

帰国研修員巡回指導班
(防災技術セミナーコース)

報告書

昭和60年 5月

国際協力事業団
研修事業部

研 管

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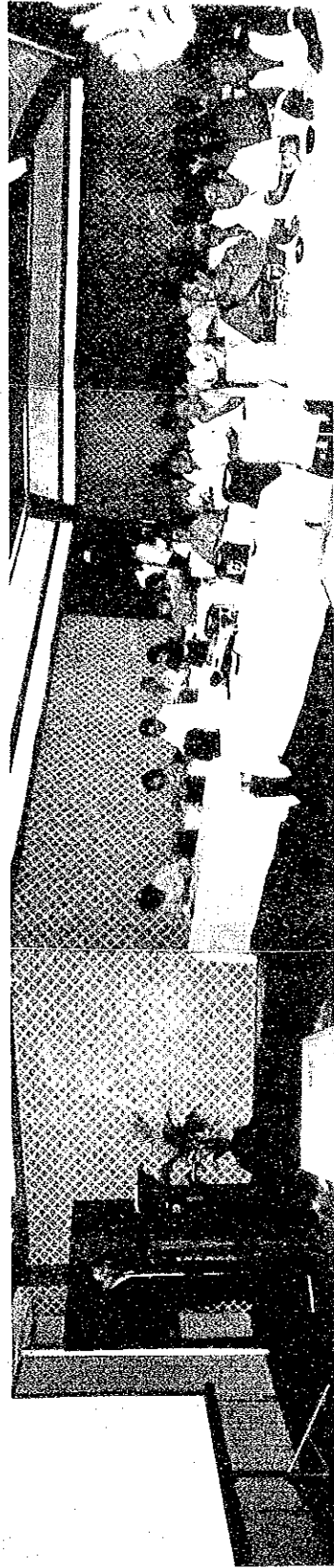
この報告書は、わが国が実施してきた集団研修コース「防災技術セミナー」に参加した帰国研修員に対するアフターケア業務の一環として、昭和60年4月8日から4月23日までの16日間、フィリピン及びインドネシアの2ヶ国に派遣した巡回指導班の業務報告である。

本書が、帰国研修員の活動状況、彼らが抱えている諸問題、要望等について関係各位の一層深いご理解をいただくための一助となり、今後の研修コース、また研修員受入事業の改善に資することができれば幸いである。

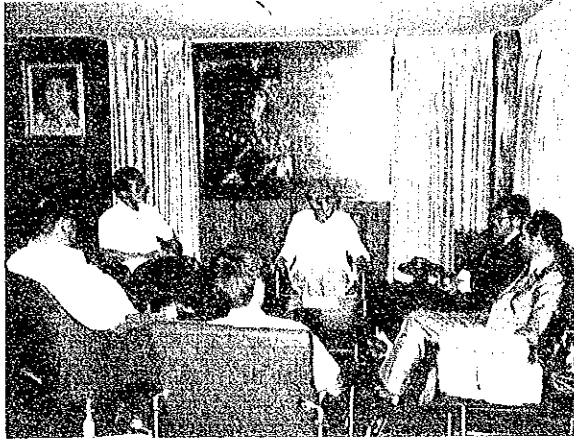
なお、本件の実施のためにご協力を賜った外務省、科学技術庁、国立防災科学技術センター及び現地において数々のご指導とご協力を賜った在外公館並びに関係機関の指導に深甚の謝意を表したい。

昭和60年5月

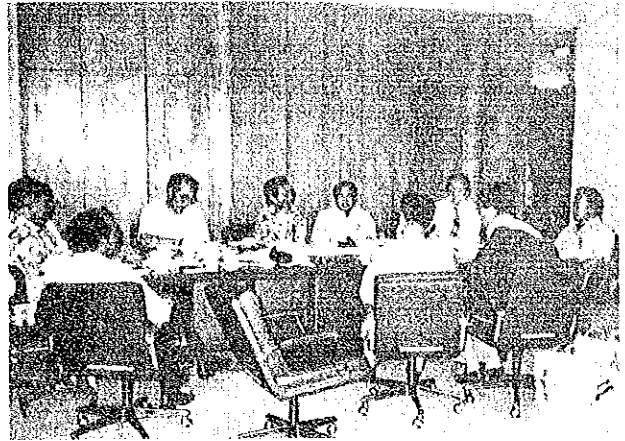
国際協力事業団
研修事業部長
宮本守也



マニラガーデンホテルにて特別講演(4/11) — 参加者は37名



PAGASAにてKintanar 長官（中央）
及び帰国研修員と意見交換（4/9）

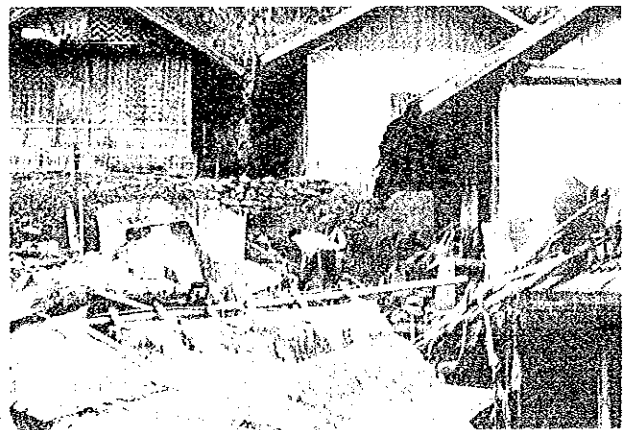


公共事業省水理工学研究所にて
Sadeli 所長（右端）及び帰国研
修員と意見交換（4/17）—バン
ドン

約2週間前に発生したガルト市郊外の
地すべり現場調査（4/18）



地 す べ り 現 場
（30名以上の死者がでた）



倒壊した家（右手前屋根が見える）

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I 巡回指導の概要

1. 防災技術セミナーの概要

防災技術セミナーは、発展途上国における防災技術担当者を対象にして1977年第1回の研修が実施されてより今年（1985年）で第9回を迎えるに至っている。セミナーの目標はこれら防災担当者に対し降雨、洪水、地すべり、火山、地震等自然現象による災害防止のための科学技術及び防災体制について専門知識を付与し、各国の実情にあった自然災害軽減対策の立案及び防災体制の確立に役立てることである。研修参加資格としては、①大学卒業者又は同等の資格を有している者、②防災に関する専門知識を有し、又は防災関係業務に7年以上従事した者、③英語が理解できる者、④心身ともに健康である者、⑤40才以下である者等で、各国政府が在外日本大使館を通し正式に推せんし、日本政府が決定している。研修期間は2.5ヶ月間で、毎年秋に実施している。

プログラムは次のように分けられる。

- (1) オリエンテーション
- (2) 各セッションごとの講義と討論：降雨・洪水、地すべり、火山・地震というように分け、3日から5日の講義をもって構成し、おわりに討論を行う。
- (3) 見学旅行：日本の防災の実情を知り、防災体制を理解するため、関東地域、関西地域、東京都内、筑波研究学園都市内等で行う。
- (4) 特論：研修員の専門に応じてグループに分かれ、より深く技術を理解するため約1週間行う。
- (5) 最終討論：各研修員はこのセミナーで学んだことを基に自国の防災体制の改善についての提言をまとめ、発表し、討論する。各研修員のレポートは防災技術セミナー報告として毎年印刷されている。

1984年までに研修を受けた受講者総数は73名で、国別にはインドネシア12名で最も多く、これにフィリピン、ペルーが続いている。年度ごとの研修員数は表1に示す。参加国は全部で24カ国である。

資料としては次の2種が定期的に発刊されている。

- (1) 防災技術セミナーテキスト（毎年1巻、1984年が第8巻－緑表紙）、国立防災科学技術センター・国際協力事業団
- (2) 防災技術セミナー報告（毎年1巻、1984年が第8巻－白表紙）、国立防災科学技術センター・国際協力事業団

表-1

回 昭和 国	1	2	3	4	5	6	7	8	計
	52	53	54	55	56	57	58	59	
	(1977)	(1978)	(1979)	(1980)	(1981)	(1982)	(1983)	(1984)	
パングラデシュ		1	1	2					4
ビ ル マ							1	1	2
チ リ		1		2	1				4
中 国								1	1
コ ロ ン ビ ア								1	1
ドミニカ共和国					1			1	2
エ ジ プ ト				1			1		2
ホンデュラス	1		1						2
ホ ン コ ン								1	1
イ ン ド				1					1
インドネシア	2	2	1	1	1	2	2	1	12
イ ラ ン			1						1
イ ラ ク	1	1	1		2				5
ジャマイカ							1		1
大 韓 民 国					1				1
マ レ イ シ ア		1				1	1		3
ネ バ ー ル		1	1		1		1		4
ナイジェリア						1			1
パキスタン		1		1					2
ペ ル ー	1		1	1	1		2	2	8
フィリピン		1	1		2	3		3	10
タ イ			1			2			3
ト ル コ	1								1
ユーゴスラヴィア						1			1
計	6	9	9	9	10	10	9	11	73

2. 巡回指導の対象国及び期間

フィリピン、インドネシア

昭和60年4月8日～4月23日

3. 巡回指導の目的

当該セミナーの帰国研修員の所属機関等を訪問し、次の事項について調査及び講演を行う。

① 研修効果の測定

② 将来の研修に対するニーズの把握

③ 特別講演 日本における防災技術、主として洪水対策技術に関する歴史的考察

上記①及び②については、巡回指導の実施に先立ち、帰国研修員に対し Questionnaire (資料3)を送付し、集計・分析をし、また直接面談及び彼らの上司等関係者との意見交換により研修効果の測定を行う。

4. 巡回指導班の構成

団 長	木 下 武 雄	国立防災科学技術センター第一研究部長
団 員	影 山 富 恵	国立防災科学技術センター管理部長
団 員	篠 塚 征 和	国際協力事業団・筑波インターナショナルセンター 研修課職員

5. 巡回指導日程

月 日	指 導 内 容
4 月 8 日 (月)	成田発 10:00 マニラ着 13:10 (JL741) 16:00 マニラ事務所にて日程打合せ 16:30 在フィリピン日本大使館表敬
4 月 9 日 (火)	9:30 NEDA (National Economic and Development Authority 訪問, Mr. Roque A. Sorioso 次長と意見交換 14:30 Office of Civil Defense (OCD) 表敬訪問, Col. Victor R. Pagulayan 所長及び帰国研修員と意見交換 16:00 Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) 訪問 Dr. Roman L. Kintanar 長官表敬, 帰国研修員と意見交換
4 月 10 日 (水)	9:30 Ministry of Social Services and Development (MSSD) 訪問 Hon. Sylvia Pascual Montes 大臣表敬, 帰国研修員他関係者と意

月 日	指 導 内 容
	見交換 16:00 Integrated National Police (INP) 訪問 Fire Lt. Col. Remigio A. Dela Cruz 表敬, 帰国研修員及び関係者と意見交換
4 月 11 日 (木)	10:00 Integrated National Police (INP) 訪問 Brig Gen Primo D. Cordeta, Jr 表敬 13:00 Philippine Institute of Volcanology 訪問 Dr. Raymund S. Punongbayan 所長表敬, 帰国研修員及び関係者と意見交換 16:00 特別講演及びビデオテープによる筑波学園都市紹介
4 月 12 日 (金)	10:30 パラニャケ市訪問 Atty. Florencio V. Bernabe 市長表敬 16:00 JICA マニラ事務所訪問 調査結果報告
4 月 13 日 (土)	マニラ発 13:30 シンガポール着 16:45 SQ081
4 月 14 日 (日)	休 日 シンガポール発 17:45 ジャカルタ着 18:15 SQ208
4 月 15 日 (月)	9:00 ジャカルタ事務所にて日程打合せ 10:00 ジャカルタ事務所にて特別講演及び帰国研修員と意見交換 14:00 在インドネシア日本大使館表敬
4 月 16 日 (火)	9:00 Department of Mines & Energy 訪問 Mr. Soebadi 海外協力局長表敬及び関係者と意見交換 10:20 Meteorological and Geophysical Agency (MGA) 訪問 Drs. C. Sutrisno 所長表敬, 帰国研修員及び関係者と意見交換 11:15 Department of Public Works 訪問 国際協力局長表敬, 帰国研修員及び関係者と意見交換 14:00 Cabinet Secretariate 訪問 Mr. Wahid Salim 総務部長表敬及び関係者と意見交換
4 月 17 日 (水)	ジャカルタ——バンドン 10:30 Institute of Hydraulic Engineering 訪問 Mr. Sadeli Wiramihardja 所長表敬, 帰国研修員及び関係者と意見交換 12:10 Volcanological Survey of Indonesia 訪問

月 日	指 導 内 容
	<p>帰国研修員及び関係者と意見交換</p> <p>13:30 Geological Research and Development Center 訪問</p> <p>Mr. Untung 所長表敬</p>
4 月 18 日 (木)	ガルート市郊外で発生した地すべり現場視察
4 月 19 日 (金)	<p>8:00 特別講演 (Institute of Hydraulic Engineering にて)</p> <p>10:00 Directorate of Environmental Geology 訪問</p> <p>帰国研修員及び関係者と意見交換</p> <p>タンクバンブラフ火山調査</p>
4 月 20 日 (土)	バンドン——ジャカルタ
4 月 21 日 (日)	ジャカルタ市の都市災害調査
4 月 22 日 (月)	<p>10:30 National Coordinating Board for Disaster Relief 訪問,</p> <p>Mr. Aspan 局長表敬及び意見交換</p> <p>14:00 ジャカルタ事務所及び日本大使館訪問</p> <p>調査結果報告</p> <p>ジャカルタ発 19:05 (JL722)</p>
4 月 23 日 (火)	成田着 6:10

Ⅱ 帰国研修員巡回指導班の活動内容

1 概 論

巡回指導班はフィリピン、インドネシアにおいて、帰国研修員との面接およびアンケートを通して、過去に実施した研修の評価、今後のコースの改善への提案等を得て、さらに当該国の技術協力窓口機関、過去に研修員を送り出した機関、この研修に関係深い防災担当機関を訪問して防災技術セミナーのこれまでの評価、将来への展望についての意見の収集を行った。以下国別に概論、研修員がわが国で習得した技術の現地における適用度の測定評価、当該分野に関する当該国の一般的事情、技術水準及び今後のわが国の研修に対するニーズの把握、対象機関の概要、帰国研修員の動向調査を述べ、それらをまとめる形で全体的に今後のわが国のフォローアップ事業に対するニーズの把握を述べる。ここで言う国別の概論とは各国において巡回指導班が提出した Summary Report のちの 5) Comments の部分を要約したものである。

2 フィリピン（帰国研修員10名）

(1) 概 論

- ① 防災に関与しているすべての機関はこれまでにまして、多くの研修員をセミナーへ参加させたいと願っている。この事実はセミナーが役に立っていることを示すのみならず、この国の専門家の訓練が極めて重要であることを示している。この国の自然条件・社会条件が日本に似ているので、日本はこの国の防災の専門家を養成するのに最も適している。さらにすべての帰国研修員は防災技術の研修に再び日本を訪れることを強く望んでいる。いわゆるリフレッシュ研修は帰国研修員全員の望むところである。防災科学技術を日本でさらに研修するための幾つかの方法について説明をして大へん喜ばれた。
- ② 防災技術の分野は大へん広いので、2、3年はある特定課題をハイライトとしてとり上げてはどうかという意見が出された。他の意見としては、セミナーの前半を総合課題とし、後半を小グループに分けて特定課題にするというものもあった。これらの意見は現在実施している特論の有用性を示しているものであるが、JICAの行っている他のコースとの重複をさけねばならないことを考えて、防災分野における総合的知識についての研修も大切であることを強調した。自然災害軽減のため、セミナーは現在の方法でよいことが全般的に同意された。
- ③ 帰国研修員及び各機関は、災害管理、災害制御、災害統計、自主防災活動などが新しい防災技術と共に大切であり、セミナーに加えるべきであるとの提案があった。わが方もこのような改良は必要であると認識している。

- ④ 帰国研修員のうちのジェネラリストの中にはセミナー中に示された数式などが理解しにくかったと言う者がいた。もっと理解しやすい方法によって、この点は解決したいが、このように言われたことで、基礎的な防災科学、例えば気象学・水文学・地質学・地震学などがあまり重要でないということにはならないということはジェネラリストの中でもよく理解されている。そればかりかジェネラリストの多くはこのような基礎的な防災科学を学んだことを大へん喜んでいて。
- ⑤ 防災セミナー報告（Final Report of the Seminar on Technology for Disaster Prevention：NRCDP及びJICA）の各巻に述べられていることには重複があることが指摘された。例えばある国の防災に関する公式手順は各巻に重複記載されている。従って、事例研究のようなものが防災についての研修員の経験の交流という観点からよいのではなかろうか。次回セミナーから事例研究を導入する予定である。
- ⑥ フィリピンにおいて自然災害研究訓練センターが設立される見とおしと聞いている。このようなセンターは防災技術の開発と普及とに有効であるので、センターができた時には協力をさらに推進し、セミナーを効果的に行うことができるだろう。
- ⑦ 帰国研修員からは日本語研修についての必要性が発言された。これは大事なことではあるが、レベルをそろえるのはこのセミナーではむづかしいのではなかろうか。
- ⑧ 防災技術について巡回セミナーは役に立つということが強調された。防災分野にたずさわる当該国の多くの専門家が参加でき、防災科学技術を容易に普及することができるとの判断からであろう。この場合帰国研修員は実行メンバーとして多大の貢献をしてくれるであろう。

(2) 研修効果の測定及び評価

フィリピンにおいては、防災に関するジェネラリスト（総合防災事業・省庁間調整・救援などの担当・地方事務所勤務などとスペシャリスト（気象・水文・地質・地震・火山など専門分野担当）とが半々であるので、測定評価の方法については2つに分かれるものである。

ジェネラリストは、習得した技術は防災活動の基本となる知識であり、このような技術知識は今後の防災活動において極めて役に立つということであつたが、反面、研修には数式などが理解しにくい面があることを指摘していた。この国では経済上の理由により、非構造的な災害対応が普及されつつあり、その場合日本の非構造的な防災技術が大へん役に立っていることが強調された。一例で言うとNRCDPで出版された台風に対する防災知識の普及用パンフレットは有意義であり、フィリピン語に訳して広く配布している最中であるとのことである。

スペシャリストは、セミナーの内容は自分の専門外も多いため、自分の専門分野をもう

少し掘り下げて研修したかったという希望もあった。しかし、自分の専門のセッションで習得した技術は確かに有益であり、特論で深く討論した内容は困難はあるが将来有用であり、又、各国間の経験・知識の相互交流は必要で、例えばこの国の火山の最近の噴火による火山堆積物の雨水による流出は、インドネシアでJICA専門家が指摘している知識が生きてくるかも知れないということが討論された。

(3) 防災に関する一般的事情、技術水準及びニーズの把握

当該国は日本と社会形態・地形・地質・気候（日本の冬を除く）が類似しているので、防災技術に関する一般的事情は日本と極めて類似しているとみてよい。

技術水準については必ずしも高いとはいえないが、防災技術セミナーの意図するところがある程度理解され、日本で発達した非構造的防災技術に対して導入を試みていることは、単に経済的に困難だから非構造的方法を採用しているというだけではなく、より深い理解に基づいていると思われる。

上記のような次第で、わが国の研修には多くの要請があり、防災技術セミナーへのより多くの人員の参加、refresherコース、個別研修、巡回セミナーの要望が強かった。

(4) 訪問機関の概要

(a) National Economic & Development Authority (NEDA) (国家経済開発省)

日本等からの技術協力の総合調整を行っている官庁で、ここで直接、防災技術は担当していないが国際協力の重要な窓口である。もっと多くの研修員を受け入れてほしいむね発言があったが、フィリピンは研修員の要請（応募）の多い年と少い年（0の年）があるので今後これを平均されたいむね述べた。

(b) Office of Civil Defense (民間防衛庁)

民間防衛の立場から災害時の現状把握、緊急対策、各機関の調整、住民に対する教育・訓練などを行う。地方に出先事務所をもちこれまでも災害時の活躍に実績がある。防災現業部門としてはよく機能しているので、防災技術セミナーについてもGIはOCDを通してNEDAに送られるべきであると主張するが、それはフィリピンの国内問題であるとして、触れなかった。

(c) Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)

天文台も含めているので、フィリピン気象庁と言えば意識にすぎるかも知れない。全国に観測所をもち気象・洪水の予報をしている。今後、科学技術庁へ移管されるところである。ASEAN Regional Disaster Research and Training Center（アセアン地域災害研究・訓練センター）の設立を提案している。こういう組織づくりには積極的で、この洪水予報センターにはJICA専門家が派遣されている。

(d) Ministry of Social Services and Development (社会福祉開発省)

国民の健康・安全などの面から防災に寄与している官庁であって、災害救助・復興・衛生などの点で重要であり多くの地方事務所をもつ。防災訓練・住民への啓発活動もさかんで種々のパンフレット、スライド等も作っている。日本で被災者をどのように取扱っているか具体的に知りたい等、積極的であった。

(e) Integrated National Police (国家統合警察)

警察・警察軍・消防を一体化した組織で国内の治安という意味から防災にあたる。実動部隊を持つ点は有利である。

(f) Philippine Institute of Volcanology and Seismology (フィリピン火山地震研究所)

はじめ火山研究所として発足したが、地震部門も最近加え科学技術庁に属することになった。まだ小さい組織ではあるが、基礎部門の充実、応用部門の発展など積極的に行っていて今回訪れた諸機関のうちでは最も研究体制が整っている所であった。

(g) Paranaque 市役所

マニラ国際空港などマニラの郊外にある発展中の中小都市で洪水の常襲地帯を含む。市長は防災問題に熱心である。

(5) 帰国研修員の動向

帰国研修員はすべてそれぞれの職場で活発に業務を遂行している。日本では内気だった者も自国へ帰れば魚が水をえたように活躍できるのであろう。帰国後昇格した者もあり、それぞれ要職についていて、喜ばしいことであった。又研修員の上司も日本へ部下が研修に行ったことを誇りとする気風があるので、大へん好ましいことと思われる。

帰国研修員の現在の職名等は付録に記す。

3. インドネシア

(1) 概 論

① インドネシアからの研修員はすべてスペシャリストである。スペシャリストは専門分野に固執する傾向があるもので、出されたコメントは防災技術セミナーにおいて専門分野を深めたいという点に集中していた。気象・水文・地質・地震・火山など特定の分野の一つを研修することをそれぞれの研修員は望んでいる。この要望を満たすため、特論が設けられているわけで、研修員の関心により小グループに分かれて実施している。特論では日本側スタッフも含めて、特定の課題、例えば洪水防御、地すべり防止、耐震工学などに取り組みレベルの高い経験の交流を行った。この特論は今後も研修員の強い支持によって実施されるであろう。さらに過去の災害において、実際どのような行動がとら

れたかを明らかにするため事例研究が強調された。すべての帰国研修員は特論が大へん役に立っていることを認め、また今後の事例研究に大きな期待を寄せている。

- ② 防災科学技術は分野が広く学際的である。このセミナーでは各種の災害が論じられている。セミナーの目的は自然災害に対する総合的な防災知識を身につけることである。さらにこの国の社会・経済の発展に伴って新しい災害が誘発される恐れがある。防災のためには専門以外の知識を持っていることが要求されることもある。次のような例も報告された。火災が専門ではない研修員は帰国後火災が頻発したため上司より火災対策について質問をうけ、このセミナーで得た知識が役に立ったという。このセミナーでは火災についての講義や、見学が用意されていたので、セミナーが大へん有用であった。
- ③ このセミナーでは科学的観測網の見学の機会が多くあった。研修員は二国間協力に関して短時間の豪雨の観測方法、地すべりの変位測定、大地震後の微小地震観測などについて関心が深かった。しかし操作がむづかしい装置の維持は困難なので、単純なシステムの方がいいという妥当な意見であった。
- ④ インドネシアと日本の今後の協力と友好の推進が強調された。JICAの集団研修コースは大へんよいと賞讃された。また、1カ国1コースあたり1名の受け入れとなっているにも拘らず、各機関はもっと多くの研修員を参加させたい旨強い希望があった。このことからセミナーが成功していると判断される。巡回セミナーは多くの機関から参加できるとして実現方強い提案があった。多くの機関からその時には準備に協力するむね申し出があった。多くの機関が協力し、調整し合うことは防災にとって大切なことである。巡回セミナーに際しては帰国研修員は実行メンバーとし多大の貢献をしてくれるであろう。

(2) 研修効果測定及び評価

インドネシアからは防災に関するスペシャリストのみがこの防災技術セミナーに参加している。彼らはインドネシアにおいてそれぞれの部門の指導的立場にある人たちで、④自分の専門を深めなければならないと同時に、⑤災害全般についての理解も深めなければいけない。そこで⑤についてはこのセミナーが広範囲の分野を扱うことから有用性が十分発揮されていることは理解されているが、④については、短いセミナー期間中に習得した技術が直ちに現地に適用されるという具合には行かない。しかし、科学・技術の発展についての広い理解を深めるにはこのセミナーは十分に役に立っているし、また特論でえた知識は確かに有用であることが認められている。この国からの研修員は見学旅行などで知った現地観測手法などについても深い関心を寄せており、わが国で習得した広い意味での技術がこの国に適用され、根づいて行く可能性に期待をよせる次第である。事実、地震の再現期間を調べたり、地すべりと地下水との関係・火山降灰の調査など日本で研修した

手法をインドネシアで現実に起った災害にあてはめて研究を開始し、それなりの成果をえている。

(3) 防災に関する一般的事情、技術水準及びニーズの把握

当該国は基本的には日本と社会形態、地形・地質・気候（日本の冬を除く）が類似しているので防災技術に関する一般事情は日本との類似性が著しい。

技術水準については必ずしも高いとは言えないが、専門分野にそれぞれ科学者・技術者がいて、彼らの代表が防災技術セミナーに参加しているので、やや専門に分化しすぎるのではないかと懸念される面があるくらい、それぞれの機関は技術の発展に努力している。専門分野の分け方はこの国の歴史の故に日本とは若干異なるがよく体系立てられている。

上記のような次第でわが国の研修には多くの要請があり、防災技術セミナーへのより多くの人員の参加、refresher コース、個別研修、巡回セミナーの要望が強かった。

(4) 訪問機関の概要

(a) Department of Mines and Energy（鉱山エネルギー省）

大きな組織でありその中の海外協力局を表敬した。鉱山保安、公害などに強い関心があった。

(b) Meteorological and Geophysical Agency

インドネシア気象庁といえば意識にすぎるかも知れない。気象観測・地震観測に力を入れている。強震観測についてはこれまでに日本とも強い協力関係にある。

(c) Department of Public Works（公共事業省）

大きな組織でその中の国際協力局を表敬した。都市建設・河川・灌漑などを広範囲に管轄しているところで、他のコースも含め JICA 研修員、JICA 専門家も多い。洪水防御・地すべり防止などで大いに協力の実をあげているところである。

(d) Cabinet Secretariate（内閣）

技術協力調整委員会を表敬する。技術協力の総元締めであるが、調整は強くは行っていないようである。もっと多くの研修員を受け入れてほしいという発言があった。

(e) Institute of Hydraulic Engineering（水理工学研究所）

公共事業省に属し、河川・ダム・灌漑などの水理構造物の設計・管理に当るほか応用地質部門は地すべりなどの防災にも活動を広げていて極めて活発な活動をしている。本セミナーのみならず、多くの職員を JICA 研修員として送っている。

(f) Volcanological Survey of Indonesia（インドネシア火山調査所）

鉱山エネルギー省に属し、火山の調査研究・防災活動を行っている。火山危険地帯分布図は、この国で最も大きな移住計画などから見て大切である。

(g) Geological Research and Development Center（地質学研究開発センター）

最近の改組でGeological Surveyが改組されて、(f)(g)(h)及びDirectorate of Mineral Resourcesに分かれ、さらに兄弟分としてMarine Geology Development Centerが提案されている。

(h) Directorate of Environmental Geology (環境地質局)

環境地質として地すべりなど災害についても強い関心を持ち、今後若い研究者を研修に送りたいという意向をもっている。

(i) National Coordinating Board for Disaster Relief (災害救助調整委員会)

災害発生の場合、国レベルでの救助の調整を行う機関でUNDROとの連絡をとり合う関係である。

(5) 帰国研修員の動向

帰国研修員はすべてそれぞれの職場で活発に業務を遂行している。帰国してからみちがえるように成長した研修員も見受けられ、また帰国後昇格した者もいるなど、喜ばしいことであった。さらに研修員の上司も日本へ部下が研修に行ったことを誇りとする気風があって大へん好ましいことと思われる。

帰国研修員の現在の職名等は資料1に記す。

Ⅲ 総 括

今回の巡回指導は、今後の防災技術セミナーを実施するうえで大変有意義であった。また、訪問した各機関も当該セミナーを高く評価するとともに、わが国の帰国研修員のフォローアップ活動に大きな期待を寄せているのがうかがわれた。

今回巡回指導を通じて得た感想を挙げると次の通りである。

- (1) 技術協力は切り花を各国に配るのではなく、根のある花を配って、それがその国で確実に根付かせるような地道な協力も重要であろう。そのためには、巡回指導、機材供与、文献供与等の側面的支援の拡充は必要不可欠の活動であろう。
- (2) 現在組織化されている帰国研修員の同窓会は、彼らの間の情報交換を通じて、その国の発展に貢献していると思われるが、この下部組織として各コース別の同窓会作りに積極的に協力し、より堅固な組織を作ることが望まれる。

これにより各省に分散している帰国研修員の連けい強化に寄与でき、彼らが直面している問題の自主解決の一助となろう。とくに防災という分野はどの国でも多くの組織が関与しているため、災害発生時の連絡・調整を円滑ならしめる意義は大きいと思われる。

- (3) ニュースレターの送付、及び帰国研修員の動向調査などを行い、常に彼らとの連絡が保持できる状態を維持することが望まれる。このような活動により、彼らのニーズ、ひいてはその国のニーズの発掘にもつながるとと思われる。
- (4) 2.5カ月の研修で彼らが防災技術すべてを修得し、その成果をただちに活用することは不可能であるが、日本での研修を土台にして積極的に防災対策に取り組んでいる姿勢が見受けられたのは大変喜ばしいことであり、今後の活動と一層の発展が期待される。
- (5) 古い帰国研修員は日本での研修の印象が薄らいでいる例が見受けられる。したがって、分野が共通する巡回指導チームが派遣される場合には、関係のある分野の帰国研修員も指導対象とし、彼らとの接触をより緊密にすることも必要であろう。
- (6) 第三国研修とは性格を異にするが、数名からなる専門家チームを編成し、各国を訪問して巡回セミナーを開催し、その国の一部の帰国研修員も講師に含めて現地でセミナーを実施することもフォローアップの一環として有意義であろう。
- (7) 各訪問国において特別講義を行ったが、帰国研修員のみならず防災関係者が多数参加し熱心に耳を傾けた。日本の先端技術の紹介にとどまらず防災対策の発展過程を主な内容としたので彼らの興味をひいたものと思われる。
- (8) 防災技術セミナーは、災害全般を対象としており、適格な研修員が選抜されるように、より具体的な情報をGIに含めることも必要であろう。

Ⅳ そ の 他

(1) バンドンの都市化状況調査

バンドン市は有名なバンドン工科大学があり、またA A諸国のバンドン宣言（1955年）でも有名な都市であるが、市街の過密化、郊外への発展も著しい。バンドン市はそのため水害などが受けやすい環境におかれている。都市内河川には小堤などが設けられてはいるが、部分的には通水断面の不足と思われる地点もある。また付近には火山もあり、降灰と降雨とが重なった場合の都市機能の低下など配慮すべき点が多い。

(2) ジャカルタの都市災害調査

ジャカルタはバタビアと言って河口に発達した旧市街から上流へ成長した都市で言うまでもなくインドネシアの首都である。低平地にあるため公共事業省は水害対策などに配慮しているし、研修員にもその事業の担当者がいた。古くからの運河等もあるが、地盤がいくらか沈下しているようで、水害危険性については十分注意する必要がある。強い地震の発生域からは少しはずれているようであり、火山からもはなれているのは幸運である。

参 考 資 料

V 資 料

資料 1. 帰国研修員名簿

資料 2. 訪問機関別面会者リスト

資料 3. 帰国研修員への質問状

資料 4. 特別講演要旨

資料 5. 各国への提出レポート

① フィリピン

② インドネシア

NAME LIST OF EX-PARTICIPANTS
(PHILIPPINES)

No. 1

アンケート 回答者	会 え た 者	参 加 年 度	氏 名	現 職	勤 務 先 待 所
		53	Ms. Juanida M. Bagis	Social Welfare Specialist, Ministry of Social Services and Development (MSSD)	IBP Complex, Constitution Hills, Quezon City, Philippines
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○	○	56	Mrs. Crispina B. Abat	Acting Chief, Civil Defense Operation Center (CDOC), Office of Civil Defense, Ministry of National Defense	Camp General Emilio Aguinaldo, Quezon City, Philippines
○	○	56	Mr. Julio Placido Sabit	Science Research Specialist, Philippine Institute of Volcanology and Seismology	5th Floor Hizon Building, 29 Quezon Avenue, Quezon City, Philippines
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NAME LIST OF EX-PARTICIPANTS
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○	○	57	Mr. Juanito E. Lucas	Weather Services Coordinator, Officer in-charge, Public Information and International Affairs Staff, Office of the Administrator, PAGASA	1424 Quezon Avenue, Quezon City, Philippines
○	○	57	Mrs. Priscilla P. Duque	Public Relations Officer, Office of Civil Defense, Ministry of National Defense	Camp General Emilio Aguinaldo, Quezon City, Philippines
○	○	59	Mr. Manuel A. Inocentes	Fire Station Commander, Integrated National Police (INP)	Paranaque Fire Section, Sucat Road, Paranaque, Metro Manila, Philippines
○	○	59	Mr. Rufino M. Gamad	Provincial Social Welfare Officer, Cavite Branch, Ministry of Social Services and Development (MSSD)	MSSD Cavite Branch, Capitol Side Trece Martinez, Cavite, Philippines
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NAME LIST OF EX-PARTICIPANTS
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No. 1

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○	○	52	Mr. Susanto	Secretary, Meteorological and Geophysical Agency, Department of Communications	JL. A. R. Hakim No.3, Jakarta, Indonesia
○	○	53	Mr. Paulus Sudarmo Darmoatmodjo	Chief, Analysis Division, Meteorological and Geophysical Agency, Department of Communications	JL. A. R. Hakim No.3, Jakarta, Indonesia
○	○	53	Mr. Saroso Bambang Suksmono	Engineering Geologist, Indoneisan Road Research Centre, Directorate General of Highways, Department of Public Works	JL. Raya Timur 264, P.O. Box 298, Bandung, Indonesia
	○	54	Mr. Susmaryanto Susmoko	Staff, Geology Engineering Branch, Institute of Hydraulic Engineering, Department of Public Works	JL. IR. H. Juanda 193, Bandung, Indonesia
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○	○	57	Mr. Sumarna Hamidi	Chief, Volcanic Hazard Mitigation Section, Directorate of Volcanological Survey of Indonesia, Department of Mines and Energy	JL. Diponegoro No.57, Bandung, Indonesia
○	○	58	Mr. Djedam Gurusinga	Chief Section III, West Region, Directorate of Sungai, Directorate General of Water Resources Development, Department of Public Works	JL. Pattimura No.20 Kebayoran Baru, Jakarta, Indonesia
		58	Mr. Herman Moechtar	Geologist, Applied Geology Section, Geological Research and Development Centre (GRDC), Directorate of Mines, Department of Mines and Energy	

NAME LIST OF EX-PARTICIPANTS
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No. 3

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Mr. Suyudno, Staff

CABINET SECRETARIATE

- Bureau of Technical Cooperation

Mr. Wahid Salim, Head, General Affairs Division

Mr. A. Sadig, Staff, General Affairs Division

- Sub-division of Colombo Plan Training

Mr. Noer Bachri, Staff

(I) QUESTIONNAIRE ON YOUR ACTIVITY

(1) Your name in full (underline the name you want to be called)

Mrs, Miss, Mr. _____

(2) Home address

Telephone number: _____

(3) Year of your participation 19 _____

(4) Name and address of your office

Name _____

Address _____

Telephone number _____

(5) Your present post in the office and brief description of your duties and activities

Post: _____

Your duties and activities: _____

(6) Recent two posts which you have held in the present office or other ones

(a) Latest one

Post: _____

Name of office: _____

Period: from _____ to _____

Your activity _____

(b) Previous one

Post: _____

Name of office: _____

Period: from _____ to _____

Your activity: _____

(II) QUESTIONNAIRE ON THE SEMINAR

(1) Which aspect of the Seminar was most beneficial to your job?

Please describe it.

(2) If you have any problems at present, please describe it.

(3) Have you ever introduced any new technology or improved previous technology by what was hinted or suggested through the Seminar?

(III) AFTERCARE ACTIVITY

(1) Do you think it necessary to organize a refresher course for you?

Yes

No

(2) For the participants who answered "Yes";

What kinds of course contents would be beneficial to you?

How long do you think it desirable?

(3) Is there any other follow-up activities you would like to be extended by JICA?

(4) Will you give any comments or suggestions to improve the Seminar in the future?

(a) Curricula (content, period, teaching method for lecture, discussion, etc.)

(b) Observation tour

(c) Others

(5) Will you let us know if you have any other requests to JICA?

(6) General comments, if any.

Will you show a chart of the organization in your Institute, University, or
Department and indicate your section in detail?

Review on Development of Technology related to
Disaster Prevention and Preparedness in Japan
—— Flood Control Technology ——

By

Dr. Takeo Kinosita

National Research Center for Disaster Prevention
Japan

1. Introductory words

Japan is called a rich country today. Concerning Japan, a rich country means a ghost image. Japan had considerable amounts of natural resources in the past, but have not at the present. The Japanese have been forced to work hard. Hard working brings forth a little bit of money. It is said that Japan has the money. Such evaluation is misleading.

Why the Japanese must work hard ? Because they must survive through winter. There was no crop in fields in winter. They must work hard for winter food storage. In addition, there are various kinds of disastrous events, such as floods, fires, earthquakes, volcanic eruptions, famine, disease etc. in Japan. Outside people may ask "are all disastrous events out now ?" "No". "Why ? You have high technology."

The Japanese have made efforts to mitigate disasters. Technology for disaster prevention have been greatly advanced in Japan. But there are still some problems. It seems useful for all people to take a look over technology grown up in Japan.

In this discussion, it will be pointed out first that the Japanese live on rice. Secondly, the Japanese history will be introduced shortly from the viewpoint of flood disaster prevention. Next, a flower of Yedo will be told and a basic role of a government related to safe living will be presented. The story is all from the experiences obtained in Japan. Exchange of experiences is basically important.

2. Rice

Rice is a high-productive crop. It makes much starch (carbohydrate). It can be planted repeatedly. It needs a plenty of sunshine and water. Rice is the most nutritious crop in humid warm regions. Many people can live on rice in an unit area. Therefore in rice region, population density becomes high. But rice grows in a marshy land, namely a low-lying or a flood-prone area. Since the old age the flood control is an important job in rice-producing areas. Drainage of rainwater, reduction of water level in a marshy land and prevention of rice fields against flooding water from a river are main rice planting works in a low-lying area.

On the other hand irrigation is also necessary for supplying water to rice constantly, especially in dry seasons. Drainage and irrigation as well as management of rice planting are a key to maintain the community living on rice in humid warm regions. A community should protect themselves against floods. So a flood fighting voluntary team has been gradually organized since old days.

Rice is not cash crop. In the most developing countries, people plant cash crops. Cash crops are beneficial to get foreign money in international trade. Mulberry was widely planted in hilly regions of Japan more than half a century ago for breeding silk worms. Silk was the most important export goods from Japan for getting US dollars. Technical innovation has rapidly progressed in recent years. Nylon and other chemical fiber are today cheaper and smoother than silk. If the Japanese farmers still plant mulberry for silk worms, Japan is soon bankrupt. Moreover any country should not buy a staple food from other countries.

Rice is a quite different plant from others as discussed above. A community based on rice is also quite different from a community based on wheat, corn, or animal husbandry. The Tennessee Valley Authorities is a famous project for mitigation of flood damage and activation of economy in the area. It is a pilot project of an integrated river basin development not only in USA but also in the world. But the project is not available in Japan. According to the project, the flood plains of Tennessee Valley were all changed to reservoirs. Water is taken from an upper reservoir for irrigation of hill-side farms, where farmers plant other crops than rice. For rice production, the flood plains, which already disappeared in TVA, are important. The way of an integrated river basin development in rice producing areas must be perfectly different from TVA.

3. What is Japan ?

Japan is a country isolated by the ocean. Japan was born about 2000 years ago, as a nation, or at least as a unified group of communities. Before

its birth, a rice-producing race, whose descendant is perhaps a today's Japanese, lived in Japan. Many archaeological remains are found in narrow plains which are less vulnerable by flooding and rather adequate to rice production under the undeveloped flood control technology.

It is formally documented that the Emperor Nintoku invited the foreign engineers to construct the Manda embankment in the Osaka plain in the early 5th Century. It means that flood control technology in Japan was developed by international co-operation, and it promoted to change a marshy land at a delta of a big river to a good rice field. The nation "Japan" became bigger and more unified than ever, because of the increase of rice production based on flood control technology.

The rice field management was emphasized at that time. In 905 A.D., the administrative formalities were declared. One of them was definition of crimes. To destroy a ridge between two rice fields, to block up a drainage ditch, and to break an irrigation conduit were criminal. The document implies the importance of safety of rice fields among communities.

In the 16th Century, the local landlords became strong by employing knights, namely a Samurai. Landlords were basically high-class knights, but were also good engineers to increase their powers by means of construction of infrastructures. Takeda Shingen was one of the most excellent landlords and engineers. He made various river training works in his land. They are all successful even today. His philosophy for river training is to use the natural power for controlling the nature and not to strive against the nature. It is from philosophy of China or India.

In the early 17th Century, the Tokugawas became the Shogun. They closed the country against foreign vessels, but promoted engineering works. They made the municipal water supply system in Tokyo. They excavated many navigation canals for transportation of daily goods for Tokyo. They controlled the flood from the Tone River by digging the flood way. Therefore 1,000,000 population could live in Tokyo (called Yedo at that time). These works were very useful to activate the city of Tokyo, when the Meiji restoration started for modernization of the country.

In 1870's, the Meiji Government invited Holland civil engineers to plan, to construct and to manage many engineering works, such as navigation canals, irrigation and drainage systems, hydropower generation, and sabo works. Flood control works started later, since about 1900. The most important slogan in Meiji was "a rich country and strong military". To increase rice production was clearly believed to be one of the activities for a rich country and strong military. In order to dry up marshy land, farmers made blind ditches, burying brushwood. These blind ditches were very effective to ensure constant high productivity of rice in marshy lands. But the works were terribly hard.

After the World War II, the words "strong military" were deleted in the slogan. But Japan was not rich. Typhoons and other disastrous events often occurred in 1940's and 1950's. The Government of Japan intensified its efforts to develop technology for disaster prevention and preparedness, especially flood control technology. People outside of the country may say Japan is well developed. But many problems still remain today in Japan.

This is Japan as it is.

4. Flower of Yedo

Yedo is the old name of Tokyo before 1867. A flower of Yedo means a fire.

A fire is not included in the category of crimes defined in the administrative formalities in 905 A.D. mentioned-above.

A house in Japan is made of wood. If a fire occurs once, all turn to ash. Therefore there should be strong countermeasure against a fire since old days. But strange as it may sound, people did not worry about a fire. The reason why so is not clear. Several speculations may be given as followings, considering the way of life in the Yedo era.

(1) In old days, a big fire was sometimes induced by a battle. People hated a battle but thought a fire unlucky. A big fire was caused by an earthquake. People thought an earthquake inevitable, therefore a fire inevitable.

(2) The thickly settled area was rare. A fire damage took place seriously in such area, but it was only in the limited area.

(3) A wooden house could be easily rebuilt. Common people never mind the damage with resignation. They soon rebuilt houses.

(4) It was rather beneficial to renew a town. An old town is apt to change slums. Renewal is preferable not only to municipal managers but also to residents. Some Samurais and big marchants had their own timbers in prefabricated forms in the timber storage yards. High-class people could renew their houses immediately after a fire.

(5) At that time the country was closed. So it was necessary to activate domestic economy. Fire damage seemed a trigger of the economic activation.

Most of the speculations about a flower of Yedo are today available to understand the meanings of disasters caused by natural hazardous events. In some Caribbean country common people never worry about a hurricane. If their houses are blown down, they can rebuild their houses a few hours after a hurricane gone away. This fact is very similar to Japan. The concept of disaster prevention and preparedness is basically international.

According to development of the city of Tokyo, social investments have much increased in Tokyo. Today a fire is not a flower. Tokyo has experienced big fires twice in the 20th Century, the fire by the big earthquake in 1923 and the fires by the air raids by US Air Force in 1945. Many kinds of

countermeasures against fires has been installed in Tokyo

(a) Fire equipments and fire engines: There are 294 fire stations and 489 fire engines in Tokyo. The ratios to the population are 25 fire stations per 1000,000 and 41 fire engines per 1000,000.

(b) Telephone calling by 119 means "a fire". A line is connected to the fire control station of the municipality by 119.

(c) The fire preventive streets and the fire preventive building group are completed in the important areas.

(d) All houses, even small private houses, are regulated by the building law for fire preventive structure. Roofs and outside walls shall be made of fire preventive material, iron plate, mortar, asbestos etc.

(e) Big houses shall be equipped with fire hydrants, sprinklers, fire preventive doors, fire escape exits etc.

(f) Self-defense fire team: In a big firm, factory or institution, a self-defense fire team shall be organized. In some municipalities, a self-defense group (Jishubo) is already made by voluntary participation.

(g) People's participation is important. Fire exercise, fire prevention week, fire prevention exhibition are carried out for common people. A slogan for fire prevention is invited from the public. The simpler, the better, for instance "Earthquake, turn off a fire".

All items (a)~(g) show that a good combination of structural and non-structural measures is necessary to prevent a fire. To prevent an earthquake disaster, a flood disaster or others is almost same to the above. Installation of heavy equipments alone is inadequate. People's participation alone is insufficient.

5. What should the government do ?

When the Meiji restoration started 120 years ago, the government introduced European technology, such as river training, railway, iron and steel, and others. Most of them have been developed by the governmental promotion. For example, the government established the national iron and steel factory in Yahata. It was very hard to make iron and steel by Japanese engineers at that time. After many trials, the factory became big and successful. Today it is a private enterprise and the biggest in the world.

The government has a direction for separation of the successful manufacture from the governmental supervision to the independent enterprise. The direction is agreeable. What kind of works will remain inside of the government after the separation of the successful works ? It is a work for safe living. Disaster prevention and preparedness is one of the most important items for safe living. In other words, disaster prevention and preparedness will be a focus of the government at the finally developed stage.

At the first step of the Meiji restoration, the maintenance of low water channels was important for navigation and irrigation. At the end of the 19th Century, many floods occurred in the major rivers in Japan. Big damages were observed. In 1896 the Government promulgated the river law, under which the Ministry of Interior would have responsibility to control floods in major rivers. The budgetary situation was very serious in Japan at that time. The flood control project proposed by the Ministry of Interior sometimes was rejected by the Diet. The Government employed the victim farmers to repair and to construct embankments after the flood. As a flood was a natural event, no body could not receive any compensation according to the Japanese custom. But the victim farmer had not a way of income until the next year's autumn. So the Government gave them the wages to survive through the winter.

There are several ways for controlling floods. An embankment has a merit. Even if it is low or discontinuous, it has an effectiveness to reduce the flood risk with the corresponding range. Embankments have been constructed step by step as far as possible. The effectiveness has increased gradually.

Diversions and cut-off channels were planned in 1910's. They became effective only when they were completed. Therefore definite plans should be established before the starts of works. Some Japanese civil engineers participated the Panama Canal Project and learned many know-hows to make a diversion and a canal. It was very difficult to finish a division or a cut-off channel. In hilly places big landslides occurred during the period of excavating canals. In alluvial plains the blockings of the old water courses were difficult. It took more than 10 years to open it generally. Of course it was costly.

In 1930's a dam was taken for a good countermeasure for flood control. A dam is useful not only to control floods but also to generate electricity and to yield water resources. In 1950's the heavy equipments, such as a dump truck, were introduced to construct a dam. Construction works became much easier than ever. In this stage, the concept of saving victim farmers was faded out. One comment must be added to operation of a dam. Before deciding the specification, a deep consideration should be focused on real operation of the dam facilities. The operation rule of the spillway gate, the conduit gate, the water intake to hydropower and irrigation must be previously determined.

Now there are many flood control reservoirs and high embankments in all the major river basins in Japan. Structural countermeasures seem to be perfect. But new problems have arisen due to developments of the Japanese economy, namely unusual increase of urbanized areas. The population concentration is highly effective for economic activities. But it is vulnerable from the viewpoints of disaster prevention and preparedness. Why such a vulnerable situation was formed? Answers are:

- (1) New settlers find their houses in risky areas, because of land price.
- (2) In new towns, the concept of community preparedness is not yet formed.
- (3) Due to urbanization, the climatic and hydrological conditions may change.
- (4) River improvement works and other structures are inadequate in some new towns because of difficulty of people's relocation.

Today all Japanese ask to themselves "What should the Government do?"

6. Conclusive remarks

The discussion about disaster prevention and preparedness is endless. They are closely related both sides, a socio-economic side and a science and technology side, like two sides of paper. Concerning a science and technology side, developments are slow and constraint within many factors. "High technology" has been improved by elaborations of engineers for a long time, even if it is greatly appreciated by opinion leaders. Technology for disaster prevention is also improved by elaborations of engineers with the support of common people. It is improved by trial and error. Don't hesitate to try. Don't worry about error. Think improvement after the error. Consequently technology for disaster prevention can progress.

The JICA Seminar on Technology for Disaster Prevention is aimed at exchanging the experiences about trial-and-error advancements of technology for disaster prevention and preparedness. It is highly appreciated that at the past Seminar all participants were eager to attend the Seminar for the purpose and achieved great success. Every year in the future, participants will be invited to the Seminar for exchange of their own experiences. The presentation of real experiences, namely a case study, is valuable to all participants including the Japanese staffs. All developing countries can walk on the same course much faster than Japan by exchange of experiences.

At this time of the Mission, we have the great pleasure of seeing all staffs and experts responsible to disaster prevention and preparedness and international co-operation in your country in order to intensify the friendship between your country and Japan.

I would like to express my sincere thanks for your joining the meeting today. I hope my presentation is useful for all of you to understand Japan and technology developed in Japan. In addition, I hope all kinds of disasters in your country will be much reduced in the near future. Thank you again.

SUMMARY REPORT OF THE TECHNICAL FOLLOW-UP TEAM FOR
THE EX-PARTICIPANTS OF THE SEMINAR IN
TECHNOLOGY FOR DISASTER PREVENTION BY JICA

1. GENERAL DESCRIPTION

Being dispatched by Japan International Cooperation Agency as part of its technical follow-up programmes for the returned participants of the group training courses so far operated by JICA, the team consisting of three members mentioned below, arrived in the Philippines on April 8 and then continued its follow-up activities for the period of 4 days.

Prior to the departure from the Philippines, the team intends to submit a summary report on the performance of its official duties for the purpose of reference by researchers, engineers and officials concerned in the Philippines.

The team members would like to avail this opportunity to express their deep appreciation for the warm hospitality and effective cooperation extended to the team members during their stay in this country.

2. TEAM MEMBERS

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National Research Center for Disaster Prevention
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Mr. TOMIE KAGEYAMA
Director
Administration Department
National Research Center for Disaster Prevention
Science and Technology Agency

Mr. MASAKAZU SHINOZUKA
Training Officer
Tsukuba International Center (TBIC)
Japan International Cooperation Agency (JICA)

3. OBJECTIVE

To visit ex-participants' organizations and related organs in order to know how and to what extent they are making use of the knowledge and technology acquired in Japan and what they think is required for improving the Seminar.

4. SCHEDULE OF THE TEAM IN THE PHILIPPINES

April 8 (Mon)		Arrival in Manila Preliminary Meeting with Embassy of Japan and JICA Manila Office
9 (Tue)	09:30	Courtesy call to NEDA Mr. Roque A. Sorioso (Assistant Director-General) Mrs. Soledad V. Ubaldo (Executive Officer of SCS) Mr. Guillermo Montanes (Officer-in-Charge)
	14:30	Courtesy call to the Office of Civil Defense, MND Col. Victor R. Pagulayan (Chief of Office of Civil Defense) Mr. Fortunato M. Dejoras (Deputy Administrator, CESO III) Mrs. Crispina B. Abat (Ex-participant) Mrs. Priscilla P. Duque (Ex-participant) Mrs. Neresia T. Lontoc (Ex-participant)
	16:00	Courtesy call to Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) Dr. Roman L. Kintanar (Director-General) Mr. Esperidon G. Aragon (Ex-participant) Mr. Juanito E. Lucas (Ex-participant)
April 10 (Wed)	09:30	Courtesy call to the Ministry of Social Services and Development (MSSD) Hon. Sylvia Pascual Montes (Minister) Mrs. Milagro's Danes (Assistant Director, Bureau of Assistance)

Mrs. Sitoria B. Galvez
 (Social Welfare Project
 Supervisor)
 Mr. Romeo A. Diccion II
 (Regional Training Coordinator)
 Mr. Aldu P. Domingo
 (Social Welfare Project
 Supervisor)
 Mrs. Aurea Lucas
 (Training Officer)
 Mrs. Mariana M. Tabano
 (Ex-participant)
 Mr. Rufino M. Gamad
 (Ex-participant)

16:00 Courtesy call to Integrated
 National Police (INP)
 Fire Lt. Col. Remigio A. dela Cruz
 (CE, F.O.)
 Fire Lt. Col. Javier de los Santos
 (DMD, F.O.)
 F/MAJ Manuel A. Inocentes
 (Ex-participant)

April 11 (Thu) 10:00 Courtesy call to Integrated National
 Police (INP)
 Brig. Gen. Primo D. Cordeta, Jr.

13:00 Courtesy call to Philippine
 Institute of Volcanology
 Dr. Raymund S. Punongbayan
 (Director)
 Mr. Emmanuel G. Ramos
 (Chief Volcanologist R&D Prog.)
 Mr. Julio Placido Sabit
 (Ex-participant)

16:00 Special Lecture by Dr. Kinoshita
 National Research Center for
 Disaster Prevention

April 12 (Fri) 10:30 Courtesy call to Atty. Florencio
 V. Bernabe, Mayor of Paranaque,
 Metro Manila

5. COMMENTS

After a four-day follow-up activities of the three
 member team as part of the technical follow-up programme
 on the Seminar in Technology for Disaster Prevention, the
 team have formulated the following comments for the
 ex-participants to the said seminar:

- (1) All organizations concerning disaster prevention and preparedness want to send more participants to the Seminar than ever. This fact shows not only the usefulness of the Seminar but also the wide needs for training experts in the country. Considering the similarities of the natural and social conditions of the country to Japan, Japan is the most adequate to train experts for disaster prevention and preparedness. In addition, all ex-participants express their eager will to come again to Japan to study technology for disaster prevention. So-called refreshing course is deeply expected. Various ways are informed to the participants to come to Japan to study technology for disaster prevention and preparedness.
- (2) As the field of technology for disaster prevention and preparedness is wide, it is proposed that the specified subjects should be taken as a high-light of the Seminar in some year(s). According to the other opinion, the early half period of the Seminar is used for general subjects and the latter half period is used for the specified subjects in sub-groups. These comments show the usefulness of "the advanced study" of the Seminar. But, in order to avoid duplication to other JICA training courses, on specified subjects, comprehensive knowledges about disaster prevention and preparedness may be more stressed in the Seminar. Most participants can agree to the present way which covers all fields of prevention of natural disasters.
- (3) The ex-participants and their organizations express the way of improvement of the Seminar amending some subjects such as disaster management, disaster control, statistics, self defense voluntary activity as well as new technology applicable to disaster prevention and preparedness. The importance of the amendments

is well understood. The mission is looking for the possibility of the improvements mentioned here.

- (4) Some ex-participants, who are mostly generalists, comment to the difficulty to understand mathematical formulas during the lecture session. Such kind of difficulty must be solved by using other easily understandable ways, but this opinion does not mean the less importance of basic scientific knowledges, meteorology, hydrology, geology, seismology, etc., for all participants, even if they are generalists. On the contrary, most of the generalists are interested in the basic scientific knowledge obtained by the Seminar.
- (5) Some duplication is pointed out in the all volumes of the Final Report of the Seminar on Technology for disaster prevention. For instance, the official pocedure to disaster prevention can be found in every volume. Therefore, the case study is proposed for exchanging participants' experiences concerning disaster prevention and preparedness. The proposal is significant. The case study will be introduced into the Seminar next time.
- (6) It is informed that Natural disaster Research and Training Center is proposed in the Philippines. The Center is very important for disaster mitigation program implementation. When the Center will be established, the co-operation will be more advanced and the Seminar will be more effective than today.
- (7) The needs for learning Japanese language are presented by ex-participants. The presentation is meaningful. But to keep the same level of the language in the Seminar may be difficult.

- (8) The usefulness of a roving seminar on technology for disaster prevention and preparedness is stressed. Many Philippine experts can participate in a roving seminar from all fields of disaster prevention and preparedness. A roving seminar makes the technology spread over easily. The ex-participants will be competent counterparts at that time.

6. ACKNOWLEDGMENT

The Follow-Up Mission would like to express hearty thanks to all the ex-participants of the JICA Seminar on Technology for Disaster Prevention and the relevant organizations of the Philippines, like, the National Economic and Development Authority (NEDA), Office of the Civil Defense (OCD), Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Integrated National Police (INP) and the Phil. Institute of Volcanology. The Mission would also like to thank the Embassy of Japan, Typhoon Committee Secretariat and JICA Manila Office.

April 13, 1985

Takeo Kinoshita

TAKEO KINOSHITA
Representative of the Follow-
up Team for the Seminar in
Technology for Disaster Preven-
tion
Japan International Cooperation
Agency (JICA)

SUMMARY REPORT OF THE TECHNICAL FOLLOW-UP TEAM FOR
THE EX-PARTICIPANTS OF THE SEMINAR IN
TECHNOLOGY FOR DISASTER PREVENTION BY JICA

1. GENERAL DESCRIPTION

Being dispatched by Japan International Cooperation Agency as part of its technical follow-up programmes for the returned participants of the group training courses so far operated by JICA, the team consisting of three members mentioned below, arrived in the Republic of Indonesia on April 14, 1985 and then continued its follow-up activities for the period of 5 days.

Prior to the departure from the Republic of Indonesia, the team intends to submit a summary report on the performance of its official duties for the purpose of reference by researchers, engineers and officials concerned in the Republic of Indonesia.

The team members would like to avail this opportunity to express their deep appreciation for the warm hospitality and effective cooperation extended to the team members during their stay in this country.

2. TEAM MEMBERS

Dr. Takeo KINOSHITA	: Director, First Research Department, National Research Center for Disaster Prevention, Science and Technology Agency.
Mr. Tomie KAGEYAMA	: Director, Administration Department, National Research Center for Disaster Prevention, Science and Technology Agency.

Mr. Masakazu SHINOZUKA : Training Officer,
Tsukuba International Center
Japan International Cooperation
Agency (JICA).

3. OBJECTIVE

To visit ex-participants' organizations and related organs in order to know how and what extent they are making use of the knowledge and technology acquired in Japan and what they think is required for improving the Seminar.

4. SCHEDULE OF THE TEAM IN THE REPUBLIC OF INDONESIA

- April 14, 1985 (Sun) * Arrival in Jakarta.
- 15 (Mon) 9:00* Preliminary Meeting with JICA
Jakarta Office.
- 10:00 * Meeting with ex-participants,
including special lecture by
Dr. T. Kinoshita at JICA Office.
- Mr. Susanto, Secretary, Meteorological and Geophysical Agency (MGA).
- Mr. R.P. Sudarmo, Head of Analysis
Division, MGA.
- Mr. Saroso B. Sukmono, Research
Engineer, Indonesian Road Research
Institute.
- Mr. Soedjono, Director of Region II,
MGA.
- Mr. Yusfik H. Salim, Head, Sub-Div.
of Data Collecting and Processing,
Region II, Department of Public Works.
- 16 (Tue) 9:00* Courtesy Call to the Department
of Mines and Energy.
- Mr. Soebadi, Head, International
Cooperation Bureau.
- Mr. Haryadi, Staff, International
Cooperation Bureau.
- Mr. Pinantun Manalu, Sub-Director,
Directorate of Geothermal Energy.
- Mr. Soetirto, Director, State Gas Co.
- Mr. Hartono Soewondo, Chief, PGN.
- Mr. Suyudno, Staff, Coal Mining Co.

April 16 (Tue) 10:20 * Courtesy Call to the Meteorological and Geophysical Agency (MGA).
 Drs. C. Sutrisno, Director General.
 Mr. H.M.K. Husodo, Chief, Planning Division.
 Mr. Soedjono, Director, Region II (Ex-Participant).
 Mr. Soetarjo, Chief, Geophysics Division.
 Mr. Susanto, Secretary (Ex-Participant).
 Mr. R.P. Sudarmo, Chief, Analysis Division (Ex-Participant).

11:15 * Courtesy Call to the Department of Public Works.
 Drs. Soekrisno, Head, International Cooperation Bureau.
 Mr. Darminto, Head, Japanese Section, International Cooperation Bureau.
 Mr. Djendam Gurusinga, Chief, Section III, West Region, Directorate of Sungai (Ex-Participant).
 Mr. Yusuf Gayo, Chief, Sub-Directorate of Construction Supervision, West Region.
 Mr. Y. Helmi Salim, Staff, Division of Monitoring and Reporting Disaster, Bureau of Planning (Ex-Participant).
 Mr. Petrus Wiyoto, Staff, Division for Cross Sectoral and Specific Region, Bureau of Planning.

14:00 * Courtesy Call to the Cabinet Secretariate.
 Mr. Wahid Salim, Head, General Affairs Division, Bureau of Technical Cooperation.
 Mr. A. Sadiq, Staff, General Affairs Division, Bureau of Technical Cooperation.
 Mr. Noer Bachri, Staff, Sub-Division of Colombo Plan Training.

April 17 (Wed) 10:30 Courtesy Call to the Institute of Hydraulic Engineering, Department of Public Works.

Mr. Sadeli Wiramihardja, Director.

Mr. Moch. Memed, Chief, Sub-Secretariate of Hydraulics.

Mr. Supardiyono, Staff Engineering Geology Branch.

Mr. Muchtadi H., Staff, Geology Engineering Branch.

Ms. Susantini R., Staff, Hydraulic Structure Branch.

Mr. Susmaryanto Susmoko, Staff, Geology Engineering Branch (Ex-Participant).

Mr. Saroso B. Sukmono, Research Engineer, Indonesian Road Research Institute (Ex-Participant).

12:10 * Courtesy Call to the Volcanological Survey of Indonesia.

Mr. Totong Suhande, Chief, Volcano Analysis Division.

Mr. Sumarna Hamidi, Chief, Volcanic Danger Mitigation Section (Ex-Participant).

Mr. Joedo D. Elifas, Chief, Geological Engineering Division, Directorate of Environmental Geology (Ex-Participant).

* Courtesy Call to the Geological Research and Development Center.

Mr. Untung, Director.

18 (Thur) * Observation of landslide site near Garut, guided by Mr. D. Pangluar and Endang Rachmad, Geologist, Institute of Hydraulic Engineering.

19 (Fri) 8:00 * Special Lecture by Dr. T. Kinoshita at the Institute of Hydraulic Engineering.

10:00 * Meeting with Ex-Participants and other Engineers concerned at the Directorate of Environmental Geology.

April 19 (Fri)

* Mr. Joedo D. Elifas, Head, Geological Engineering Division,
(Ex-Participant).

Mr. N.A. Sutarto, Chief, Engineering Geological Mapping Section
(Ex-Participant).

Mr. Yousana O.P. Siagian, Chief, Landslide Mapping.

Mr. Wahyono, Staff, Landslide Mapping.

Mr. Sumarna Hamidi, Head, Volcanic Hazard Mitigation Section, Volcanological Survey of Indonesia (VSI) - (Ex-Participant).

5. COMMENTS

After a five-day follow-up activities of the three member team as part of the technical follow-up programme on the Seminar in Technology for Disaster Prevention, the team have formulated the following comments for the ex-participants to the said Seminar :

- 1) All participants from Indonesia were specialists while other countries sent both generalists and specialists. All specialists are apt to stick to their own specialities. Therefore, the comments given by the Indonesian ex-participants are concentrated on how to deepen their own knowledges during the period of the Seminar on Technology for Disaster Prevention. One of the special fields, such as meteorology, hydrology, geology, seismology, volcanology etc., was generally expected by each Indonesian participant. In order to meet such needs, the advanced study was already carried out at the later period of every Seminar. A few small groups were organized, based on the interests of the participants, at the time of the advanced study. All participants, including the Japanese staffs, were willing to exchange their own experiences about the specialized

subjects, for instance, flood control, landslide prevention, earthquake engineering etc. in advanced levels of technology. The advanced study will be held in the future Seminar by the strong support of the participants. Moreover, the case study is emphasized for clear analysis of the real action for the countermeasures against the past disaster. The ex-participants highly appreciate the usefulness of the advanced study and fully agree to the proposal of the case study.

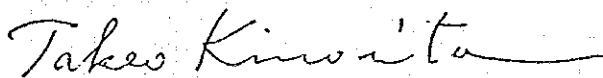
- 2) Technology for disaster prevention covers very wide areas and is interdisciplinary. In the Seminar, various kinds of natural disasters are discussed. One of the purposes of the Seminar is to obtain the comprehensive knowledge about prevention and preparedness against natural disasters. In addition, new kinds of disasters are sometimes induced by the socio-economic development of the country. In order to mitigate new disasters, a specialists is required to have the knowledge other than his speciality. An example was reported by the ex-participant, who is not a specialist of fire disaster and was requested to find an effective way of fire disaster prevention when he came back to Indonesia. In the Seminar the lectures on fire prevention and the observation tour to see fire prevention drills were programmed. So the Seminar was found to be very useful.
- 3) During the Seminar period, there are many chances to see and discuss the scientific observation systems. The participants are very interested in the observation systems, such as rainfall intensity during the short period, the strain-meters for landslides and micro-seismographs for after-shock measurement, related to the bilateral cooperation. The participants know the difficulties of maintenance of sophisticated systems. They said the simpler the better. This opinion is sound.

4) It is also stressed to promote the cooperation and the friendship between Indonesia and Japan. The way to increase them was discussed. The group training courses and seminars by JICA are greatly appreciated. But it is rather regretful that only a participant must be invited from a country for a course. The organizations which already sent participants express their hopes to send more participants to the Seminar. This fact means that the Seminar is well evaluated by them. The individual training course is explained by JICA. A roving Seminar is proposed to invite more participants from the various Indonesian organizations concerned. The most of organizations visited by the team expressed their eager intention to be a host organization at that time. The coordination among disaster prevention organizations is basically important to effectively mitigate disasters. The ex-participants will be competent counterparts at that time.

6. ACKNOWLEDGEMENT

The Follow-Up Team would like to express hearty thanks to all the ex-participants of the JICA Seminar on Technology for Disaster Prevention and the relevant organizations of the Republic of Indonesia, like, the Department of Mines and Energy, the Department of Public Works, the Cabinet Secretariate, the Meteorological and Geophysical Agency, Directorate of Environmental Geology, the Institute of Hydraulic Engineering, the Institute of Volcanological Survey of Indonesia, and the Geological Research and Development Center.

Jakarta, April 22, 1985



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Representative of the Follow-Up Team
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JICA