

What lessons we should learn from the Great East Japan Disaster ?

**The University of Tokyo, Science Council of Japan
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April 2nd, 2012

Organization of Science Council of Japan

● President

- **Vice-President** in charge of Organizational Management
- **Vice-President** in charge of Contacts with Government and Society
- **Vice-President** in charge of International Activities

Science Council of Japan

210 Council Members
General Assembly

Approximately 2,000
Members

Secretariat

Executive Board

Auxiliary Committees

Sections

Section I: Humanities and Social Sciences

Section II: Life Sciences

Section III: Physical Sciences and Engineering

Committees

Administrative Committees for Operation

Committee based on Fields of Specialties

Issue-Oriented Ad Hoc Committees

What is Science Council of Japan?

- Established in January 1949 as a “Special Body” under the jurisdiction of the Prime Minister
- Represents Japan’s scientists both domestically and internationally
- Its two functions are:
 - To deliberate on important issues concerning science and to help solve such issues
 - To coordinate scientific studies and to achieve higher efficiency therein
- Focusing on the following four activities:
 - (1) Policy recommendations to the government
 - (2) International activities
 - (3) Enhancement of public opinion on the roles of science
 - (4) Establishment of networks among scientists

Recent Activities in response to
the Great East Japan Earthquake
and the accident of
the Fukushima-Daiichi Nuclear Power Plant

- ◆ Establishing the " **Great East Japan Earthquake Task Force** " within SCJ to deliberate the wide range of issues and **declared the emergency recommendations to the government**, and to **release statements and President's comments to the public** in order to **provide the information necessary to overcome the damages caused by the disaster or the accident.**
(<http://www.scj.go.jp/en/report/shinsai.html>)

Recent Activities in response to
the Great East Japan Earthquake
and the accident of
the Fukushima-Daiichi Nuclear Power Plant

- ◆ The related information on the earthquake and the nuclear accidents and our emergency response has been delivered to more than 120 academies overseas this May, 2011.
- ◆ **Dispatching experts**, selected among our Council Members or Members, to the workshops or symposia held overseas

Tsunami hit Japan - Miyako City, Iwate Prefecture -

Tsunami easily surmounted the Great Seawall.

Photo originally provided by Taro-cho Fishery Cooperative;
Courtesy of Cabinet Office, Government of Japan

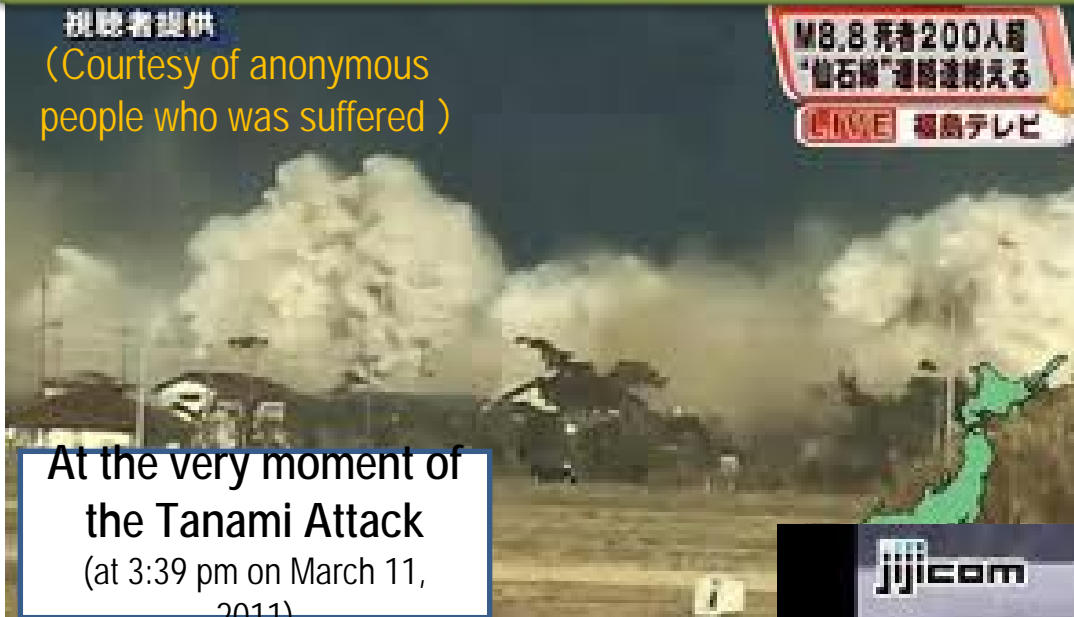


Tsunami hit Japan

(Left: Minamisanriku-cho, Fukushima; Right, Kesen-numa City, Miyagi)

視聴者提供

(Courtesy of anonymous people who was suffered)



At the very moment of the Tanami Attack

(at 3:39 pm on March 11, 2011)



(Courtesy of the Japan Coast Guard)

Tsunami hit Japan (Minamisanriku-cho, Miyagi Prefecture)

Tsunami reached at the top of the roof of the Minamisanriku Disaster Center Headquarters.

Photo originally provided by Town Office of Minamisanriku-cho;
Courtesy of Cabinet Office, Government of Japan



Tsunami hit Japan (Sendai Airport, Miyagi Prefecture)

Tsunami was reaching to the Sendai Airport;
From "Record of Rescue Activities for the Great
East Japan Earthquake" 2012, Japan Coast Guard



Heavily Damaged City

Miyagi Prefecture (*March 17, 2011*)

Courtesy of Cabinet Office,
Government of Japan



Heavily Damaged City

Kesen-numa City, Miyagi Prefecture *(March 23, 2011)*

Courtesy of Cabinet Office,
Government of Japan





Activities of Emergency Fire Response Teams

Kesen-numa City, Miyagi Prefecture (taken by Tokyo Fire Department)

Courtesy of Fire and Disaster Management Agency of the Ministry of Internal Affairs and Communications (from White Paper on Disaster Management 2011, Cabinet Office, Government of Japan)



Heavily Damaged City

Higashi-Matsushima City, Miyagi Prefecture *(March 27, 2011)*

Courtesy of Cabinet Office,
Government of Japan



Fukushima Daiichi Nuclear Power Plant

(April 26, 2011)

Photo by Japan Ground Self Defense Force
White Paper on Disaster Management 2011,
Cabinet Office, Government of Japan



Fukushima Daiichi Nuclear Power Plant - No.1 Unit (taken on 27 March, 2011)



Fukushima Daiichi Nuclear Power Plant - No. 4 Unit (Taken on 22 May, 2011)

Courtesy of Nuclear and
Industrial Safety Agency



1. Reconstruction from the Great East

Japan Disaster

- Compound Disaster –Earthquake, Tsunami and Nuclear Power Generation Accident
- Wide Areas Stricken
 - Stricken Areas: Death casualty in 11 prefectures and heavily in 3 prefectures and about 40 local municipalities
 - Damage: More than 19 thousand people killed, more than 117 buildings completely broken.
 - Repeated Tsunami –Jogan Tsunami(869), Keicho Tsunami(1611), Meiji Sanriku Tsunami(1896), Shouwa Sanriku Tsunami(1933), Chile(1960), East Japan(2011)
- Disaster in Depopulated Areas – The population in Affected Areas, which is Pacific Coastal areas of North-East Japan, has been losing its population by 5% every 5 years

Budgets:

1st supplementary budget in May, 2011 was about 4 trillion yen.

2nd supplementary budget in July, 2011 was about 2 trillion yen.

3rd supplementary budget in November, 2011 was about 12 trillion yen.

Organization:

Reconstruction Headquarters was formed in June, headed by PM.

Reconstruction Agency was established in February, 2012, with three branch offices in Iwate,

Miyagi and Fukushima prefectures.

Reconstruction programs:

Basic Act was enacted in June(復興基本法)

Reconstruction Special Area Act in December(復興特区法)

Tsunami Disaster Prevention Area Construction Act in December(津波防災地域づくり法)

Reconstruction Plans by Stricken Prefectural Governments

- Tsunami Disaster Reconstruction Plan of Iwate Prefecture, August 11th
- Disaster Reconstruction Plan of Miyagi Prefecture, August 26th
- Fukushima Reconstruction Plan, December 28th

Reconstruction Plans of Stricken Areas

All the local municipalities in coastal area of East Japan, more than 40 local municipalities, made their recovery plans till the end 2011 fiscal year.

各市町村における計画策定スケジュール

| 都道府県 | 市町村 | 復興計画策定期間 | | | | H23.12.31 進捗状況 △: 内部検討中 ○: 何らかの案公表済 | |
|------|--------|---------------|---------------|-----------------|---------------|---|---------------|
| | | H23年度 4~6月 | H23年度 7~9月 | H23年度 10~12月 | H23年度 1~3月 | 市町村レベル 復興構想 | 地区レベル 復興構想 |
| 青森 | 三沢市 | | | | | ○ | — |
| 青森 | 八戸市 | | 復興計画 | | | ○ | △ |
| 青森 | 洋野町 | 復興ビジョン | 復興計画 | | | ○ | ○ |
| 青森 | 久慈市 | 復興ビジョン | 復興計画 | | | ○ | ○ |
| 青森 | 野田村 | 復興基本方針 | | 復興計画 | | ○ | ○ |
| 青森 | 釧代村 | 復興基本方針 | 復興計画 | | | ○ | — |
| 青森 | 田野畑村 | 復興基本方針 | 復興計画 | | (復興追加計画) | ○ | ○ |
| 岩手 | 岩手町 | 復興計画書子 | 復興計画 | (復興追加計画) | | ○ | ○ |
| 岩手 | 宮古市 | 基本方針 | 復興計画 | (推進計画) | | ○ | ○ |
| 岩手 | 山田町 | 復興ビジョン | | 復興計画 | | ○ | ○ |
| 岩手 | 大槌町 | 復興方針 | | 復興計画 | | ○ | ○ |
| 岩手 | 釜石市 | 復興プラン書子 | 復興プラン | | | ○ | ○ |
| 岩手 | 大船渡市 | 復興基本方針 | 復興計画 | | | ○ | ○ |
| 岩手 | 陸前高田市 | 復興計画書子 | | 復興追加計画 | | ○ | ○ |
| 岩手 | 奥仙沼市 | | | 復興計画 | | ○ | ○ |
| 岩手 | 南三陸町 | | | 復興計画 | | ○ | ○ |
| 岩手 | 石巻市 | 復興構想 | 復興計画 | | | ○ | ○ |
| 岩手 | 安川町 | | 復興計画 | | | ○ | ○ |
| 岩手 | 栗山町 | 復興計画書子 | 復興追加計画 | 復興追加計画 | | ○ | ○ |
| 岩手 | 松島町 | 復興基本方針 | 復興追加計画 | 復興追加計画 | | ○ | ○ |
| 岩手 | 利府町 | | | 復興計画 | | ○ | △ |
| 岩手 | 雄勝市 | | | 復興計画 | | ○ | △ |
| 岩手 | 七ヶ浜町 | 復興基本方針 | | 復興追加計画 | | ○ | ○ |
| 岩手 | 多賀城市 | 復興ビジョン | 復興追加計画 | 復興追加計画 | | ○ | ○ |
| 岩手 | 仙台市 | 復興ビジョン | | 復興計画 | | ○ | ○ |
| 岩手 | 名取市 | | | 復興計画 | | ○ | ○ |
| 岩手 | 釜淵市 | | 復興計画 | | | ○ | ○ |
| 岩手 | 宮里町 | 復興基本方針 | 復興追加計画 | 復興追加計画 | | ○ | ○ |
| 岩手 | 山元町 | 復興基本方針 | 復興追加計画 | 復興追加計画 | | ○ | ○ |
| 福島 | 新地町 | | 復興構想 | 復興計画 | | ○ | △ |
| 福島 | 柳屋市 | | 復興計画 | | | ○ | △ |
| 福島 | 柳屋町 | 復興ビジョン | 復興計画 | | | ○ | ○ |
| 福島 | 広野町 | | | 復興計画 | | ○ | ○ |
| 福島 | いわき市 | 復興ビジョン | (復興追加計画) | | | ○ | ○ |
| 茨城 | 北茨城市 | | | 復興計画 | | △ | △ |
| 茨城 | 高萩市 | 復興追加計画 | | | | △ | △ |
| 茨城 | 日立市 | | 復興計画 | | | ○ | △ |
| 茨城 | ひたちなか市 | | | 復興計画 | | △ | △ |
| 茨城 | 大洗町 | | | 復興ビジョン | | △ | △ |
| 茨城 | 機構町 | 復興構想 | | 復興計画 | | △ | △ |
| 茨城 | 神栖市 | | 復興計画 | | | △ | △ |
| 千葉 | 船市 | 復興計画書子 | | 復興計画 | | ○ | — |
| 千葉 | 山成市 | | | 復興計画 | | ○ | — |

復興計画策定予定

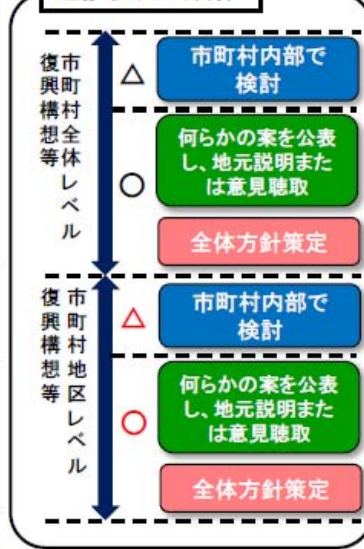
○12/31時点で全体(43市町村)の約8割の34市町村が年内に復興計画を策定済。(うち、岩手・宮城・福島の3県は32市町村のうち、30市町村が復興計画策定済。)

| | |
|--------|-------|
| 4~6月 | 0市町村 |
| 7~9月 | 12市町村 |
| 10~12月 | 22市町村 |
| 1~3月 | 7市町村 |

各市町村における復興方針等の進捗状況

○地区レベルの検討を実施している39市町村のうち約7割にあたる27市町村において、地区レベルの構想を公表済。

進捗状況の分類



| 市町村レベル 復興構想進捗状況 | 市町村数 (岩手、宮城、福島) |
|--------------------|--------------------|
|--------------------|--------------------|

| | |
|----|--------|
| △ | 5(0) |
| ○ | 38(32) |
| 合計 | 43(32) |

| 地区レベル 復興構想進捗状況 | 市町村数 (岩手、宮城、福島) |
|-------------------|--------------------|
|-------------------|--------------------|

| | |
|----|--------|
| △ | 12(4) |
| ○ | 27(27) |
| 合計 | 39(31) |

(— …地区レベルの検討予定無し)²²

Present and Future Situation of Stricken Areas

- Rubble was put away in stricken areas, but reconstruction has not yet started in full scale.
- Planning and local agreement building is tried for reconstructing communities in safer high ground not to repeat similar damage.
- Since it takes several years for the completion of reconstruction, it is worried whether local employment and population can be maintained.
- In the stricken areas by collapsed Nuclear Power Generation Plants, no more major emission of radioactive materials observed since April, 2011. Government is planning to rezoning Warning Area and Planned Evacuation Area into Long-term Difficult-to-Return Area (More than 100 mSv of Annual Radiation Exposure), Prioritized Decontamination Zone and Decontamination and Possible to Return Area. It is worried that many people, especially younger generation, may not come back their home towns affected by radiation.
- All the nuclear power plants in Japan will stop working in April this year for trouble or regular check. The Government says there will be no shortage of electricity, but the future electricity supply will be unclear.

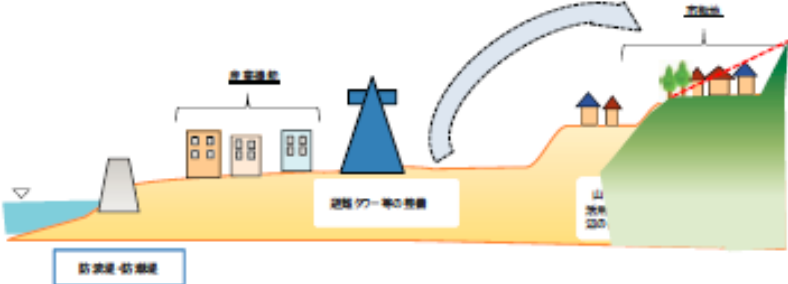
Tsunamis hit Sanriku-area

| | |
|---|--|
| Meiji Sanriku Earthquake Tsunami, 1896 | At 19:32 , June 15th. Mw 8.2. Seismic intensity was not strong. The first tsunami was hit 30 minutes later. 38.2m high at Ryori Bay. Death 21.9 thousands. |
| Showa Sanriku Earthquake Tsunami, 1933 | At 3:30, March 3rd. Mw8.4. Seismic intensity was about 5. Death 3.5 thousands. The most serious casualties were in taro Village, where 763 people were killed. |
| Chile Earthquake Tsunami, 1960 | <u>At 15:11, May 22nd in Chile. Mw 9.5. Tsunami came to Sanriku early in the morning, May 24th a whole day after.</u> 142people were killed. |
| The Great East Japan earthquake Tsunami,2011 | At 14:46, March 11th. Mw 9.0. the strongest seismic intensity was 7.0. Death 19 thousands. |

2. From the disaster prevention to the disaster reduction

- Disasters can be beyond assumption
- From disaster prevention planning to disaster reduction planning.
- Disasters cannot be prevented by man-made facilities, such as water breaks or sea walls.
 - The combination of disaster prevention facilities, town and village planning and evacuation facilities is most important
 - People's life must be saved, and the properties are protected as much as possible.
- The disaster reduction planning should be applied to the recovery plans of damaged areas and the preventive plans of areas where large scale natural disasters are expected.

Communities should be moved to higher ground so that Tsunami does not reach. Tsunami Evacuation buildings or man-made deck should be built at lower ground where business and commercial activities may be located.



3. Learning lessons from the past experiences

Ex. 1 Sanriku-cho Yoshihama

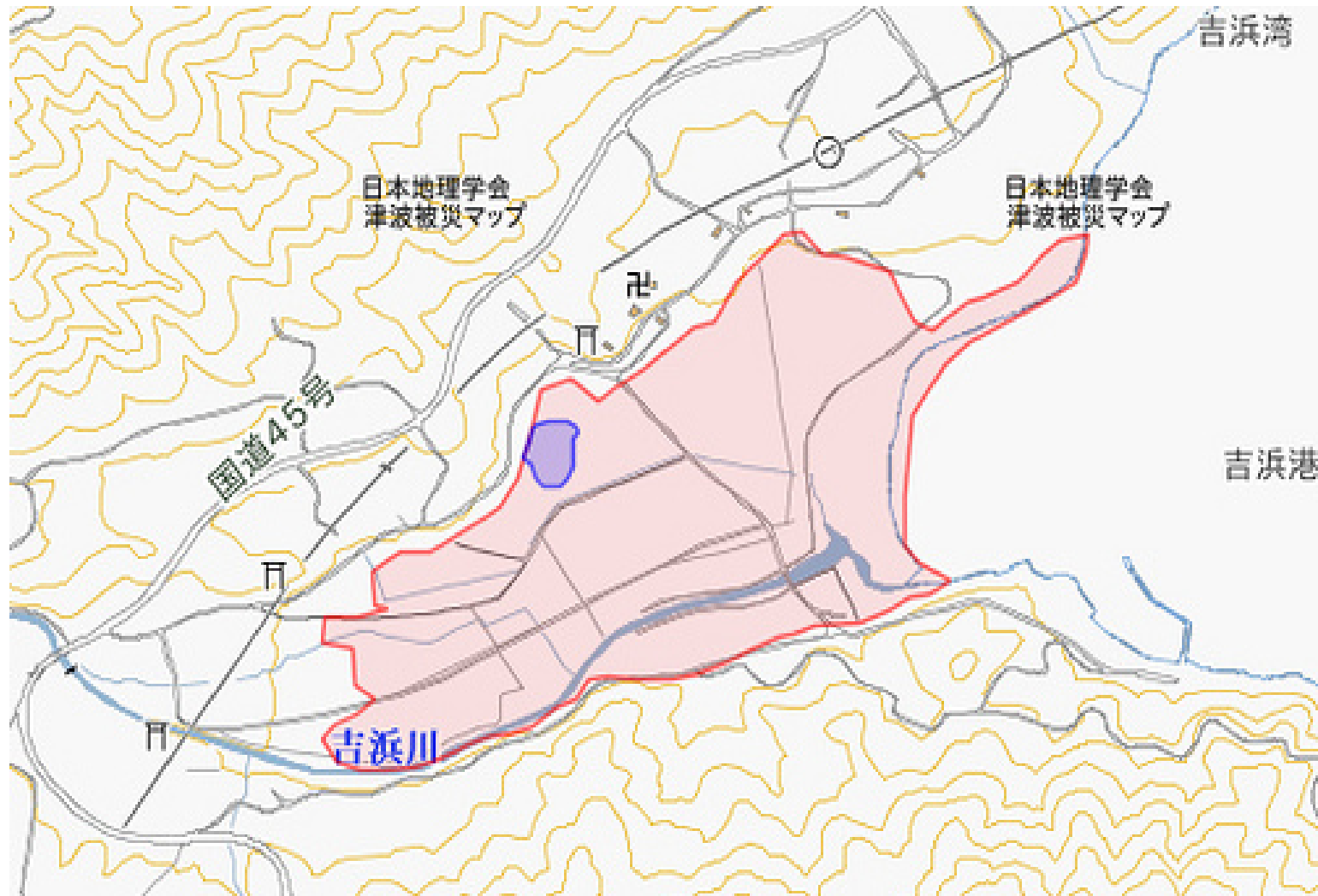
Ofunato City, Iwate Prefecture, before the disaster



Yoshihama

Tsunami Flooding areas in 2011

Pink color: flooding areas, Purple color: houses were damaged



The community of Yoshihama, at high ground



Broken seawall in Yoshihama

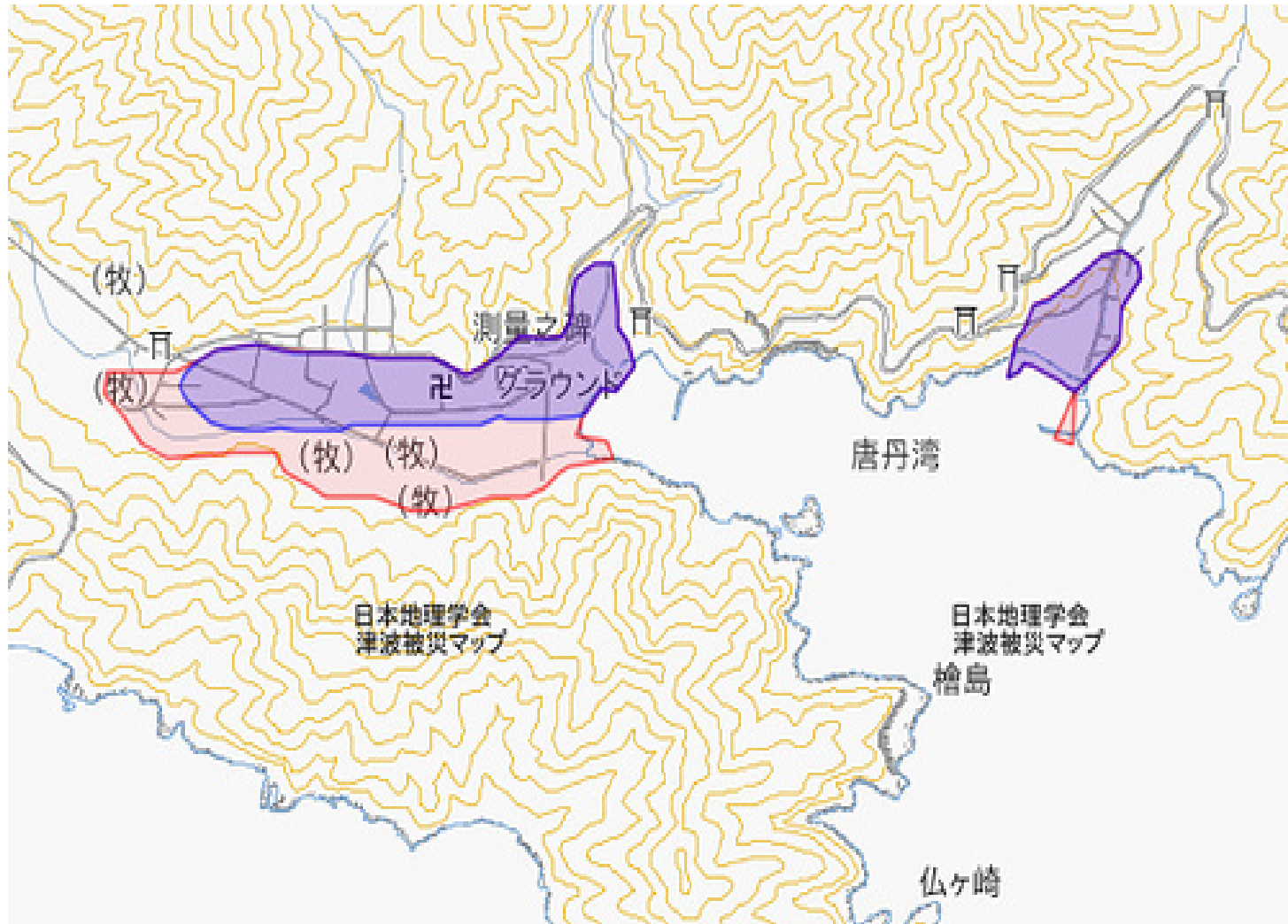


Ex.2 Touni-hongo, Kamaishi City, before the disaster.



Touni-hongo, Kamaishi City

Pink color: flooding areas, Purple color: houses were damaged



Toni-hongo, after the disaster



Toni-Hongo, seawall



Ex.3 Taro, Miyako City, Iwate Prefecture before the disaster

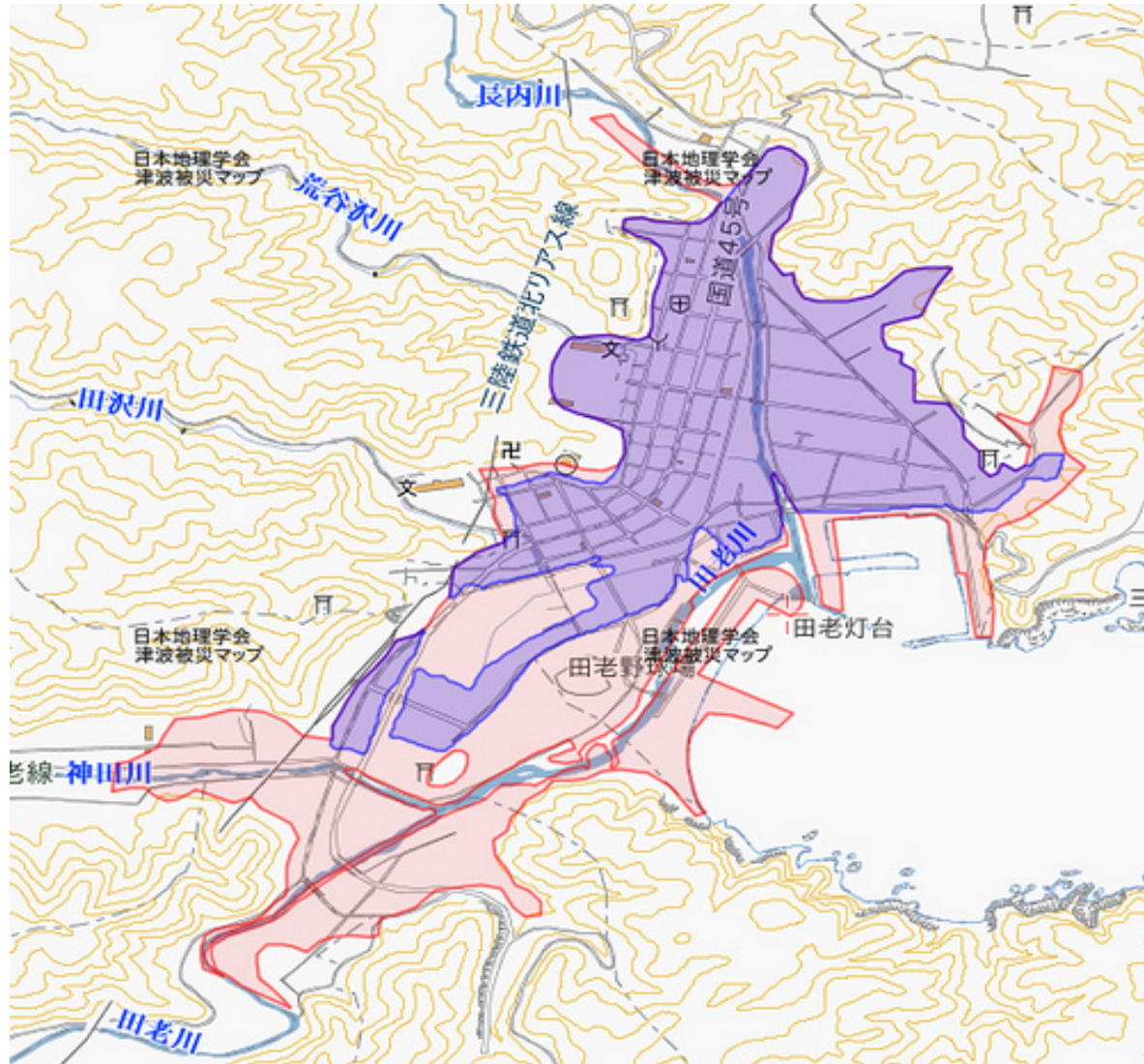


Toro, Seawall



Taro

Pink color: flooding areas, Purple color: houses were damaged

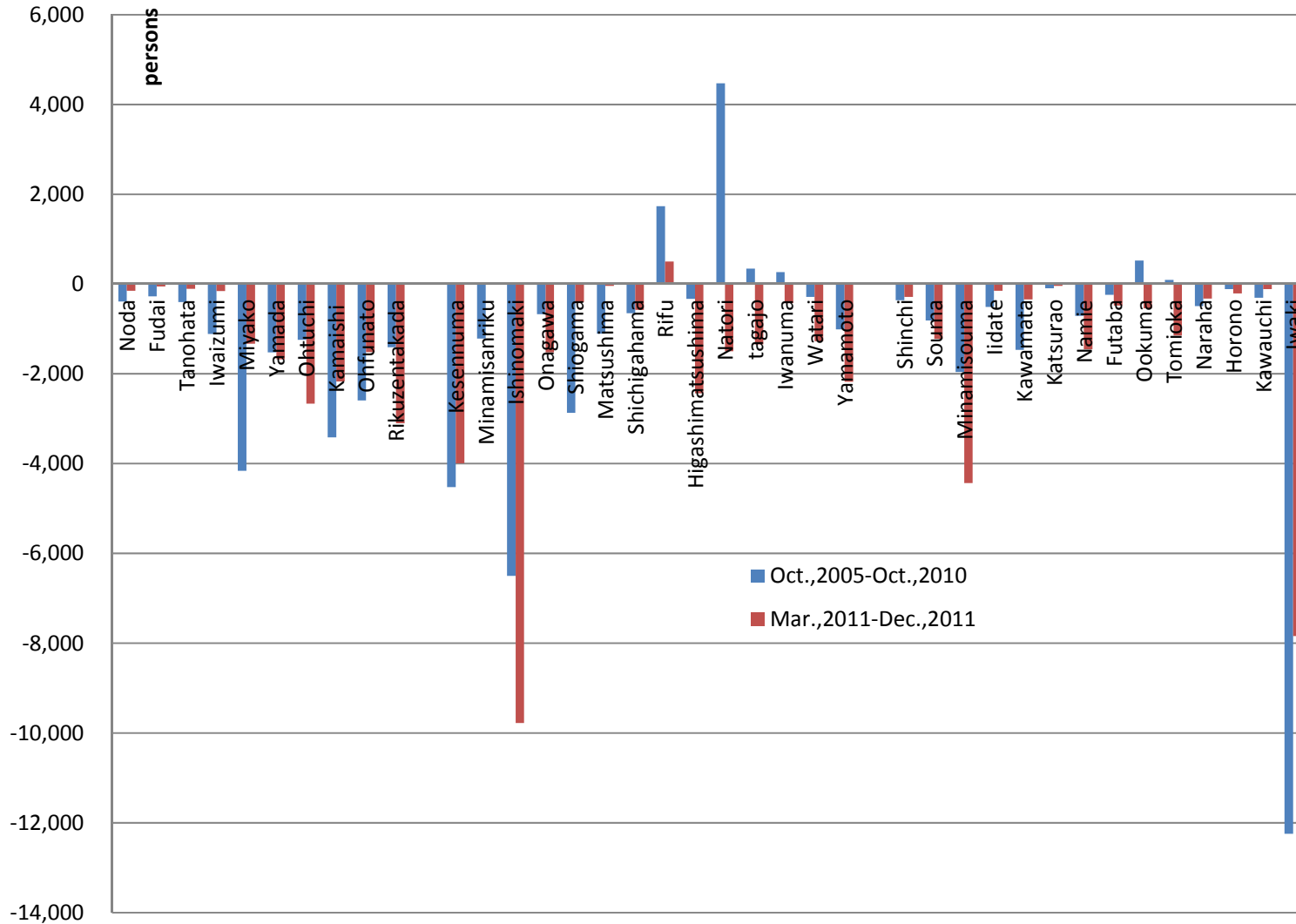


Taro, 2011, after the disaster

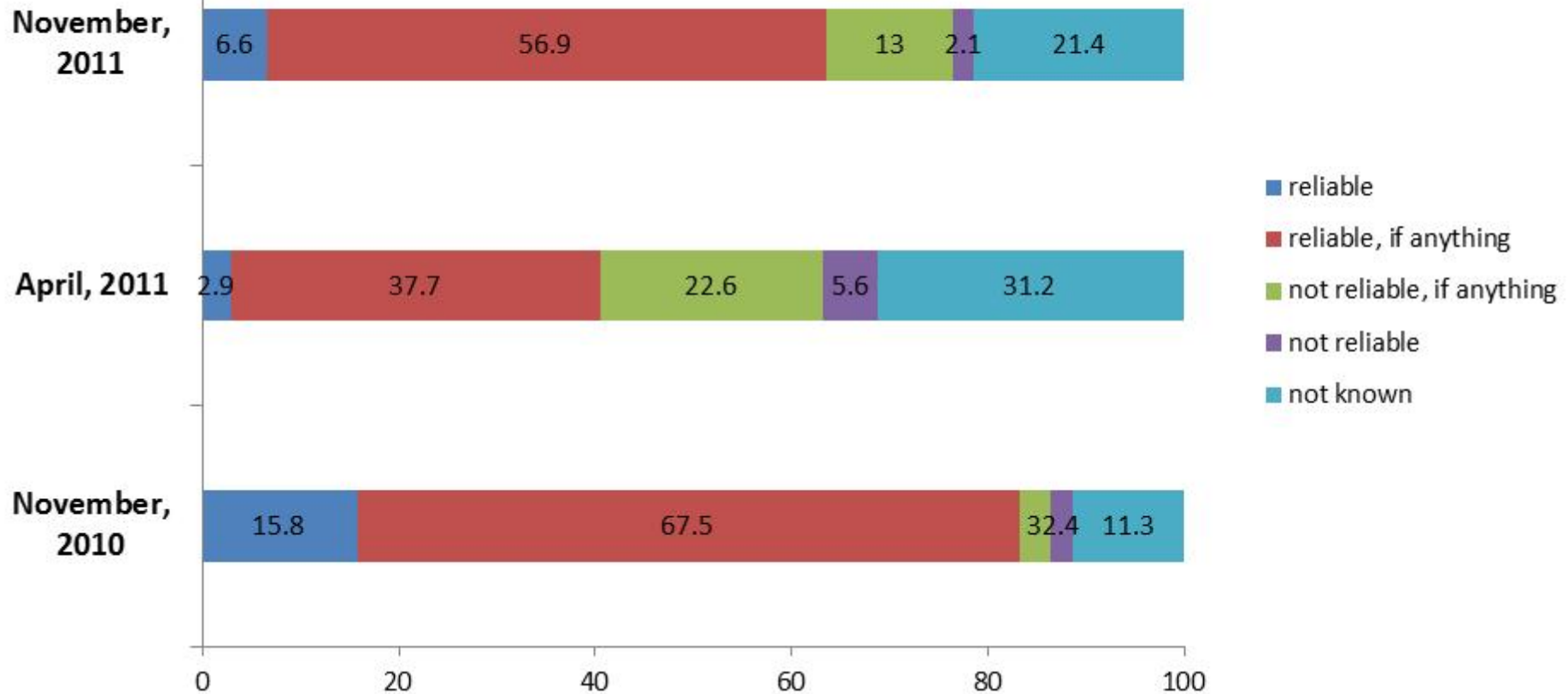


4: Conclusions

Population Change in Damaged Municipalities

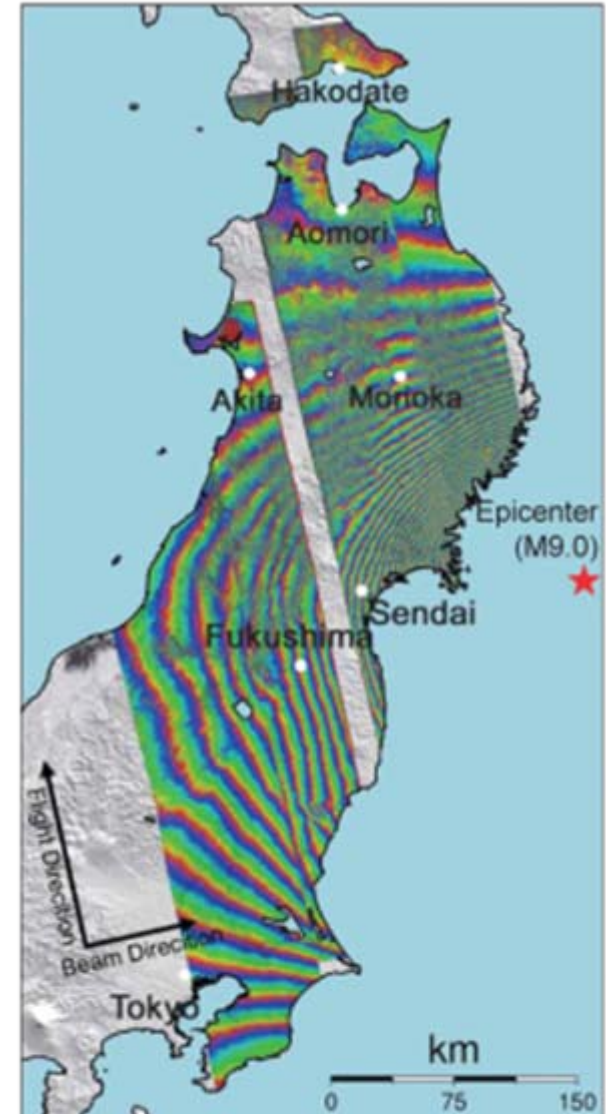
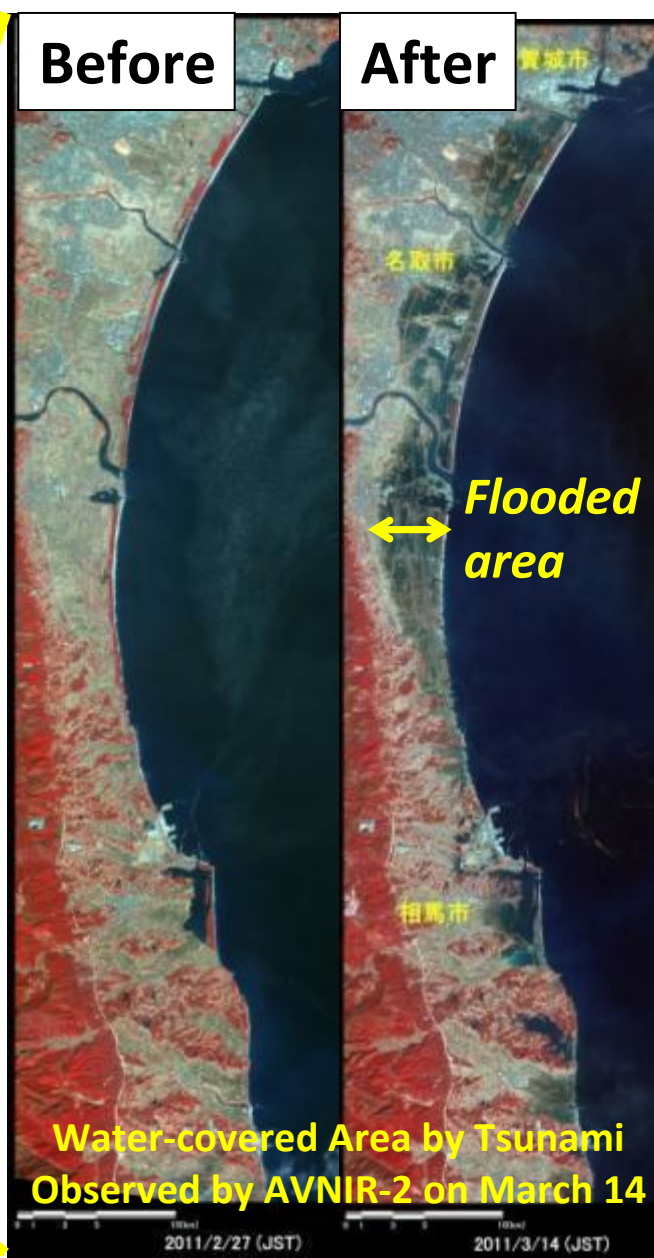


Reliability on Scientists NISTEP, Min. of Education & Science



For getting the whole picture, qualitatively and quantitatively

Satellite Observations for Great East Japan Earthquake



For getting the detail picture, qualitatively and quantitatively

Mobile Mapping System for Great East Japan Earthquake

