the number of researchers who makes long term recovery research is very limited.

Based on those mutual understanding among Japanese and Indonesian researchers in recovery research filed, we clarifies present situation of long term recovery research both in Japan and Indonesia through the research project. Following things are shared among researchers from Japan and Indonesia. 1) Research frame work on a long term recovery, 2) Field survey techniques and data analysis, 3) recovery simulation techniques of life line systems, 4) long term recovery monitoring index development, 5) Present situation of long term recovery research in Indonesia, 6) researchers lists on a long term recovery in Indonesia, 7) Data availability on the long term recovery from the 2004 Indian Ocean Tsunami research, and 8) Long term recovery process of the 1995 Kobe earthquake.

Also the workshop sharing information about Japanese experiences in Banda Aceh in 2009, and that sharing Indonesia experiences in Kobe in 2010 were conducted inviting researchers and practitioners in each country, and sharing the research output of this project with them.

As the results, following things were acquired as the impacts of collaborative research: 1) development of sustainable organizational and systematic collaborative research collaboration scheme, 2) common understanding about framework of a long term recovery research, 3) sharing information about research results on the 2004 Indian Ocean Tsunami research both in Japan and Indonesia, 4) sharing techniques of field survey and data analysis on a long term recovery, 5) conducting collaborative survey about the long term recovery from the 1995 Kobe earthquake, especially about disaster reduction countermeasures reflecting lessons from disaster, and 6) sharing research outputs with researchers and practitioners both in Indonesia and Japan.

Based on the common understanding about recovery research, the evaluation of water supply system renewed through recovery project was conducted as a collaborative survey of Japanese and Indonesian researchers. Posters showing long-term recovery process in Banda Aceh based on a common framework of disaster recovery process was also created, and exhibited in tsunami research center.

Workshop sharing information about the 3.11 East Japan Earthquake Disaster were organized, and the lessons about Japan tsunami disaster were shared. Through discussion, 1) tsunami warning, 2) peoples evacuation, 3) disaster response, 4) recovery, and 5) awareness rising and record of disaster were clarified as common issues need to be addressed.

G4-4: Warning Dissemination and Residents' Psychological Process Under Natural Disasters

Group 4-4 (G4-4) has been aimed at suggesting requirements for developing a more suitable warning system which adequately considers residents behavior in disaster situations. The requirements are examined based on survey results from case studies.

A volcanic eruption of Mt. Kelud in 2007 was dealt as a case study. The mountain locates in East Java province, and its volcanic activities have been intense in October and November in 2007. The volcanic alert level reached the highest level 4 (AWAS), and the evacuation order has been issued. As a result, residents have been affected for about two months.

A mass-survey has been implemented in February 2011 to clarify how residents received disaster information such as volcanic alerts and, evacuation order and to analyze their evacuation behavior.

A two-step random sampling was employed as a sampling method of the mass-survey. The target of the survey was affected areas which received evacuation order from two regencies (kabupaten) existing around Mt. Kelud. The evacuation order issued to thirty villages (desa): seventeen villages in Kediri Regency and thirteen villages in Blitar Regency. In the first step of the sampling, ten villages were randomly selected from the thirty villages and five villages were equally allocated to these two regencies. In the second step, forty-five residents were randomly chosen from each village. Thus, 450 respondents were planned to gain, and finally 427 respondents were obtained.

For a comparison with the Kelud survey, additional case study was conducted around Mt. Sinabung in North Sumatera province. Mt. Sinabung was chosen because it had been in dormancy for four hundred years and located in Sumatera island where its people have different socio-cultural background in comparison to people in Java island. Mt. Sinabung suddenly exploded in August 2010, and over 20,000 residents were affected by the incident. Although a perfect comparative analysis was hard to be done due to several reasons, semi-structured interviews were organized and findings from that qualitative survey could complement results of the Kelud survey.

Based on the results of the mass-survey and the interviews done by G4-4, it is argued below which conditions are necessary for the improvement of the disaster management in Mt. Kelud.

Leaders of villages (desa/ dusun) seem to play a critical role in terms of information dissemination. Desa/ dusun leaders obtained the highest rate in each of the following questions; "From whom did you hear AWAS at first? (the rate is 54.5%)", "From whom did you receive Evacuation Order at first? (the rate is 61.9%)" and "Whom do you trust most for information about Mt. Kelud activity? (the rate is 29.0%)" These results indicate that desa/ dusun leaders play a role as information hub between residents and government officials. Also, their credibility as information source is quite remarkable.

In addition with the role of formal leaders at desa/ dusun, it is highly desirable that a variety of information dissemination tracks are secured. Informal community based organizations, called Bumi Lestari or Kontak Tani, work implicitly. Furthermore, as a comparison with Mt. Merapi, observatory posts close to the summit have sirens, and these sirens warn in case of emergencies. The sirens are equipped only in Mt. Merapi, but they could be feasible in other volcanoes. Interviewees in the Sinabung survey mentioned that the sirens could be very effective since its sounds are big enough to reach their fields. Also, mobile phones as communication media

might be useful. Whereas possession rate of mobile phones is quite high, the possession rate of the mobile phone is varied across places. Based on the data of Badan Pusat Statistik in 2010, the possession rate in East Java Province is about 70%. On the contrary, the G4-4 result shows that the lowest rate in Kediri is about 49% and 35% in Blitar. Furthermore, the Sinabung survey revealed that access of connection for the mobile phone is partially limited around the volcano. Taking into account with local difference and environment of the communication media, several methods are required to be utilized.

Technical terms of KRB and Ring are required to be reviewed by PVMBG. KRB and Ring enable us to recognize where hazardous areas locate around volcanos. However, the result of the mass-survey indicates that 71.1% of residents have never heard about KRB and Ring. And even kabupatens set dangerous zones based on their own determination based on previous experience when Satkorlak PB was existed, so they do not utilize these technical terms.

The satisfaction of evacuation shelters influences on residents' evacuation intention for the future eruption. The statistical analysis of the mass-survey verified causal effects: residents who had more satisfied with services provided at evacuation shelters have the higher evacuation intentions against the future eruption. Thus, it is reasonable for the central government and the local authorities to keep on improving their services given at evacuation shelters.

Inclusiveness of the mass-media, such as TV and radio stations, is highly required. Interviews with kabupatens near Mt. Kelud by G4-4 demonstrated that they do not have a standard operating procedure which clearly regulates roles and works of the mass-media during crisis. Although G4-4 referred to a manual prepared by TVRI, the manual does not have descriptions that explain meanings of KRB and Ring, or the way to broadcast the volcanic alert level issued by PVMBG. In order to improve the current situation, it seems very operational that the government provides a legal status to the mass-media and vitalizes its role and obligation, just as "Designated Public Corporations" in Japan are formally formulated in Disaster Countermeasures Basic Act.

Group 5: Promoting disaster education and upgrading disaster awareness

G5-1: Development of effective disaster education program at school and effective disaster awareness raising program and collaborations with local governments and teachers

The purposes of this subgroup are to seek methodologies in developing effective disaster education program at school and effective disaster awareness raising program for local governments. The group conducted the following researches: (1) Research on the effective disaster education at school, (2) Establishment of Disaster Awareness Upgrading Program using People's Participatory Approach and Cooperative System with Local Government, (3) Development of simulations for people's evacuation from tsunami inundation and its application to disaster education, and (4) Awareness raising and enlightenment of disaster mitigation and their applications to other areas and support of network establishment of affected people, using methods such as memorial poles.

In schools, disaster risk reduction (DRR) education are not only perceived as integrating disaster knowledge into curriculum. To have a sustainable and institutionalized DRR efforts, disaster education should target in integrating the DRR into school management system. Since 2009, LIPI together with TDMRC Syiahkuala University with support from UNESCO had established school models in Banda Aceh. The research activities in this project are to aim at looking at how motivations are nurtured and how methods and approaches were upscaled to other schools prone to natural disasters. It also includes sharing experiences and methodologies based from Japan's experiences. At the end, the sub group developed a school guidebook compiling lessons from Indonesia and Japan in building school-based preparedness towards natural disasters. The results were taken up to wider users such as the Indonesian Disaster Education Consortium, which consist more than 50 organizations with concerns related to disaster education in Indonesia. Teachers from other tsunami prone area were invited through a national workshop to share the lessons from schools in Banda Aceh.



As a methodology in understanding disaster risk reduction, a program named , (1) Disaster Awareness Upgrading Program using People's Participatory Approach ("Disaster Prevention Town Watching Method") was introduced and implemented in Banda Aceh, Jakarta and East Java. The guidebook was developed in Japanese, English and Indonesian language and tutorial DVD also developed for easily used widely in Indonesia. From Indonesian counterpart, LIPI, the guidebook and methodology was also adapted to a specific user, which are school community. A 'School Watching' guidebook was developed by LIPI in Indonesian language, as a result of the adaptation process, and being tested and used in many schools prone to tsunamis in Indonesia. (2) The people's evacuation simulation from tsunami by multi-agent method was developed cooperatively and implemented to Banda Aceh. The simulation using DVD format was developed to be interactively operable by an average PC which was distributed to all of the schools, the city offices and Aceh Tsunami Museum. Three young researchers

were invited to Japan for 6 weeks to study the simulation, and they have received a research grant from RISTEK to continue the development by themselves.(3) Visualization of disaster hazard and sharing of disaster awareness methods have been transferred through activities such as “disaster education using Tsunami Memorial Pole”, “disaster awareness through Museum Exhibition”, “Flower Message Exhibition” and “Map of monuments of Sanriku Tsunami of 1896 and 1933 for transfer lessons learned”.

Fig 3.3.5.1- Guidebook and method of Disaster Town Wathtching Method

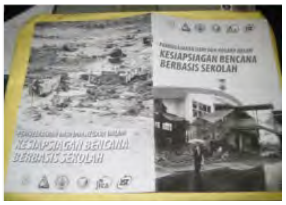

Fig. 3.3.5.2- Guideline of School

Fig. 3.3.5.3- Simulation of Evacuation from Tsunami

Fig. 3.3.5.4- Memorial pole

G5-2: Collection and Transfer of Disaster lessons

A practical study is planned in order to transfer the disaster experiences to the future generations. To this end disaster education materials that tell disaster lessons are organized by drawing pictures of "surviving experience" according to the testifies gathered by doing oral history program on the disaster experiences.

Activity of 2009

(1) Verified reliability of collected Tsunami experience by numerical simulation. Tsunami experience talks written by Indonesia are collected and main part of the collected talks is translated to Japanese.

(2) Disaster education text in based on Tsunami experience and pictures was made.

(3) Indonesia counterpart introduced new scientific reader series with many illustrations and characters based on Indonesian features of earth science.

Activity of 2010

(1) Field research on preparedness for future big earthquake were held in July, 2010. 2 Indonesian-side researchers came to Shizuoka, Japan and did interview to the local government staff and joining in public education meeting.

(2) We made prototype of the drill book based on tsunami evacuation experiences. We did the workshop using the drill book for school students and teachers in Bantur, Yogyakarta. Students and Teachers evaluated this text high.

(3) Joint research about evacuation process of 2010 Mentawai Tsunami earthquake were held in Feb., 2011. We collected 13 victims stories and made pictures of evacuation process.

Fig. 3.5.2.1: Joint research in Mentawai(Left), Visualized evacuation process (Right).

Activity of 2011

(1) The drill book"Pengalaman di balik Tsunami Aceh & Mentawai" was made and printed.

(2) The workshop "Learning from evacuated people" was held in Ujung Genteng, West Jawa .

Fig. 3.5.2.2: WS in Ujung Genteng(left and center), Drill book(right).

G5-3: Test and development of disaster education using internet

1. Research Objectives

This subgroup develops and implements disaster mitigation education using an Internet-based distance education system. Seminars, international workshops, and lectures in disaster educations are broadcasted by this subgroup to the Internet. This distance education system allows meeting participants as well as lecturers and students to interact in such activities. The system is effective to disseminate distance education without being hindered by the location barriers, such as places and countries.

2. Research methodology

1.Develop a series of lectures introducing the research topics and expertise of researchers in this project, both Indonesia and Japan sides, and broadcast the lectures to Indonesia and other parts of Asia using the distance education system.

2. Support the environment for remote participations using the Internet for seminars and workshops held by this project.

3. Progress compared with the original schedule

Implemented in FY2009

Provided remote participation environment and real-time streaming for:

"Multi-disciplinary Hazard Reduction Program from Earthquakes and Volcanoes in Indonesia Kick-off Workshop", 21 April 2009.

"International Workshop on Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia and Beyond", 12-13 October 2009.

Implemented in FY2010

Provided remote participation environment and real-time streaming for: "International Workshop on Geodynamics and Disaster Mitigation of West Java", 12-14 July 2010.

Preparing disaster reduction lectures: preparing streaming and recording system and meetings to coordinate the lectures and lecturers.

Implemented in FY2011

Provided remote participation environment and real-time streaming for: "Disaster Management and Climate Change Conference (Coordinating Ministry for People's Welfare) and Indonesia-Japan Workshop on Multi-Disciplinary Hazard Reduction From Earthquakes and Volcanoes in Indonesia", 27-29 October 2011.

Disaster reduction lectures: record 8 lectures by Group 5 members to be uploaded on the web http://soi.asia/.

Group 6: Application of the research and establishment of collaboration mechanism between researchers and the government officials

1. Objectives

Activities of Group 6 aimed to propose a system to apply the research results to policy making by building up synergy among governmental organizations, universities and research institutes. To this end, the role of the Joint Coordination Committee (JCC) of this project, composed of researchers participating in this project and the high-ranking officials of Indonesia's government organizations, was enhanced so as to strengthen the linkage between research activities and policy making while promoting outreach activities.

2. Methodologies

As for the role of the JCC, the linkage between research activities and policy making was discussed and examined by using the Japan's Central Disaster Management Council (CDMC), the Headquarters for Earthquake Research Promotion (HERM) and other institutions in Japan as models. In parallel, Japanese participants also enhanced their understanding about Indonesian institutions and their activities.

3. Achievements

Mechanisms and relevant activities of the CDMC and the HERM were explained in details to Indonesian participants in 2010 thereby enhancing their understanding about ways to apply research results to policy making in Japan. In the wake of the 2011 Great East Japan Earthquake in March, experiences of the said disaster were shared among Japanese and Indonesian participants through various means which included an overview of Japanese Government's response to the Great Eat japan Earthquake, centering on the role the CDMC and HERM.

These activities culminated at the panel discussion titled "From Science to Society", organized as part of Group 6 activities, in Jakarta in October 2011 where the project members agreed on, among others: i) the function of the JCC should be continued or expanded to continue the collaboration between Indonesia and Japan in relevant fields and to enhance the use of research outcomes for policy making in Indonesia, and; ii) the National Disaster Management Agency (BNPB) of the Indonesian Government needs to take the lead and thus should be further involved.

Moreover, outreach activities were implemented through three issues of Newsletter published in both English and Indonesian and a series of TV interviews "IPTEK Talk" broadcast in Indonesia.

Lastly, the high-ranking officials of the Indonesian government organizations, namely, RISTEK, BPPT, BNPB and LIPI, visited various Japanese Government organizations, namely, Japan Metrological Agency (JMA), the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Cabinet Office, and gained further understanding of their activities in March 2012.

4. Impact

As described before, the understanding of activities of the Japan's Central Disaster Management Council and the Earthquake Research Promotion Headquarters was greatly enhanced among Indonesian participants of this project. Moreover, through outreach activities such as Newsletters and TV interviews, the results of this project were widely disseminated. These activities certainly had a significant impact on the ways that Indonesian institutions approach issues of disaster risk reduction by enhancing synergy among governmental organizations, universities and research institutes.

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Awards, Media articles, etc.

(1) Awards

[Japan]

Date	Title / Organization	Recipient of the prize	Group number / Organization	Detail
February 13, 2010	AGU fellow	Kenji Satake	G1	American Geophysical Union
June 26, 2010	5th Yasuhiro Nakasone Prize	Fumihiko Imamura	G3	Institute for International Policy Studies on Web
September 16, 2010	Japan Society for Natural Disaster Science Distinguished Presentation Prize	Kenji Harada	G3	Japan Society for Natural Disaster Science
May 28, 2010	Outstanding Civil Engineering Achievement Award for the paper	S. Koshimura and F. Imamura	G1 and G3	Japanese Society of Civil Engineers
November 9 , 2011	The 2011 Coastal Engineering Awards	S. Koshimura and F. Imamura	G1 and G3	Japanese Society of Civil Engineers

[Indonesia]

Date	Title / Organization	Recipient of the prize	Group number / Organization	Detail
29 Dec, 2009	Model Sekolah Siaga Bencana : antisipasi bencana gempa dan tsunami/LIPI	Deny Hidayati	G4/LIPI	Penelitian terbaik Program Dikti th 2009. Penelitian group, lokasi di Bengkulu 2009 年高等教育総局のベスト研究
29 Dec, 2009	Materi Pendidikan Publik Berbasis Ilmu Pengetahuan Kebumian/LIPI	Munasri	G5/LIPI	Salah satu dari 15 Peneliti Terbaik “Program Insentif Peneliti dan Perekayasa 2009 di Lingkungan LIPI 2009LIPI 集中研究プログラムベスト１５
26 September 2011	Himpunan Ahli Geofisika Indonesia (HAGI)/Indonesian Asscociation of Geophyscists	Hery Harjono	PI/LIPI	HAGI Awarad 2011 for Contribution to Geophysical Knowledge インドネシア地球物理学会賞

14 August 2011	Bintang Jasa Utama / Government of Indoensia	Surono	G2/PVMBG	火山災害から国民を守った功績
18 December 2010	Pawata Reksa Utama / Gaja Madah University	Surono	G2/PVMBG	ガジャマダ大学および社会への貢献
14 February 2011	Narasumber Terbaik 2010/ Radio Elshinta	Surono	G2/PVMBG	2010 年を代表する人物
27 January 2011	Men of the year 2010 / Media Rakyat Merdeka	Surono	G2/PVMBG	The Guard of Nature
2 March 2011	Ganesa Widya Jasa Adiutama / Institute Teknologi Bandung	Surono	G2/PVMBG	科学技術発展の功績

(2) Newspaper report

[Japan]

Date	Title / newspapers	Name of person	Group number / organization	Detail
19 April 2009	Kahoku-Shinpo	F. Imamura, H. Matsutomi and T. Nishimura	G3	International Project began
9 June 2009	Doshin	Y. Nishimura	G1-2	
30 November 2009	The Sankei Shinbun	F. Imamura	G3	
22-31 July 2010	Kyodo News	T. Kato	Project	
29 September 2010	Mainichi Daily News	M. Sugimoto	G3/G5	届け一万人の希望　パダン地震被災地にメッセージ
2 October 2010	The Daily Jakarta Shinbun	F. Imamura, M. Sugimoto		1 万人の祈り、花開くパダン沖地震から 1 年
16 October 2010	Minami-Nihon Shimbun	M. Iguchi	G2-2	
29 October 2011	The Daily Jakarta Shinbun	F. Imamura, K.Satake, M.Iguchi, A.Koresawa	Project	研究成果の発信不可欠 日イ研究者が報告会
19 December 2011	Ishinomaki-Niti niti Shinbun	Y. Goto	G5	Reported the workshop about evacuation held in

				Ishinomaki city
22 December 2011	Jomo Shiinbun	Y. Goto	G5	ditto
18 December 2011	NHK Sendai	Y. Goto	G5	ditto
27 Dcember 2011	The Daily Jakarta Shinbun	H.Yamamoto, Y.Nishi	G4-2	Symposium 7th year memorial Aceh
4 May 2012	The Daily Jakarta Shinbun	K.Satake	Project	Final JCC 日イ総合防災研究が終了

[Indonesia]

Date	News Paper	Title	Contents
2009/8/21	Serambi Indonesia	Pakar Bencana dari Jepang Teliti Alam Aceh	G5 activities
2009/10/8	(Kompas.com) web site	Perubahan iklim membuat gempa menjadi lebih dahsyat	
2009/10/13	News paper (Kompas)	Menyiapkan Aceh dan Padang	Kejadian tsunami di pesisir barat dan utara Sumatera tidak hanya berulang dalam kisaran 200 hingga 300 tahun. Penelitian paleotsunami menemukan bahwa kejadian itu berselang 20 tahun. Hal ini mengharuskan penyiapan masyarakat menghadapi tsunami kapan pun.
2009/10/22	(Kompas.com)web site	LIPI-Jepang ambil sample lapisan	Pusat Penelitian Geoteknologi LIPI bersama peneliti dari Jepang melakukan penggalian untuk mengambil sampel tanah di areal kawasan Patahan Lembang, Kamis (22/10). Menurut peneliti dari Pusat Geoteknologi LIPI Eko Yulianto, penggalian yang dilakukan dengan menggunakan bor khusus milik LIPI ini bertujuan mengumpulkan data mengenai rekaman gerakan Sesar Lembang selama 40 ribu tahun terakhir ini. (Eko Yulianto) G1-1
2009/10/27	(Kompas.com)web site	Ancaman gempa di Jawa diteliti mulai 2009	Mulai tahun 2009, Pulau Jawa menjadi sasaran penelitian kegempaan setelah Pulau Sumatera. Hal tersebut untuk mengantisipasi kemungkinan terjadinya bencana geologi yang berpotensi menimbulkan kerugian materi dan korban jiwa mengingat Pulau Jawa merupakan daerah pata penduduk. (Dr. Hery Harjono)
2009/10/31	News paper (Kompas)	Patahan opak peringatan untuk Lembang	Gempa berkekuatan 5,9 skala *Richter* yang menerjang Bantul dan Klaten pada tahun 2006 diketahui bersumber pada Patahan Opak yang telah lama tertidur. Belajar dari bencana tersebut, perhatian para ilmuwan kini mengarah pada patahan-patahan di Jawa Barat, antara lain Lembang yang melewati permukiman padat.
2009/11/6	(Pirba Ristek – JICA) web site	International Workshop	
2009/12/26	News paper (The Daily Jakarta Shimbun)	Lari ke jembatan Tsunami	Komentar dari Prof. Imamura
2010/1/8	Pikiran Rakyat	Indonesia Mesti Kejar Ketertinggalan Mitigasi	
2010/1/8	Radar Bandung	Pemerintah Indonesia Belum Paham Gempa	

2010/01/23		Lempeng Mentawai Belum Bergerak / Padang Ekspress	The newspaper reported the seminar at Balai Kota Padang presented by Yozo Goto, Kazuhiro Miyatake, Akio Hayashi, and Mulyo Harris Pradono (Yozo Goto & Mulyo Harris Pradono)
2010/01/23		Prediksi Gempa di Padang: Takkan Sebesar di Aceh / PosMetro Padang	The newspaper reported the seminar at Balai Kota Padang presented by Yozo Goto, Kazuhiro Miyatake, Akio Hayashi, and Mulyo Harris Pradono (Yozo Goto & Mulyo Harris Pradono)
2010/2/10	RADAR KEDIRI	Tertarik Kliping Berita Kelud	
2010/3/24	Padan Ekspres	Belajar Mitigasi Gempa pada Negara Jepang: Peringatan Dini Bukanlah Kabar Pertakut	
2010/5/6	Serambi		
2010/07/15	Suara Pembaruan	Penanganan Bencana Kesiapan Pemerintah Rendah	Dalam acara, *International Workshop "Geodynamic and Disaster Mitigation of West Java" di ITB.*
2010/07/15	Suara Merdeka	Ahli Tsunami Usulkan Peta Risiko Rentan Bencana	Dalam acara, *International Workshop "Geodynamic and Disaster Mitigation of West Java" di ITB.*
2010/07/23	AntaraNews	Indonesia – Jepang Gelar Peringatan Rangkaian Tiga Gempa – Tsunami	*International Workshop "Geodynamic and Disaster Mitigation of West Java" di ITB.*Lembaga Earthquake Research Institute, University of Tokyo, Jepang, bersama pihak terkait di Indonesia akan menggelar rangkaian peringatan tiga bencana gempa dan tsunami yang pernah melanda wilayah di dua negara ini.
2010/07/25	The Jakarta Globe	Hope Blooms for Quake Victims in Students' Tribute	Japanese and Indonesian students will commemorate the one-year anniversary of the devastating Sumatra earthquake that killed thousand of people by laying bouquets of paper flowers on September 30.
2010/10/02	Padang Today		G3 Fumihiko Imamura
2010/11/04	detikNews	Istana Fasilitasi Tim Peneliti LIPI dan EOS ke Mentawai untuk pelajari Tsunami	*Joint Survey team to Mentwai.*Istana memfasilitasi tim survey tsunami LIPI dan EOS untuk meneliti tsunami di Kabupaten Mentawai, Sumatera Barat.
2010/11/05	yahooNews	Sembilan Pakar Tsunami Jepang berangkat ke Mentawai	*Joint Survey team to Mentwai.* Sembilan pakar gempa dan tsunami asal Jepang akan berangkat ke Mentawai, Sumatera Barat, tanggal 5 November 2010, untuk melakukan penelitian kondisi Kepulauan Mentawai setelah diguncang gempa 7,2 SR disertai tsunami dengan ketinggian gelombang mencapai 12 meter.
2011/7/22	Radar Malang	Jepang ajari warga ngadas lepas dari bencana Bromo	*Workshop on Town Watching.* Prof.Dr.Ogawa Yujiro dari JICA dan Prof.Bambang Rudiyanto dari Wako member penyadaran kepada warga ngadas dan kerjasama dengan Satrak PB Kab.Malang membuat peta awas bencana.
2011/7/22	Surya	Jepang latih Mitigasi Warga Ngadas	*Workshop on Town Watching.* JICA, LIPI dan Pemkab Malang kerjasama terkaitpelatihan mitigasi bidang volkanologi. Triyono dari JICA dan Prof.Dr.Ogawa Yujiro ahli town watching.
2011/7/23	Surya	Sering Celaka, Jalan Ngadas dilebarkan	*Workshop on Town Watching.* Warga Ngadas petakan bencana disaksikan oleh tim JICA-LIPI.
2011/9/13	Rakyat Merdeka online	Dua Profesor dari jepang Jelaskan Potensi Gempa Selat Sunda *(Bina Graha9/29)*	*Similar caractor Earthquake and Tsunami between Sendai and Sunda straits.* Prof.Kenji Satake dari U Tokyo dan Prof.Tanioka dari U Hokkaido menjelaskan kesamaan karakter kawasan pantai Tohoku dengan kawasan Selat Sunda.

2011/9/28	Rakyat Merdeka online	Besok Tsunami Jepang dan Potensi Gempa Selat Sunda dibicarakan di Istana *(Bina Graha9/29)*	*Similar caractor Earthquake and Tsunami between Sendai and Sunda straits.*Prof.Kenji Satake dari U Tokyo dan Prof.Tanioka dari U Hokkaido akan membedah persamaan tsunami di sendai dan Jepang dengan potensi bencana di Selat Sunda, di Bina Graha Istana Negara Hamzah Latief, Surono, Yusuf Surahman,Mansyur Irsyam, Danny Hilman, I Wayan Sengara
2011/10/02	Rakyat Merdek online	Jepang dan Indonesia punya banyak Kesamaan dalam Penanganan Bencana *(Bina Graha9/29)*	*Similar caractor Earthquake and Tsunami between Sendai and Sunda straits.*Menurut dua pakar dari jepang, Prof.Kenji Satake dari U Tokyo dan Prof.Tanioka dari U Hokkaido, Indonesia perlu mempelajari cara Jepang mitigasi dan menangani bencana, dalam diskusi di Bna graham tgl.29 Sep.
2011/10/26	Suara Pembaruan	Perlu Terapkan Kurikulum Siaga Bencana (G5-1-1 SSB)	ADRC Makoto Ikeda mengungkapkan peran guru untuk mengetahui penanggulangan bencana sangat penting. *G5-1-1 workshop Irina Rafliana*
2011/10/26		G3	Workshop di Kementerian Kelautan dan perikanan, hasil penelitian secara koraborasi dengan pakar dair jepang
2011/10/26	Halo Jepang .com	Kementerian Kelautan & Perikanan Selanggarakan Workshop Mitigasi Tsunami di Jakarta	*Workshop at MoMF.* KKP, JICA, JST selanggarakan workshop mitigashi bencana tsunami, ada paparan dari ahli jepang Prof.Imamura dari Tohoku U, Prof.Matsutomi dari Akita U, dan Prof.Meguro dari Tokyo U
2011/10/28	Pikiran Rakyat	Tingkatkan Sinergi Penanggulangan Bencana *(Bina Graha9/29)*	*Similar caractor Earthquake and Tsunami between Sendai and Sunda straits.* Program kerjasama riset Indonesia-Jepang melibatkan 25 institusi dan perguruan tinggi jepang serta 22 institusi,dipimpin oleh Prof.Kenji Satake dan U Tokyo dan Hery Harjono wakil dari LIPI
2011/9/13	Riau today.com	Dua Ahli Jepang Urai Potensi Gempa Selat Sunda *(Bina Graha9/29)*	Kedua Pakar Prof.Kenji Satake dan Prof.Tanioka menjelaskan karakter kawasan pantai timur Tohoku dengan kawasan selat Sunda dalam pelatihan managemen kebencanaan.
2011/9/28	Pilarnusantara news	Memiliki jalur Gempa *(Bina Graha9/29)*	Dea Pakar Prof.Kenji Satake dan Prof.Tanioka akan jelaskan karakter sendai dan sulat Sunda pada besok di Bina Graha. Yusuf Srahman, Dr.Ridwan, Dr.Surono,Dr.Hamzah,Dr.Mansyur, Dr.Dany Hilman, Iwan Sengara akan hadir.
2011/9/28	Jaring news .com	Kantor Staf Khusus Presiden Bidang Bantuan Social dan Bencana akan melakukan panel diskusi . *(Bina Graha9/29)*	Dea Pakar Prof.Kenji Satake dan Prof.Tanioka akan jelaskan karakter sendai dan sulat Sunda pada besok, ,Dr.Hamzah ,ITB, Dr.Surono, PVMBG juga panelist
2011.9.29	Jaringan news.com	Pakar Gempa Bahas Antisipasi dan Pola Penanganan Gempa *(Bina Graha9/29)*	Prof.Kenji lebih menceritakan bagaimana antisipasi dan pola-pola penagnanan yang perlu dilaksanakan serta peringatan dini akan bahaya tsunami jika terjadi gempa. Kenji Satake, Tanioka, Danny Hilman, Hamzah Latief, Surono
2011.9.29	Rakyat Merdeka online	Dipo Alam Diskusi Soal Gempa *(Bina Graha9/29)*	Menteri sekretaris Kabinet , Dipo Alam didampingi Staf Khusus Presiden Sosial Andi Arief buka acara. Menerut Prof.Kenji struktur badan penanggulangan bencanma di Indonesia hamper sama yang ada di Jepang. Tanioka, Danny Hilman, Hamzah Latief
2011.9.29	Koran Jakarta	Indonesia Butuh Komite Mitigasi Nasional	Perlu dibuat khusus komite yang bias memprediksi gempa dan tsunami agar para ahli tidak ngomong macam-macam dan benar

		Indonesia Need National Commettee for Mitigation. / (Bina Graha9/29)	benar terkoordinasi, kata Andi.Kenji mengatakan semua bentuk peringatan akan percuma jika kesiagaan pemerintah rendah dalam menghadapi bencana. Surono, Kenji Satake, Yusuf Surahman, Mansyur Irsyam, Danny Hilman
2011.10.02	Rakyat Merdeka online	Jepang dan Indonesia Punya Banyak Kesamaan dalam Penanganan Bencana *(Bina Graha9/29)*	Indonesia perlu mempelajari cara Jepang memitigasi dan menangani bencana. Data data disampaikan oleh dua pakar dari jepang prof.Kenji Satake dan Prof.Tanioka
2011.09.28	Bandar Lampung News	Kesamaan Karakter Sendai dan Selat Sunda, Dibahas Istana. *(Bina Graha9/29)*	Kantor Staf Khusus Presiden bidang Bantuan Sosial dan Bencana (SKP BSB)kembali melakukan diskusi dengan pakar gempa dan tsunami. Prof.Kenji Satake dan Prof Tanioka Hamzah Latief, Yusuf Surahman, Mansyur Irsyam, Danny Hilman
2011.10.01	Polotik Indonesia	Seputar Kontroversi Potensi Bencana Selat Sunda *(Bina Graha9/29)*	Terkala kami ,menyampaikan ke berbagai pihak mengenai potensi bencana yang berasal wilayah sekitar selat Sunda, kontroversi bermunculan.Sepakat dengan Prof.Kenji membangun program, Riset prediksi gempa antara ERI dan LIPI Surono, Danny Hilman, Hamzah Latief, kenji Satake
2011.11.13	Koran Jakarta edisi minggu	Menguak Aktivitas Sesar Lembang	Photo; Eko Yulianto and Hery Harjono. Regarding Lembang Fault. LIPI and JICA held workshop at Bandung 2010.June togather with invited stakeholders. Eko yulianto, Hery Harjono, Irwan Meilano
2011.10.31	Tempointeraktif.com	Gempa 6.7 SR Bayangi Lembang	Workshop was organized LIPI and JICA, Jakarta Friday 28th October 2011. Eko Yulianto
2011.10.28	Kompas.com	Pergeseran Sesar Lembang Terungkap	Previous Activities of Lembang fault has reported as result of research at conference and workshop LIPI and JICA on 28 Oct. Eko Yulianto, Irwan Meilano
2011.10.28	Kompas.com	Sesar Cimandiri Diduga Memanjang sampai ke Laut	Cimandiri Fault is long, reach to the Sea. Reported as result of research at conference and workshop LIPI and JICA on 28 Oct. Irwan Meilano
2011.10.28	Viva news .com	Pakar Gempa Kuak Misteri Patahan Lembang	Lembang Fault moved 2000years ago because of big earthquake. Irwan Meilano reported at Workshop"multi disciplinary hazard reduction from earthquake and Vilcano in Inodnesia, IDEC Kemayoran Jakarta Friday 28th, Oct 2011
2011.10.28	Viva news .com	Patahan Lembang Aktif Gempa Ancam .Bandung	Denger is not only big earthquake but ground condition around fault. Result of research in workshop "Multi-Disiplinary Hazard reduction from Earthquake and Vilcano in Indonesia, at Jakarta International Expo
2011.10.27	Tribun news.com	LIPI Bekerjasama Denagn Jepang Kurangi Efek Gempa	Joint Research Program Indonesia –Japan, consist of 25 Indonesian institue and 22 Japanese institute, organized by RISTEK LIPI JICA and JST. Hery Harjono, Satake Kenji
2011.10.29	Media Indonesia	Proyek Jembatan Selat Sunda harus Perhatikan Faktor Gempa	Based on result of research we should pay attension to construction of Sunda Strait bridge, there are risk of earthquakes.mentioned at workshop on 28th Irwan Meilano, Hery Harjono
2011.10.28	Jurnas.com	Jepang Gandeng Indonesia Teliti Gempa	Indonesia and Japan work together scince 2009 for joint reaearch for earthquakes. Hery Harjono, Irwan Meilano
2011.10.28	Pkiran Rakyat	Tingkatkan Sinergi	Improve sinergi for disaster mitigation. To

		penanggulangan Bencana	explain IDEC Expo, and LIPI implement project " Multi-disiplinary Hazard Reduction from Earthquke and volcano in Indonesia , RISTEK and LIPI work together with JICA ,JST. Hery Harjono, Satake Kenji
2011.10.27	Okezone.com	Ancaman Gempa 8 SR di bandung Belum Bisa Diprediksi	Still we can't make prediction toword 8 SR Earthquake in Bandung Area. LIPI implemented joint research with Japan regarding 3 fault, Lembang, Cimandiri, and Baribis. Hery Harjono
2011.10.28	Harian Semarang	Gempa Besar Acam Bandung	Result of research was presented on workshop "Multi-disiplinary Hazard reduction from Earthquake and Volcano in Indonesia" Kemayoran Jakarta on 28th Oct. researchers from LIPI, JICA and RISTEK. Irwan Meilano
2011.10.29	KONTAN (Kelompok Kompas Gramedia)	Bandung di Bawah Ancaman Gempa Bumi	Lembang Fault still active. Risk of earthquake and effect to Bandung is big impact.ITB work together with JICA and JST to continue GPS survey around Lembang Fault. Eko Yulianto, Irwan Meilano
2011.12.27	Serambi Indonesia	Simposium Internasional dan Workshop tentang Warisan Bencana serta Upaya Ekonomi Kreatif	G4-2 activity for the international symposium and workshop on inheritence of disaster and efforts for creative economy
2011.12.28	Harian Aceh	Tsunami Mobile Museum Oleh-oleh Jepang untuk Aceh	G4-2 activity for Tsunami Mobile Museum: Japanese people for Aceh
2012.05.01	Vivanews.com	Hasil Penelitian Bencana RI-Jepang Dikuak	After Final JCC, LIPI held press conference with participants of JCC

Others (TV program, etc.)

NHK ,OHAYO NIPPON intoruduce Project on May 2009

NHK Special: taped and televised on March 2010. G1-5: Kenji Hirata

Talkshow Iptek Talk TVRI NASIONAL: interviewed on 24 June 2010 and televised in early August. G1: H.Z. Abidin and T. Kato

Talkshow Iptek Talk TVRI NASIONAL: interviewed on xx xxx 2010 and televised on 3 October 2010. G2: Surono and M. Iguchi

Kagoshima Yomiuri TV: Expedition of volcanic eruption of Mt. Sinabun (G2-2, G2-4), televised on 8, 9, and 10 November 2010.

NHK news, report of Tsunami survey around Mentawai Islands 12th November 2010

NHK news, report of workshop at Kobe 22nd November 2010

Radio Program, Dialog Pagi Seputar Kebencanaan 18th August, 2011 H. Yamamoto and Y. Nishi (G4-2)

Radio Program, Dialog Pagi Seputar Kebencanaan 22ndDecember, 2011 H. Yamamoto and Y. Nishi (G4-2)

Talkshow Iptek Talk TVRI NASIONAL: televised on 19 September 2011: Deny Hidayati (G4-1), and H. Yamamoto and Y. Nishi (G4-2)

Talkshow Iptek Talk TVRI NASIONAL: televised on 10 October 2011: Bagyo, and H.Matsutomi (G3)

Talkshow Iptek Talk TVRI NASIONAL: televised on 24 October 2011: Hery Harjono, and K.Satake (PI)

NHK Radio; report coraborative research for natural disaster in Indonesia, 6th April 2012

(3) Workshops, Symposiums, etc.

Date	Name	Place (Country)	Number of attendee （Nubmer of invited attendee from CP）	Outline
<Plenary meeting>				
20 April 2009	Joint Coordination Committee meeting	Jakarta (Indonesia)	27 (15)	Explanation of outline of the project and discussion
20 April 2009	2nd Group Leader Meeting	Jakarta (Indonesia)	16 (8)	Discussion of total plan, group plan, plenary meeting, etc.
21 April 2009	Kick-off Workshop	Bandung (Indonesia)	59 (27)	Introduction of research plan from each subgroups and panel discussion (Internet conference connected between Tokyo and Bandung)
11-14 October 2009	1st International Workshop	Aceh (Indonesia)	About 50 (about 25)	The first plenary research conference. Introduction of plan and results from each subgroups. Participation to the tsunami drill after the conference.
8 January 2010	3rd Plenary Meeting for Japanese members	Earthq. Res. Inst.	43	Discussion on the whole aspects of the project
22 March 2010	3rd Group Leader Meeting	Jakarta (Indonesia)	16 (8)	Report of research activity in 2009 and discussion on the action plans in 2010
22 March 2010	Joint Coordination Committee Meeting	Jakarta (Indonesia)	33 (18)	Report of research activity in 2009 and discussion on the action plans in 2010, and their approvals.
29 May 2010	4th Group Leader Meeting	Makuhari, Chiba (Japan)	29 (11)	Report of each group and remarks on the progress of researches. Discussion on meetings in July and in November.
8 September 2010	Group Leader Meeting by Japanese members	Earthq. Res. Inst. (Japan)	15 (0)	Discussion and remarks on ppended budget, midterm evaluation of the project, WS in November, etc.
22 November 2010	5th Group Leader Meeting by Japanese members	JICA Hyogo (Japan)		
22-25 November 2010	2nd International Workshop	JICA Hyogo (Japan)		

<G1>				
21-22 December 2009	Japan-Indonesia workshop on geology and tectonics offshore of Sumatra	Tsukuba City (Japan)	3	Discussion on the newly obtained sea-floor topography and other existing deata.
29 January 2009	Joint Meeting of 1-2 and 1-6 of the JICA-JST Indonesia Project	Hokkaido Univ., Enreisou 1st Meeting Rm. (Japan)	13 (8 Japanese and 5 Indonesian)	Introduction of results obtained in the year and discussion on the plan next year.
12-13 July 2010	International Workshop on Geodynamics and Disaster Mitigation of West Java	Auditorium of ITB, Bandung, Indonesia	About 90 (5 countries)	Presentation on results from researches in the west Java including Bandung area, together with discussion of future plan.
10-11 March 2011	International workshop on Subduction processes, tectonics, and related topics along the Sumatra-Java arc	Atmosphere and Ocean Research Institue, Univ. of Tokyo, 2F Meeting Rm.	About 30 (5 countries)	Presentations on results from international offshore researches off Sumatra and west Java, with discussions of future plan (the WS ended at 14:46 of 11 March)
<G4>				
26 September 2009	Joint Research Workshop among Physics, Disaster Prevention and Regional studies "Synthetic approach toward earthquake disaster prevention and recovery – case study of 2009 Java earthquake –"	Earthq. Res. Inst.	About 20 (only Japanese)	Imminent research reports on the September 2nd South-off-Java earthquake
25 November 2009	Bridging between field of support and laboratory – gender, community and information for the 2009 September West Java earthquake -	No. 18 Bld. Hall, Comaba campus, Univ. Tokyo	About 40 (only Japanese)	Imminent meeting on September 30, 2009, west Sumatra earthquake (sponsored by the Japan Society for Southeast Asian Studies)
7 June 2010	Japan Society for Southeast Asian Studies, No. 83 General Meeting, Panel "Academic Research and humanitarian support"	Aichi University	About 30	Symposium on recovery process from the September 30 West Sumatra earthquake by the researchers and practitioners

16 March 2011	Workshop Dissemination of Fieldwork Results	Facultas Geografi, Universitas Gadjah Mada	About 55	The results of the G4-1 collaborative field researches in Bantul, Yogyakarta, inviting students, public officers and local people
21-25 December 2011	Disaster Heritage and Creative Economy: From Perspective of Area Informatics	Syiah Kuala University	600	To introduce the online mapping system on disaster information developed by Group 4-2 and to discuss how to apply area studies and area informatics into local-based disaster management .

<G5>				
9 December, 2009	Training of teachers and discussion on disaster mitigation	The First Junior High School of Banda Aceh	Elementary and Junior high school teachers, and school board members of Banda Aceh City	Capacity building of teachers on disaster mitigation and discussion
8 December 2009	Training on Disaster Awareness Upgrading Program using People's Participatory Approach ("Disaster Prevention Town Watching Method")	TDMRC, Syiah Kuala Univ., Banda Aceh	School board members and teachers	Training on the method of "Disaster Prevention Town Watching"
9 December 2009	"Disaster Prevention Town Watching Method" field training	The First Junior High School of Banda Aceh	30 students	Training of the Disaster Prevention Town Watching Method by the TDMRC staff members
8-9 December 2009	School education using tsunami evacuation simulation	Two elementary, two junior high and two high schools in Banda Aceh	220 students and 6 teachers	Training on early and effective evacuation using the first version of tsunami evacuation simulation animation
23 February to 8 March 2010	Technical workshop for Indonesian distance learning environment operators			Workshop for training Indonesian engineer of maintaining distance learning environment operations
14-23 March 2010	Training of researchers of Syiah Kuala Univ.	Kamaishi City Sanriku coast Eartq. Res. Inst.	Lecturer of Syiah Kuala University	Training of utilizing tsunami evacuation simulation, visiting

	in Japan	Tohoku Univ. AIST etc.		tsunami disaster mitigation system and facilities, method of developments of tsunami evacuation simulation
1 August 2010	Group 5 Meeting	TDMRC, Syiah Kuala Univ.	Japanese and Indonesian group members	Plenary meeting for Group 5, approval of future action plans
2-3 August 2010	Workshop on Disaster Mitigation Education	TDMRC, Syiah Kuala Univ.	About 30 teachers	Simulation on roles at the time of disaster and discussion on appropriate handling method for such occations.
3 August 2010	"Disaster Prevention Town Watching Method" training	The First Junior High School of Banda Aceh	About 10 teachers	Training on mapping of dangerous areas at the time of earthquake and tsunami in and around the elementary school using the "Disaster Prevention Town Watching Method"and discussion on countermeasures
3 August 2010	Seminar of Usage of developed CD on tsunami evacuation simulation program	The Eleventh Junior High School of Banda Aceh	18 teachers and 3 employee of city hall	Distribution of tsunami evacuation simulation CD and training how make it and explanation of CD. Training of how to use the simulaton.
3 August 2010	Model lecture of developed CD on tsunami evacuation simulation program	The Eleventh Junior High School of Banda Aceh	50 junior high school students, 18 teachers and 3 employee of city hall	Model lectures on tsunami evacuation simulation.
5 August 2010	Introductory Seminar on tsunami evacuation simulation in Meulaboh	Conference Room of Meulaboh City Hall	23	Introduction of project and tsunami evacuation simulation
November 2010	Group 5 consolidation & planning meeting	TDMRC Syiahkuala University Banda Aceh	10 persons	Group planning for December 2010 and following year on 2011
October 2011	Tsunami Evacuation Simulation Development as Community Preparedness Development Model in High Risk	TDMRC	15 persons	Introduction of the development of tsunami evacuation simulation by SATRESPS project and discussion on the research plan

	Area			
October 2011	G.5.1.1	LIPI Jakarta	25 persons	National Workshop on Lesson from Banda Aceh School Based Prepardness and Improvement of School Preparedness Guidebook
January 2012	Third G1.6-G5.1.3 Joint meeting	PPKPL Laboratory, ITB, Bandung	15 persons	1) Research planning in disaster field for this year and years to come, etc.

Appendix 1:

MINUTES OF MEETINGS
BETWEEN JAPANESE DETAILED PLANNING SURVEY TEAM
AND AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
ON JAPANESE TECHNICAL COOPERATION FOR
MULTI-DISCIPLINARY HAZARD REDUCTION FROM
EARTHQUAKES AND VOLCANOES IN INDONESIA

In response to the request of the Government of Republic of Indonesia (hereinafter referred to as "GOI"), the Japanese Detailed Planning Survey Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Michio Kanda, visited the Republic of Indonesia from Dec.1 to Dec 15, 2008 for the purpose of clarifying the framework of the technical cooperation for Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia (hereinafter referred to as "the Project") in the Republic of Indonesia.

During its stay in the Republic of Indonesia, the Team exchanged views and had a series of discussions with the Indonesian authorities concerned with respect to desirable measures to be taken by JICA and the Indonesian Government for the successful implementation of the Project.

As a result of the discussions, the Team and the Indonesian authorities concerned agreed on the matters referred to in the document attached hereto.

Jakarta, December 10, 2008

Mr. Michio Kanda
Leader,
Japanese Detailed Planning Survey Team
Japan International Cooperation Agency
Japan

Dr. Iwan Suhardi
Deputy State Minister for Utilization and Dissemination of Science and Technology
State Ministry of Research and Technology
(RISTEK)
Republic of Indonesia

ATTACHED DOCUMENT

I. Summary of the Project

In this project, five research themes listed hellow will be conducted;

(1) Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations,

(2) Short-term and long-term prediction of volcanic eruptions and development of their evaluation method,

(3) Establishment of social infrastructure based on engineering developments,

(4) Mitigation of social vulnerability against geo-hazards, and,

(5) Education and outreach for disaster reduction

Through the Project activities, self-sustaining collaboration mechanisms between researchers, as well as government officials, will be activated.

II. The Framework and the Master Plan of the Project

The Project will be carried out under normal procedure of a technical cooperation between two governments. During the meetings, the Team and the Indonesian respective authorities discussed and confirmed the framework of the Project as follows;

1. Title of the Project

Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia

2. Project Implementing Agency

(1) Indonesian side;

1) State Ministry of Research and Technology (RISTEK)
2) Indonesian Institute of Science (LIPI)
3) Ministry of National Education (DIKNAS) coordinating Syiah Kuala University (Unsyiah), Andalas University (Unand), Gadjah Mada University (UGM), University of Indonesia (UI), Brawijaya University (Unibraw), Sam Ratulangi University (Unsrat), Hasanuddin University (Unhas), State University of Jakarta (UNJ)
4) Ministry of Energy and Mineral Resources (ESDM)
5) Ministry of Marine Affairs and Fisheries (DKP)
6) Ministry of Communication and Information Technology (KOMINFO)
7) Ministry of Public Works (PU)
8) Ministry of Home Affairs (DEPDAGRI)
9) Agency for the Assessment and Application of Technology (BPPT)
10) National Agency for Disaster Management (BNPB)
11) Agency for Meteorology, Climatology and Geophysics (BMKG)
12) National Coordinating Agency for Surveys and Mapping (BAKOSURTANAL)
13) Institute of Technology Bandung (ITB)

(2) Japanese side;

JICA will cooperate the implementation of the Project.

3. Beneficiaries

Indonesian counterpart personnel who are assigned to the Project will be the direct beneficiaries.

The project is expected to increase resilience of society in Indonesia and it will be in-direct beneficiaries.

4. Cooperation Period of the Project

The cooperation period will be three (3) years.

5. The Master Plan of the Project

Overall goal

To enhance capabilities on disaster prediction and community preparedness to earthquakes, tsunamis and volcanic hazards for resilient society

Project purpose

To strengthen the platform of collaboration among researchers and officials concerned for disaster risk reduction.

Outputs

1. Scientific understanding of crustal deformation related to earthquake, tsunami hazard are increased.
2. Short term and long term prediction of volcanic eruption is developed.
3. Better infrastructures based on engineering development are planned.
4. Community preparedness to mitigate social vulnerability is promoted.
5. Application of the research and establishment of collaboration mechanism between researchers and the government officials are promoted.

Activities

1-1. Study of historical earthquakes based on active fault surveys
1-2. Study of historical earthquakes based on tsunami deposit and coastal geology
1-3. Crustal deformation monitoring using space geodesy and gravity
1-4. Study on strong ground motion prediction
1-5. Investigation of submarine active faults
1-6. Prediction of tsunami using numerical simulations
2-1. Research on Mechanism of explosive eruption and its prediction – case study in Semeru
2-2. Research on Mid- and long-term forecasts of volcanic eruption and tectonic environments – in Central
2-3. Geological evaluation of frequency and process of caldera-forming eruption
2-4. Proposal of evaluation method of volcanic activity
3-1. Effective use of tsunami hazard map
3-2. Reduction of tsunami damage through the practical use of vegetation
3-3. Technology development for mitigating hazards due to liquefaction
3-4. Improvement of building code and development of earthquake-proof construction
4-1. To strengthen community based disaster preparedness mechanism
4-2. Investigation of community based disaster prevention and restoration based on cultural background
4-3. Development of long term recovery framework from natural disasters
4-4. Study on warning dissemination and residents' psychological process under natural disasters
5-1. Study on platform for practical synergy among researchers, governments and practitioners*
5-2. Development of effective disaster education program at school and effective disaster awareness raising program and collaborations with local governments and teachers
5-3. Research on effective methodology for collecting and diffusing of disaster lessons
5-4. Experiment and deployment of disaster management education on internet

*Activity "5-1" will be examined further in implementation before the commencement of the Project.

III. Measures to be taken by both sides

For the implementation of the Project, both sides will take the following necessary measures.

1. Japanese Side

(1) Dispatch of experts

JICA will dispatch experts in the following fields.

- Project Leader
- Project coordinator
- Study of historical earthquakes based on active fault surveys
- Study of historical earthquakes based on tsunami deposit and coastal geology
- Crustal deformation monitoring using space geodesy and gravity
- Study on strong ground motion prediction in Indonesia

- Investigation of submarine active faults
- Prediction of tsunami using numerical simulations
- Research on Mechanism of explosive eruption and its prediction – case study in Semeru
- Mid- and long term forecasts of volcanic eruption and tectonic environments – in Guntur
- Geological evaluation of frequency and process of caldera-forming eruption
- Proposal of evaluation method of volcanic activity
- Making Effective use of tsunami hazard map
  Reduction of tsunami damage due to the practical use of vegetation
  Technology development for mitigating hazards due to liquefaction
- Improvement of building code and development of earthquake-proof construction
- To establish community-based disaster preparedness mechanism
- Investigation of community based disaster prevention and restoration based on cultural background
- Development of long term recovery framework from natural disasters
- Study on warning dissemination and resident' psychological process under natural disasters
- Development of effective synergy among researchers, governments and practitioners through symposiums and workshops
- Development of effective education program and collaborations with local governments and teachers
- Research on effective methodology for collecting and diffusing of disaster lessons
- Experiment and deployment of disaster management education over the internet

(2) Training of Indonesian Personnel in Japan
JICA will receive Indonesian personnel connected with the Project for technical trainings in Japan. RISTEK will endorse the training requests from Indonesian side

(3) Provision of equipment
The equipments necessary for the effective implementation of the Project will be considered to provide within the budget allocated for the Project.

2. Indonesian Side

(1) Assignment of counterpart personnel
The Indonesian side shall assign a sufficient number of capable counterpart personnel including administrative staff in order to assure effective implementation of the Project.

(2) Provision of office space and facilities
The office space and its facilities in LIPI shall be provided.

(3) Allocation of budget
The following items will be allocated by the Indonesian side to maintain effective implementation of the Project.
a) Salaries and other allowances for the Indonesian counterpart personnel and other staff
b) Expenses for utilities such as electricity, fixed telephone line, internet and water.
c) Expenses for custom clearance, storage and domestic transportation of the equipment provided based on request of Indonesian side.
d) Expenses for maintenance of the equipment provided based on request of Indonesian side.
e) Other contingency expenses related to the Project

(4) Arrangement for field survey
Necessary arrangement for agreed field survey will be prepared by Indonesian side.

IV. Administration of the Project

For effective implementation of the Project, Indonesian side will assign the Project Supervisor and the Project Director while Japanese side will assign the Project Leader.

1. Project Supervisor

Dr. Iswan Sukardi (Deputy State Minister for Utilization and Dissemination of Science and Technology, RISTEK) will supervise and coordinate the overall Project as the chairperson of the Joint Coordinating Committee.

2. Project Director

Dr. Hery Harjono (Deputy Chairman of Earth Sciences, LIPI) will be responsible for the overall administration, managerial and technical matters in the implementation of the Project as the Project Director.

V. Joint Coordinating Committee

1. Functions

A Joint Coordinating Committee will be organized. The committee meeting will be held at least once a year and whenever need arises.

The functions of the Committee are as follow.

(1) To supervise the annual work plan of the Project in line with the Plan of Operations.
(2) To review the annual and overall progress of the Project and to evaluate the accomplishment of the annual targets and achievement of the objectives.
(3) To find out proper ways and means for solution of the major issues arising from or in connection with the Project.

2. Composition of the Committee

(1) Chairperson

Project Supervisor will be the chairperson.

(2)Members

a) Indonesian Side

Representatives of Ministries and Institutions stated in II.2.(1) (Project Implementing Agency).

b) Japanese Side

1. Representative(s) of JICA Indonesia Office
2. Project Leader
3. Other Japanese experts
4. Member(s) of missions dispatched by JICA
5. Official(s) of the Embassy of Japan may attend the Committee meetings as observer(s).

Other officials of appointed by the Project Leader may attend the committee meetings as observer.

VI. Science and Technology Research Partnership for Sustainable Development

Both sides noted that the Project is implemented under the Science and Technology Research Partnership for Sustainable Development promoted by JICA and Japan Science and Technology Agency (hereinafter referred to as "JST") in collaboration.

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

VII. Memorandum of Understanding between Japanese and Indonesian Research Institutes

For effective and smooth implementation of the Project, Japanese representative research institute in which the Project Leader belongs and Indonesian representative research institute in

which the Project Director belongs will have the "Memorandum of Understanding" for intellectual property and other necessary matters in accordance with the Master plan of the Project.

VIII. Capacity Building

During the discussion, Indonesian side, especially LIPI, ESDM and ITB emphasized the necessity of capacity building of younger lecturer or researcher through the implementation of the Project.

IX. Following steps

1. Formal document for the implementation of the Project (Record of Discussion) will be signed between JICA Indonesia Office and RISTEK before the end of March 2009.
2. Indonesian side will submit the counterpart personnel list before the signing of the R/D.

ANNEX Attendant List

ANNEX ATTENDANT LIST

Indonesian side:

Dr. Idwan Suhardi
Deputy State Minister for Utilization and Dissemination of Science and Technology, RISTEK

Dr. Tegoh Raharjo
Deputy State Minister for Science and Technology Program, RISTEK

Dr. Paristiyono
Assistant to Deputy Minister for Promotion and Commercialization of Science and Technology / Head of Information Center on Research on Natural Disaster, RISTEK

Mr. Edie Prihantoro
Assistant to Deputy Minister for Analysis of Science and Technology Needs, RISTEK

Dr. Lukman Hakim
Vice Chairman, LIPI

Dr. Hery Harjono
Deputy Chairman for Earth Sciences, LIPI

Dr. Dany Hidayati,
Research Center for Population, LIPI

Dr. Danny Hilman Natawigjaya
Research Center for Geotechnology, LIPI

Dr. Jana T. Anggadiredja,
Deputy Chairman for Technology for Natural Resources Assessment, BPPT

Dr. Ir. Yusuf S. Djajadihardja
Director of Center for Natural Resources Inventory Section, BPPT

Dr. Suroso
Head of Center for Volcanology and Geological Hazard Mitigation Geological Agency, PVMGB, ESDM

Dr. Hasanuddin Z. Abidin
Professor and Head of Geodesy Research Division, ITB

Japanese side:

Mr. Michio Kanda
Detailed Planning Survey Team, JICA

Mr. Satoru Murata,
Detailed Planning Survey Team, JICA

Mr. Chiaki Kobayashi,
Detailed Planning Survey Team, JICA

Dr. Kenji Satake
Detailed Planning Survey Team, JICA
(Professor of the Earthquake Research Institute, University of Tokyo)

Mr. Toyomitsu Terao
Detailed Planning Survey Team, JICA

Mr. Yoshitaka Yamazaki
Detailed Planning Survey Team, JICA

Dr. Yoshimori Honkura
Program Officer in the research area of Natural Disaster Prevention, JST
(Professor at Tokyo Institute of Technology)

Mr. Masahiro Kumeta
Manager for Research Partnership for Sustainable Development, JST

Dr. Kuniehi Tsuchiya
Assistant for Program Officer, JST

Mr. Hiroshi Takahayashi
JICA Indonesia Office

7

Appendix 2:

RECORD OF DISCUSSIONS
BETWEEN JAPAN INTERNATIONAL COOPERATION AGENCY
AND AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
ON JAPANESE TECHNICAL COOPERATION FOR
MULTI-DISCIPLINARY HAZARD REDUCTION FROM
EARTHQUAKES AND VOLCANOES IN INDONESIA

Japan International Cooperation Agency (hereinafter to as "JICA") had a series of discussions through JICA office in the Republic of Indonesia with the Indonesian authorities concerned with respect to desirable measures to be taken by JICA and authorities concerned of he Government of the Republic of Indonesia for the successful implementation of the Project for Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia.

As a result of the discussions, JICA and the Indonesian authorities concerned agreed on the matters referred to in the document attached hereto.

Jakarta, May 22 2009

Mr. Takashi Sakamoto
Chief Representative
Indonesia Office
Japan International Cooperation Agency
(JICA)

Dr. Idwan Suhardi
Deputy State Minister for Utilization and
Dissemination of Science and Technology
State Ministry of Research and Technology
(RISTEK)
Republic of Indonesia

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN JICA AND THE AUTHORITIES CONCERNED OF THE INDONESIAN GOVERNMENT

1. The authorities concerned of the Government of the Republic of Indonesia will implement Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia (hereinafter referred to as "the Project") in cooperation with JICA.

2. Japanese detailed planning survey team and authorities concerned of the Government of the Republic of Indonesia agreed on the Minutes of Meeting dated December 10, 2008 as a memorandum of the discussion. The Record of Discussion is the official agreement on the Project between JICA and authorities concerned of the Government of the Republic of Indonesia based on the Minutes of Meeting.

3. The authorities concerned of the Government of the Republic of Indonesia and JICA reaffirm the technologies and knowledge acquired by the collaborative research activities under Japanese technical cooperation will contribute to the improvement of disaster management of both countries.

4. The Project will be implemented in accordance with the Master Plan, which is given in Annex I.

II. MEASURES TO BE TAKEN BY JICA

In accordance with the laws and regulations in force in Japan, JICA will take, at its own expense, the following measures according to the normal procedures under the Colombo Plan Technical Cooperation Scheme.

1. DISPATCH OF JAPANESE EXPERTS
JICA will provide the services of the Japanese experts as listed in Annex II.

2. PROVISION OF MACHINERY AND EQUIPMENT
JICA will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project

as listed in Annex III. The Equipment will become the property of the authorities concerned of the Government of the Republic of Indonesia upon being delivered C.I.F. (cost, insurance and freight) to the Indonesian authorities concerned at the ports and/or airports of disembarkation.

3. TRAINING OF INDONESIAN PERSONNEL IN JAPAN

JICA will receive the Indonesian personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF INDONESIA

1. The authorities concerned of the Government of the Republic of Indonesia will take necessary measures to ensure that the self reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through full and active involvement in the Project by all related authorities, beneficiary groups and institutions. The self reliant operation includes budgetary measures, personnel planning and planning of machinery and materials.

2. While experts from both countries obtained technologies and knowledge from the Project, the authorities concerned of the Government of Republic of Indonesia will ensure that the Project will contribute to the economic and social development of the Republic of Indonesia.

3. The Indonesian authorities concerned ensure to take necessary measures the Government of the Republic of Indonesia to grant in the Republic of Indonesia privileges, exemptions and benefits to the Japanese experts referred to in II-1 above and their families, which are no less favorable than those accorded to experts of third countries working in the Republic of Indonesia under the Colombo Plan Technical Cooperation Scheme.

4. The authorities concerned of the Government of the Republic of Indonesia will ensure that the Equipment referred to in II-2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts

referred to in Annex II.

5. The authorities concerned of the Government of the Republic of Indonesia will take necessary measures to ensure that the knowledge and experience acquired by the Indonesian personnel from technical training in Japan will be utilized effectively in the implementation of the Project.

6. In accordance with the laws and regulations in force in the Republic of Indonesia, the authorities concerned of the Government of the Republic of Indonesia will take necessary measures to provide at its own expense:
   (1) Services of the Indonesian counterpart personnel and administrative personnel as listed in Annex IV;
   (2) Office space and its facilities which are provided for the Project;
   (3) Supply or replacement of machinery, equipment, instruments, tools, spare-parts and any other materials necessary for the implementation of the Project other than the Equipment provided by JICA under II-2 above;

7. In accordance with the laws and regulations in force in the Republic of Indonesia, the authorities concerned of the Government of the Republic of Indonesia will take necessary measures to meet:
   (1) Expenses necessary for transportation within the Republic of Indonesia of the Equipment referred to in II-2 above as well as for the installation, operation and maintenance thereof;
   (2) Customs duties, internal taxes and any other charges, imposed in the Republic of Indonesia on the Equipment referred to in II-2 above; and
   (3) Running expenses necessary for the implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

1. Deputy State Minister for Utilization and Dissemination of Science and Technology, State Ministry of Science and Technology (RISTEK) will supervise and coordinate the overall Project as the Project Supervisor and chairperson of the Joint Coordinating Committee.

2. Deputy Chairman of Earth Sciences, Indonesian Institute of Science will be

responsible for the overall administration, managerial and technical matters in the implementation of the Project as the Project Director.

3. The Japanese and Indonesian Team Leader will provide necessary recommendations and advice to the Project Supervisor and the Project Director on any matters pertaining to the implementation of the Project.

4. The Japanese experts will work with Indonesian counterpart personnel for the implementation of the Project by sharing the necessary technical knowledge and experiences.

5. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex V.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly through Joint Coordination Committee.

VI. CLAIMS AGAINST JAPANESE EXPERTS

The Indonesian authorities concerned ensure to take necessary measures the Government of the Republic of Indonesia to undertake to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Indonesia except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VII. MUTUAL CONSULTATION

JICA and the authorities concerned of the Indonesian Government will promote mutual consultation through Joint Coordination Committee on any major issues arising from, or in connection with this Attached Document. Technical issues will be discussed within each research group facilitated by the Project secretariat.

VIII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

JICA and the authorities concerned of the Indonesian Government will carry out the promotion of the joint activities both in Indonesia and world-wide. The authorities concerned of the Government of the Republic of Indonesia will take appropriate measures to make the Project widely known to the people of the Republic of Indonesia.

IX. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be three (3) years from April 2009.

ANNEX I	MASTER PLAN
ANNEX II	LIST OF JAPANESE EXPERTS
ANNEX III	LIST OF MACHINERY AND EQUIPMENT
ANNEX IV	LIST OF INDONESIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL
ANNEX V	JOINT COORDINATING COMMITTEE
ANNEX VI	PLAN OF OPERATION

ANNEX I MASTER PLAN

1. Overall Goal

To enhance capabilities on disaster prediction and community preparedness to earthquakes, tsunamis and volcanic hazards for resilient society

2. Project Purpose

To strengthen the platform of collaboration among researchers and officials concerned for disaster risk reduction

3. Outputs

(1) Scientific understanding of crustal deformation related to earthquake, tsunami hazard are increased.
(2) Short term and long term prediction of volcanic eruption is developed.
(3) Better infrastructures based on engineering development are planned.
(4) Community preparedness to mitigate social vulnerability is promoted.
(5) Application of the research and establishment of collaboration mechanism between researchers and the government officials are promoted.

4. Activities

(1-1) Study of historical earthquakes based on active fault surveys
(1-2) Study of historical earthquakes based on tsunami deposit and coastal geology
(1-3) Crustal deformation monitoring using space geodesy and gravity
(1-4) Study on strong ground motion prediction
(1-5) Investigation of submarine active faults
(1-6) Prediction of tsunami using numerical simulations
(2-1) Research on Mechanism of explosive eruption and its prediction – case study in Semeru
(2-2) Research on Mid- and long-term forecasts of volcanic eruption and tectonic environments – in Gculur
(2-3) Geological evaluation of frequency and process of caldera-forming eruption
(2-4) Proposal of evaluation method of volcanic activity
(3-1) Effective use of tsunami hazard map
(3-2) Reduction of tsunami damage through the practical use of vegetation
(3-3) Technology development for mitigating hazards due to liquefaction
(3-4) Improvement of building code and development of earthquake-proof

construction

(4-1) To strengthen community-based disaster preparedness mechanism

(4-2) Investigation of community based disaster prevention and restoration based on cultural background

(4-3) Development of long term recovery framework from natural disasters

(4-4) Study on warning dissemination and resident' psychological process under natural disasters

(5-1) Development of effective disaster education program at school and effective disaster awareness raising program and collaborations with local governments and teachers

(5-2) Research on effective methodology for collecting and diffusing of disaster lessons

(5-3) Experiment and deployment of disaster management education on internet

(6-1) Application of the research and establishment of collaboration mechanism between researchers and the government officials

ANNEX II LIST OF JAPANESE EXPERTS

Japanese Experts will be dispatched as following fields:

- Project Leader
- Project coordinator
- Study of historical earthquakes based on active fault surveys
- Study of historical earthquakes based on tsunami deposit and coastal geology
- Crustal deformation monitoring using space geodesy and gravity
- Study on strong ground motion prediction in Indonesia
- Investigation of submarine active faults
- Prediction of tsunami using numerical simulations
- Research on Mechanism of explosive eruption and its prediction – case study in Semeru
- Mid- and long-term forecasts of volcanic eruption and tectonic environments – in Guntur
- Geological evaluation of frequency and process of caldera-forming eruption
- Proposal of evaluation method of volcanic activity
- Making Effective use of tsunami hazard map
- Reduction of tsunami damage due to the practical use of vegetation
- Technology development for mitigating hazards due to liquefaction
- Improvement of building code and development of earthquake-proof construction
- To establish community-based disaster preparedness mechanism
- Investigation of community based disaster prevention and restoration based on cultural background
- Development of long term recovery framework from natural disasters
-Study on warning dissemination and resident' psychological process under natural disasters
-Development of effective education program and collaborations with local governments and teachers
- Research on effective methodology for collecting and diffusing of disaster lessons
- Experiment and deployment of disaster management education over the internet
- Application of the research and establishment of collaboration mechanism between researchers and the government officials

ANNEX III LIST OF MACHINERY AND EQUIPMENT

1. Observation Equipments

-GPS System

-Tilt meter

-Digital Tilt Sensor

-Angle meter

-Accelerometer

-Earthquake sensor

-Data Logger

-Data Recorder

2. Analytical Equipments

-Personal Computers and related software and devices such as printer, data scanner, and etc.

ANNEX IV

LIST OF INDONESIAN COUNTERPARTS AND ADMINISTRATIVE PERSONNELS

1. Overall responsibility for the administration and implementation of the Project
Deputy State Minister for Utilization and Dissemination of Science and Technology, State Ministry of Science and Technology (RISTEK)

2. Responsibility for managerial and technical matters of the Project
Deputy Chairman of Earth Sciences, Indonesia Institute of Science

3. Counterpart institutions for technical positions
- State Ministry of Research and Technology (RISTEK)
- Indonesian Institute of Science (LIPI)
- Ministry of National Education (DIKNAS) coordinating Syiah Kuala University (Unsyiah), Andalas University (Unand), Gadjah Mada University (UGM), University of Indonesia (UI), Brawijaya University (Unibraw), Sam Ratulangi University (Unsrat), Hasanuddin University (Unhas), State University of Jakarta (UNJ)
- Ministry of Energy and Mineral Resources (ESDM)
- Ministry of Marine Affairs and Fisheries (DKP)
- Ministry of Communication and Information Technology (KOMINFO)
- Ministry of Public Works (PU)
- Ministry of Home Affairs (DEPDAGRI)
- Agency for the Assessment and Application of Technology (BPPT)
- National Agency for Disaster Management (BNPB)
- Agency for Meteorology, Climatology and Geophysics (BMKG)
- National Coordinating Agency for Surveys and Mapping (BAKOSURTANAL)
- Institute of Technology Bandung (ITB)

Counterpart personnel from the organizations above will work together as working group.

4. Contact person
Each Organization will assign a contact person by the end of March. The person is mainly for the administrative communication between JICA and each organization.

11

ANNEX V JOINT COORDINATING COMMITTEE

1. Functions

A Joint Coordinating Committee will be organized. The committee meeting will be held at least once a year and whenever need arises.

The functions of the Committee are as follow.

(1) To supervise the annual work plan of the Project in line with the Plan of Operations.

(2) To review the annual and overall progress of the Project and to evaluate the accomplishment of the annual targets and achievement of the objectives.

(3) To find out proper ways and means for solution of the major issues arising from or in connection with the Project.

2. Composition of the Committee

(1) Chairperson

Deputy State Minister for Utilization and Dissemination of Science and Technology, RISTEK

(2)Members

a. Indonesian Side

-State Ministry of Research and Technology (RISTEK)

-Indonesian Institute of Science (LIPI)

-Ministry of National Education (DIKNAS) coordinating Syiah Kuala University (Unsyiah), Andalas University (Unand), Gadjah Mada University (UGM), University of Indonesia (UI), Brawijaya University (Unibraw), Sam Ratulangi University (Unsrat), Hasanuddin University (Unhas), State University of Jakarta (UNJ)

-Ministry of Energy and Mineral Resources (ESDM)

-Ministry of Marine Affairs and Fisheries (DKP)

-Ministry of Communication and Information Technology (KOMINFO)

-Ministry of Public Works (PU)

-Ministry of Home Affairs (DEPDAGRI)

Agency for the Assessment and Application of Technology (BPPT)

-National Agency for Disaster Management (BNPB)

-Agency for Meteorology, Climatology and Geophysics (BMKG)

-National Coordinating Agency for Surveys and Mapping (BAKOSURTANAL)

-Institute of Technology Bandung (ITB)

b. Japanese Side

-Representative(s) of JICA Indonesia Office

-Project Leader

-Other Japanese experts

-Member(s) of missions dispatched by JICA

-Official(s) of the Embassy of Japan may attend the Committee meetings as observer(s).

Other official(s) of appointed by the Project Leader may attend the committee meetings as observer.

Appendix 3:

Report of the first JCC (Joint Coordination Committee) meeting

10 – 12 am, April 20

Conference room (3rd floor) of LIPI Coremap building

Agenda

(1) Introduction of participants

Twenty seven (27) participants, including 14 group leaders were introduced. Project supervisor, Dr. Idwan Suhardi (Deputy State Minister for Utilization and Dissemination of Science and Technology, RISTEK) attended the preparatory meeting this morning, but could not attend the JCC meeting.

(2) Greetings of JST Program Officer

Dr. Yoshimori Honkura (JST program officer, Professor of Tokyo Institute of Technology) described JST-JICA projects for Science and Technology Research Partnership for Sustainable Development, and expressed his expectation on this Indonesian project.

(3) Greetings of Project Director

Dr. Hery Harjono (Indonesian Project Director, Deputy Chairman of Earth Science, LIPI) expressed welcome for the Japanese participants. He also mentioned that the Indonesian participants made preparatory meeting just before the JCC meeting.

(4) Overview of the Project

Dr. Kenji Satake (Japanese Project Director, Professor of University of Tokyo) explained the structure and plan of the project, using ppt file.

(5) Status report of the project

Mr. Kiichi Tomiya (JICA Jakarta Office) reported that R/D (Record of Discussion) has not signed yet, and two JICA coordinators will be dispatched to Jakarta as soon as R/D is signed and related paperwork is completed.

(6) Status report for the agreement (R/D singing)

Dr. Pariamono (RISTEK) reported that RISTEK and JICA has negotiated on signing R/D, and preparing for final agreement.

(7) Schedule and planning

It was agreed to hold the project workshop will be in this fall held in Indonesia, and details will be further discussed.

JCC Participant List

1. Surono (Center for Volcanology and Geological Hazard Mitigation)
2. Sukhyar (Geological Agency)
3. Hassanuddin Z. Abidin (ITB)
4. Indratmo Soekarno (Vice Rector of ITB)
5. Pariatmono (RISTEK)
6. Hery Harjono (LIPI)
7. Edie Prihantoro (RISTEK)
8. Mulyo Harris Pradono (BPPT)
9. Deni Hidayati (LIPI)
10. TeddyW. Sudinda (RISTEK)
11. Tiomega Gultom (RISTEK)
12. Budianto Ontowirjo (BPPT)
13. Fauzi (BMKG)
14. Irina Rafliana (LIPI)
15. Kanako Hiraoka (JICA)
16. Kiichi Tomiya (JICA)
17. Y. Honkura (JST)
18. Koichi Tusukioka (JST)
19. Masato Iguchi (Kyoto U.)
20. Koji Suzuki (ADRC)
21. Masatomoto Umitsu (Nagoya U)
22. Kenji Satake (U. Tokyo)
23. Teruyuki Kato (U. Tokyo)
24. Fumihiko Imamura (Tohoku U.)
25. Yujiro Ogawa (Fuji Tokoha U.)
26. Nobuo Hamada (JICA-BMKG)
27. Triyono (LIPI)

JCC meeting

Participants to JCC meeting

Appendix 4:
Report of the first Group Leader Meeting

1 – 3 pm, April 20, 2009
Conference room (3rd floor), LIPI Coremap office

Agenda

(1) The Kick-off meeting

The program and presenters of the Kick-off workshop were confirmed. It was also confirmed that the workshop will be connected through Internet to Tokyo (Univ. of Tokyo), Jakarta (DIKTI), Yogyakarta (UGM) and Banda Aceh (USK).

(2) Activity of Each Group

It was noted that the 2009 Ramadan will be from August 20 through September 20, followed by Idul Fitri holidays for September 21 through 27. It was also noted that possible difficulty for foreigners to visit Aceh during a month before and after the Presidential election planned in July.

(3) About the Project Workshop

Two possibilities of the project workshop in the fall are proposed and discussed.

A. October 12 and 13 in Banda Aceh, just before the tsunami training for the Indian Ocean scheduled on October 14
B. November 30 and December 1 in Jakarta

It was agreed that the Indonesian side will further discuss the above possibilities.

(4) Website and Newsletter

It was reported that Japanese-language website was set up at Univ. of Tokyo
http://www.eri.u-tokyo.ac.jp/indonesia/index.html

For the Indonesian-language site, it was proposed to set up on RISTEK site, and Mr. Burianto (RISTEK) will prepare it, consulting with JICA Coordinators.

About the Project Pamphlet, the Japanese-language version is completed and distributed. It was agreed to make Indonesian-language version.

(5) Preparation for the kick-off Workshop

The meeting was broken into groups to prepare for the Kick-off Workshop.

Participant List

Kenji Satake, Hery Harjono (co-PI)

Teruyuki Kato, Hassanuddin Z. Abidin (Group 1)
Masato Iguchi, Surono (Group 2)
Fumihiko Imamura, Mulyo Harris Pradono (Group 3)
Masatomoto Umitsu, Deni Hidayati (Group 4)
Irina Rafliana, Yujiro Ogawa (Group 5)
Koji Suzuki, Pariatmono (Group 6)
Y. Honkura, Koichi Tusukioka (JST)


Group Leader Meeting


Discussion for Group 5

Appendix 5:

Report of the Kick-off Workshop

9:30 to 15:30 (IST) or 11:30 to 17:30 (JST) on April 21, 2009
Bandung Institute of Technology Auditorium and
Information Technology Center (room 413), University of Tokyo

The first workshop of this project was held, with support by SOI (School on Internet) project of Keio University, in both Bandung Institute of Technology and University of Tokyo. Numer of participants were 36 in Bandung and 23 in Tokyo. The workshop was also aired to Universitas Gadjah Mada (UGM) in Yogyakarta and Universitas Syiah Kuala (USK) in Banda Aceh, through DIKTI office in Jakarta. About 15 participants observed at USK.

Following the program, panel discussions for about 50 minutes were made for each group (Groups 4 and 5 were combined). In each group, the group leaders explain the overview, followed by activity plan for sub groups.

Group 1 (Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations). Kato briefly explain the overview, then 1-1 Active fault studies (Awata from Tokyo). 1-2 Recurrence of subduction-zone earthquakes (Nishimura from Tokyo), 1-3 Geodetic surveys (Adbin from Bandung and Imakiire from Tokyo), 1-4 Strong-motion prediction (Adnimar from Bandung), 1-5 Marine geophysical surveys (Hirata from Tokyo) and 1-6 Tsunami forecast (Hamzah from Bandung and Tanioka from Tokyo) were presented.

Group 2 (Short-term and long-term predictions of volcanic eruptions and development of their evaluation method). Iguchi explained the overview, followed by 2-1 Semeru (Nishimura from Tokyo), 2-2 Guntur (Iguchi from Bandung), 2-3 Caldera eruptions (Takada from Tokyo) and 2-4 Evaluation of prediction (Surono from Bandung) were reported.

Group 3 (Establishment of social infrastructure based on engineering developments). Both Imamura and Pradono explained the overview, followed by 3-1 Tsunami hazard maps (Muhari), 3-2 Vegetation (Matsutomi from Tokyo), 3-4 Measurement of wave strength (Pradono from Bandung).

Groups 4 and 5 (Education and outreach for disaster reduction and Investigation of community based disaster prevention). Umitsu explained overview of group 4, then 4-1 Community preparedness (Hidayati from Bandung), 4-2 Cultural background (Nishi from Tokyo), 5-1 Education material (Ogawa and Rafiliana from Bandung), 5-2 Lessons (Hayashi from Tokyo and Didik from Bandung), 5-3 Internet (Okawa from Tokyo).

Group 6 (Application of the research and establishment of collaboration mechanism between researchers and the government officials). Suzuki explained the background and activity, then each group leader commented, including the Japanese situation (Kato), Indoensian experience on Tsunami Warning System (Pariatomono), and education activity of LIPI (Munasri).

The details of this workshop, including CVs of participants and presentation files can be found at http://www.soi.asia/event/20090421-disastermng/

Participant List

Bandung (36)

Kenji Satake (U. Tokyo), Teruyuki Kato (U. Tokyo), Masatomo Umitsu (Nagoya U.), Fumihiko Imamura (Tohoku U.), Masato Iguchi (Kyoto U.), Yujiro Ogawa (Fuji Tokoha U.), Yoshimori Honkura (JST, Tokyo Inst. Tech), Koichi Tsukioka (JST), Koji Suzuki (ADRC), Starif Kurniawan (ITB), Lina Handayani (Geoteknologi, LIPI), Hery Harjono (LIPI), Deny Hidayati (LIPI), Mulyo Harris Pradono (BPPT), Pariatmono (RISTEK), Afnimar (ITB), Hasannuddin Z. Abdin (ITB), Hamzah Latief (ITB), Munasri (LIPI), Andonowati (ITB), Surono (Geologcial Agency, DESDM), Hendra Grandis (ITB), Ratna P. (ITB), Eko Yulianto (LIPI), Adrin Tohari (LIPI) , Irina Rafliana (LIPI), Triyono (LIPI), Asep Koswara (LIPI), Dio (LIPI), Dina A Sarsito (ITB), Cecep Subardja (BAKOSURUTANAL), Abdul Muhari (DKP), Didik Sugiyanto (TDMRC, UNSYIAH), Imam A. Sadisun (GL FITB), Dedo Mulyadi (LIPI), Achmad Husni Thamrin (Keio Univ.)

Tokyo (23)

Chiaki Kobayashi (JICA), Hiroyuki Tomita (MEXT), Hideo Matsutomi (Akita U.), Yoshinari Hayashi (Shizoka U.), Yuichiro Tanioka (Hokkaido U.), Yuichi Nishimura (Hokkaido U.), Makoto Ikeda (ADRC), Takeshi Nishimura (Tokhku U.), Yushiro Fujii (BRI), Yasuo Awata (AIST), Tetsuro Imakiire (GSI), Kenji Hirata (MRI), Yoshimi Nishi (U. Tokyo), Keiko Okawa (Keio U.), Sayaka Fujuda (Keio U.), Akira Takada (AIST), Fumie Imabayashi (JST), Yasuto Jibiki (U. Tokyo), Shigehiro Fujino (AIST), Kiyomi Endo (JICA), Isamu Kuboki (JICA), Yozo Goto (Fuji Tohoka U.) and Satoi Itakura (U. Tokyo)

Kickoff Workshop at Bandung Site

Kickoff Workshop at Tokyo Site

Multi-disciplinary Hazard Reduction Program from Earthquakes and Volcanoes in

Indonesia

Kick-off Symposium

Co-organized by University of Tokyo and Lembaga Ilmu Pengetahuan Indonesia (LIPI), Indonesia
Co-hosted by University of Tokyo and Institute of Technology Bandung (ITB) and DIKTI, Indonesia
Supported by Japan International Cooperation Agency(JICA) and
Science and Technology Research Partnership for Sustainable Development,
Japan Science and Technology Agency (JST)
Broadcasted by SOI Asia project

Tuesday, April 21th, 2009

Indonesia	Japan
9:00-15:30 WIB	11:00-17:30 JST
Main Venue	**Main Venue**
Auditorium, Campus Center, ITB, Bandung, Indonesia	Room 413, Information Technology Center Hongo Campus, University of Tokyo, Tokyo Japan
Satellite Venue	
DIKTI, Jakarta, Indonesia	

PROGRAM (draft as of Apr. 14th)

Bandung	Tokyo	
9:00-9:20	11:00-11:20	**Opening Session**
		Welcome Address Prof. Hasanuddin Z. Abidin, *Head of Geodesy Research Division, Faculty of Earth Science and Technology, ITB* **Opening Remarks** By Dr. Hery Harjono, *Indonesian Institute of Sciences (LIPI)* **Project Summary** by Prof. Kenji Satake, *Earthquake Research Institute, University of Tokyo*
9:20-10:10	11:20-12:10	**Panel Discussion for Group I**
		"Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations" Moderators: Prof. Teruyuki Kato, *Univ.Tokyo* and Prof. Hasannudin Z. Abidin, *ITB* Panelists: ・ Prof. Teruyuki Kato, University of Tokyo ・ Mr. Yasuo Awata, AIST ・ Mr. Yuichi Nishimura, Hokkaido University

- Prof. Hasannudin Z. Abidin, ITB
- Mr. Tetsuro Imakiire, GSI
- Mr.Afnimar, ITB
- Mr. Kenji Hirata, MRI
- Prof. Yuichiro Tanioka, Hokkaido University

10:10-10:40	12:10-12:40	**Coffee Break**
10:40-11:30	12:40-13:30	**Panel Discussion for Group II**

"Short-term and long-term predictions of volcanic eruptions and development of their evaluation method"

Moderators: Prof. Masato Iguchi, *Kyoto Univ.* and Dr. Surono *PVMBG ESDM*

Panelists:

- Assoc. Prof. Masato Iguchi, Kyoto University
- Assoc. Prof. Takeshi Nishimura, Tohoku University
- Mr. Akira Takada, AIST
- Mr. Surono, PVMBG

11:30-12:30	13:30-14:30	**Lunch Break**
12:30-13:20	14:30-15:20	**Panel Discussion for Group III**

"Establishment of social infrastructure based on engineering developments"

Moderators: Prof. Fumihiko Imamura, *Tohoku Univ.,* and Dr. Mulyo Harris Pradono, *BPPT*

- Prof. Fumihiko Imamura, Tohoku University
- Mr. Mulyo Harris Pradono, BPPT
- Prof. Hideo Matsutomi, Akita University
- Mr. Abdul Muhari, DKP

13:20-14:10	15:20-16:10	**Panel Discussion for Groups IV and V**

"Education and outreach for disaster reduction and Investigation of community based disaster prevention"

Moderators: Prof. Masatomo Umitsu, *Nagoya Univ.* Prof. Yujiro Ogawa, *Fuji Tokoha Univ.* Dr. Deni Hidayati, *LIPI* and Dr. Irina Rafliana, *LIPI*

Panelists:

Group 4

- Prof. Masatomo Umitsu, Nagoya University
- Mr.Deni Hidayati
- Ms. Yoshimi Nishi, University of Tokyo

Group 5

- Prof. Yujiro Ogawa, Fuji Tokoha University
- Ms. Irina Rafliana, LIPI
- Assoc. Prof. Yoshinari Hayashi, Shizuoka University
- Prof. Keiko Okawa, Keio University

14:10-14:30	16:10-16:40	**Coffee Break**
14:30-15:20	16:30-17:20	**Panel Discussion for Group VI**

"Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia-Project Objectives and Goal"

Moderator: Mr. Koji Suzuki, *ADRC* and Mr. Pariatomono*, RISTEK*

- Representatives from Group 1-5

15:20-15:30	17:20-17:30	**Closing Session**

Appendix 6:

International Workshop on Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia and Beyond

The workshop was held in Banda Aceh from October 11 to 13, 2009, followed by observation of Indian Ocean Wave (tsunami drill) on October 14. The technical sessions on October 12 and 13, held at University of Syiah Kuala (Unsyiah), were broadcasted through internet to Bandung Institute of Technology (ITB) and Keio University.

The opening ceremony was held in the Sunday evening at Hermes Palace Hotel, following dinner and local cultural dance of Ache. Guest speeches were made by Dr. Lukman Hakin (vice chairman of LIPI), Mr. Rikio Minamiyama (MEXT), Syamsul Rizal (vice rector of Unsyiah), Dr. Idwan Suhardi (Deputy State Minister of RISTEK), and M. Nazar (Vice Governor of Aceh). From our project, Satake (co PI) made welcome speech. Dr. Sri Woro Harijono (Director General of BMKG) then made a keynote speech on the current status of Tsunami Warning System in Indonesia. About 80 people, from Indonesia, Japan, Germany and Philippines participated.

Photo 1. Group photograph after the opening ceremony

Group 1: Evaluation of Potential and Prediction of Earthquakes and Tsunami

Fifteen presentations related to Group 1, earthquake studies, were presented in the Monday morning. Awata (GSJ/AIST) presented ongoing paleoseismological studies on Lembang fault to identify past earthquake occurrence with a possible size of M~7. Heri Andreas (ITB) reported GPS monitoring on the Cimandiri-Lembang-Baribis fault system with proposed fault models of future earthquakes. Kimata (Nagoya U.) reported GPS measurements in Aceh which detected postseismic movement of the 2004 earthquake. Bacolcol (PHIVOLCS) reported GPS measurements along the Valley fault system near metropolitan Manila.

Koketsu (U. Tokyo) reported strong motion studies in Java, including modeling of the 2006 Yogyakarta earthquake, micro-tremor measurements and preparation to set up a strong motion instrument in Bandung basin. Inoue (NIED) proposed to set up Earthquake Early Warning system in Padang. Nishimura (Hokkaido U.) reported coastal paleoseismological studies, tsunami deposits on Sumatra Island and coral drilling on Mentawai Island. Eko Yuliant (LIPI) discussed possible relationship between paleotsunami and traditional wisdom, Smong, in both Simuele Island and south coast of Java. Hamzah Latif (ITB) tried to report from Bandung on tsunami numerical simulation, but it was truncated because of connection problem. Nishimura (Hokkaido U.) also reported the result of field survey following the recent Samoa earthquake. Fauzi (BMKG) reported three earthquakes (Figure 1), West Java on September 2, West Sumatra on September 30 and Jambi on October 1, based on the observation and reaction made at BMKG. Later, in the Tuesday afternoon, Danny Natawidjaja (LIPI) presented a forecast of large interplate earthquake off Padang and recent earthquake occurred within subducting slab. He also reported the recent (2007 and 2009) earthquakes on Sumatra fault and plan for paleoseismological surveys. In addition to the above oral presentations, Imakiire (GSI) presented a poster on GSI's deployment of GPS continuous observation stations in Indonesia for crustal deformation monitoring. Preliminary reports, mostly photographs, of damage in Padang due to the September 30 earthquake were also presented by Inoue (for Shiwaku, NIED) and Koresawa (ADRC).

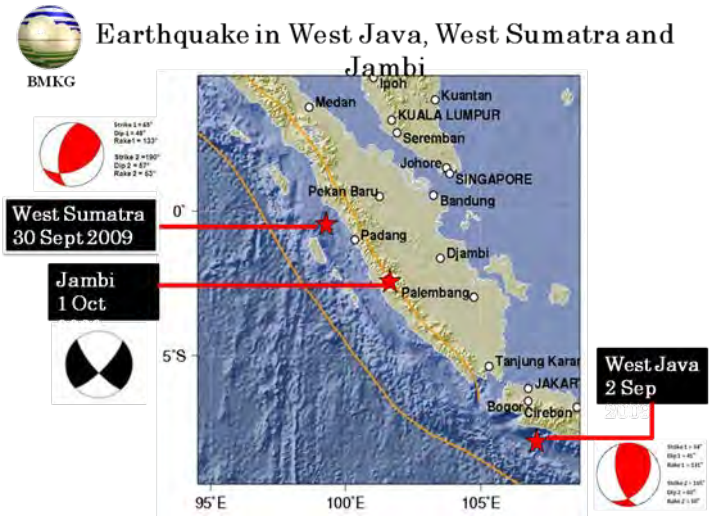

Figure 1. Recent three earthquakes in Java and Sumatra (BMKG).

Group 5: Education and Outreach for Disaster Reduction

Nine presentations from Group 5 were made in the Monday afternoon. Most of them were reports of practical programs in Banda Aceh, following the 2004 tsunami (Figure 2). Irina Rafliana (LIPI) reported development of school preparedness for natural hazards in Banda Aceh. Syahrial (Unsyiah) introduced town watching method as a disaster awareness program in Banda Aceh. Nakamura (Ryukyu U.) introduced studies to combine fisherman's interview and tsunami numerical simulation. Agussabti (Unsyiah) reported population data

development in Meuraxa sub district, known as “ground zero” of the 2004 tsunami. Didik Sugiyanto (Unsyiah) reported a method, use of painting based on interviews, for keeping tsunami lessons and education. Sugimoto (Kyoto U.) reported, with posted maps, tsunami poles constructed throughout the city of Banda Aceh for recording tsunami heights and future education. Basuki (ITB) introduced internet education program (NREN and others) and its use for disaster reduction. Goto (U. Tokyo) presented a poster on scientific tsunami evacuation simulation of Meuraxa, using impressive moving evacuation images on large computer display, and discussed its effectiveness in disaster awareness education and disaster prevention planning. Affan (Unsyiah) also presented a poster on tsunami evacuation plan and spatial data development for simulation.

Figure 2. Summary of education program at TDMRC

Group 6: Research Collaboration and Application for Government Policies

Two presentations from Group 6 were made in the Monday afternoon. Koresawa (ADRC) explained how research activities were linked to policy making at the national level in Japan by focusing on activities of Central Disaster Management Council as a possible model for BNPB. Also, each group leader was requested to start considering what suggestions they would make concerning better synergy among researchers, policymakers and practitioners. Ridha (Unsyiah) reported end-to-end tsunami drill made in Banda Ache in 2008.

Group 2: Short-term and Long-term Predictions of Volcanic Eruptions

Five presentations from Group 2 were also made in the Tuesday morning. Iguchi (Kyoto U.) first introduced the proposed studies and current status of volcanic eruption prediction. Hendrasto (PVMBG) introduced historical eruptions and current statues of Semeru volcano, very active volcano with frequent eruptions, where two tiltmeters were installed in July (Figure 3). Sri Hidayati (PVMBG) reported historical eruptions and current states of Guntur volcano, where eruption and volcanic earthquakes may be controlled by regional tectonics. Sipriyati Andreastuti (PVMBG) reported fieldwork in Batur volcano in Bali for geological aspects of caldera-forming eruptions. Hendrasto (PVMBG) reported crisis of Kelud volcano in

September to November 2007 and discussed the problems for declaring alert levels.

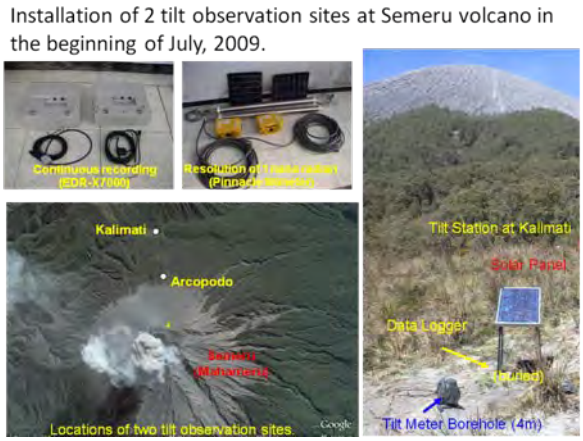

Figure 3 Installation of titlmeters at Semeru volcano

Group 3: Establishment of Social Infrastructure based on Engineering Developments

Five presentations from Group 3 were also made in the Tuesday morning. Imamura (Tohoku U.) discussed effective use of tsunami hazard map, introducing a concept of cognitive map. Chaeroni (BPPT) presented current status of tsunami hazard map in Padang City, where many tsunami hazard maps (Figure 4) have been proposed and workshops were held to make the "Official Hazard Map". Matsutomi (Akita U.) discussed problems in tsunami inundation simulation for multi-stories forest, with brief introduction of planned physical experiment to be carried out in BPPT. Harris Pradono (BPPT) discussed about research and implementation, or guidelines, of safe buildings for earthquakes and tsunamis in Indonesia. Adrin Tohari (LIPI) introduced surveys for liquefaction potential and hazard maps as outcome in five coastal cities, Banda Aceh, Padang, Pariaman, Bengkulu, and Cilacap (Figure 4).

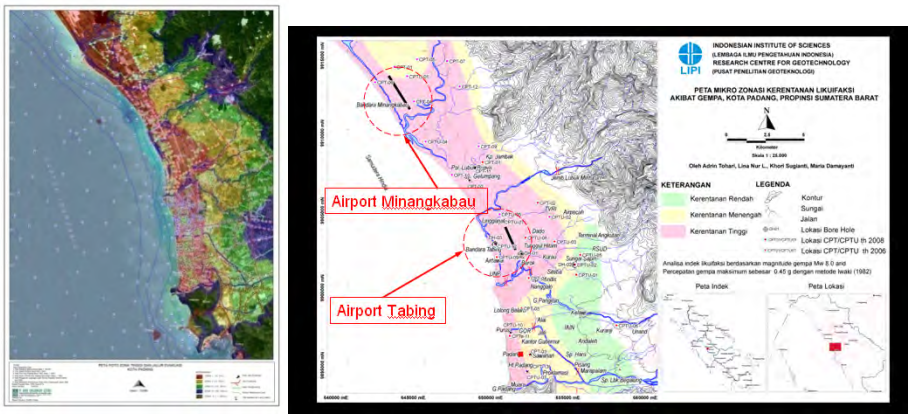

Figure 4. Hazard maps for tsunami (left) and liquefaction (right) in Padang City

Group 4: Mitigation of Social Vulnerability

Five presentations on social studies were made in the Tuesday afternoon. Deny Hidayati

(LIPI) compared the community preparedness for earthquakes in several cities and reported that the preparedness in Padang, where the recent earthquake occurred, was relatively higher. Yamamoto (Kyoto U.) and Nishi (U. Tokyo) discussed about bridging gaps between science and local knowledge considering the characteristics of Indonesian people. Dirhamsyah (Unsyiah) reported recovery framework from tsunami in Banda Aceh, with introduction of activities of Tsunami and Disaster Mitigation Research Center (TDMRC). Dicky (U. Indonesia) presented his survey results to study psychological well-being for survivors of the 2004 Aceh tsunami. Tanaka and Takahashi (Nagoya U.) presented a poster on how to strengthen community-based disaster preparedness mechanism.

Figure 5. Community building for tsunami evacuation (left), Tsunami and Disaster Mitigation Research Center (TDMRC, center) and Tsunami Museum (right)

General Discussion and Summary

During the general discussion, several proposals for future activities were made, such as publishing papers in multi-disciplinary journal or a book. Because of the multi-disciplinary nature of this project, it was recognized that information exchange and coordination of activities of different groups are very important. For this purpose, information exchange through newsletters or website, both among our project members and with other people include public, were proposed to promote. From now on, when the group meeting is scheduled, information should be sent to other groups, and leaders of other groups should be invited. For the coordination with government sectors (Group 6), policy recommendation from each group was advised.

Observation of Indian Ocean Wave Drill

On Wednesday October 14, some participants observed Indian Ocean Wave drill. This is a drill of information transmission on tsunami warning for the entire Indian Ocean countries. The tsunami warning messages, originated from Pacific Tsunami Warning Center and Japan Meteorological Agency were sent to BMKG, then provincial government as well as some district and sub-district communities. Based on the received information, local people stared evacuation to community buildings. We observed the evacuation to TDMRC building. In the afternoon, we visited some tsunami heritages including stranded power barge and tsunami

museum.

Photo 2: Evacuation of coastal residents to TDMRC in Meuraxa.

INTERNATIONAL WORKSHOP on

Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia and Beyond

Banda Aceh, 11 – 13 October 2009

RISTEK-LIPI/JST-JICA & TDMRC-UNSYIAH

I. Background

Indonesia archipelago with a chain of 129 active volcanoes frequently erupted has been the world's most suitable for forecasting volcanic eruptions. It is important to learn the knowledge from Japan long years experiences in volcanic earthquake disaster prediction and observation techniques, share the knowledge to mitigate earthquake and volcanic disaster hazard potential for both in Indonesia and Japan.

In order to make the actual disaster reduction and social research results effectively, the multi-institutional collaboration is formed through JST-JICA ERI Ristek Lipi Collaboration Research Program. The program entitled ” Multi-disciplinary Hazard Reduction from Earthquake and Volcanoes in Indonesia”

II. Purpose and Outputs

The ultimate purpose of this study, for Japan and Indonesia, is to reduce the disaster caused by earthquakes and volcanic eruptions. Damage caused by natural disasters, natural phenomena (hazards) and social vulnerability caused by natural phenomena such as earthquakes and volcanic eruptions can not be prevented but the impact of disaster with a good predictions based on research and observations could reduce the scale of damaged. In order to have a good prediction of the real disaster, it is necessary to implement the framework of interdisciplinary collaboration and research and researchers of these studies. In this workshop the following studies therefore are promoted;

① Mechanism and prediction of earthquakes and tsunamis,

② Evaluation methods to predict volcanic activity,

③ Building disaster-resistant infrastructure,

④ Methodology to overcome the vulnerability of society at the time of the disaster response and reconstruction,

⑤ Study to increase awareness and promote disaster prevention education divided into five subgroups to conduct a comprehensive interdisciplinary research under the close coordination.

⑥ Inter-institutional coordination to take advantage of the administration and coordination of research results.

The expected output of the workshop program is to promote the most recent finding on;

① The mechanism of earthquakes and tsunamis of Reveal the heterogeneity with the coupling between the plates in the region from Sumatra, Java.

② The risk of future earthquake and tsunami earthquake recurrence period of earthquakes through understanding of the past. In addition, this area is an area that has led to Indonesia, Japan, researchers improve the level of Indonesia.

③ The new knowledge about the diversity of subduction process through the comparison of plate subduction zone between Indonesia and Japan.

④ Capability to enhance volcanic eruption prediction and evaluation methods activities. Understanding of the process of long-term prediction of volcanic eruptions and the prediction before conducting experiments to clarify the evaluation method of volcanic activity in Indonesia. Research results are expected volcano in Indonesia and can also provide new insight for the study of volcanoes in Japan.

⑤ Building disaster-resistant infrastructure

From a hardware approaches, with the aim to reduce the tsunami disaster through the use of vegetation to contribute to building a safe and secure social infrastructure in coastal areas of Indonesia through an intensive use of tsunami hazard maps. Create and construct hazard maps based on geological hazards in terms of prediction of liquefaction and ground survey methods for safe and secure society based on Indonesian earthquake in Indonesia for the development of measures contributed to the building.

⑥ Methodology to overcome the vulnerability of society at the time of the disaster response and reconstruction. Sheds light on the social vulnerability of communities and religious backgrounds of Indonesia, to identify problems with, for individual earthquakes and volcanic disaster research community through the psychological aspects of communication with the other hand contribute to overcoming vulnerability. Also, make useful recommendations for an effective post-disaster reconstruction. Strengthen collaboration with scientists and disaster areas of Indonesia through sociological research.

⑦ Promoting disaster education and awareness

Development of methods for disaster education and awareness programs in Indonesia, take advantage of the experience affected the development of educational materials and scientific knowledge, and the development of distance education using satellite techniques and aims to spread the practice to verify.

⑧ Cooperation with the government to utilize the research results

To reduce the research community, education and awareness programs will be conducted independently by researchers in Indonesia for research and practice activities to build a more secure society through training and safety.

In addition, challenge through a strong collaboration and information sharing to achieve the Indonesian government officials and scientists awareness and to promote measures for volcanic disaster of earthquake and tsunami disaster in Indonesia.

Program:

11 October 2009			
Time	Activity		Organization
14.00-19.00	Registration, check-in		Secretariat, TDMRC-Unsyiah
19.00-19.55	Dinner & Cultural dance		
19.55-20.30	Opening Ceremony		
1’	Tribute to the earthquake victims by a minute of silence		
5’	Welcome Note	Vice Chairman of LIPI	
5’	Welcome Note	Rikio Minamiyama (MEXT)	
5’	Welcome Note	Kenji Satake (ERI, Univ. Tokyo)	
5’	Welcome Note	Rector of Univ. Syiah Kuala	
5’	Welcome Note	Deputy Minister of S&T (Ristek)	
10’	Opening Speech	Vice Governor of Aceh	
20.30-21.00	Keynote Speech:	Head of Climatology Meteorology and Geophysics (BMKG)	Hery Harjono (LIPI) Kenji Satake (ERI, Univ. Tokyo)

12 October 2009 Technical Session (TS)			
Time	Topic	Speaker	Moderator/Notula
08.00-08.30	Registration		Secretariat
08.30-08.45	Remarks (Introduction of project; purpose of workshop etc.) Harjono/Satake		
08.45-12.30	Theme Group 1: Evaluation of potential and prediction of earthquakes and tsunami based on geophysical investigations (TS 1)		
08.45-09.00	historical earthquakes based on active fault surveys	Yasuo Awata (AIST)	Teruyuki Kato (ERI, Univ. Tokyo) Hasanuddin Z. Abidin (ITB)
09.00-09.15	historical earthquakes: case of Indonesia and mitigation	Danny H. Natawidjaja (LIPI)	
09.15-09.30	GPS observations in Java	Hasanuddin Z. Abidin (ITB), Heri Andreas (ITB)	
09.30-09.45	GPS measurements in Aceh after the 2004 earthquake	Fumiaki Kimata (Nagoya)	
09.45-10.00	Crustal Deformation along active faults	Dr. Toto Bacolcol (PHIVOLCS)	
10.00-10.15	Study on strong ground motion prediction	Kazuki Koketsu, (ERI, Univ. Tokyo)	
10.15-10.30	Padang Earthquake Report	Fauzi (BMKG)	
10.30-10.45	Coffee and snack		
10.45-11.00	Earthquake Early Warning in West Sumatra: a system design and preliminary survey for its feasibility.	Hiroshi Inoue (NIED)	Eko Yulianto (LIPI) Yuichi Nishimura (Hokkaido Univ.)
11.00-11.15	Study of historical earthquakes based on tsunami deposit and coastal geology	Yuichi Nishimura (Hokkaido Univ.)	
11.15-11.30	Paleo-tsunami record of Indonesia areas and future activity	Eko Yulianto (LIPI)	

11.30-11.45	Progress of numerical simulations at Indonesia coastal areas	Hamzah Latief (ITB), Budianto Ontowirjo (RISTEK)	
11.45-12.00	Preliminary report on the Sept. 30 Samoa earthquake/tsunami	Yuichi Nishimura (Hokkaido Univ.)	
12.00-12.30	Panel Discussion		Teruyuki Kato (ERI, Univ. Tokyo) Hasanuddin Z. Abidin (ITB)
12.30-13.30	Lunch, Shalat, Break, Poster Session		Secretariat
13.30-13.55	Special lecture on the Sept. 30 Padang earthquake		BMKG
13.55-14.00	Comments		From the floor
14.00-16.00	Theme Group 5: Education and outreach for disaster reduction (TS 2)		
14.00-14.15	Developing School Preparedness Model in Banda AcehTsunami Disaster	Irina Rafliana (LIPI), M.Ridha (Unsyiah)	
14.15-14.30	Disaster education for community through participatory approach	Syahrial Mursyad (TDMRC, Syiah Kuala University)	
14.30-14.45	Numerical simulation of the large tsunami observed by fishermen far away from the northern Sumatra coast	Mamoru Nakamura (Ryukyu Univ.)	
14.45-15.00	Population Data Development in Meraxa Sub-district	Agus Sabti (Unsyiah)	
15.00-15.15	Disaster effective methodology: lesson from Banda Aceh	Didik Sugiyanto, (Unsyiah)	
15.15-15.30	Tsunami height poles and disaster awareness for the reconstruction toward resilient city	Megumi Sugimoto (Kyoto Univ.)	
15.30-16.00	Panel Discussion	Basuki Suhardiman (ITB), Keiko Okawa (Keio Univ.)	Yujiro Ogawa (Fuji-Tokoha Univ.) Irina Rafliana (LIPI)
16.00-16.30	Parallel Coffee Break, Shalat, Poster Session		
16.30-17.45	Group 6: Research Collaboration (TS 3)		Secretariat
16.30-16.45	Japan's Disaster Management System & International Cooperation	Atsushi Koresawa(Asian Disaster Reduction Center)	Hery Harjono (LIPI) Kenji Satake (Univ. of Tokyo)
16.45-17.00	Tsunami Drill: experience on mechanism between researchers and the government officials	Pariatmono, Yudho Baskoro (RISTEK)	
17.00-17.15	Australia Indonesia Facility Disaster Reduction Program	Dr. Trevor Dhu (Aus-AID AIFDR)	
17.15-17.45	Panel Discussion and result today		

13 October 2009 Technical Session (TS)			
Time	Topic	Speaker	Moderator/Notula
08.00-08.30	Registration		Secretariat, TDMRC

08.30-10:15	Theme of Group 2: Short-term and long-term predictions of volcanic eruptions and development of their evaluation methods (TS 4)		
08.30-08.45	Current status of Semeru Volcano	Sri Hidayati (PVMBG)	Masato Iguchi (DPRI, Kyoto Univ.) Surono (PVMBG)
08.45-09.00	Project of Prediction of Volcanic Eruptions at Indonesian volcano -Short, middle, long-term predictions and evaluation of activity	Masato Iguchi (DPRI, Kyoto Univ.)	
09.00-09.15	Current status of Guntur Volcano	Muhamad Hendrasto (PVMBG)	
09.15-09.30	Geological aspect of caldera-forming eruption	Supriyati Andreastuti (PVMBG)	
09.30-09.45	Kelud volcano: monitoring and mitigation experiences	Surono (PVMBG)	
09.45-10.15	Panel Discussion		
10.15-11.00	Coffee Break		
11.00-14.00	Theme of Group 3: Establishment of social infrastructure based on engineering developments (TS5)		
11.00-11.15	Tsunami hazard Map and its Utilization in Padang	Fumihiko Imamura, (Tohoku Univ.)	Fumihiko Imamura, (Tohoku Univ.) M. Harris Pradono (BPPT)
11.15-11.30	Current status of hazard map of Padang City	Velly Asvaliantina (BPDP, BPPT)	
11.30-11.45	Problems in the simulation of tsunamis inundationg the region of multi-storied forest	Hideo Matsutomi (Akita Univ.),	
11.45-12.00	Practical use of vegetation as tsunami barrier: progres in Indonesia coastal area	Subandono Diposaptono (DKP)	
12.00-12.15	Liquefaction hazard potential along coastal of Indonesia	Adrin Tohari (LIPI)	
12.15-12.30	Research and implementation of earthquake safer housing in Indonesia	M. Harris Pradono (BPPT)	
12.30-13.30	Lunch, Shalat, Break, Poster Session		Secretariat
13.30-14.00	Panel Discussion		Fumihiko Imamura, (Tohoku Univ.) Febrin A. Ismail (Andalas Univ.)
14.00-15.30	Theme Group 4: Mitigation of social vulnerability against geohazards (TS6)		
14.00-14.15	Science based community preparedness in Indonesia	Deni Hidayati (LIPI)	Makoto Takahashi (Nagoya Univ.) Deni Hidayati (LIPI)
14.15-14.30	Bridging gaps between science and local knowledge in disaster management in Indonesia (Indonesian/Japanese)	Hiroyuki Yamamoto (Kyoto Univ.), Yoshimi Nishi (Univ. Tokyo)	
14.30-14.45	Community Relief based on cultural background	Makmuri Sukarno (LIPI)	
14.45-15.00	Recovery framework from natural disasters: lesson learnt from Banda Aceh	Muhammad Dirhamsyah (TDMRC, Syiah Kuala Univ.)	
15.00-15.15	Trauma healing of disaster impact	Dicky Pelupessy (UI)	
15.15-15.30	Coffee Break		

15.30-16.00	Panel Discussion and result today, General Discussion on IOWave09 Technical program, Resume; prospect, future plan, crystallized		This session should be separate into two parts; one is for TS6 and the other is for entire parts.
16.00-16.30	Closing Ceremony	(Deputy Ristek / Rector Unsyiah)	Secretariat, TDMRC

Posters

1-3 Tetsuro Imakiire (GSI)

4-1 Masatomo Umitsu, Shigeyoshi Tanaka and Makoto Takahashi (Nagoya Univ.)

5-1 Yozo Goto, Scientific Tsunami Evacuation Simulation of Meuraxa, Banda Aceh

5-1 Muzailin Affan (Unsyiah), Tsunami Evacuation Plan and Spatial Data Development for Simulation.

Note : Poster size : A1 Landscape

(Comments: one or two more poster boards would be preferable for free access. Some people may want to raise some pictures on recent earthquakes and tsunamis)

14 October 2009

08.00-12.00: Indian Ocean Wave-tsunami Drill

12.30-14.30: Flashback to 2004's tsunami trail: a reflection for the future safety live of coastal area (excursion program)

Appendix 7:

MINUTES OF MEETING BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF REPUBLIC INDONESIA
ON
JAPAN-INDONESIA TECHNICAL COOPERATION PROJECT
FOR
MULTI-DISCIPLINARY HAZARD REDUCTION FROM EARTHQUAKES AND VOLCANOES IN INDONESIA

JAKARTA, MARCH 22nd, 2010

INTRODUCTION OF THE MEETING
The chair of the meeting, Prof. Dr. Hery Harjono, led the opening of the meeting, and circulate the agenda of the meeting. Chair asked meeting member: from Ministry of Home Affairs, Civil Unit and Bakosurtanal, Tokyo from JICA Jakarta Office, in charge of disaster management sector, Rector of ITB, Minorita from BMKG, JICA expert.
Introduction was normally given by Idrawan Subardi. Due to his inability to attend, Prof. Dr. Hery Harjono will present, on behalf. Hery welcomed meeting participants to the LPI building. Chair had introduced all organizations involved in this collaboration. Activities were already conducted by group 3 to 6 in 2009, and results was presented during workshop in Aceh, 1, October 2009. Chair raised the question most requested be made during previous media briefing, on what this research collaboration will contribute to the local government and public. It is expected that research resulted by the member of JCC be the inputs to end users. Plan of 2010 is also already in place.

OPENING ADDRESS
Opening was made by Yoshinori Suzuki (MEXT). MEXT support the construction of research on disaster education and technology being common subject around the world, and should be tapped in collaborative research, in particular such research as developed by the Headquarters for Earthquake Research Promotion (HERP). Research outcomes is to ensure human security against disaster, promoted by science, technology and research. MEXT hope for the success and partnership of the project include its continuation.
Opening address was also made by Mr. Kiichi Tomiie, Senior Representative of JICA Indonesia Office. JICA express gratitude to RISTEK, LIPI, Japanese universities and related institutions who made efforts in realizing this meeting, including JICA Indonesia. Aside the early confusion, but grateful that eventually the collaboration platform is understood well. It is hoped, through this partnership can combined results may benefit stakeholders, including local government.

REPORT FOR ACTIVITIES FY 2009
Reports on progresses were made by all group leader consecutively.

REPORTS ON MEETINGS
Reporting on group meetings was delivered by Prof. Kenji Satake. Reporting last year JCC meeting, in April 2009, with 27 participants of working group leaders and related agencies. During the meeting, the project intentions were presented. Following the JCC meeting, a group leader meeting was conducted, as commented in the report. Following the group leader meeting, a kick off workshop in Bandung was conducted, using internet connection using SOI facility and connected to Tokyo, using ITB facilities. The plans of each sub groups was presented. An international workshop was conducted in Banda Aceh, October 11-15th 2009, continued with observation to the Indian Ocean tsunami drill, visit to TDMRC and Tsunami Museum.

JICA & INDONESIAN INPUTS TO THE PROJECT FY 2009

Inputs from JICA are including mobilization of some others to visit from Japan and Indonesia, and also equipments. The third input is budget for activities. In FY 2009, the budget input from JICA is Rp 2,094,000,000.

Input from Indonesia side, provided by RISTEK and LIPI for workshops and secretariat including one secretariat staff. BPPT, BKPMinistry of Marine Affairs, ITB and DSDM Dinas also shared financial resources for research activities.

CONFIRMATION OF PROJECT MEMBERS FROM INDONESIAN SIDE AND JAPANESE SIDE

Changes made were:

Group 2.1 from Japanese Side, Masyamto is move to Indonesia side, since his study will be finished at end of March 2010, in Brawijaya University

Group 2.2 from Indonesian side, Hetty Triastuty is replacing Sri Hidayati as sub group leader

Group 4.1 from Indonesian side, suggested additional one (1) member from Ministry of Home Affairs (DEPDAGRI PUM)

Group 6.1 from Japanese side: Makoto Takahashi will take lead as sub group leader, replacing Shigeyoshi Tanaka.

RESULTS OF JICA TASKS

- Should continue to discuss the framework covering the wide range of topics in group 4, and elaborate the existing framework. Group 4 will also use gender analysis, taking lessons learnt from disaster events in Indonesia.
- Group 5 will jointly continue collaboration to support disaster education
- Group 6 propose to involve local policy makers or government at local level as member of the group. The group will also continue to explore establishing cross sector platform, mainly engaging BNPB. Also discussing means of dissemination of research results.
- Comments from Kichi Tomiya (JICA), this first year activity run quite smoothly, therefore suggested that the collaboration continues in such manner.
- Comments from Syahril (ITB), the cooperation is considered useful. A simple question to address is, whether it is possible to propose additional program or member inside the group. There may be some other experts that might be related to this activity, who are interested to join this activities.
- Bakosurtanal suggest, observing the topics of research, it is insufficient to only have one staff (Ceceb Subarya) from Bakosurtanal and expect many staffs can be included. The group leader from Indonesia side should decide whether they wish to recruit new member.
- Yoshimori Honkura (IST) appreciate the presentation. The project will be terminated in 2011 FY, and IST side will start planning on evaluation of the whole project. JICA will also conduct evaluation of the project, in Indonesia, whilst evaluation by IST will be made in Japan. Evaluation will be made from sustainable development point of view. Research activities and outcomes are fine, in the framework of one year. An question to address is how certain research outcomes is useful for other groups. One year activities may be too preliminary to make such conclusion. But if this interrelation is emphasized, it will be effective. Including dissemination of research results to community. JICA (Tomiya) commented that JICA also have evaluation criteria, for the research collaboration is new to JICA, and have different characteristics, whilst JICA experiences in evaluating this is not much. Cooperative evaluation will be done at the end of the project.
- Group 5 leader (Digowa), at first came out with "outreach", but this may need to wait for results from others. In that way, group 5 question, who will mainly consider about the risk.
- In realizing disaster, group 1 and 2 provide time hazards, and group 3 and 4 conduct vulnerability aspects, while group 5 is still in the context of research and group 6 in collaborating with local government/end users. It is realized that more discussion is

important within group. Sample of collaboration between group 1 and 2 in Bandung can be taken. Teruyuki Kato underline the importance to understand each others group, and in order to do so, some trials and efforts should be taken to help others to understand.

- Group 6 leader (Atsushi Koresawa) had already suggested during Banda Aceh workshop how other groups start to think on how to apply such results to policy making. It is suggested to continue this discussion in May. A question in involving local government, how in practice, should we involve local government in 33 provinces in Indonesia. Hery Harjono suggest perhaps engaging a representative from local government at provincial level may be useful, as example. Fumihiko Imamura also suggest a joint work engaging local government, for example when developing official hazard map. Group 5 leader (Irina) pointed out the importance to give inputs to local government in developing their local disaster risk reduction action plan which is formally derived from Hyogo Framework of Action.
- For the policy making recommendation raised in October 2009, all group leader is requested by Kenji Satake to develop points of policy recommendation, by May 2010. Template will be provided by group 6 to all group leaders.
- It is important for group 6 especially from Indonesia side to discuss which area should be covered.
- Group 6 leader (Pariatmono) question any plans for inputs allocated to newsletters or publications. JICA JST Secretariat (Kubota), there are no plans to purchase any equipments. To Indonesia side this is important to find out and calculate how much Indonesia should co-finance the production.

PLAN OF OPERATION

Kenji Satake reported the plan of operation, listed JPGU meeting, with consecutive group meeting in Japan in May 28, 2010. The work of the JICA JST LIPI RISTEK Collaboration takes the opportunity to disseminate the work to international community. May 29, 2010 on the group meeting, the policy recommendation should be submitted by all group leaders. Satake also announced the workshops and activities planned for the entire group in last week of November 2010, tentatively 22-25th. Group 1 had budgeted two mini workshop in Bandung and in Aceh. In total, there are 135 persons is from Japan for 1362 days in Indonesia , and 76 person for 676 days in Japan, which doubled from 2009, and to be approved by the JCC.

Jakarta, March 22nd, 2010

Koichi TOMIYA

JICA Indonesia Office

Dr. Idwan Suhardi

Deputy State Minister for Utilization and Dissemination of Science and Technology

State Ministry of Research and Technology

Appendix 8:

MINUTES OF MEETING

Group Leader Meeting – Makuhari, Chiba

29 May 2010

Attended: Kenji Satake, Hery Harjono,Teruyuki Kato, Hasanuddin Abidin, Masato Iguchi, Fumihiko Imamura, Mulyo Harris Pradono, Makoto Takahashi, Deny Hidayati, Yujiro Ogawa, Irina Rafliana, Atsushi Koresawa, Pariatmono, Edie Prihantoro, Muhamad Hendrasto, Sri Hidayati, Isamu Kuboki, Kiyomi Endo, Yozo Goto, Hirofumi Yamamoto, Yoshimi Nishi, Keiko Okawa, Haruhito Watanabe, Megumi Sugimoto, Ahmad Basuki, Abdul Muhari, Fumie Imabayashi (JST), Koichi Tsukioka(JST), Akimichi Takagi(MEXT)

1. OPENING

The meeting was started with suggested agenda for the Leader Group Meeting, lead by Kenji Satake.

2. GROUP REPORT

Group 1

Report from Dr. Kato: The groups work already started. In March paleoseismology groups made field work. There are some problems at field, which will be reported by Hery. GPS will be done in June and July. Gravity will start in July. Students from ITB will be invited for training in Japan. Strong Motion group, as well as the Tsunami Simulation group are planning their surveys. Submarine survey group will be doing marine survey using research vessel.

Report from Hasan Abdin: GPS campaign in June will be along Cimandiri and Lembang faults. Some gravity work will be conducted in Jakarta and Semarang in July. Staffs from ITB will study in IMSA Japan. The group is submitting few papers, among others in EGU and other international conferences. In the conference the report was not only for group 1 but for the entire research project.

Group 2

Report by Iguchi: Group 2 has the same plans with 2009. About the short term prediction in Semeru, they will re-install tiltmeter and broadband seismometer this year, because there were technical problems. Data will be transmitted to Bandung. Group 2.2 for the long term prediction will work

on Guntur and Talang volcanoes in October 2010. Group 2.3 is working very long term prediction in calderas by taking geological samplings in Batur (Bali) and Bromo (Java) volcanoes. Evaluation methods on volcano eruptions are developed by Group 2.4.

Group 3

Report by Imamura: The group is working on establishment social infrastructure based on engineering studies. Effective use of hazard maps, and expect to integrate. Practical use of vegetations. Integration of liquefaction. Safe use of houses both technological and social approach. All group started last year all together. This year add one activity, which is tsunami memorial pole. Already done in Aceh and will be developed in Padang. This year, there is also a consensus on Padang Hazard Map. Discussion on how to implement tsunami hazard map was raised. German provided detailed work, Japan as well.

The group proposed an international project on tsunami evacuation raised earthquake park (TERP) by GeoHazard International US, Andaman University and JST JICA group 3. This project is already approved by Swiss Re.

Report by Harris Pradono: Group 3-2 also reported the completion of tsunami test canal at BPPT-Jogjakarta. In August 2010 a visit to Indonesia by Japan researcher will take place. In March 2010, a group of researchers visited Indonesia to discuss PP Band applications in Indonesia. There is one interested local organizer in Indonesia, Yapera who wish to apply this technology in Banda Aceh. In May, Harris Pradono visited Yapera, to get the information on the type of buildings and technical information required by the Japan scientist.

Group 4

Reports by Takahashi , Nishi and Yamamoto: Group meeting was conducted in March. The group is still developing their framework on analysis to work upon and no existing progresses for the last two months between March and May. Group 4 composed of 4 subgroups. Group 4.1 entered the field this year in Jogjakarta – Bantul area. Group 4.2 investigating detailed deep structure of cultural background in Aceh, in addition to their work from last year, which is to construct information on infrastructure and disaster information system. Group 4.3 tried to investigate economic background to reduce vulnerability in Aceh. Plan to hold workshop in Aceh in July was discussed. Group 4.4 already conduct fieldwork in March. The focus is more to general information on disaster management, specially the inter-relations between national and local government. Studies on the social structures of local community are also planned. There is a plan for group meeting at the

workshop in November, back to back with the Kobe JICA JST workshop, to discuss of some theoretical background framework to cover all groups' research interests.

Reports by Hidayati: Group 4.1 consists of 3 team, Nagoya, LIPI, and UGM. The group is developing joint research instruments. The field work will be in late July. Questionnaire survey will be conducted by UGM students in Ramadhan. There are different topics but put it into one framework and deriving from the framework to develop questionnaires. LIPI submitted two papers and UGM one paper to be published. Group 4.2 from Indonesian side will conduct development of disaster management based on Local Knowledge, From Mbah Marijan's –Mount Merapi, to coastal areas. Research from Japan team and Indonesian team differs. Group 4.3 Indonesian team consist of Unsyiah(Dirhamsyah) and ITB, on the process of developing research design. Until now there is no available budget to conduct the research. They discussed with Japan side to conduct joint workshop in July and continue in Aceh. Budget availability became the main issue. Group 4.4, researchers from UI and LIPI will participate meeting in Japan in June, and preparing data collection. Data collection is planned from 4th week of July and 1st week of August in Mount Kelud.

Group 5

Report by Ogawa: Group 5 is divided into three sub group. 5.1.1 is aiming on school disaster education. 5.1.2 is aiming on community based disaster management, 5.1.3 simulation evacuation as a tool for disaster education. 5.2 develop experiences in tsunami into materials to transfer lessons learnt. 5.3 is education through internet. Education on volcanic hazard will be added from PVMBG.

The overall of group activities is not progressing from March. Sometime in August – September is planned to conduct workshop. Second workshop will be held outside in Banda Aceh, perhaps Padang. For individual activities; Town watching method for disaster education was developed with participatory approach. A guidebook is already developed in three languages, sent to Indonesia. TDMRC once held town watching by themselves. This method was also implemented in Jakarta and Bogor. The objective of the guidelines is to understand the basic method, and help users being accustomed with the method. The guidelines should be revised to the Indonesian context. A new member (Sugimoto-san) joined group 3 and 5, which advocate disseminating research output in the tsunami museum.

Report by Goto: 5.1.3 will develop evacuation simulation, to include evacuation with motorcycles and cars. Two researchers will be visiting ERI and AIST until end of July.

Report by Okawa: 5.3 develop education program over the internet. ITB and Tokyo University broadcast in 2009, as well as in October 12 and 13 in Syiahkuala University. The group planned to have hands on training on learning style with contents from the entire group. In 2010 plans to have remote workshop in Bandung, and invite group to join this worldwide broadcast. Kobe workshop will also have such broadcast. All groups are invited to lecture and broadcast output from the research results, Asia-wide.

Group 6

Reports by Koresawa and Pariatmono: Group 6 consist of all group leaders as members. Group 6 develops mechanism on using research results to policy-making. A form was circulated and filled by group leaders. There are many good ideas on what to do at community level, but not any proposal yet for national policy level. ADRC brought one product about Jogjakarta recoveries.

It is proposed to include leader of subgroup 5.3 (from Japanese-side) as member of group 6, because the close linkages with the work of group 6.

Newsletter No.2 (in Bahasa Indonesia) was published.

3. JPGU MEETING IN SPECIAL SESSION

Kenji Satake updated the meeting with the session dedicated for the Multi-discipline studies on Multi hazards in Indonesia. 19 (16 orals and 3 posters) presentations were made from this project, out of 33 total presentations. Other presentations from Tohoku University. Program book is available.

4. ADMINISTRATION REPORT

JICA (Mr. Kanda and Kayo) visited Hery Harjono and the secretariat and discuss how the project is managed. It was explained by Prof Harjono, that the group had known each other long before, which made the project run smoother and relatively well. Some problems relate to budget availability, mainly from universities. Group 1.2 lead by Prof. Nishimura also had problem at the field. Normally, security clearance from the Navy is unnecessary unless using research vessel. The group used small boats. But there are questions for this, and created more problem, because the two of the researchers was not the member of JICA JST. RISTEK (Pariatmono) and LIPI (Hery) is trying to negotiate with the Navy. This imposes a strong message for the upcoming campaign or fieldwork that the researcher should be in the list of the JICA JST. This issue is still sought to be solved.

Suggested solutions are, if the group wish to be accompanied by non members (students of company), should previously apply to JICA JST secretariat very advanced. An adjustment to the application form was proposed, to tick categories of researcher (JICA expert will be requested for permits to SETNEG, researchers supported by JST should apply permits through the Jakarta project office, and others should apply permits by themselves). Kenji Satake underlined, that these issues may affect the entire project in overall, therefore requesting all group to be well prepared.

Edy Prihantoro (RISTEK) as secretariat suggests it will be better if we can predict areas to be visited, then the minister will assign letter acknowledging this. The project is dynamic in regards of members, prone to member changes and additions.

LIPI will provide budget for the year 2011. Additional budget is also required for Group 6.

5. **JULY BANDUNG WORKSHOP**: Geodynamics and Disaster Mitigation in West Jawa

The workshop will take place in two days: 12-13 July 2010 in ITB Bandung. A field trip on the third day is arranged. Representatives from Japan side are already proposed. Preparations for the workshop is ongoing, coordinated by Irwan Meilano. Pariatmono (group 6) suggest to discuss with BNPB on the preparation. Suggestions made to involve the Governor of West Jawa, to advocate support from local government, as well as important entity in local disaster management.

6. NOVEMBER WORKSHOP

Dates were already set, in November 22-26. The group will have group discussions and intra-group discussion on the 22nd November. Joint workshop will be conducted in 23rd and 24th. On the 25th an excursion is prepared. The entire group will return to Kobe on the 26th. Indonesian group will depart on November 21st.

7. POLICY ARRANGEMENTS

Presentation was made by group 6. Some issues imposed were the lack involvement of media on disseminating results of the research. Media also tend to misinterpret information provided by researchers, therefore, it is encouraged that researcher put more effort in writing popular articles for media. Two newsletter editions were already produced. The third edition is still uncertain. Television talkshow programs are arranged for 5 series, with all group leaders participate as resource

persons. Radio programs with more slots for broadcasts are also allocated, and each subgroup is requested to develop synopsis, with resource persons from each sub groups.

Other means of dissemination is also workshops/conference. Each group had arranged their own workshops. The group 6 request to all group to include disaster management agencies, and pay good attentions in communicating results of research for effective use. Final workshop at the end of 2011 (November) will be conducted, and suggested to be conducted at the International Conference on Tsunami Warning II (ICTW II) – Banda Aceh. TDMRC-Syiahkuala university had pledged to provide conference venue and logistics.

Okawa (Keio University) question whether there will be rights provided to broadcast the TV and radio shows, and upload the records over the internet. Pariatmono replied that RISTEK owns copyright and therefore does not see any problems to freely distribute the records. Edy Prihantoro suggested, in relations with dissemination in TV and radio, that the group to acknowledge local government, and the use of popular language to ensure effective and understandable science communication to public. Both sides, Japan and Indonesia, need to pledge whether we can cover the proposed budget far in advanced, especially when engaging media. Indonesian side is ready to pledge the budget allocation for this media dissemination. Hasanuddin suggest that the broadcast is not made in real time, but delayed. There are scientists in Bandung who can be resource persons, and media can be invited to the excursions as well. Combinations is also can be made, enriched by stock shoots of field works and excursions.

Prof. Kato supports the idea with the TV program. Kato also reminded the group that the general idea is also to document the process. Video documentations is also important. Some samples are available. Hery Harjono also suggest advocating the entire project framework through media. Pariatmono suggest to all group to provide synopsis to elaborate to media plan.

Endo had shared that the amount of the money was not planned. If this plan is accepted, then the total amount of the project must be squeezed. The budget plan was already discussed with Prof.Kato and Koresawa. Group Leaders agreed to reallocate their budget for dissemination and socialization purposes. Press conferences may be integrated with workshop budget.

Koresawa propose to allow Group 6 to analyze the inputs from all group in developing policy strategy. The result will be presented in July or August workshop.

8. NEXT PROJECT

This project will terminate in March-May 2012. JST JICA will have a call for proposal for 2011 project in September. Kenji Satake illustrates the choices of continuation of the project, if proposed in 2010. If successfully accepted, the project will commence in late 2011 or early 2012. If proposed in 2011, there will be approximately 1 year gap. The current group leaders are not allowed to propose in 2010, but the member of the group may propose. Hery Harjono suggest to propose a smaller group, in order to achieve effective project management, and elaborate into in depth research, expanding to eastern part of Indonesia and Sunda Straits. Proposal should also go through RISTEK. Prof. Hasanuddin support the suggestions to work on Sunda Straits, and relations to the plan to build Sunda Straight bridge. Pariatmono on the other hand, suggest elaborating a bigger group for the project, related to the bridge building. It will connect two major islands in Indonesia, hence the bridge will alter transportation systems, economic development, etc. Eddy Prihantoro recalls many players in this area, that will make the 'field' uncomfortable. Specific focus is important, as coordination is not an easy word to say. Hery Harjono reminded that there are still some areas not touched by existing works, for example what kind of earthquake may generate tsunamis in this particular area. Eddy is confident with the opportunity to work in this area. For the future cooperation, he reminded the implementation for disaster management that still need support, e.g: development of tsunami evacuation shelters, shelter management, even under earthquake and tsunamis or all kind of disasters.

Kenji Satake invited the group members to start thinking about this.

Appendix 9:

INTERNATIONAL WORKSHOP "GEODYNAMIC AND DISASTER MITIGATION OF WEST JAVA"

An international workshop on Geodynamic and Disaster Mitigation of West Java was held at Auditorium of Bandung Institute of Technology for Bandung in July 12-14.

The main guests include vice Rector of ITB (on behalf of Rector), on behalf of West Java governor, Mr. Hiroyuki Hasegawa from MEXT and Ms. Imabayashi from JST. The total participants were 88, not only from our project but also from U.S., Australia and Singapore.

On the first day (July 12), 14 talks on tectonics and active fault observations, strong motion prediction and seismic hazards, tsunami observation and potential were presented. On the second day (July 13), 6 talks on volcano observation and mitigation were presented in the morning. In the afternoon, field trip to Lembang fault and seismic station (BMG) was held. On the third day (July 14), 5 talks on vulnerability and social aspects of disaster were presented.

In the afternoon of the third day, general discussion was held to summarize the workshop as follows.

Cimandiri and Lembang Faults

1. Paleoseismological studies show that Lembang Fault produced tens of meter of normal-fault displacement in last 25 ka, with a possible most recent event a few hundred years ago.
2. Monitoring of earthquakes indicates some seismic activity along LF.
3. GPS measurements detects left-lateral motion of Cimandiri Fault and right-lateral slip movement of Lembang Fault, but ongoing continuous measurements may show vertical movement.
4. Bandung basin has variable soil conditions, which strongly affects ground shaking.
5. Recent probabilistic hazard map for building code purpose has already considered Cimandiri and Lembang Faults.
6. Both update of Probabilistic and Deterministic modeling of ground shaking and hazard map may be needed.

Tsunamis

7. Tsunami hazard assessments have been done for Pelabuhan Ratu, and are being made for Pangandaran and Cilacap.

Volcanoes

8. Seismic and geodetic monitorings have started at Guntur, and seismic monitoring at Papandayan and Tangkuban Parahu volcanoes to study volcanic activity as well as tectonic situation on around these volcanoes.

Landslides

9. West Java experiences many landslides.

Vulnerability

10. Quantitative preparedness assessments are being made in Serang district, in the neighboring province.
11. Preparedness assessment may be needed in West Java.
12. More room to increase preparedness in local government and school levels. Coordination between stakeholders (e.g., Univ., NGO) may be needed.
13. Studies of online information indicate people reacted for the 2009 West Java earthquake based on individual experience. To implement disaster mitigation program, consideration of people's mobility in Indonesia's society is important.
14. RADIUS: risk analysis and increase awareness project (1999-) needs reassessments, enlargement of area, as well as implementation and actions.

Vice Rector Prof. Abidin at Opening

Field trip to Lembang Fault trench site

AGENDA

INTERNATIONAL WORKSHOP "GEODYNAMIC AND DISASTER MITIGATION OF WEST JAVA"

Auditorium ITB-Bandung, 12-14 July 2010

Monday, July 12, 2010

08:00 - 09:00 *Opening Speeh*

- Rector of ITB
- Governor of West Java
-
- MEXT representative (Mr. Hiroyuki Hasegawa)
  The state of earthquake evaluation in Japan
  Activities of the Earthquake Research Committee (ERC) in the HERP
- JST-JICA representative (Prof. Kenji Satake), Probabilistic Seismic and Tsunami Hazard Assessments An example of integration of our project

09:00 - 10:00 *Tectonic and Active Fault Observation*

- Paleoseismology Observation of Lembang Fault

  (Eko and Awata)
- Tectonic Landform of the Lembang Fault and Northern Bandung Area (Awata, Y., Daryono, M.R., Yulianto, E., and Natawidjaja, D.H)
- Geodetic Observation of Cimandiri and Lembang fault (Irwan, Abidin, Kato, Sarsito, Andreas, Irwan Gumilar, Teguh)
-

10:00 - 10:30 *Coffee Break*

10:30 - 12:00 *Tectonic and Active Fault Observation*

- Active Tectonic of Cimandiri Fault (Supartoyo, Emmy Suparka,Chalid Idham, Imam Ahmad Sadikun and Surono)
- Seismological Evidence of Lembang and Cimandiri Fault (Jaya Murjaya, BMKG)
- Application of A10 Absolute Gravimeter for Monitoring Land Subsidence and Crustal Movement in Indonesia (Fukuda and Hasanuddin)

12:00 - 13:00 *Lunch Break*

13:00 - 14:30 *Strong Motion Prediction and Seismic Hazard Subsidence*

- Geological hazard threat at West Java province (Surono,

Gede Suantika, Athanasius Cipta and Sumaryono)

- Source fault and rupture process of the 2006 Yogyakarta earthquake: worst example of Javanese island earthquake (Koketsu and Kawazoe)
- Seismic Hazard Analysis for Bandung Basin (Wayan Sengara, Afnimar and Sri Widiyantoro)
- Estimation of Bandung Basin Structure using Microtremor data (Afnimar, Sengara, Yamanaka and Koketsu)
- Investigation of Design Ground Motion and Implementation of Earthquake Safer Housing (M. Harris Pradono)
- Progress of Earthquake Hazard Mapping in Indonesia (Irsyam et al.)

14:30 - 15:00 *Coffee Break*

15:00 - 16:00 *Tsunami Observation and Potential*

- Source determinations using tsunami numerical simulations (Aditiya Gusman and Tanioka)
- Tsunami hazard and mitigation of West Java (Hamzah Latif, Tanioka, Satake, Sunendar, and Natawidjaja)

Tuesday, 13 July 2010

08:00 - 09:30 *Volcano Observation and Mitigation*

- Seismicity of South of Guntur volcano, West Java, Indonesia (Iguchi Masato, Takahiro Ohkura, Hetty Triastuty, Muhamad Hendrasto, Agoes Loeqman, Yasa Suparman, Ahmad Basuki, Surono)
- Continuous GPS observation at Guntur volcano, West Java, Indonesia (Takahiro Ohkura, Iguchi Masato, Muhamad Hendrasto, Umar Rosadi, Agoes Loeqman, Surono)
- Evaluation of Recent Activities of Papandayan Volcano, West Java (Hetty Triastuti, Hendrasto, Aditya, Umar Rosadi, Agoes Lukman, Yasa Suparman and Novianti)
- Seismic Activity of Tangkuban Parahu Volcano, WestJava (Estu Kriswati, Agus Budianto, Evrita Luci, Syegi Kunrad and Anna Mathovani)
- Community Preparedness in Serang district (Widayatun)
- Community vulnerability: case study in Serang district, Banten (Deny Hidayati)

09:30 - 10:00 *Coffee Break*

10:00 - *Field Trip to Lembang Fault*

Wednesday, 14 July 2010

08:00 - 10:00 *Vulnerability and Social Aspects of Disaster*

- Effective Disaster Education in Indonesia (Irina Rafliana and Ogawa)

- Local knowledge and disaster management: case of 2009 West Java earthquake (Yamamoto and Nishi)
- Seismic Risk Assessment in Bandung Basin (Krishna and Sengara)
- Roles of organizations for disaster education in emergency situation (Megumi Sugimoto)
- Distance Education Environment: Technical Update (Okawa, Thamrin, Watanabe, Suhardiman)

10:00 - 10:30 *Coffee Break*
10:30 - 12:00 *Discussion* (Kato, Satake, Hery, Hasanuddin)

12:00 - 13:00 Lunch Break
13:00 - 15:00 *Press Release, non technical and Media Discussion*

Appendix 10:

International Workshop on Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia

The second annual workshop of SATREPS project "Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia" was held from November 22 through 25, 2010 at JICA Hyogo center in Kobe, Japan. The total participants were 84, 48 from Japan and 36 from Indonesia, including 8 guests from JCC member agencies in Indonesia and 17 general audience (mostly from Japanese media).

On the first day (Monday November 22), after the registration and remarks by secretariat, each group met in separate rooms and discussed their activities. Discussion across groups led by Groups 5 and 6, and group leader meeting were held before the opening ceremony.

The opening ceremony was attended by Mr. Suzuki (MEXT), Mr. Ibnu Hadi (Consul General), Mr. S. Okaya (JST), Mr. E. Irei (JICA) and Mr. H. Kimura (Hyogo Prefecture), in addition to the group members. Following their opening addresses and welcome speeches, four special reports on recent earthquakes, tsunami, and volcanic eruptions were made. Reception at JICA center was followed.

In the morning of the second day (Tuesday November 23), a brief introduction and 11 presentations were made from Group 1 for studies of earthquakes and volcanoes. They were: paleoseismological studies on active faults, coastal tsunami deposits, and living corals, GPS studies on both Java and Sumatra for active faults and subduction-zone earthquakes, earthquake source modeling and microtremor observations for strong-motion prediction, report of recent marine surveys and structure of offshore faults, and tsunami modeling for Java coasts.

In the afternoon, an introduction, 7 oral presentations and 2 poster presentations were made on volcanic studies from Group 2. They were: recent activity and tilt changes before eruption at Semeru volcano, seismic activity around Guntur volcano, geological studies at Batur caldera, and long-term forecasting at Kelud volcano. In addition, a report on recent activity of Sinabun volcano was also presented.

From Group 3, an introduction and 7 presentations were made. They were: tsunami hazard maps and its use for mitigation in Padang, use of coastal vegetation for tsunami disaster reduction, microtremor surveys in Padang for liquefaction and house design purposes. Because different groups made similar surveys (e.g., microtremor surveys in Bandung and Padang), needs for coordination among subgroups were pointed out.

On the third day (Wednesday November 24), after an introduction, 7 presentations were made from Group 7. They were: community-based disaster management for Bantul, effects of cultural difference between Indonesia and Japan or local knowledge on disaster management, recoveries of lifeline in Padang and Banda Aceh, and psychological studies on warning and evacuation for Mt. Kelud.

From Group 5, an introduction, 6 oral presentations and 2 poster presentations were made on disaster education. They were: on education and outreach program at school and community, use of tsunami simulation, painting of memories, and practice in both Japan and Indonesia.

In the afternoon, a summary and 4 presentations were made from Group 6. In addition to report on linkage between research and policy of our project, presentations on early warning system from KOMINFO and BMKG, and on disaster management policy at Ministry of Home Affairs were made from participants outside this project.

After the above project workshop, an open session was held, in which four presentations were made with general audience. After brief summary of this project and workshop were presented, disaster managements at Bantul regency, West Sumatra province, and Hyogo prefecture were introduced.

After the workshop, the Indonesian participants and group leaders were invited to Consol General's residence.

On the fourth day (Thursday November 25), a study trip was carried out to visit Nojima fault museum and E-defense. On the way to Nojima Fault museum, the buses crossed Akashi Bridge and travelled along Nojima fault. At the museum, participants observed preservation of surface fault and experienced simulated shaking. After lunch at Kande-Kande, participants visited E-defense to observe the large 3-dimentional shaking table facility.

Opening address by Indonesian PI, Hery Harjono

Experiencing shaking table at Nojima Fault Museum

Discussion in front of one of the test buildings at E-defense

Group photo, courtesy of Mohamad Hendrasto

Appendix 11:

MINUTES OF MEETING
JOINT COORDINATING COMMITTEE (JCC) MEETING
ON
MULTI-DISCIPLINARY HAZARD REDUCTION FROM EARTHQUAKES AND VOLCANOES IN INDONESIA
JAKARTA, MAY 6th,2011

Introduction of the Meeting

The chair of the meeting, Prof. Dr. Hery Harjono, leads the opening of the meeting, and invites Mr. Yano for the short presentation before the meeting begins. Mr. Yano (JST Singapore) presented new project about SATREPS (Science and Technology Research Partnership for Sustainable Development) conversation of ecosystem in ocean. Any 59 project all of the world about environment, science, disaster, health crisis. SATREPS is online community and the participants, supporters, or friends are community based on research.

The chair of the meeting, Prof. Dr. Hery Harjono, lead the photo section and introduce all members of meeting : KEMENDAGRI, RISTEK, BMKG, BNPB, BAKOSURTANAL, LIPI, PVMBG, BPPT, KOMINFO, ITB, JST, JST Singapore, JICA Tokyo, JICA Indonesia, Gronps 1 – 6, Newspaper media (Suara pembaharuan).

Introduction was normally given by Dr. Ir. Idwan Suhardi (Deputy State Ministry for the Utilization of Science and Technology, Ministry of Research and Technology Republic of Indonesia). He said thanks to all of institution that have comes and to the project director Prof. Hery and Prof. Kenji. This gathering subject is to observe the current progress report with the title "Multi-disciplinary hazard reduction from earthquakes and volcanoes in Indonesia". He is very sympathetic with Japan earthquake and tsunami on 11 may 2011, with 9 magnitude and claiming heavy casualties and also destruction infrastructure. That's occasion to be lesson learn for Indonesia especially about disaster management. Cooperation between Indonesia and Japan on earthquakes and volcanoes already more that 3 years, and a lot of inputs that Indonesia have. We expected the participants to provide inputs to this progress report. He is belief that this cooperation will decrease casualties and destruction infrastructure.

1

Opening Address by JICA

Opening was made by Mr. Jitsuo Ishiguro. He said thanks full to all participants that coming. Today, will reporting the result activities progress. The importance is the output and outcomes will considers how to apply outcomes disaster mitigation administration in Indonesia. JICA-JST website will be given information about this project. JICA will help the government in the face of disaster risk reduction and climate change.

Report for Activity JFY 2010

Prof. Kenji Satake explain the content in Mid-term report (as a replacement of the annual report 2010) include the group table, the summary of mid-term report, exchange of researches, meeting and workshops, earthquake and volcanic hazards (2009 – 2011).

- **Progress Report of Activities each Groups**

  Reports on progresses were made by all group leaders consecutively.

Input JICA 2010-2011 / Indonesian Side, Confirmation of Project Members Indonesian side and Japanese side

In generally 2010, 100 researchers from Japan can come to Indonesia. And 56 researchers from Indonesia visited to Japan. Input Japanese side equipment (purchase in Japan), equipment (purchase in Indonesia), and input Japanese side in Indonesia for activity, can be known on documents that were distributed. All the budgets can be known on document planned inputs (person and days) for tasks in Indonesia and Japan (2011/2/25). One mistake in group 2 but we can still arrange the budget in 2011.

Report of Midterm Evaluation by JST

Report on the provisional mid-term evaluation. Explain the project flow (JST collaborate with JICA), overall comments are progress in individual research issue has been steadily made as originally planned and further progress will be expected, some issue aim at development of basic research and other at application and technology program. Explain comments on earthquake, tsunami and volcano; comments on the active fault group; comments on management and system, comments on collaboration among groups, comments on mutual exchange, capacity building, and technology transferring.

Issues for Coming JFY 2011: JpGU, Final Evaluation and Next Project

Professor Kenji Satake Will sent comments to group leader and will discuss the final workshop. Any 9 participants from Indonesia and all group leader attending. Final workshop will held on 27 – 30 October 2011 meeting at IDEC expo at Kemayoran (Jakarta fair), north Jakarta. About publication of research papers (Journal of Disaster Research, English by English publish, Bimonthly Journal Refereed paper) will submission on August and revised on October. Very important that published on January 1st 2012. The Issue about general disaster research and will published at website, so everybody in the world can be read this paper.

Discussion

- Mr. Idwan suhardi: He is very proud of this project and also very good for Indonesia. This project can inform BNPB (National agency of disaster management) with similarity capability on mitigation works. He is explains how this research result can be implemented until in the district of our country, because it is very important things for Indonesia. In the university, it's very good if this knowledge delivery to the assistant researchers so it will be created a good scientific people.
- Mr. Pardino (PU): He is said very good collaborative research for all the institution. One of collaboration result that PU was had the seismic zoning map. He hope in the next activity or project will be held in Jakarta to research the complex problem especially the infrastructure. At the workshop on October 2011, will extend that map and the workshop can result how to integrated problem about volcano, tsunami and earthquake.
- Mr. Awang (Kemendagri): He is said for the next project, Kemendagri will be support. And he explain that Kemendagri have regulation with BPBD in province at district area. That is easier to implementation the research result at the district area for mitigation.
- Mr. Harjono (BMKG): He said this is a very good project but BMKG not yet participate in this project. He hopes that result of the project is tsunami risk map, that can to be data base for mitigation and disaster risk reduction. Because the tsunami risk map still very limited so very difficult to be get it.
- (BAKOSURTANAL): He is explaining about how to make all of the reports from group 1 until group 6 collaborate into one report and base on science. After that, the report can be sent to all institution that needs. Bakosurtanal will be support this research project.
- Mr. Subandono (Ministry of Marine and fishery): He is explaining that Indonesia needs hazard map in the susceptive area because related with preparedness, which can use for disaster risk reduction. And he hopes that the project will be continued.

- (KOMINFO): He is explain that Indonesia have established early warning system from BMKG now. He hopes, how the next project can be disseminate the early warning system deliver to mobile phone like Japan do. That is one of lesson learn that very importance which can applied in Indonesia.
- (ITB) : He said that this project very use full for education especially at research. Created capacity building for the college students with related educational background, can be cooperated between different grade and level on disaster research. Involving students in these projects or exchange student with another country, it will produce gradnates who are to be good researchers.
- JST : He said that all of the suggestions will be recommended for next years.

Closing Address by JST

Closing was given by JST. He said thank you for the kindly sympathize and response from the participants. He is also very happy to be here and can be finished the report this year. He said that all of suggestion from the participants will be recommended for next years. After that, this session continned with introduction about Sea-Floor GPS / Acoustic Observation Technology. Japan and Thailand are cooperated in Sea-Floor GPS in this year. And also we can get a lot of information about see observation by GPS which connected with LAN.

Appendix 12: Indonesia-Japan Workshop on Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia

Program:

Indoensia-Japan Workshop on Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia

Period: October 27 (Thu.) – 29 (Sat.), 2011
Venue: JAKARTA INTERNATIONAL EXPO / JI EXPO(PRJ)

Thursday October 27
Venue: JAKARTA INTERNATIONAL EXPO / JI EXPO(PRJ)
Bus: Hotel to JI Expo 09:00(?)

10:00	11:30	Opening Ceremony IDEC Limited person from Project attend this ceremony	

Venue: JAKARTA INTERNATIONAL EXPO / JI EXPO(PRJ) ruang Bromo 6FI
Bus: Hotel to JI Expo 11:00

11:30	12:30	Regstration	
12:30	13:30	'Disaster Management and Climte Change Conference(Coordinating Ministry for People's Welfare)' & 'Indonesia-Japan Workshop on Multi-Disiplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia'	
		Report from committee	
		Opening Remarks	Coordinating Ministry for People's welfare of the Republic of
		Keynote Speech	UKP4
		General Lecture	Prof.Satake Kenji : Unforecasted earthquake and forgotten tsunami-Lessons from the March 2011 Tohoku disaster
13:30	18:00	Disaster Management and Climte Change Conference	
		Session 1 BNPB, BASARNAS, BMKG, DNF*we follow until end of conference	
		Session 2 LIPI, USGS,UGM, IRD	
		Session 3 Iguchi Masato, Koresawa Atsushi	

Bus: JI Expo to Hotel 18:20

19:00	21:00	Reception	Dinner at Novotel Hotel Ballroom

Friday October 28
Venue: JAKARTA INTERNATIONAL EXPO / JI EXPO(PRJ) 6F, Krinci room
Bus: Hotel to JI Expo 08:00

09;00	**09;20**	**Introduction of workshop**	**PI: Hery Harjono/ Satake Kenji** **Mext; Yukiko Kato**
09;20	11;00	Panel Discussion "From Science to Society" Moderator BNPB / Teddy	
09;20	09;25	Inroduction	
09;25	09;45	Depdagri	
09;45	10;05	ADRC	
10;05	10;25	SKP	
10;25	10;45	Bantul District	
10;45	11;05	Padang District	
11;05	11:20	Formulation Meeting Note	Panelist and Moderator sign in minuite of meeting
11:20	11:50	**Press Conference**	
11;50	13:30	Break, Lunch, Pray & Poster viewing	
		Workshop Session 1	
13:30	13:35	Summary T. Kato	
13:35	13:50	G1-1 Awata, Y., E. Yulianto, Daryono, M. and Natawidjaja,	Long-term evaluation of earthquake occurrence from the Lembang fault, West Java
13:50	14:05	G1-1	
14:05	14:20	G1-3 Teruyuki Kato and the research group G1-3	Tectonic deformations in the west Java and the northern Sumatra
14:20	14:35	G1-3 Irwan Meilano	GPS observation of crustal deformation in West Java and Aceh
14:35	14:50	G1-4 Hiroe Miyake	Source modeling towards broadband ground motion prediction
14:50	15:05	G1-4 Afnimar Maharlis	Modeling of seismic wave propagation in the Bandung basin from Lembang fault
15:05	15:20	G1-6 K.Satake	Tsunami analysis of the 2010 Mentawai tsunami earthquake
15:20	15:35	G1-6	
15:35	15:45	Discussio Hasanuddin	
	Poster	G1-5 K.Hirata	
15:45	16:00	Break	
16:00	18:15	Session 3	
16:00	16:05	G3 summ F. Imamura	
16:05	16:20	G3-1 Abdul MUHARI,, Imamura,	Potential tsunami hazard and risk prediction to human in Padang
16:20	16:35	G3-1	
16:35	16:50	G3-2 Matsunami, Subandono	Effects and Limits of Coastal Forests in Japan and Indonesia
16:50	17:05	G3-2	
17:05	17:20	G3-3 Adrin Tohari	Liquefaction risk evaluation, Kohji Tokimatsu, Adrin Thari
17:20	17:35	G3-3	
17:35	17:50	G3-4 Wayan	Ground-motion, Wayan

17:50	18:05	G3-4	Watanabe, Meguro	Development of promotion system for implementation of earthquake safer non-engineered
18:05	18:15	Discussio	Harris	

Bus: JI Expo to Hotel 18:20

Saturday October 29
Bus: Hotel to JI Expo 07:30

8:00	10:15	Session 4		
8:00	8:05	G4 Summ	Takahashi	
8:05	8:20	G4-1	Deny Hidayati	The Role of Community Leaders in Disaster Risk Reduction: Lessons Learnt from the 2006 Eartquake
8:20	8:35	G4-1	Djati Mardiatno	Community participation for disaster risk reduction: case from
8:35	8:50	G4-2	H. Yamamoto, and Y. Nishi	Bridging Local Knowledge and Global Science : Auto-mapping System
8:50	9:05	G4-2		
9:05	9:20	G4-3	Y. Kuwata,	Inhabitant Consciousness on Disaster Reconstruction of Water
9:20	9:35	G4-3	M.Dirhamsyah	
9:35	9:50	G4-4	JIBIKI Yasuhito	Disaster Warning and Evacuation Behavior: the Case of Mt. Kelud in 2007
9:50	10:05	G4-4	Dicky Pelupessy	
10:05	10:15	Discussio	Deny	
10:15	10:30	Break		
10:30	12:05	Session 5		
10:30	10:35	G5 Summ	Irina	
10:35	10:50	G5-1-1	M.Ikeda	Explanation of the outline on G5-1-1 activity "Research on the effective disaster education at school"
10:50	11:05	G5-1-1	Asep K	Analysis and Result on G5-1-1 activity "Research on the effective disaster education at school"
11:05	11:20	G5-1-2	Ogawa	Development of Tutorial Material DVD and Guidbook of Disaster Town Watching
11:20	11:35	G5-1-2	Ridha, Triyono	
11:35	11:50	G5-1-3	Yudha Nurdin(UNSYIAH), Brian Sulaiman(ITB) and Divah	Development of Tsunami Evacuation Simulation using NetMAS - Result of Training in AIST of Tsukuba
11:50	12:05	G5-1-3	Yozo Goto	Disaster Education and Actual Evacuation in Yamada-machi
	Poster	G5-1-3	Yozo Goto(ERI), Muzailin Affan(UNSYIAH), and Megumi	On-demand Tsunami Evacuation Simulation for the Whole Coastal Area of Banda Aceh
		G5-1-4	SUGIMOTO(University of Tokyo), Harris Pradono(BPPT), Rudi	The monuments condition diagrams of the 2004 Sumatra tsunami and the 1896 Meiji and the 1933 Showa Sanriku tsunamis
12:05	13:00	Lunch and poster viewing		
13:00		Session 6		
13:00	13:15	G5-1-4	Megumi SUGIMOTO(University of Tokyo), Harris Pradono(BPPT), Rudi Kurniawan (TDMRC), Dara Alldira (UNSYA)	Disaster education and awareness continued by tsunami memorial statues -Case study in Aceh and Tohoku
13:15	13:30	G5-1-4		
13:30	13:45	G5-2	Munasri, Didik	
13:45	14:00	G5-2		
14:00	14:15	G5-3	Okawa	Internet and Distance Education for Disaster Prevention
14:15	14:30	G5-3		
14:30	14:45	G6	PU	
14:45	15:00	G6	KOMINFO	
15:00	15:10	Discussio	Pariatmono & A. Koresawa	
15:10	15:30	Break		
15:30	17:45	Session 2		
15:30	15:35	G2 summ	M. Iguchi	
15:35	15:50	G2-1	T. Nishimura, M. Iguchi, R. Kawaguchi, M. Handrasto, U. Rosadi	Volcanic eruption mechanism of Semeru volcano and short-term prediction based on the analyses of tilt data
15:50	16:05	G2-1	Agoes Loeqman, M. Hendrasto, M. Iguchi	Evaluation of seismic activity at Semeru volcano
16:05	16:20	G2-2	T. Ohkura, M. Iguchi, M. Hendrasto, U. Rosadi	Evaluation of volcanic activity of Indonesian volcano based on continuous GPS observation
16:20	16:35	G2-2	H. Triastuty, A. Basuki, A. Budianto, M. Iguchi, T. Ohkura	Seismic activity in and around West Java volcanoes - Guntur and Papandayan
16:35	16:50	G2-3	A. Takada, R. Furukawa, K. Toshida. S.D. Andreastuti	Geological Evaluation of Frequency and Process of Caldera-forming Eruption
16:50	17:05	G2-3	E. Kadarsetia, I. S. Sutawidiava. S.D. Andreastuti.	Characteristics Of Batur Volcanic Rock: Pre-Caldera, Caldera And Post Caldera As A Comparison

17:05	17:20	G2-4	K. Ishihara	Diagnoses of volcanic activity and long-term prediction of volcanic eruption-Kelud volcano and some Japanese volcanoes
17:20	17:35	G2-4	A. Basuki, Novianti I., M. Iguchi	Evaluation of VT earthquakes in Sinabung volcano after 2010's eruption
17:35	17:45	Discussio	Surono	
	Poster	G2-3-1	R. Furukawa et al.	Explosive eruptions associated with Batur and Bratan caldera, Bali
	Poster	G2-3-2	Kiyoshi Toshida, Shingo Takeuchi, Ryuta Furukawa, Akira Takada, Supriyati Andreastuti, Nugraha Kartadinata, Anjar Heriwaseso and Oktory Prambada	Long-term variation of pre-caldera volcanic activity in Bali and East Java
17:45	18:00	Internal Discussion		
17:00	18:00	closed session, only project members and stake holders		
18:00	18:10	Closing		JICA

Bus: JI Expo to Hotel 18:20

Photo: Presentation by Satake at the opening ceremony of iDEC2011 (International Exibition & Conference on Disaster Management and the Latest Products in Indonesia)

Photo: Presentation at the workshop

Summary

"Indonesia-Japan Workshop on Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia"

Jakarta, 27 – 29 October 2011

Introduction

The JST-JICA SATREPS[1] "Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia" (hereinafter "the Project") organized, as part of its activities, the Indonesia-Japan Workshop on Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia, at JIEXPO (Jakarta International Exposition) KEMAYORAN, Jakarta from 27 October to 29 October. The members of the Project, officials of government of Indonesia and Japan, representatives of JST and JICA, other experts participated in the Workshop.

This Workshop was held to coincide with the Indonesia Disaster Preparedness, Response, Recovery Exhibition & Conference (IDEC) 2011. On the first day, 27 October, the project members participated in the Disaster Management and Climate Change Conference, a main event of the IDEC 2011, organized by the Coordinating Ministry for People's Welfare, Republic of Indonesia. Project members were invited to speak at the Conference thereby presenting the activities of the Project and underlying their relevant to disaster management in Indonesia. Also, they made presentations on the Great East Japan Earthquake and Tsunami which occurred on 11 March in Japan as well as the Merapi volcano eruption in October 2010. In particular, the participants in the Conference showed great interest in sharing information on the Great East Japan Earthquake and Tsunami since Indonesia is a country prone to recurrent earthquake and tsunami disasters including the Indian Ocean Tsunami in December 2004 and the Mentawai Tsunami in October 2010. This collaboration with the Coordinating Ministry for People's Welfare clearly indicated strong interest of the government of Indonesia in the activities of the Project.

1 SATREPS (Science and Technology Research Partnership for Sustainable Development) is a Japanese government program that promotes international joint research targeting global issues, supported by the Japan Science and Technology Agency (JST) and the Japan International Cooperation Agency (JICA)

Reports by individual groups and sub-groups

On 28 and 29 October, the member of the Project were engaged in intensive discussion to share information on progresses and achievements made to-date by each group and sub-group as well as to exchange views and ideas on how to proceed on with the preparation of final products of the Project as a whole in the remaining period. The following summarizes main results of discussion.

Group 1:

From Group 1, six oral and on poster presentations were made covering paleoseismology on inland active faults and coasts, GPS and other geodetic measurements, strong motion and tsunami prediction, and offshore marine surveys.

It has been stressed that multiple sub-group researches should be integrated: for example, active fault surveys (1-1), geodetic surveys (1-3) and strong motion prediction (1-4) for the Lembang fault can be integrated to produce a consistent results on precise prediction of strong motion in Bandung Basin due to an earthquake along the Lembang fault.

Group 2:

The goal of Group 2 is a proposal of methods for forecasting and evaluation of volcanic activity. We propose methods of ground deformation for short-term and long-term forecasting, combination of seismicity and eruption rate of magma, and geological survey and dating for long-term or super-long-term evaluation for caldera eruption. The scientific evidences of the proposal were shown by 8 oral presentation and 2 posters in the workshop.

Group 3:

After introducing the purpose and goals of Group 3 and progress for two years, including the workshop at Padang dated on 26 October 2011, the members from each sub-group made the presentations to explain the tentative result and final goals to compile the all data and result on the hazard map at the specific area, which should be provided to the central and local governments and people.

Padang and Bantul are selected to be the area for multiple hazards map including the ground motion, liquefaction, tsunami, and information on the evacuation. The guideline to utilize the green belt for reducing the tsunami impact is designed to be published in G3-2.

Group 4:

The session of Group 4 had six papers about a wider range of topics in the social and cultural aspects, including community activities, local knowledge,

informal information channel. They noted fruitful local initiatives, and stressed their future potentials, taken by various bodies as universities, media, and locality-rooted organizations.

For the community-based disaster management, on which the research purpose of this group focuses, the governmental mechanisms are fundamental, while the institutional framework to involve such non-governmental practices is critical, as well.

Group 5:

Group 5 delivered 9 presentations consist of each sub groups. During the presentations, it was found that for disaster education, it is important to institutionalize school preparedness for sustainability using available methods and experiential learning. These are to allow better understanding on local risk, and town watching/school watching method offers such simple tool. Moreover, there also gaps making disaster education materials available. To overcome difficulties in accessing different education materials, database materials through internet access is one of the solution, can be used in both Japan and Indonesia, and proposed by group 5.1.2. , and the Lack of awareness were contributed also due to language barriers and differences of terminologies. Therefore, group 5.1.2 develops studies on different terminology understanding at local level.

For project sustainability issue, it was raised by group 5.1.3 on the need for capacity and technology transfer to Indonesian researchers related to evacuation and tsunami inundation simulation development. Indonesian researchers and research institutions should combine resources and knowledge. Support for young researchers is important with enough time and funding allocation. Users of research results for public education needs social senses and users perspectives should also be taken into account.

About lessons from Japan tsunami it was found out that quick evacuation during Japan tsunami 2011 is related to participation to regular drills. Yet, many past events and education still failed in ensuring proper response to save lives (lessons from Yamada machi and Mentawai). Many cases of awareness and lack of preparedness in Japan also relevant to Indonesia and vice versa (over-expectation of the mitigation system). Decision making by people's own judgment is highly important, whether the community is in urban or remote area. This is highly important to be considered for further education intervention in both countries. For Indonesian interest, there are many gaps and weak areas need for further education improvement, such as slow earthquake which is also scarcely introduced to community. In other case in Indonesia, Richter scale is more familiar than earthquake intensity (MMI, Shindo). This can lead to misleading perception/interpretation about the risk. It is understood that wrong education message can create wrong perception and add to possible casualties.

For future follow up, Group 5 sees that it is strategic to utilize of global education

platform for sharing knowledge and lectures/courses with global community. Follow up with global courses on disaster management (utilizing research results and findings) using SOI Asia facility is one possible channel. Stronger collaboration with other groups is still considered important. From Indonesian side, disaster education particularly at schools in Indonesia will be continued to be supported by TDMRC and LIPI. Indonesia also need to support stronger collaboration among young researchers with adequate resources and time to work together and build better models, tools, methodologies upon existing JICA JST work experiences.

From Science to Society

In addition to discussion on each group's activities as described above, a panel discussion "From Science to Society" was organized as part of activities of Group 6 to specifically address issues on how the research results should be further integrated with policy making at various levels to reduce future disaster risks in Indonesia. The representatives of the Ministry of Communication and Information Technology (KOMINFO) and the Ministry of Public Works (PU) were invited to present their activities on how research activities are integrated in policies and delivered to the public at respective ministries.

Through a series of presentations and intensive discussion, the Project members agreed that the Project, covering earthquake, tsunami and volcanic hazards from different perspectives, natural, engineering and social sciences as well as disaster education and coordination with government, was proven to be extremely important and effective in Indonesia and in the context of Indonesia-Japan collaboration as well.

It has been well recognized that each group and sub-group has making steady progresses toward their set goals and will likely produce tangible results in the end. Several suggestions however were made on the following points:

- Various studies, undertaken individually by each group and sub-group, is necessary to be integrated or linked not only within each group but also across different groups;

- Likewise, the integration or linkage of research results with policy-making needs to be further enhanced to facilitate the better use of research results for policies aimed to reduce future disaster risks in Indonesia;

- Outreach activities conducted by Group 6 so far through such means as workshops, newsletters, press conferences, TV talk show program "IPTEK Talk", radio program, and the participation in IDEC 2011, should be continued to make those research results widely known and available to a variety of potential users including policy makers, academicians and the public.

Recommendation

The members of the Project, in view of the fact that the project will come to an end in March 2012, stressed a need that collaboration between Indonesia and Japan on research activities for natural disaster reduction should be further strengthened while efforts should be continued so as to facilitate further integration and outreach activities.

They suggested that the Joint Coordination Committee (JCC), established to monitor the progress of the projects and composed of numerous disaster-related institutions in Indonesia, namely, RISTEK, LIPI, DIKNAS, ESDM, DKP, KOMINFO, PU, DEPDAGRI, BPPT, BNPB can be promoted to Indonesian key stakeholder like BNPB, as a platform to pursue such objectives, specifically to continue the collaboration between Indonesia and Japan for research activities and policy development for natural disaster reduction. The participants therefore have agreed and requested that the function of the JCC should be continued in any format to act as a window for international collaboration in future along this line.

Moreover, they underscored that BNPB, responsible for disaster management, needs to take the lead and thus should be further involved in such activities. Hence, a special request for this end will be made to BNPB so as to discuss how international collaboration between Indonesia and Japan in this field should be further enhanced.

Finally, the Workshop was successfully closed by thanking all the participants from both Indonesia and Japan for their efforts and dedication in the last three days.

Appendix 13:

MINUTES OF MEETINGS
BETWEEN JAPANESE TERMINAL EVALUATION TEAM
AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF
THE REPUBLIC OF INDONESIA
ON
JAPANESE TECHNICAL COOPERATION PROJECT FOR
MULTI-DISCIPLINARY HAZARD REDUCTION FROM
EARTHQUAKES AND VOLCANOES IN INDONESIA

Jakarta, 22 December, 2011

Jitsuya ISHIGURO
Team Leader
The Terminal Evaluation Team
Japan International Cooperation Agency

Idwan SUHARDI
Deputy Minister for Utilization of Science and Technology
Ministry of Reserch and Technology (RISTEK)
Republic of Indonesia

The Japanese Terminal Evaluation Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Jitsuya ISHIGURO, visited the Republic of Indonesia from Dec 4 to 22, 2011, for the purpose of conducting terminal evaluation the Japanese technical cooperation (SATREPS: Science and Technology Research Partnership for Sustainable Development) for Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia (hereinafter referred to as "the Project").

During its stay, the Team and the Indonesian side formulated the Joint Evaluation Team, exchanged views and had series of discussions with the Indonesian authorities concerned.

As a result of the discussions, The Team explained the contents of the Terminal Evaluation Report (hereinafter referred to as "the Report") to the Indonesian authorities concerned at the Joint Coordination Committee held on 22nd Dec, 2011.

The Team submitted the Report as attached Attachment 1 and both side agreed upon the descriptions of the Report.

Attachment 1: TERMINAL EVALUATION REPORT

Attachment 2: ATTENDANT LIST

Attachment 2

ATTENDANT LIST

<Indonesia Side>

1. Amin Soebandrio	Deputy Minister for Science and Technology Network Ministry of Reserch and Technology (RISTEK)
2. Hery Harjono	Researcher, Center for Geotechnology, Indonesian Institute of Sciences (LIPI)
3. Pariatmono	Director for Empowering Science and Technology for Government Institutions / Head of Information Center on Research on National Disaster RISTEK
4. P. J. Prih Harjadi	Deputy Director General for Geophysics, Meteorological Climatologically and Geophysical Agency(BMKG)
5. Mulyo Harris Pradono	Agency for the Assessment and Application of Technology (BPPT)
6. Togap Simangunsong	Assistant Deputy for Disaster Coordinating Ministry for Peoples Welfare (Kesra)
7. Hotman	Coordinating Ministry for Peoples Welfare (Kesra)
8. Nanang T. Puspito	Professor of Seismology Institute of Technology Bandung (ITB)
9. Anas Luthfi	Head of Mitigation Sub Directorate National Agency for Disaster Management (BNPB)
10. Perwira T.	Head of Sub Directorate Organism, System and Procedure Ministry of home Affair
11. Sulasmini	Head of Sub Division for International Affairs Division for Cooperation Bureau for Cooperation and Promotion of S&T Indonesian Institute of Sciences (LIPI)
12. Fakhri Zakaria	Public relation Indonesian Institute of Sciences (LIPI)
13. Mafaza	Indonesian Institute of Sciences (LIPI)

14. Johny F. S. Subrata	Head of Program and Cooperation Division Ministry of Public Works (PU)
15. Puspita Ramadhiana	Secretariat Project
16. Blandina F.T	Secretariat Project

<Japanese Side>

1. Kenji SATAKE	Project Leader Professor, Earthquake Research Institute University of Tokyo
2. Isamu KUBOKI	Project Coordinator
3. Kiyomi ENDO	Project Coordinator
4. Yoshimori HONKURA	Program Officer Science and Research Partnership for Sustainable Development (SATREPS) Program
5. Masayuki SATO	Director for Special Missions Research Partnership for Sustainable- Development Division Japan Science and Technology Agency (JST)
6. Koichi TSUKIOKA	Senior Staff Research Partnership for Sustainable Development Division Japan Science and Technology Agency (JST)
7. Yoshio Tokunaga	JICA Expert for BNPB
8. Yosuke Okita	Assistant resident representative JICA Indonesia

Terminal Evaluation Team

<Indonesia Side>

1. Nada DS. Marsudi	Director for International Science & Technology Network Ministry of Research and Technology

<Japanese Side>

1. Jitsuya ISHIGURO	Japanese Team Leader, JICA Indonesia office
2. Kenji TANAKA	Evaluation Planning, Deputy Assistant Director, Disaster Management Division 1, Grobal Environment Department, JICA
3. Kinuko MITANI	Evaluation Analysis, Consultant IC Net Ltd.

(Terminal Evaluation Report is separated with this Finel Report)

Appendix 14:

J-RAPID

Urgent Survey on the Actual Behavior of the People Evacuating from the Destructive Tsunami

1. Purpose:

Nearly twenty thousand people died by the giant tsunami of 2011 East Japan Great Earthquake Disaster. Why did they fail to escape? The purpose of this study is to ascertain the fact through field survey and to collect the lessons for the tsunami disaster reduction of Indonesia and Japan.

2. Research activity of the first year:

Japan team selected two areas, Yamada-machi of Iwate prefecture and Ishinomaki-shi of Miyagi prefecture, and interviewed 550 survivors there. The team also distributed questionnaire to the people in temporary houses in Ishinomaki-shi and received 800 answer sheets. Additionally, the team received information from the municipalities, such as tsunami photos and movies, casualty distribution, record of tsunami-alert broadcasts, and documents about trainings building up disaster preparedness. Japan team held an international workshop in Ishinomaki to share information with other teams surveying other disaster areas.

Indonesia team prepared a questionnaire based on their interest, and got answers from one hundred persons in the disaster area by the collaboration of Japan team.

In addition, in order to share the live experiences in both countries, Japan team collected one hundred twenty short writings about the tsunami experience and message of the refugees, and translated them into Bahasa Indonesia, and Indonesia team also collected about twenty of short writings from Aceh and Mentawai disaster areas and translated them into Japanese.

The outcomes of these surveys have been reported to the community people and the municipalities continuously. They were reported also in international symposium, seminar, academic meeting and lecture meeting.

3. Appearance of jointly operated survey

1) September 23-25, 2011 field survey

Indonesia: Yudha Nurdin, Japan: Yozo Goto and 10 members

2) February 10-11 field survey

Indonesia: Mr. Muzailin Affan, Japan: Yozo Goto

3) February 19-23, 2012 field survey

Indonesia: Hery Harjono and Trijono SP, Japan: Yujiro Ogawa and Yozo Goto

4) February 16 field survey

Indonesia: Hery Harjono, Deny Hidayai, Mulyo H. Pradono and Irina Rafliana, Japan: Yozo Goto

4. Perspective of the leftover task for the second year

1) The analyses on the collected data will be finalized by Japanese researchers in 201. Numerical simulations about the people's evacuation phenomena will be pursued in both countries.
2) The short writings collected in both countries and translated will be published by web.
3) The evacuation rush in Banda Aceh triggered by the April 11, 2012 offing-Sumatra earthquake will be surveyed and analyzed jointly.

5. Members

Japanese members		Indonesia members	
Name	Affiliation	Name	Affiliation
(Leader) Kenji Satake	ERI, Univ. of Tokyo	(Leader) Hery Harjono	LIPI, Earth Science
(Researcher)		(Researcher)	
Yozo Goto	ERI, Univ. of Tokyo	Febrin A. Ismail	Andalas Univ., Center for Disaster Study
Fumihiko Imamura	Tohoku Univ.		
Yujiro Ogawa	IIS, Univ. of Tokyo	Hamzah Latief	ITB, Geophysics and Meteorology
Atsushi Tanaka	CIDER, Univ. of Tokyo		
Itsuki Nakabayashi	Meiji Univ.	M. Ridha	Syiah Kuala Univ., Tsunami and Disaster Mitigation Research Center
Hitomi Murakami	Yamaguchi Univ.		
Taku Mikami	Gunma National College of Technology	Muzailin Affan	Syiah Kuala Univ., GIS Research Center
Taro Ichiko	Tokyo Metropolitan Univ.	Deny Hidayati	LIPI., Center for Population and Manpower Studies
Shigeki Nakamura	Nippon Univ.		
Chikako Isouchi	DMRC, Kagawa Univ.	Munasri	LIPI. Research Center for Geotechnology
Shoji Hasegawa	Tokyo Metropolitan Univ.		
Hikari Suzuki	Institute for Fire Safety & Disaster Preparedness	Eko Yulianto	LIPI. Research Center for Geotechnology
Kazuko Kamita	Land Brains Co., Ltd.	Dyah Rachmawati	LIPI , Cooperation and Corrections Bureau of Science and Technology
Nodoka Ujita	Land Brains Co., Ltd.		
		Irina Rafliana	LIPI, Community Preparedness Program
Hiroyuki Morita	Chiken Sogo Consultants Co., Ltd.		
		Medy Eka Suryana	RISTEK
Kazutoshi Yamamoto	Pacific Consultants Co., Ltd.	Mulyo Harris Pradono	BPPT, Technology Centre of Land and Regional Disaster Management
Seiichi Sato	Nippon Koei Co., Ltd.		
Tsutomu Tanaka	Eight-Japan Engineering	Yudha Nurdin	Syiah Kuala Univ., Electrical

	Consultants Inc.		Engineering Department
Jyunya Fukuoka	Eight-Japan Engineering Consultants Inc.	Triyono SP	LIPI, Community Preparedness Program
Sumio Yanagihara	Okumura-gumi Corp.		
Hirotaka Ikeda	Fuji Tokoha Univ.		
Ikuo Abe	Fuji Tokoha Univ.		
Masaru Kitaura Tetsuo Morita	Graduate school of Kanazawa Univ. Gunma National College of Technology		

Appendix 15:

Printed Materials published by Project

No	Title (Original)	Language	The tile /English	Group	Publish time	Target	Number of Copies
1	News letter 1,2,3,4,5	Indoneisa/ English	News letters	G6	2009-2012	Related Institutions	4000
2	Orang Orang Yang Bertahan Dari Tsunami	Indonesia	People whom survived from a tsunami	G4-1	2011 March	Teachers, and Schools	2000
3	Pembelajaran dari Dua Negara dalam Kesiapsiagan Bencana Berbasis Sekolah	Indonesia	Disaster Education Guidebook	G5-1	2012 March	Teachers, and Schools	2000
4	Cara Menarik Waspadai dan Mengantisipasi Bencana	Indonesia	Town Watching Guidebook +DVD	G5-1	2012 March	General	2000
5	Tsunami Evacuation Simulation DVD	Indonesia / English	Tsunami Evacuation Simulation DVD	G5-1	2012 April	government Officer in Aceh and others	650
6	Selamat dan Terjangan Tsunami, pengalaman dari Aceh dan Mentawai	Indonesia	Lesson learnt Picture and story Tsunami	G5-2	2012 April	General	2000
7	Penoman Mitigasi Tsunami Dengan Vegetasi Pantai	Indonesia	Guideline for the Tsunami Mitigation with Coastal Vegetation	G3-2	2012 May	Government Officer, Researchers	1500
8	Community Approach to Disaster	English	Community Approach to Disaster	G4-1	2012 May	International organization, Teachers	500
9	Disaster Heritage and Creative Economy +DVD	Japan Indonesia	Disaster Heritage and Creative Economy +DVD	G4-2	2012 April	Government Officer, Researchers	500
10	Project Final Report	English	Project Final Report	-	2012 May	JCC members and Project Members	300

Appendix 16:

AGREEMENT ON TRANSFER OF OWNERSHIP
OF ASSETS OF THE JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BETWEEN:

THE JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
(hereinafter referred to as "JICA")

AND:

THE **MINISTRY FOR RESEACH AND TECHNOLOGY OF INDONESIA (RISTEK)**
(hereinafter referred to as " RISTEK or the Recipient")

(both hereinafter referred to as "the Parties")

PREAMBLE

This project "Multi-disciplinary Hazard Reduction from Earthquakes and volcanoes in Indonesia" officially started in June 2009, as a part of "Science and Technology Research Partnership for Sustainable Development" (SATREPS) supported jointly by JST (Japan Science and Technology Agency) and JICA (Japan International Cooperation Agency). On the Indonesian side, support of funding is provided by Ristek (Ministry of Research and Technology), LIPI (Indonesian Institute of Sciences), ESDM (Ministry of Energy and Mineral Resources), Diknas (Ministry of National Education) and KKP (Ministry of Marine Affairs). The ultimate goal of this project is to reduce disaster from earthquakes and volcanoes by

enhancing capability of forecasting hazards, by reducing social vulnerability, and by promoting education and outreach activity of research outcomes. We also plan to provide platform of collaboration among researchers in natural science, engineering and social sciences, as well as officials in national and local governments.

JICA have provided the equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project.

THIS AGREEMENT

This is to certify that the equipments in the attached Annex 01 have been handed over properly to Ristek (Ministry of Research and Technology). Ristek will utilize the donated equipment to its maximum level of effectiveness in order to the continuation of the research disaster reduction.

IT **IS HEREBY AGREED** by the Parties:

Article I. TRANSFER OF PROPERTY

1. JICA shall transfer to RISTEK its entire rights of all assets specified in the list attached to this Agreement (and equipment annex 1). Subsequently, RISTEK then transfers the ownership of the equipments to associated Indonesian institutions and set-up necessary arrangements for operation and maintenance of the assets according to governing laws in Indonesia.
2. RISTEK and its associated Indonesian institutions shall use the assets for a purpose compatible to the JICA mission and objectives only and any subsequent disposal of assets, whether by sale or donation, shall be for the exclusive benefit of comparable purposes in the country.

Article II. RESPONSIBILITIES

1. While JICA is exempt from taxes and customs duties in respect of articles imported or exported for its official use, with the transfer of assets under this agreement, the Recipient becomes solely responsible for such taxes or duties, if any, applicable in the country of use.
2. The authorities concerned of the Government of the Republic of Indonesia take necessary measures to ensure that the appropriate use and maintenance of the equipments. And Ristek have responsibility to request the periodical management report of equipment to the institution which uses the equipments.
3. Indonesian side undertakes to meet all future recurring, operating and servicing costs, as well as any immediate costs of re-commissioning or relocation of the asset(s).

Article III. GENERAL PROVISIONS

1. JICA shall transfer the ownership of the assets specified in the attached list to the Recipient, on the date of signature of this Agreement by RISTEK and JICA.
2. JICA shall not be liable to indemnify any third party in respect of any claim, debt, damage or demand arising out of the implementation of this Agreement.
3. The solution to any dispute, controversy or claim arising out of or in relation to this Agreement should be settled by seeking to promote the friendship between the two countries.

Article IV. VALIDITY

This Agreement is signed in Jakarta on 1 May 2012 in duplicate in the English language.

Signed In 2 Originals By The Duly Authorized Signatories On Behalf Of The Following Parties.

Mr. Tada Tomoyuki, M.Sc

Senior Representative
Japan International Cooperation Agency, JICA Indonesia Office

Drs. Mujianto

Director of General Affair,
Ministry of Research and Technology of the Republic of Indonesia (RISTEK)

Total Number of Equipments

	Institute	Item	Price Yen	Price Dollar	Price Rupiah
1	LIPI	7	3,472,082	0	7,240,000
2	BPPT	26	3,259,305	5,666	0
3	Badan Geologi (PVMBG)	17	40,762,328	0	0
4	ITB	27	14,423,700	18,783	0
5	UGM	4	579,600	2,635	0
6	UNSYIAH	15	0	6,538	3,300,000
7	Tsunami Museum	1	81,690	0	0
	Total	97	¥62,578,705	$33,622.00	Rp10,540,000.00

LIPI

1. Equipments (purchase in Japan)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
K-GPS Magellan ProMark-3	LIPI	2003.6	G1-1 Geological survey	Research Center for Geotechnology	Dr. Danny Hilman	Good	¥1,050,000.00
Seismometer GEODAS/S-19	LIPI	2008.8	G3-3 Microtremor Survey	Engineering Geology Laboratory, RC for Geotechnology	Dr. Adrin Tohari	Good	¥924,000.00
Note PC, Panasonic Lets note R	LIPI	2008.8	G3-3 Microtremor Survey	Engineering Geology Laboratory, RC for Geotechnology	Dr. Adrin Tohari	Good	¥161,800.00
Seismometer GEODAS/S-19	LIPI	2010.3	G3-3 Microtremor Survey	Engineering Geology Laboratory, RC for Geotechnology	Dr. Adrin Tohari	Good	¥924,000.00
PC WTR01PA 2340g 650M	LIPI	2010.5	G3-3 Microtremor Survey	Engineering Geology Laboratory, RC for Geotechnology	Dr. Adrin Tohari	Good	¥113,820.00
Handycam JVC G2-HM570, and Tripod	LIPI	2011.2	G5-2 Mentawai Tsunami Interview	Research Center for Geotechnology	Dr. Mirwan	Good	¥218,662.00

¥3,472,082.00

2. Equipments (purchase in Indonesia)

Chest Freezer	LIPI	2009.10	G1-1 Geological survey	Research Center for Geotechnology	Dr. Eko Yulianto	Good	Rp7,240,000.00

Rp7,240,000.00

1. Equipments (purchase in Japan)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
Keyence UD-500 Ultrasonic High Accuracy Sensor	BPPT	2009.8	G3-2 Evaluation Tsunami fo	BPDP BPPT, Yogyakarta	Bagyo Widagdo	Good	¥642,600.00
Power Unit NZ-U5	BPPT	2009.8	G3-2 Evaluation Tsunami fo	BPDP BPPT, Yogyakarta	Bagyo Widagdo	Good	¥19,950.00
Data Recorder EDS400A	BPPT	2009.8	G3-2 Evaluation Tsunami fo	BPDP BPPT, Yogyakarta	Bagyo Widagdo	Good	¥520,800.00
SSK L790	BPPT	2009.7	G3-2 Evaluation Tsunami fo	BPDP BPPT, Yogyakarta	Bagyo Widagdo	Good	¥1,071,000.00
Force Gauge	BPPT	2010.6	G3-2 Evaluation Tsunami fo	BPDP BPPT, Yogyakarta	Bagyo Widagdo	Good	¥419,055.00
Digital measuring instrument of direction	BPPT	2010.6	G3-2 Evaluation Tsunami fo	BPDP BPPT, Yogyakarta	Bagyo Widagdo	Good	¥585,900.00

¥3,259,305.00

2. Equipments (purchase in Indonesia)

LB S9430 (T9400/2X2GB/320GB/VBIZ)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$1,000.00
Software (Microsoft Office Professional 2007)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$325.00
Software (Norton Anti Virus 2009)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$20.00
Software (Adobe Illustrator CS4)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$315.00
Software (Adobe Photoshop CS4)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$365.00
Software Applications	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Software (Product Recovery CD/DVD)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Software (Norton Security Suite)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Software (Acronis True Image 10.0)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
LB S9430 (T9400/2X2GB/320GB/VBIZ)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$1,800.00
Software (Microsoft Office Professional 2007)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$325.00
Software (Norton Anti Virus 2009)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$25.00
Software (Adobe Illustrator CS4)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$315.00
Software (Adobe Photoshop CS4)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$365.00
Adobe Photoshop CS4 Media	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Illustrator CS4 Media	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Software Applications	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Software (Product Recovery CD/DVD)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Software (Norton Security Suite)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00
Software (Acronis True Image 10.0)	BPPT	2009.9.15	G1-5 Submarine active fault	BPPT	Udrekh	Good	$0.00

$5,606.00

1/1

1. Equipments (purchase in Japan)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
Pinnacle Tilt meter hybrid	PVMBG	2009.6	G2-1 Volcano observation	Mt. Bromo and Semeru (Summit)	Head of Administration Division	Good	¥4,620,000.00
Infrasound Microphone	PVMBG	2009.6	G2-1 Volcano observation	Mt. Semeru and Sinabung	Head of Administration Division	Good	¥987,000.00
Data Logger EDR-X7000	PVMBG	2009.6	G2-1 Volcano observation	Mt. Bromo	Head of Administration Division	Good	¥3,603,900.00
Data Logger EDR-X7000	PVMBG	2009.6	G2-1 Volcano observation	Mt. Semeru (Kalimati)	Head of Administration Division	Broken in 2010	¥0.00
GPS Leica GRX1200GGPro	PVMBG	2009.6	G2-1 Volcano observation	Mt. Guntur (Masigit, Sodong, Citiis)	Head of Administration Division	Good	¥4,410,000.00
Wireless Modem SC-FFX900	PVMBG	2009.11	G2-2 volcano observation	Mt. Talang (Kopi, Summit and Pos)	Head of Administration Division	Good	¥2,247,000.00
Data Logger EDR-X7000	PVMBG	2009.11	G2-2 volcano observation	Taraju, Dano Halimun	Head of Administration Division	Good	¥3,540,765.00
Analog to Digital Converter LS-7000XT-301	PVMBG	2009.11	G2-2 volcano observation	Mt. Talang (Kopi, Summit)	Head of Administration Division	Good	¥1,680,000.00
Antenna 900MHz connect cable	PVMBG	2009.12	G2-2 volcano observation	Mt. Talang (Kopi, Summit and Post Observ)	Head of Administration Division	Good	
Surge Protective Device ALPK.BNJ/PP-VAA3020 DI	PVMBG	2010.3	G2-2	Mt. Talang and Guntur	Head of Administration Division	Good	¥546,000.00
Data Logger EDR-X7000	PVMBG	2010.3	G2-2	Lembang Wanaseuka, Sinsang, Cisarua and	Head of Administration Division	Good	¥1,660,000.00
Leica GNSS GR10 AR10	Mt.Merapi	2010.12	G2 volcano(Merapi) observation	Klatakan, Deles, Jurang Gemsam	Head of Administration Division	Good	¥5,213,250.00
Leica GNSS GR10 AR10	Mt.Sinabung	2011.2	G2 volcano(Sinabung) observation	Lau Kawar Sukanalu, Gurukinayan, Post Observ	Head of Administration Division	Good	¥0.00
DIONEX Ion Chromatograph ICS-900	Mt.Merapi	2011.6	G2 volcano(Merapi) survey	CVGHM-Bandung	Head of Administration Division	Good	¥2,901,150.00
GNSS Spider	PVMBG	2011.3	G2 volcano(Sinabung) observation	Mt. Sinabung (Pos Observ.)	Head of Administration Division	Good	¥7,042,350.00
GNSS soft Spider GGO	Mt.Guntur Observatory, Merapi/BPPT	2012.01	G2-2 volcano observation	Mt. Guntur (Pos Observ.), BPPTK-Yogya	Head of Administration Division	Good	¥1,575,000.00
Reinstated NANOpure Diamond case	PVMBG	2012.3(plan	G2-4 analysis allophane and ash				¥716,210.00
							¥40,762,328.00

1/1

1. Equipments (purchase in Japan)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
GPS Leica GX1220 GNSS	ITB	2009.6	G1-3 GPS Team	Lab Geodesi	Teguh P.S.	Good	¥3,465,000.00
Altus Elna	ITB	2009.6	G1-4 Strong motion	Labtek XI	Afnimar	Good	¥1,275,750.00
Box case EAO-600MN-40	ITB	2009.6	G1-4 Strong motion	Labtek XI	Afnimar	Good	¥484,260.00
VRLA Battery PE12V17	ITB	2009.6	G1-4 Strong motion	Labtek XI	Afnimar	Good	¥169,515.00
Data Logger LS-7000XT	ITB	2009.7	G1-4 Strong motion	Labtek XI	Afnimar	Good	¥3,150,000.00
Mitsutoyo Portable Measurement	ITB	2009.7	G1-4 Strong motion	Labtek XI	Afnimar	Good	¥1,911,000.00
Box case EAO-600WN-40	ITB	2009.7	G1-4 Strong motion	Labtek XI	Afnimar	Good	¥484,260.00
Ocom Hydrotrac Echosuder 33kHz	ITB	2009.7	G1-5 Geological survey	Labtek VI 4b	Hamzah Latief	Good	¥1,176,000.00
GPS Trimble SPS351 DGPSRover Receiver	ITB	2009.7	G1-5 Geological survey	Labtek VI 4b	Hamzah Latief	Good	¥987,160.00
Yamatake Intelligent Earthquake	ITB	2009.7	G3-4 earthquake motion		Wayan Sengara		¥378,000.00
Leica Geo Office	ITB	2009.9	G1-3 GPS team	Lab Geodesi	Iwan Meilano	Good	¥52,500.00
Note PC Del. Latitude E5400	ITB	2009.9	G1-4 Strong motion	Labtek XI	Afnimar	Good	¥98,655.00
Yamatake Intelligent Earthquake SES60	ITB	2010.2	G3-4 Earthquake motion		Wayan Sengara		¥1,050,000.00

¥14,423,700.00

2. Equipments (purchase in Indonesia)

LB S6420 (T9400/2X2GB/320GB/VB	ITB	2009.9.15	G1-3 GPS team	Lab Geodesi	Teguh P.S.	Good	$1,800.00
Software (Microsoft Office Professional 2007)	ITB	2009.9.15	G1-3 GPS team	Lab Geodesi	Teguh P.S.	Good	$325.00
Software (Norton Ant Virus 2009)	ITB	2009.9.15	G1-3 GPS team	Lab Geodesi	Teguh P.S.	Good	$29.00
Software Applications	ITB	2009.9.15	G1-3 GPS team	Lab Geodesi	Teguh P.S.	Good	$0.00
Software (Product Recovery CD/DVD	ITB	2009.9.15	G1-3 GPS team	Lab Geodesi	Teguh P.S.	Good	$0.00
Software (Norman Security Suite)	ITB	2009.9.15	G1-3 GPS team	Lab Geodesi	Teguh P.S.	Good	$0.00
Software (Acronis True Image 10.0)	ITB	2009.9.15	G1-3 GPS team	Lab Geodesi	Teguh P.S.	Good	$0.00
AW-T7500V Dell Precision T7500	ITB	2009.10.28	G1-6 Tsunami simulation	Labtek VI 4b	Hamzah Latief	good	$8,450.00
HDD Ext 4TB Interface USB 2.0 Seagate 7200 rpm	ITB	2009.10.28	G1-6 Tsunami simulation	Labtek VI 4b	Hamzah Latief	good	$1,195.00
Intel Visual Fortran Compiler 11.0 Professional	ITB	2009.10.28	G1-6 Tsunami simulation	Labtek VI 4b	Hamzah Latief	good	$745.00
Debin 7 Enterprise Box Product-DD	ITB	2009.10.28	G1-6 Tsunami simulation	Labtek VI 4b	Hamzah Latief	good	$2,450.00
Tatuk GIS Developer Kernel VCL Edition SKU	ITB	2009.10.28	G1-6 Tsunami simulation	Labtek VI 4b	Hamzah Latief	good	$2,190.00
TatukGIS SUPPORT UPGR/	ITB	2010.9	G1-6 Tsunami simulation	Labtek VI 4b	Hamzah Latief	good	$800.00
TatukGIS SUPPORT UPGR/	ITB	2010.9	G1-6 Tsunami simulation	Labtek VI 4b	Hamzah Latief	good	$800.00

$18,783.00

UGM

1. Equipmants (purchase in Japan)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
Yamatake Intelligent Earthquake Sensor SES90	UGM	2011.2	G1-4 Earthquake motion	UGM	Prof. Dwikorita		¥579,600.00
							¥579,600.00

2. Equipments (purchase in Indonesia)

Fujitsu Lifebook Processor Intel Core2Duo T4400, Harddisk 320GB 5400rpm SATA	UGM	2009.9.10	G4-1 Recovery framework	Jurusan Geografi Lingkungan Fakultas Geografi untuk analisis data	Syarifah Aini, M.Sc	Hilang/dicuri (surat terlampir)	$1,910.00
Software Microsoft Office Professional; Kaspersky Anti Virus 2009	UGM	2009.9.10	G4-1 Recovery framework	Jurusan Geografi Lingkungan Fakultas Geografi untuk analisis data	Syarifah Aini, M.Sc	Hilang/dicuri (surat terlampir)	$345.00
Printer Canon Pixma IX 5000	UGM	2009.9.10	G4-1 Recovery framework	Jurusan Geografi Lingkungan Fakultas Geografi untuk analisis data	Syarifah Aini, M.Sc	Baik	$380.00
							$2,635.00

1/1

UNSYIAH

1. Equipments (purchase in Japan)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
[illegible] Evacuation Simulation / upgrade version	Unsyiah	2011.12	G5-1 Promoting Disaster education	DVD distributed to related institution			

2. Equipments (purchase in Indonesia / Rupiah)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
[illegible] SEG [illegible] + manual	Unsyiah	2011.10	G5-1 Promoting Disaster education	Pusat Komputer dan Sistem Informasi UNSYIAH	Yudha Nurdin	Good	Rp3,300,000

Rp3,300,000

2. Equipments (purchase in Indonesia / Dollar)

Item	Location	Arrival date	purpose	Installation Location	Person in charge	condition	Price
LB 5420 ([illegible])	UNSYIAH	2009.9.14	G4-3 Recovery framework	TDMRC	Wan Akmal	good	$1,800.00
Software (Microsoft Office Professional 2007)	UNSYIAH	2009.9.14	G4-3 Recovery framework	TDMRC	Wan Akmal	good	$325.00
Software (Norton Anti Virus 2009)	UNSYIAH	2009.9.14	G4-3 Recovery framework	TDMRC	Wan Akmal	good	$28.00
Software Applications	UNSYIAH	2009.9.14	G4-3 Recovery framework	TDMRC	Wan Akmal	good	$0.00
Software (Product Recovery CD/DVD	UNSYIAH	2009.9.14	G4-3 Recovery framework	TDMRC	Wan Akmal	good	$0.00
Software (Norton Security Suite)	UNSYIAH	2009.9.14	G4-3 Recovery framework	TDMRC	Wan Akmal	good	$0.00
Software (Acronis True Image 10)	UNSYIAH	2009.9.14	G4-3 Recovery framework	TDMRC	Wan Akmal	good	$0.00
LCD Projector EMP [illegible] merk Epson	UNSYIAH	2009.10.2	G5-1 Development educational material	TDMRC	Wan Akmal	good	$1,505.00
Screen OHP or LCD Projector, Screenview 84x84	UNSYIAH	2009.10.2	G5-1 Development educational material	TDMRC	Wan Akmal	good	$150.00
Photo Printer Canon Pixma [illegible]	UNSYIAH	2009.10.2	G5-1 Development educational material	TDMRC	Wan Akmal	good	$350.00
Fujitsu Lifebook Processor Intel Core2Duo [illegible] Harddisk 320GB [illegible] SATA	UNSYIAH	2009.10.14	G6 collaboration between researchers and government officials	TDMRC	Nurul	good	$1,835.00
Software Microsoft Office Small Business 2007	UNSYIAH	2009.10.14	G6 collaboration between researchers and government officials	TDMRC	Nurul	good	$245.00
Software Adobe Acrobat Standard Ver.9	UNSYIAH	2009.10.14	G6 collaboration between researchers and government officials	TDMRC	Nurul	good	$250.00
Software Kaspersky Anti Virus 2009	UNSYIAH	2009.10.14	G6 collaboration between researchers and government officials	TDMRC	Nurul	good	$20.00

$6,538.00

1/1

1. Equipments (purchase in Japan)

Item	Location	Arrival date	Installation Location	Person in charge	condition	Price
PC included Touch Panel HP TouchSmart PC520-1180jp/CT	Tsunami Museum, Aceh	20124	Tsunami Museum, Aceh	Rahmadhani, M.Bus	Good	¥81,690.00
						¥81,690.00