

參加「台加雙邊防災研討會」暨「台美雙邊
2002 年預防及減輕天然災害技術研討會」
會議報告

行政院研考會/省(市)研考會
編號欄

服務機關：行政院國家科學委員會
出國人職稱：副研究員、研究員
姓名：謝志毅、魏良榮

出國地點：加拿大渥太華、美國華府
出國期間：91 年 7 月 15 日至 7 月 21 日
報告日期：91 年 10 月 21 日

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參加「台加雙邊防災研討會」暨「台美雙邊 2002 年預防及
減輕天然災害技術研討會」會議報告

一、前言

台灣地理環境特殊，颱風與地震頻仍，再加上近數十年經濟高度成長，產業及人口紛向都市集中，都市邊緣土地利用程度逐年增加，發生災害之潛在危機不斷升高。近幾年，連續發生多次重大天然與人為災害事件，政府與社會大眾之防災意識大幅提昇。

由於防救災相關政策與措施，必須以堅實的科技研發為基礎，始可掌握正確方向，有效運用有限資源，發揮減災實效。為瞭解國際防災科技研發相關工作之推展情形，並汲取有關經驗。九十一年七月十五日至二十二日，國科會與防災國家型科技計畫相關人員赴加拿大 Ottawa、美國華盛頓 DC 參加 Canada-Taiwan National Hazards Mitigation Workshop 及 US-Taiwan Symposium on Natural Disaster Reduction 兩項研討會，相關研發成果及經驗，可供我國推動災害防救研究與實務工作參考。

二、會議議程

| 日期 | 參訪事項 | 住宿 |
|-----------------------|---|--------|
| 91年 7月15日 (星期一) | 去程：台北中正機場→Vancouver → Toronto → Ottawa | Ottawa |
| 7月16日 (星期二) | 13:30-16:00 參觀 Geological Survey of Canada | Ottawa |
| 7月17日 (星期三) | 08:00-16:50 Canada-Taiwan National Hazards Mitigation Workshop | Ottawa |
| 7月18日 (星期四) | 08:00-12:30 Canada-Taiwan National Hazards Mitigation Workshop 13:30-16:50 參觀 Digital Simulation Laboratory, PWGS | Ottawa |
| 7月19日 (星期五) | 08:00-12:00 Canada-Taiwan National Hazards Mitigation Workshop 13:30-15:00 參觀 Remote Sensing in Canada | DC |
| 7月20日 (星期六) | 09:00-17:00 US-Taiwan Symposium on Natural Disaster Reduction | DC |
| 7月21日 (星期日) | 09:00-12:30 US-Taiwan Symposium on Natural Disaster Reduction 16:30-- 回程：D.C. → New York→台北 | |
| 7月22日 (星期一) | 回程→ 台北中正機場 | |

三、參加成員

| 姓名 | 職 稱 |
|-----|--------------------------------|
| 黃文雄 | 國科會副主任委員 |
| 羅俊雄 | 國家地震工程研究中心主任 防災國家型科技計畫總主持人 |
| 蔡義本 | 防災國家型科技計畫共同主持人 |
| 陳亮全 | 防災國家型科技計畫共同主持人 兼防救災體制研究群召集人 |
| 許銘熙 | 防災國家型科技計畫防洪研究群召集人 |
| 林美聆 | 防災國家型科技計畫坡地研究群召集人 |
| 溫國樑 | 防災國家型科技計畫地震研究群召集人 |
| 蔡克銓 | 防災國家型科技計畫地震工程研究群召集人 |
| 孫志鴻 | 防災國家型科技計畫資訊研究群召集人 |
| 何興亞 | 防災國家型科技計畫執行秘書 |
| 魏良榮 | 國科會永續會研究員兼副執行秘書 |
| 謝志毅 | 國科會企劃處副研究員 |

四、Canada-Taiwan National Hazards Mitigation Workshop

主辦單位：Public Works and Government Services (PWGS) Canada
National Science Council, Taiwan
National Center for Research on Earthquake
Engineering, Taiwan
Office of Critical Infrastructure Protection and
Emergency Preparedness, Canada
Science and Technology Division,
Taipei Economic and Cultural Office, Canada

會議主席：C. Beal, ADM, RPS, PWGSC, Canada
黃文雄副主委, NSC, Taiwan

籌備委員：M. Cheung (Co-Chair, Canada)
羅俊雄 (Co-Chair, Taiwan)
B. Belwa (Canada)
S. Foo (Canada)
J. R. Hsu (Canada)
C. Tucker (Canada)

參加人數：約六十人。

研討主題：包括防災科技研發推動與管理、災害潛勢分析與境況模擬、現地監測、建築結構與維生管線減災措施、防救災資訊系統建置、重大災害案例與探討、災損分析、社區防災工作推動、防災意識調查分析等，詳如研討會議程。

Canada-Taiwan National Hazards Mitigation Workshop 議程

July 17th – Wednesday

| Time | Presentations | Authors/ Presenters |
|-------------|---|--|
| 8:00 | Coffee | |
| 8:30 | Welcome and Opening Remarks by Co-Chairs | C. Beal W.H. Huang |
| 9:00 | Keynote Speaker #1 R & D Initiatives towards Risk Management Solutions | C. Tucker |
| 9:30 | Keynote Speaker #2 National Science & Technology Program for Hazard Mitigation: State of the Art Activities | C.L. Yen, C.H. Loh H.Y. Ho |
| 10:00 | Keynote Speaker #3 Experiment as an Aid for Performance Based Seismic Design Research and Practice | K.C. Tsai |
| 10:30 | Break | |
| 10:45 | Keynote Speaker #4 Catastrophic Loss Reduction Strategies | P. Kovacs |
| 11:15 | Characteristics of Site Effects on Ground Motion Attenuation Model | W.Y. Jean, C.H. Loh |
| 11:35 | Estimations of Soil Liquefaction Potential and Settlement in Scenario Earthquakes | C.H. Yeh, M.Y. Hsieh, C.H. Loh |
| 11:55 | Lunch | |
| 12:50 | Remote Sensed Data for 921 Disaster Area Management | F.T. Lin |
| 1:10 | The Canadian Urban Seismology Program – assessing seismic hazards and mitigating risk to Canada's cities | J. Adams, G.Rogers, T. Onur, A. Bent, J. Cassidy, D. McCormack, S. Halchuk |
| 1:30 | Design of buildings for seismic hazard: Provisions of the 2004 National Building Code of Canada | J. Humar |
| 1:50 | Significant Geoscience Factors Affecting the 1999 Chi-Chi, Taiwan Earthquake Disasters | Y.B. Tsai |

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| 2:10 | Strong Motion Observations in Taiwan and Ground Motion Characteristics of the 1999 Chi-Chi, Taiwan, Earthquake | K.L. Wen |
| 2:30 | Catastrophic Rock Slope Failure | S. Evans |
| 2:50 | Break | |
| 3:10 | A Study on Debris-Flow Hazards in Central Taiwan after Chi-Chi Earthquake | C.L. Shieh |
| 3:30 | Method for Scenario Simulation of Debris Flow Hazard | M.L. Lin |
| 3:50 | Debris Flow Hazards in Canada | P. Bobrowsky |
| 4:10 | Canadian Geomagnetism Hazard Program | R. Coles, D. Boteler |
| 4:30 | Typhoons of the Western Pacific | T. Murty |
| 4:50 | Workshop Adjourned | |

July 18th - Thursday

| Time | Presentations | Authors/ Presenters |
|-------------|---|--|
| 8:00 | Coffee | |
| 8:30 | Dynamic Inundation Simulation in Urban Areas | M.H. Hsu |
| 8:50 | Sustainable Floodplain Management in the Red River Basin | H. Rasid |
| 9:10 | Providing Tornado and Severe Weather Warnings in Canada | P. Joe, S. Lapczak |
| 9:30 | Wildfire Information System | A. Simard |
| 9:50 | Seismic Damage Assessment of Highway Bridge Systems | C.H. Loh, W.I. Liao, C.H. Yeh |
| 10:10 | Break | |
| 10:30 | Retrofit of Existing Street Buildings in Disaster Area of the Taiwan Chi-Chi Earthquake | M.S. Sheu, Y.S. Tu, P.C. Lan |
| 10:50 | Earthquake-resistant Design of Telecommunication Towers | G. McClure |
| 11:10 | Analytical Models of Predicting Lateral Load Response of RC Squat Walls | S.J. Hwang, H.W. Yu |
| 11:30 | Seismic Repair and Retrofit of Shear-Failure Bridge Columns Using CFRP Jacketing | Y.F. Li, Y.Y. Sung |

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| 11:50 | Seismic Retrofit of Masonry Infill Walls Using CFRP Sheets | F. Serato, M.Saatcioglu, S.Foo |
| 12:10 | Seismic Retrofit Study of Infilled RC Frames | K.C. Chang , S.J. Hwang, L.L. Chang |
| 12:30 | Lunch | |
| 1:30 | Application of Spaceborne Remotely Sensed Data in Support of Natural Disasters | T.J. Pultz , J. Sokol |
| 1:50 | Hazards to Critical Infrastructure in Canada; an overview with selected case illustrations | R. Phillips |
| 2:10 | Municipal Preparedness and Response | H. Murphy , J. Littlewood |
| 2:30 | "Getting the numbers right: the challenge of estimating the cost of disasters in Canada" | L. M. Bellisario |
| 2:50 | The Willingness to Pay for Natural Disaster Reconstruction: An Application of CVM Method to the 921 Chi-Chi Earthquake | W.S. Yang |
| 3:10 | Break | |
| 3:30 | Natural Hazards and Sustainable Community | A. Jeena |
| 3:50 | The Learning Process of Community-Based Hazard Mitigation: The Case Studies of Shgang-Ann Community and Feng-Chiou Community, Nantou County, Taiwan | L.C. Chen |
| 4:10 | Public Communication and Awareness Raising | Joanne Schwartz , Paul L'Arrivée |
| 4:30 | In Search of a Comprehensive Natural Hazards Mitigation Curriculum for Pre-college Students – Earthquake for Example | T.Y. Lee , F.Y. Yang , Y.S. Hsu , and C.Y. Chang |
| 4:50 | Workshop Adjourned | |

July 19th – Friday

| Time | Presentations | Authors/ Presenters |
|-------------|--|---|
| 8:00 | Coffee | |
| 8:30 | Panelist #1 Canada's National Disaster Mitigation Strategy | Marc-Andr é Poisson |
| 8:50 | Panelist #2 Development of an Advanced Disaster Management Decision Support System in Taiwan | C.H. Sun |
| 9:10 | Panelist #3 Seismic Risk Reduction of Existing Buildings | S Foo, M. Cheung, N Naumoski |
| 9:30 | Panelist #4 Research and Application on Seismic Safety of Functional Components in Buildings | G.C. Yao |
| 9:50 | Break | |
| 10:10 | Panel Discussion | M. Cheung C.H. Loh |
| 11:50 | Closing Remarks | M. Cheung C.H. Loh |
| 12:00 | Workshop Adjourned | |

五、US-Taiwan Symposium on Natural Disaster Reduction

補助單位：National Science Council, Taiwan

主辦單位：Chinese American Association for Natural Disaster
Reduction (CAA-NDR)

會議主席：Chia-Ming Uang, President, CAA-NDR
羅俊雄, Director of NCREE, NSC, Taiwan

籌備委員：Peter C. Chang, NSF, USA
Ed Hsing-Hua Shih, NOAA, USA
G.Z. Chi, Infratech, Inc.
Ken P. Chong, NSF, USA
Yaw-Nan Chen, TECRO Science Division, ROC

執行秘書：Teresa Yuan, TECRO Science Division, ROC

顧問：S.C. Liu, NSF, USA
George C. Lee, MCEER, SUNY, Buffalo, USA

參加人數：約一百一十人。

研討主題：包括防災研究與措施、災害潛勢分析與境況模擬、災
損評估分析、防救災資料系統建置、災害緊急應變、
防災教育、社區防災工作推動、國際合作防災研究
等，詳如研討會議程。

US-Taiwan Symposium on Natural Disaster Reduction 議程

July 20th – Saturday

| Time | Presentations | Speakers | Notes |
|---|---|------------------------------------|--------------|
| 09:00-09:10 | Welcome and Opening Remarks | Chia-Ming Uang Wen-Hsiung Huang | 汪家銘 黃文雄 |
| Session 1: Review of Natural Disaster Mitigation/Response Measures | | Chair: Peter hang | 張春圃 |
| 09:10-09:30 | Development of HAZ-Taiwan Seismic Risk Assessment Methodologies: An Overview | Chin-Hsiung Loh Hsin-Ya Ho | 羅俊雄 何興亞 |
| 09:30-09:50 | Application of Geo-science Information for Seismic Hazard Mitigation-A Prospective from the Chi-Chi Earthquake Experience | Ben Tsai Kuo-LiangWen | 蔡義本 溫國樑 |
| 09:50-10:05 | Natural Hazard Mitigation Activities of FEMA in the USA | Robert Hanson Michael Mahoney | 韓 遜 麥和倪 |
| 10:05-10:20 | Earthquake Engineering Research in USA and International Cooperation | Joe Penzien S.C. Liu | 潘 遜 劉師琦 |
| 10:20-10:35 | Coffee Break | | |
| Session 2: Earthquakes | | Chair: Chin-Hsiung Loh | 羅俊雄 |
| 10:35-10:50 | Seismic Capacity and Stiffness of Infilled Brick Wall | Maw-Shyon Sheu | 許茂雄 |
| 10:50-11:05 | A Taiwan-US Cooperative Research on Steel and Concrete Composite Building Structures | Keh-Chyuan Tsai | 蔡克銓 |
| 11:05-11:20 | Impact of WTC Tragedy on the Catastrophe Risk Management | Wei-Ming Dong | 董偉民 |
| 11:20-11:35 | Overview of Seismic-Resistant Structural Design | Franklin Cheng | 鄭 毅 |
| 11:35-11:50 | In Search of a Comprehensive Natural Hazard Mitigation Curriculum for Pre-college Students | Tung-Yi Lee | 李通藝 |
| 11:50-12:05 | Technological Frontiers of Smart | Bill Spencer | 蘇磐石 |

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|---|--|--------------------|-----|
| | Damping for Protection of Civil Infrastructure | | |
| 12:05-13:30 | Lunch at Greenfield | | |
| Session 3: Hurricane/Flood | | Chair: Arthur Chiu | 邱南烈 |
| 13:30-13:45 | Mitigating Damage From Wind Hazard | Arthur Chiu | 邱南烈 |
| 13:45-14:00 | Emergency Hurricane Evacuation | Mike Lindell | 林德兒 |
| 14:00-14:15 | Urban Inundation Model with Dynamic Interaction between Overland and Storm Sewer Flows | Ming-His Hsu | 許銘熙 |
| 14:15-14:30 | Sea Level Rise: A Global Natural Hazard to Coastal Communities | Benjamin F. Chao | 趙 丰 |
| 14:30-14:45 | Coffee Break | | |
| Session 4: Landslide | | Chair: Moh Huang | 黃漢見 |
| 14:45-15:00 | A Study on Debris-Flow Hazards in Central Taiwan after Chi-Chi Earthquake | C. L. Shieh | 謝正倫 |
| 15:00-15:15 | Remote Sensing of Natural Hazards | William Tseng | 曾雲驥 |
| 15:15-15:30 | Liquefaction and Ground Failure Potential Maps of Yuanlin, Taiwan | Hsein Juang | 莊長賢 |
| 15:30-15:45 | Post Chi-Chi Earthquake Geotechnical Exploration in Central Western Taiwan | An-Bin Huang | 黃安斌 |
| 15:45-16:00 | Coffee Break | | |
| Session 5: Emergency Response, Temporary Relief, Social and Educational Issues | | Chair: Ken Chong | 張建平 |
| 16:00-16:15 | Development of an Advanced Disaster Management Decision Support System in Taiwan | Chih-Hong Sun | 孫志鴻 |
| 16:15-16:30 | Local Government Disaster Mitigation and Response Plans | L C. Chen | 陳亮全 |
| 16:30-16:45 | Emergency Preparedness and Response in the United States | Dennis Wenger | 溫 格 |
| 16:45-17:00 | Strategy Planning of Community Sponsored Volunteer Emergency Recovery Team (VERT) | James Lai | 黎守仁 |

July 21th – Sunday

| Session 6: Smart Structures | | Chair: S. C. Liu | 劉師琦 |
|------------------------------------|---|-------------------------|----------|
| 09:00-09:15 | Remote Sensed Data for Potential Hazard Area Management | Feng-Tyan Lin | 林峰田 |
| 09:15-09:30 | Diagnosis of Steel Reinforcement Debonding with Embedded Piezoelectric Sensing Elements | Fannie Wu | 吳 凡 |
| 09:30-09:45 | Rapid Dissemination of Strong-Motion Data for Post-Earthquake Response in the US | Moh Huang | 黃漢見 |
| 09:45-10:00 | Recent Advances in Applying Wavelets for Health Monitoring Using ASCE Benchmark Data | Fu Gwo Yuan | 袁福國 |
| 10:00-10:15 | Structural Control for Hazard Mitigation | Jann Yang | 楊振南 |
| 10:15-10:30 | Coffee Break | | |
| Break Sessions | | Chair | Recorder |
| 10:30-11:30 | Session 1: Mitigation Measures for Earthquake & Geotechnical Engineering | B. Spencer | P. Chang |
| | Session 2: Mitigation Measures for Wind, Storm, and Flood | A. Chiu | H. Huang |
| | Session 3: Emergency Response/Management | D. Wenger | J. Lai |
| 11:30-11:45 | Session 1 Summary Report | P. Chang | |
| 11:45-12:00 | Session 2 Summary Report | H. Huang | |
| 12:00-12:15 | Session 3 Summary Report | J. Lai | |
| 12:15-12:30 | Concluding Remarks | C. H. Loh C. M. Uang | |
| 12:30 | Adjourn | | |

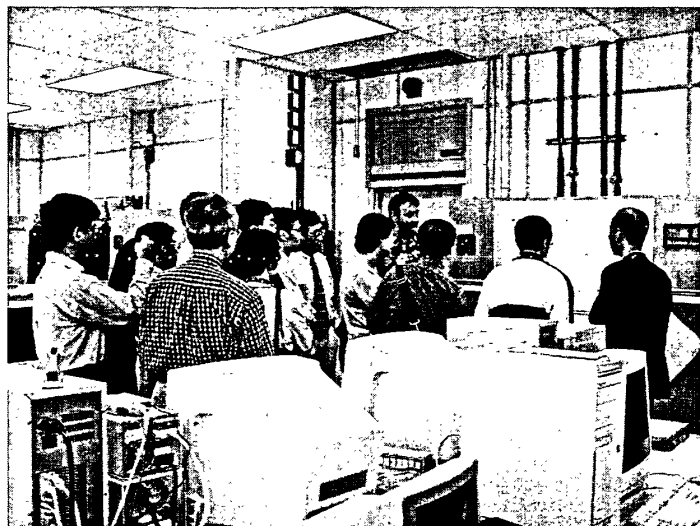
六、心得

- (一)加拿大利用遙測技術，進行高精度之環境監測，對災害防治工作效能提昇助益甚大。
- (二)我國地震與地震工程之研究，在理論與實驗工作方面，均較加拿大更為先進與堅實。
- (三)經由此次研討，雙方學者得以進一步瞭解加拿大、美國及台灣防災科技研發推動情形，對今後我國防災科技研發工作之規劃推動及國際合作，極具參考價值。

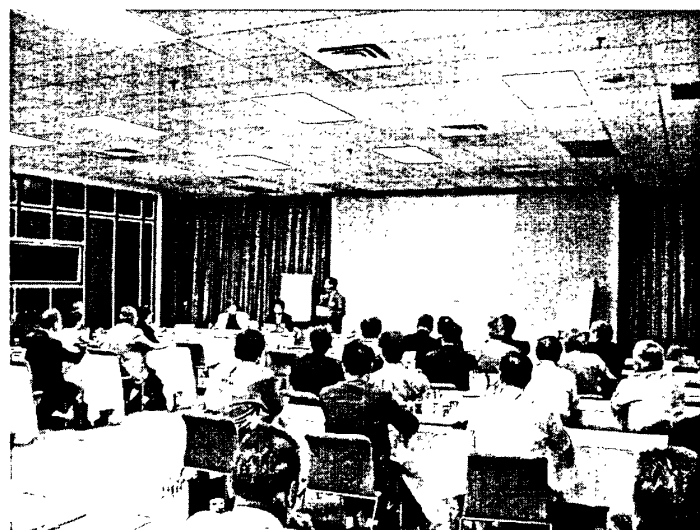
七、致謝

經由國科會駐加拿大科學組許榮富組長與駐美國華府科學組陳耀南組長的協助與安排，使得會議順利進行，收獲亦甚為豐富。在此，一併致謝。

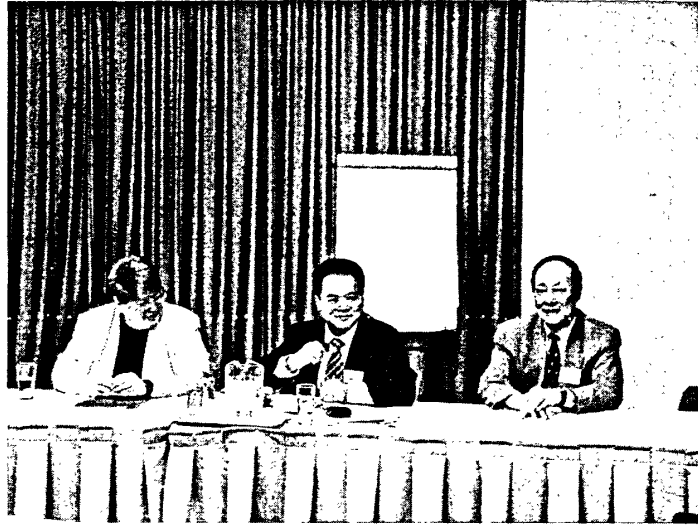
八、相關照片



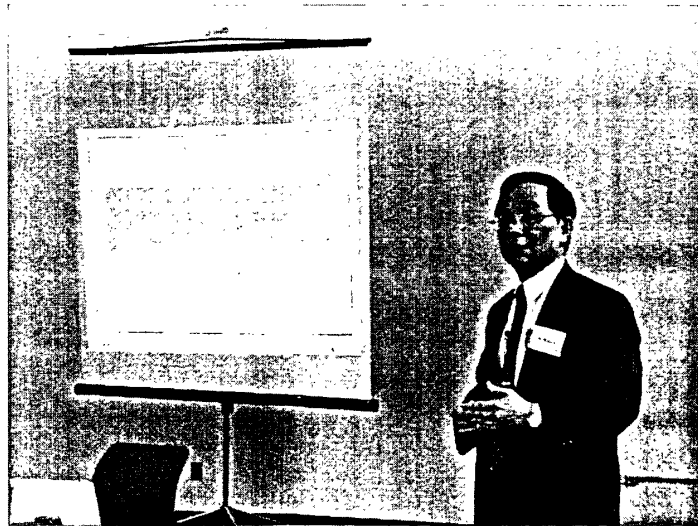
照片一 台灣學者專家參觀 Geological Survey of Canada



照片二 Canada-Taiwan National Hazards Mitigation Workshop
開幕典禮



照片三 國科會黃副主委文雄於 Canada-Taiwan National Hazards Mitigation Workshop 開幕典禮中致詞



照片四 防災國家型科技計畫總主持人羅俊雄教授於 Canada-Taiwan National Hazards Mitigation Workshop 介紹我國防災科技研究進展情形



照片五 台灣學者專家參觀 Digital Simulation Laboratory, PWGS



照片六 台灣學者專家參觀 Remote Sensing in Canada



照片七 Canada-Taiwan National Hazards Mitigation Workshop
全體與會人員合影



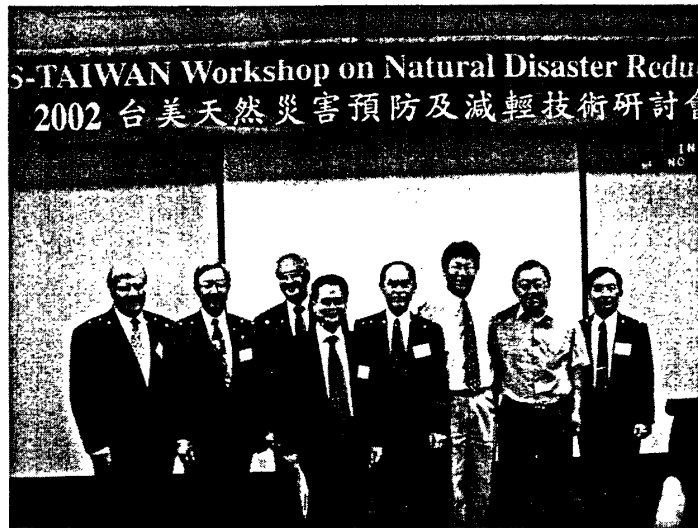
照片八 US-Taiwan Symposium on Natural Disaster Reduction
開幕典禮



照片九 美華學會汪會長家銘於 US-Taiwan Symposium on Natural Disaster Reduction 開幕典禮中致詞



照片十 國科會黃副主委文雄於 US-Taiwan Symposium on Natural Disaster Reduction 開幕典禮中致詞



照片十一 US-Taiwan Symposium on Natural Disaster Reduction
主要籌辦人員與國科會黃副主委文雄合影



照片十二 US-Taiwan Symposium on Natural Disaster Reduction
全體與會人員合影