Room Document 19

High-Level Roundtable on the Financial Management of Earthquakes

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OECD Headquarters, 2 rue André Pascal, 75116 Paris

Integrated Disaster Risk Management in Japan and Lessons from the March 11 events

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High-Level Roundtable

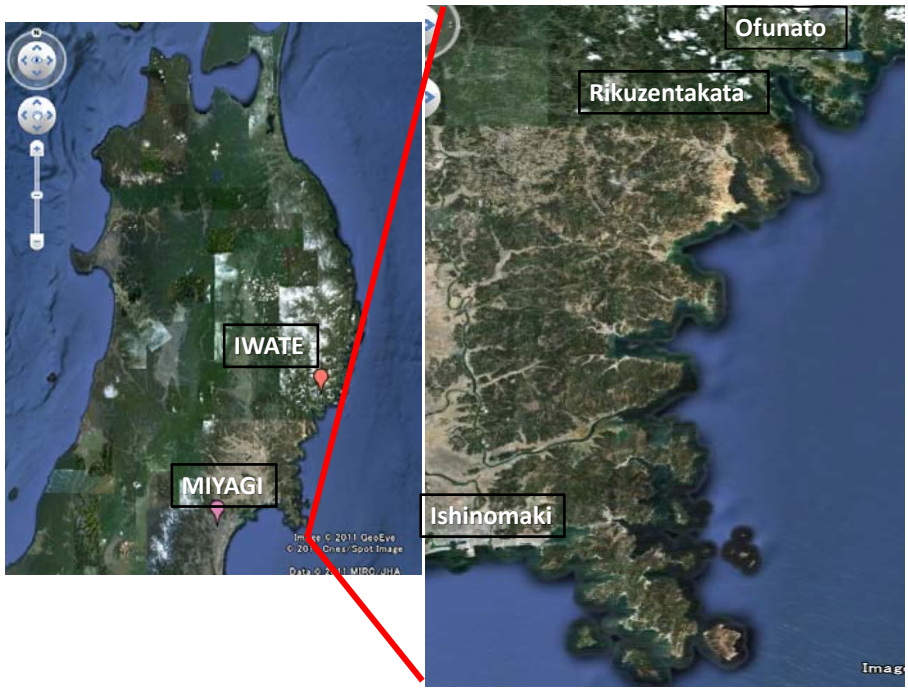
on the Financial Management of Earthquakes

OECD High-Level Advisory Board on the Financial Management of Catastrophes

and the Ministry of Finance, Chile

23 March 2011

- 14 ,46 minutes, 18 seconds on March 11, 2011
- Magnitude 9.0 richter scale
- Ojika Peninsular shifted 5. 3m in south-south eastern direction and sunk 1.2 m
- Tsunami height at the shore maximum 10 m ca reaching inland as high as 39 m (yet to be investigated)



Focuses of Presentation

- **Characteristics of Hazards and Disaster**

Building & Infrastructure Damages (Field survey reports with pictures)

- Overview of Socio-Economic Impacts

  -direct & Indirect Losses, supply-chains, Business continuity plan in industrial parks
- Recovery plans & Future Disaster Prevention

  - Land use policies, educations, etc.
- Implications to other countries

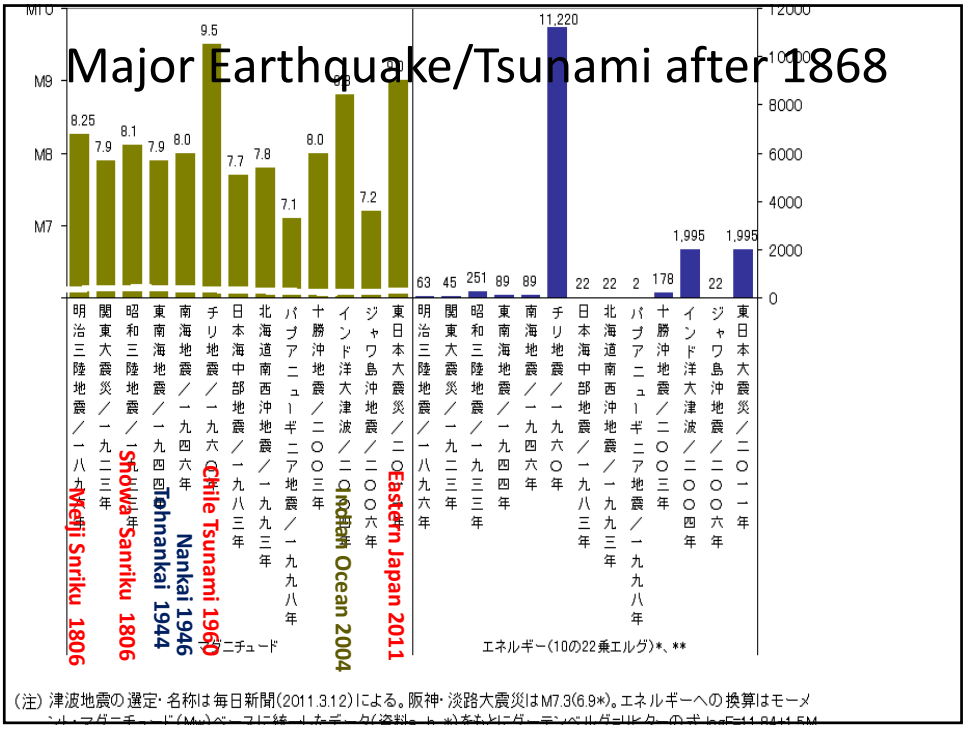
  - **Disaster education actually helps if systematically repeated and colearned**

  - **Maybe as a country and global community it deserves to finance the program as a success model.**

Characteristics of The Great Eastern Japan Earthquake and Tsunami Disaster

- Mega-scale triggering natural hazard (earthquake)
  -Magnitude 9.0 Richter scale
- Mega-scale induced natural hazard (tsunami)
  -10 m high at seashore, 30-40 m high inland
- Other combined natural hazards
  -Landslides, Land liquididication, Land subsidence
- Extraordinary level of induced human hazard
  -Nuclear plants' radiation accidents (bio-hazard)
- Super Compound (Multiple) Hazards
- Hyper-areawide Hazards (hitting 400-500 km)
- A very low-frequency/high-impact disaster

Major Earthquake/Tsunami after 1868



(注) 津波地震の選定・名称は毎日新聞(2011.3.12)による。阪神・淡路大震災はM7.3(6.9*)。エネルギーへの換算はモーメ

Characteristics of The Great Eastern Japan Earthquake and Tsunami Disaster (continued)

- Gigantic socio-economic impact and consequences

  -Local, regional, national, global

  -Cascading events

  -Complex Systems

  - Critical infrastructure systems (even on global level)
- Yet-unfolding disaster

Characteristics of The Great Eastern Japan Earthquake and Tsunami Disaster (continued)

- Cities, towns, villages, neighborhood communities and landscapes totally devastated
- Local industries heavily damaged
- Long enduring impacts and long process to recover and restructure
- Gigantic financial losses
- Huge amounts of investment needed for this

What the disaster seems to be special about?

- Hyper-areawide
- Tsunami-multiplied
- Huge Compound and Complex
- Nuclear Plant Catastrophe
- Challenges toward Recovery and Restorration of many, many communities, municipalities.
- Challenges towards Social Resilience
- Challenges towards 21st Century's Civilization, Civilization and Lifestyles on a global scale

Lessons to be learned (though too early to assess overall)

- Limit to Hardware (Physical Structure, Large Facility) dependent approach
- Limit to base disaster risk management mainly on a single risk acceptance level
- More and more integrated disaster risk management needed and actually practiced

More and more integrated disaster risk management needed and actually practiced

- Worst-thinkable/imaginable survivability-achievable framework (agenda) on the side of "victim candidates" (residents (children and adults), non-residents and companies)
- Enhancing evacuation success level
- Enforcing and systematizing disaster education for victim candidates and participatory disaster drills

More and more integrated disaster risk management needed and actually practiced (continued)

- Multiple-hazard and disaster based approach
- Timing, Diagnosing and Going through every phase of Disaster management cycle process
- Combining proactive and retroactive approaches
- Combining tools, medias , technologies and methods for risk management and governance relevant to disaster risks
- More strategically incorporating financial risk management
- Balancing top-down and bottom-up approaches
- Advancing more disaster risk communication
- Enhancing the level of social implementation
- Sharing data, experiences and disseminating mutually success models and practices

Major damages and damaged areas as of mid-May

- Casualties 14,800 people as of May 4, 2011 drowning 92;5% crushing 4/4% fire 1.1 %
- Missing 10,300
- Severely injured 5,300
- Major damaged municipalities

Iwate Pref. 4300 deaths 3300 missing

Morioka (NOT damaged) 292,000 total population

Miyako 61,200
Taro-cho
Rikuzen Takada 24,500

Miyagi Pref. 8900 deaths 6100 missing

Ohfunato 41,400
Kamaishi 41,000

Kesen'numa 75,500
Ishinomaki 165,000
Higashimatsushima 43,5000
Shiogama 58,100
Natori 70,900
Tagajo 62,900

Sendai 1,006,500

Number of Evacuees

- 434,000 persons as of March 16 (5 days after)
- 335,000 March 19 (8 days after)
- 293,000 March 30 (19 days after) at 20,000 public shelters
- 114,700 May 12 (62 days after)

Economic losses Quick Estimate (Infrastructure and other Stocks) 14-25 trillion yen

経済的影響の試算

公表時期	試算機関	被害試算結果	出典	手法等詳細
4月28日	日本政策投資銀行	約16兆円	『東日本大震災資本ストック被害金額推計』について ーエリア別(県別／内陸・沿岸別)に推計ー	
4月18日	株式会社三菱総合研究所	14兆～18兆円(直接被害総額)	2010～2012年度の内外景気見通し(東日本大震災後の改定値)	
4月12日	岩手県	1，661億円(商工業関係の被害額(津波による流出・浸水被害のみ))	岩手県商工労働観光部商工企画室	
4月11日	関西社会経済研究所	17兆7800億円(住宅5兆2000億円,社会インフラ7兆2400億円,民間企業設備3兆6200億円,津波で押し流されるなどした自動車と船舶1兆2800億円)	東日本大震災による被害のマクロ経済に対する影響	警察庁発表の被災戸数データをもとに、被災率を推計。それを用いて、民間資本ストック、社会資本ストックの損傷額なども計算。
3月23日	内閣府	16 - 25兆円	月例経済報告等に関する関係閣僚会議震災対応特別会合資料	
3月16日	EQECAT	120 - 250 億 USD (insured property losses)(地震保険80-150億USD,自動車保険0-10億USD,海上保険10-30億,生命保険20-30億円,Personal Accident10-20億USD)	http://www.eqecat.com/catWatchREV/secureSite/report.cfm?id=313	
3月16日	ゴールドマン・サックス証券	16兆円規模	毎日新聞	
3月16日	バークレイズ・キャピタル	15兆円超	毎日新聞	
3月16日	野村証券金融経済研究所	13兆円程度	毎日新聞	
3月12日	EQECAT	1000億USD超(火災50 ~100億USD,津波200億USD超,インフラ300億USD超,港湾100億USD)	PRELIMINARY DISCUSSION OF IMPACTS FROM THE MARCH 11, 2011 M 8.9 MIYAGI EVENT	
3月12日	AIRワールドワイド	1.2 兆円 ～ 2.8 兆円(insured property losses)	http://alert.air-worldwide.com/EventSummary.aspx?e=549&tp=72&c=1	AIR Earthquake Model(ただし津波は考慮されていない)

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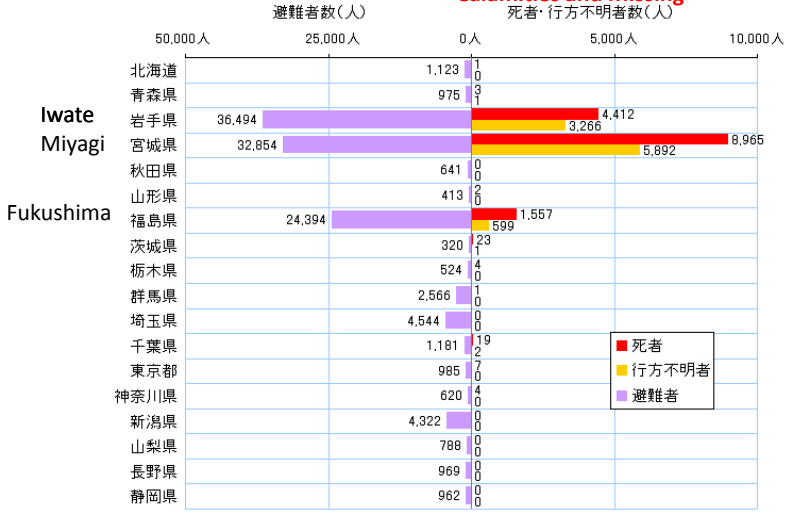
Numbers of victims May 12, 2011

東日本大震災の被害者数

Evacuees

Calamities and Missing

（全国被害者数） 死者 14,998人
避難者 114,675人 行方不明者 9,761人



Iwate
Miyagi
Fukushima

（注）2011年5月12日現在。岩手、福島以外の避難者数には県外からの避難者を含む。
（資料）警察庁「平成23年(2011年)東北地方太平洋沖地震の被害状況と警察措置」

Question to be raised:
Why such a country like Japan was yet so non-resilient ?

- one of the most advanced countries and a country highly and long experienced in disasters, seemingly much prepared, yet so?
- If so, what and how other countries could do better in combating such a low-frequency/high-impact disaster
- How Japan can learn more and work together with other countries?

Another way to look at:
Was that so bad for all?

- Not really
- Some encouraging evidences

-for anti-seismic countermeasures: very good

-Shinkansen (bullet) trains all stopped with real-time control

-Participatory disaster education for elementary school children (with teachers) worked very successfully in some tsunami-stricken municipalities

-NGO/NPOs roles, other voluntary associations and active participation by ordinary people who live remote

- Speedily and efficiently self-organized community 's response and mutual assistance

Distribution of Victims in age

- By Asahi Shinbun (Newspaper) April 10

  Among 13,000 casualties (7935 sampling survey), 55/4 % above 65 years old

  (for actual ratio 22-27 %)

(NB)

1995 Kobe Earthquake 49/6 % (most of them crushed)

- Children 7-18 years old (6.7 for 11-12 %)
- Particularly in Iwate Pref. The ratio is 2.1

  presumably due to the effects of the school disaster education implemented since long.

【東日本大震災】MSN Sankei News 16 March 2011
釜石市内の小中学生の避難率100%近く ほぼ全員が無事

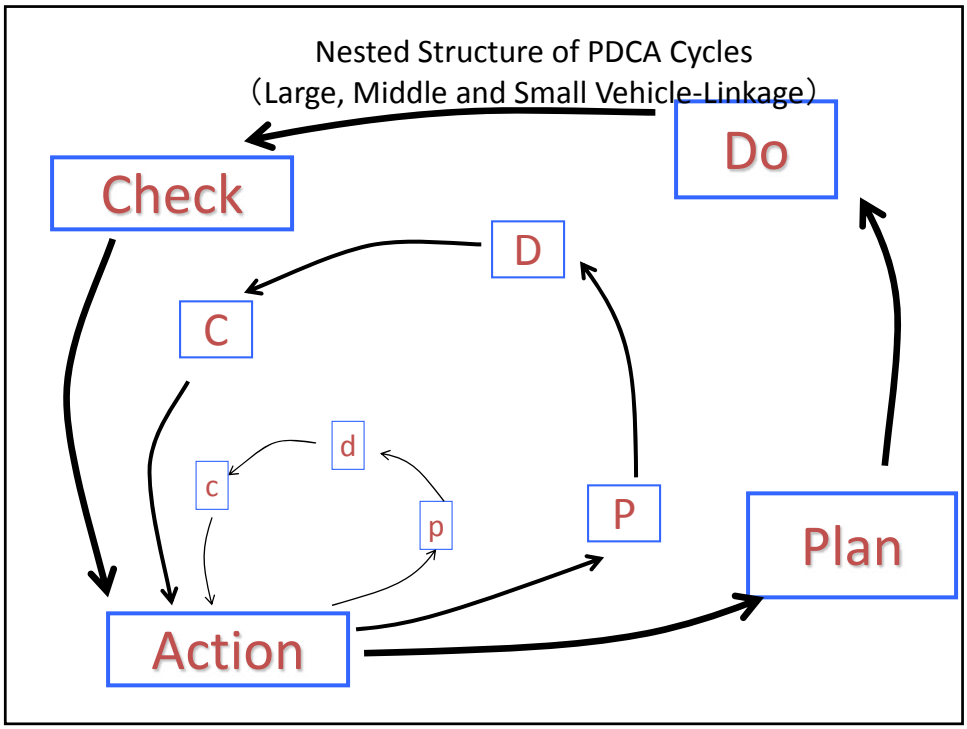
2011.3.16 19:46（1/2ページ）

避難所となっている釜石小の体育館で遊ぶ子どもたち＝15日、岩手県釜石市

東日本大震災の大津波で多数の死者・行方不明者が出ている岩手県釜石市で、市内の小中学校全14校の児童・生徒約3000人の避難率が100%に近く、ほぼ全員が無事であることが16日、群馬大学の片田敏孝教授（津波防災）の調査で分かった。平成18年の千島列島沖地震の際に避難率が10%未満だったため釜石市教委が避難訓練などを徹底して取り組んでおり、防災教育の重要性を裏付ける結果となった。

片田教授によると、市内の児童・生徒は地震発生時、下校の直前で教室にいた。児童・生徒らは警報と同時に、避難を開始し、各学校はあらかじめ決めていた徒歩5～10分の近くの高台にそれぞれ避難した。ところが高台から市内に押し寄せる津波の勢いをみて、さらに後背地の高台に移動した。この間、中学生が不安がる小学生を誘導し、迅速に避難したという。大槌（おおつち）湾からわずか約800メートルの市立鵜住居（うのすまい）小周辺は壊滅状態だったがほぼ児童全員が無事だったという。

ただ市内の児童・生徒のうち、地震発生当日に病欠した数人については、現在も安否が不明だという。



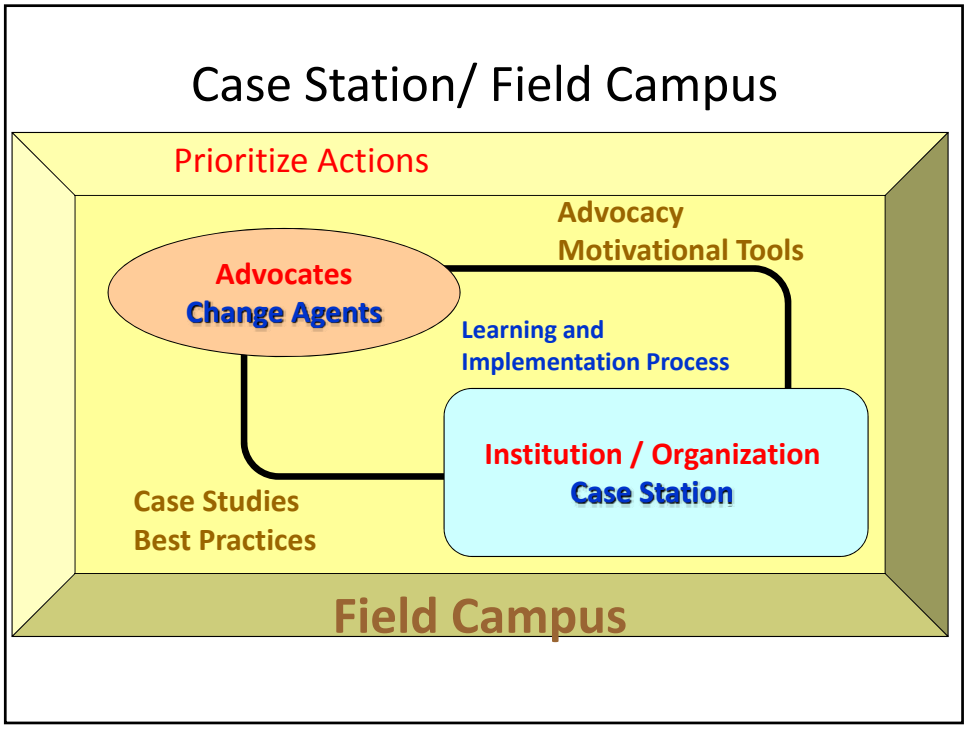
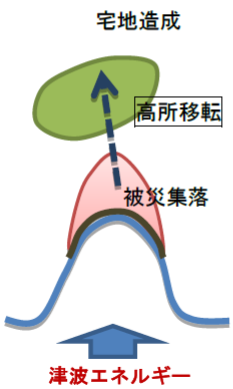
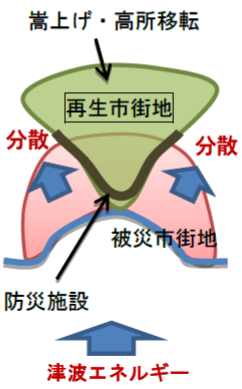
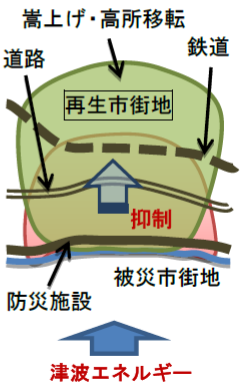


図１　津波防災の分類

分類	回避型	分散型	抑制型
ねらい（巨大津波に対して）	生命と財産を守る	生命を守り、財産の多くを保全する	生命を守り、財産の壊滅的被害を防ぐ
イメージ			

Iwate Prefecture

Tokai-Tonankai, Nankai Earthquakes to come quite likely by mid this centuary