


Pontificia Universidad Católica de Chile
 カトリカ大学、チリ
 地震防災の国際協力
International Cooperation on Earthquake Disaster Management to Protect Lives
 ラウル・アルバレス・モデル カトリカ大学、チリ
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Credits for Photos and Information: Faculty, Students, WW Web, Onemi, Other Universities, own.
UNESCO – IPRED5 Workshop
 ユネスコIPRED第5回会合、東京、2012
 27 June 2012, Tokyo, Japan
 Structural and Geotechnical Engineering


Chile, un país con múltiples amenazas
 様々な脅威のある国 チリ



Seismic /
地震 Earthquake



Volcanic
Eruptions 火山



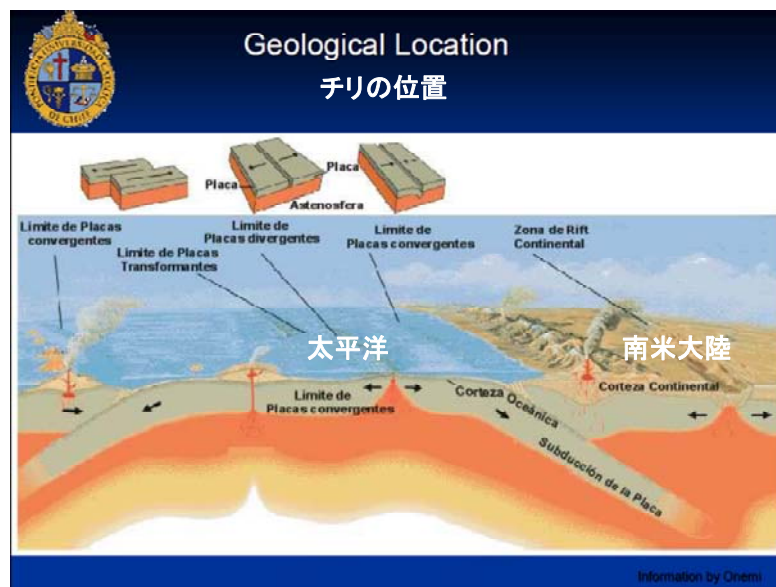
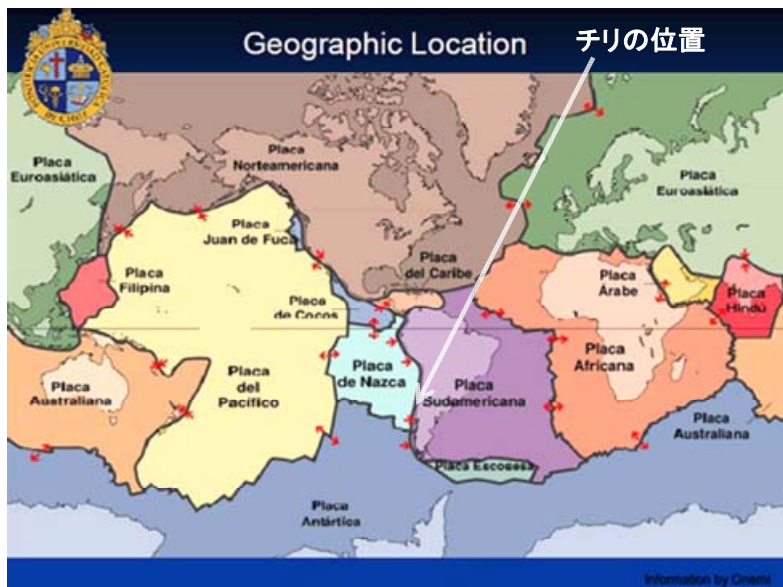


Tidal waves /
津波 tsunamis



Flood / 洪水
drought · 干ばつ

Information by Onemi



Footprint historic earthquake in Chile
チリにおける地震の歴史

Earthquakes

- About 90 earthquakes since 1570
1570年以降約90の地震
- 200 earthquakes per day (between perceptible and imperceptible)
体感しない地震を入れると一日200地震
- Greater magnitude earthquake recorded in the world
世界最大のマグニチュードを記録

Information by Onemi

Footprint historic earthquake in Chile
チリにおける地震の歴史

Earthquake, Santiago 1647
1647年サンチャゴ地震

Earthquake, Valparaiso 1907
1907年バルパライソ地震

Information by Onemi

Footprint historic earthquake in Chile
チリにおける地震の歴史

Earthquake, Santiago 1985
1985年サンチャゴ地震

Earthquake, Cauquenes 2010
2010年カウケネス地震

Information by Onemi

Experiences of the last earthquake
最近の地震の経験

Government and Institutions 政府及び関係機関

- Lack of coordination between different Government Departments, Onemi, Shoa, Regional Governments, Municipalities. 調整の不足
- The institution that was closer to disaster management, was not up to the circumstances (Onemi). It was overtaken by events. 無理な業務
- Personnel in charge of management, did not have enough technical competence, and autonomy, and budget according to circumstances. 担当者の能力と予算の不足



Experiences of the last earthquake 最近の地震の経験

Government and Institutions 政府及び関係機関

- The buildings of some government institutions were destroyed during the earthquake or tsunami, so there was no basis from which to coordinate. 地震や津波で倒壊した政府の建物がある
- Lack of unique methodology of evaluation of structures after the earthquake, so that the interpretation of the data was very difficult. 被害評価
- Local pressures were accepted to build in areas unsuitable (poor soil, areas affected by tsunami, etc.). Lack of strong and consistent policy of the Municipalities and the Government 不適格地へ建設



Experiences of the last earthquake 最近の地震の経験

Government and Institutions 政府及び関係機関

- It depends on the willingness of other institutions like the U of Chile, but have other purposes. チリ大
- Absence of a crisis management plan internalized in the population, where tsunamis be taught drills, earthquake drills, where to evacuate, have places to take in people injured, define where welcome, hopefully with insulation systems or energy dissipation that were operational after the earthquake.
津波・地震訓練、避難場所情報など危機管理計画の欠如



Experiences of the last earthquake 最近の地震の経験

Government and Institutions 政府及び関係機関

- Delayed reaction of political power to establish strict protection measures for civility against looting and vandalism. 略奪暴動対策の政治的遅れ
- None of the tsunami early warning. 津波警報がない
- Serious problems in mobile communication during the crisis. 危機時の携帯電話連絡の深刻な問題
- Concentration of knowledge in the capital. 首都集中
- Great extension of the country and affected areas. 広大な被災地と国土



Experiences of the last earthquake 最近の地震の経験

Of Civility 市民活動

- Lack of volunteers to assess the damage after an earthquake 被災度判定ボランティアの不足
- Using materials not suitable even for a seismic country like adobe. アドベなど不適切な材料の使用
- Auto building without control. 規制のない自主建築
- Lack of coordination and management of civility to the crisis in some areas. 危機時の調整管理欠如
- Acceptance of economic structural solutions from non-seismic countries, very easily. 地震のない国からの経済的な構造方法の安易な受け入れ



Experiences of the last earthquake 最近の地震の経験

Equipment 設備機器

- Lack of proper equipment, in order to have a monitoring of the country (accelerographs, seismographs, equipment at sea), considering the vast extension of the country. 監視機器の不足
- Lack of maintenance of existing instruments, for lack of funds and lack of qualified personnel, especially outside of Santiago. メンテ・人材の不足
- Data from the few devices that work are not accesibles the scientific community, so you have the information months or years of delay.
研究者に情報が届かず、数ヶ月数年遅れて情報が得られる



Implement Improvements 改善の実施

Government and Institutions 政府及び関係機関

- Completely restructure the ONEMI, giving emphasis in management. Change its organic law. Major institutional change. 政府機関の機構改革
- Provide it with sufficient budget. 予算の充実
- Empower them against the conjunctural political power. 政治への抗力
- Professionalize their members and provide them with professional training in seismology, volcanology, tsunami experts, engineers, seismic, etc. 政府機関要員への地震、火山、津波の専門的な訓練
- Develop a strong research area in all subjects listed above. 全ての課題でしっかりした研究分野を開発



Implement Improvements 改善の実施

Government and Institutions 政府及び関係機関

- Create an early warning network nationwide, with sufficient resources to operate and maintain, with appropriate staff in evaluating the information obtained. 人材と予算付きで早期警報ネットワークを構築
- Knowledge permeate the province. 地方へ知識普及
- Share this information with local and international scientific community. 地域・国際間で科学情報を共有
- Ensuring the continuous operation of the communication network at the country level, citizen. 全国、市民レベルで情報ネットワークを持続運営



Implement Improvements 改善の実施

Government and Institutions 政府及び関係機関

- Implement a quick inspection of structures and create and coordinate a volunteer at the country level for implementing disaster. 早期被災判定体制
- It seems obvious, but provide the necessary budget to function and operate as indicated in the course of time. 当然だが、時系列で必要な予算
- In schools the curriculum incorporate the issues of natural disasters. 学校での自然災害に関する教育
- Crisis management education to the population. 市民への危機管理教育



Tips to Japan and UNESCO 日本とユネスコへの示唆

- Share positive experiences in institutional issues, management and monitoring of successful countries. 成功国の制度、実施など積極的な経験の共有
- Exchange of technical personnel and experts in risk management, methodologies, studies of human behavior in emergencies, etc. 専門家の交流
- Help create a critical mass of experts in each area of risk, to permeate this knowledge throughout the country. 全国への知識普及のための最低必要な専門家育成支援



End of Presentation 発表は以上です

