

## ENHANCING COMMUNITY-BASED DRR AND ROLE OF SCHOOLS BASED ON LESSONS LEARNT FROM THE 3.11 DISASTER

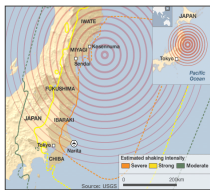
Aiko SAKURAI (sakurai@irides.tohoku.ac.jp)  
Associate Professor, IRIDeS, Tohoku University  
Deputy Head  
International Collaborating Center of Disaster Education Research  
and Implementation  
(<http://drredu-collabo.sakura.ne.jp/en/>)  
July 19, 2016  
APRU Multi-Hazards (MH) Summer School



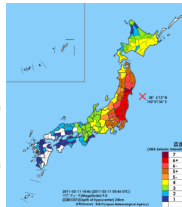
## Topics

1. Introduction
2. Community Disaster Management Plan
  - Case of Kamikama, Miyagi
3. Role of schools in enhancing community's disaster resilience

### The 2011 Great East Japan Earthquake and Tsunami



- Occurred at 14:46 on Friday, March 11, 2011
- Epicenter: Sanriku offshore (latitude 38.6 north, longitude 142.52 east, around 130 km east-southeast of Ojika Peninsula)
- 24km deep (ocean-trench earthquake)
- Magnitude 9.0
  - 15,859 deaths
  - 3,021 missing
- More than 90% of death were caused by drowning and 65% of the dead were over 60
- Housing: approx. 100,000 demolished, 60,000 partially destroyed
  - The largest earthquake in Japan
  - The 4<sup>th</sup> largest in the world since 1900



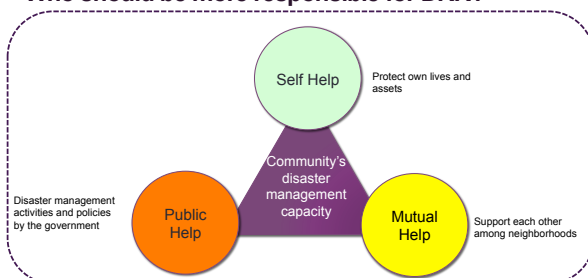
3

## Disaster Risk Reduction

$$\text{Risk} = \frac{\text{Natural Hazards} \times \text{Vulnerability}}{\text{Capacity of Societal System}}$$

Capacity= Policies and institutional systems at the national, provincial, local and household levels to reduce hazard damaging potentials and reduce vulnerability.

### Community Preparedness: Who should be more responsible for DRR?



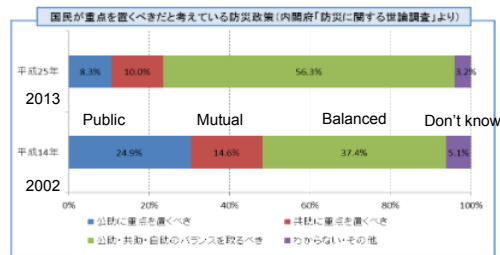
We learned that we could not protect own lives and communities without making the community resilient and strengthening disaster management capacity of the community. (Murosaki, 2014)

### Lessons from the 2011 Great East Japan Earthquake and Tsunami

- Super-wide scale disaster (earthquake, tsunami and Fukushima NPP accidents) paralyzed **function of governments in municipalities**. **Community based mutual help played important roles in operating evacuation shelters, and others.**

## Who should be more responsible for DRR?

図表4 国民が重点を置くべきだと考えている防災政策（内閣府（2014）より）



- Survey confirmed that the Japanese people thought that balanced efforts among self-help, mutual-help and public-help could help effective disaster response.

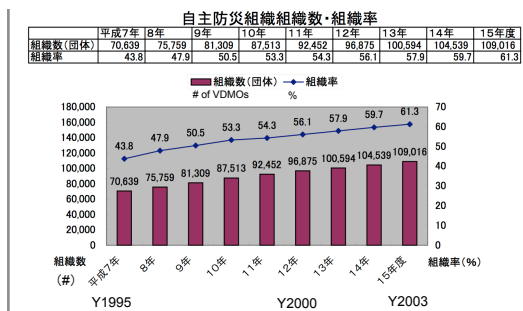
## What is a Local Community?

- A place where local residents live, and where mutual exchange activities are made among residents in consumption, production, working, education, public health and medical services, play and sporting, and art festivals, and so on.
- Unit: **neighborhood associations, residents' associations**, etc.
- Features :
  - Information exchange networks among residents
  - Trustful relationships
  - Mutual help disciplines, and reciprocity
- Recently in Japan, with increase of a large complex apartment housing, and frequent relocation of residents, **participation rate in neighborhood association is decreasing in trend**. Daily local community activities are challenged due to the change of characteristics of community.

## Unit of Community DRR in Japan: Volunteer Disaster Management Organizations

- In Japan community-based DRR organizations are legally designated for community-managed disaster preparedness, but it is volunteer-based.**
- Disaster Countermeasures Basic Act** (Revised in 1995)
  - (Article 2-2 Clause 2) Volunteer Disaster Management Organizations are formed among residents based on spirits of neighborhood cooperation
  - (Article 7-3) VDMO must contribute to disaster prevention through taking countermeasures to prepare for a disaster, participating in DRR drills and other activities, facilitating sharing and transcending lessons and learned from the past disasters
- However, these CDMOs and other fire prevention clubs in the communities have not much been active due to declining population and aging society.

## Rate of VDMOs in Japan



[http://www.fdma.go.jp/html/new/pdf/1512\\_tiiki\\_s1.pdf](http://www.fdma.go.jp/html/new/pdf/1512_tiiki_s1.pdf)

## Rate of VDMOs by Prefecture in 2001

都道府県名	組織率	都道府県名	組織率	都道府県名	組織率
北海道	28.8	東京都	71.1	滋賀県	57.6
青森県	22.6	神奈川県	81.5	京都府	78.2
岩手県	59.4	新潟県	19.9	大阪府	54.5
宮城県	76.9	富山県	33.6	兵庫県	87.5
秋田県	55.9	石川県	66.7	奈良県	19.7
山形県	49.8	福井県	46.4	和歌山県	47.9
福島県	76.4	山梨県	92.0	鳥取県	57.0
茨城県	53.5	長野県	64.5	島根県	24.3
栃木県	60.8	岐阜県	80.5	岡山県	42.7
群馬県	55.9	静岡県	97.1	広島県	54.2
埼玉県	48.4	愛知県	91.9	山口県	26.2
千葉県	50.4	三重県	77.7	徳島県	42.6
				全国	57.9

(注) 消防庁資料、数値は平成13年4月1日現在

Aichi, Mie

## Bottom-up Approach required in addition to top down efforts by Cabinet Office

- The 2011 GEJET showed demands for locally-led and localized efforts on DRR (who's demands?)
- How to improve DRR capacity at local levels?
- How to implement and scale up the locally based DRR efforts?
  - It requires that member of the community, who are primary responsible for the community's DRR efforts, share goals
  - It requires that each community should have a DRR plan that guides residents and shows the principles for achieving the target and for the collaborative efforts on DRR.

## Disaster Countermeasure Basic Act (Revision in 2013)

- Added new clauses on self-help and mutual help in the Act (Article 42-2 and 42-3) to newly introduce a system of community disaster management plan started in April 2014.

- Municipal government's DRR plan could define communities' DRM plans, which include community's DRM drill, storage of materials, DRR mutual help activities
- Local residents and others could jointly propose the community's DRM plan to municipal government's DRR conference

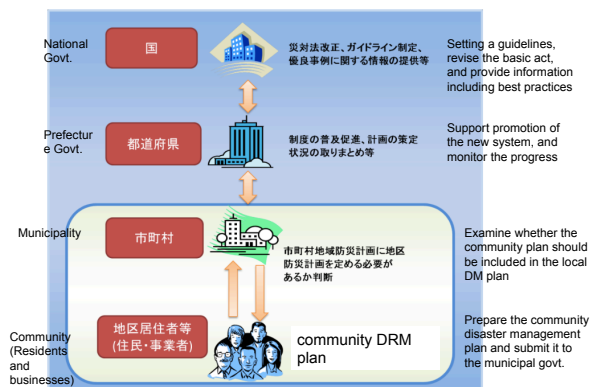
(市町村地域防災計画)

第四十二条 三

市町村地域防災計画は、(略)、市町村内の一定の地区内の居住者及び当該地区に事業所を有する事業者（以下この項及び次条において「地区居住者等」という。）が共同して行う防災訓練、地区居住者等による防災活動に必要な物資及び資材の備蓄、災害が発生した場合における地区居住者等の相互の支援その他の当該地区における防災活動に関する計画（同条において「地区防災計画」という。）について定めることができる。

第四十二条の二 地区居住者等は、共同して、市町村防災会議に対し、市町村地域防災計画に地区防災計画を定めることを提案することができる。この場合においては、当該提案に係る地区防災計画の案を添えなければならない。

## Institutionalizing a community DRM plan into the Government DRM structure



みんなであつくる「地区防災計画」～東日本大震災の教訓を踏まえて～

災害は忘れた頃に起こるともいわれています。

地区防災計画を活用して、いざというときに地域コミュニティごとに効果的な防災活動を実施できるようにすることが重要です。



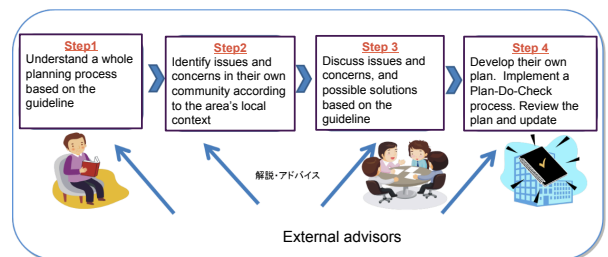
<http://chikubousai.go.jp>

地区防災計画ガイドライン

## Guideline on Community Disaster Management Plan

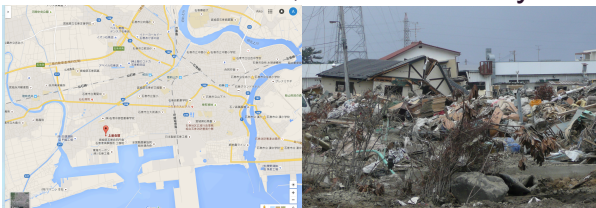
- explains how to prepare a plan at a community level.
- Encourage ownership among residents
  - Emphasize taking initiative by the community, developing a plan in the local context, and working together among residents

図表3 Flowchart of utilizing the community based DRR planning guideline



<http://go-the-in.seesaa.net/article/367675582.html>

## Kamikama-District, Ishinomaki-City



- Kamikama had 1000 households before the 2011 tsunami.
- 240 lives were lost in Kamikama.
- Currently, 550 households returned. However, younger generations with small children hesitate to come back.
- No higher grounds and hills in the community.
- Residents need to cross bridges to evacuate from tsunami
- Kamikama Disaster Management Committee was established in April 2015

<http://go-the-in.seesaa.net/article/367675582.html>



- Kamikama Reconstruction Council established in August 2012 as activities of Kamikama Neighborhood Association

- Examine areas where community reconstruction projects are implemented and approach to the reconstruction
- Examine disaster risk reduction facilities and infrastructures, including high-rise road and tsunami evacuation buildings
- Examine ways to share information and to form consensus on reconstruction







**"Community Reconstruction making Mr. Kawamura Magobe as a symbol of the community: Safe and Secured Community and Maintain our Community"**

75% of residents want to keep living in Kamikama Community  
Kamikama Reconstruction Council requests to the City Government in order to maintain the community that:

- Accelerate completion of high-rise roads in the community
- Expand bridges that helps residents to cross from the community to the Northern inland
- Prepare for evacuation facilities
- Prioritize former local residents to live in public reconstruction housing complex.

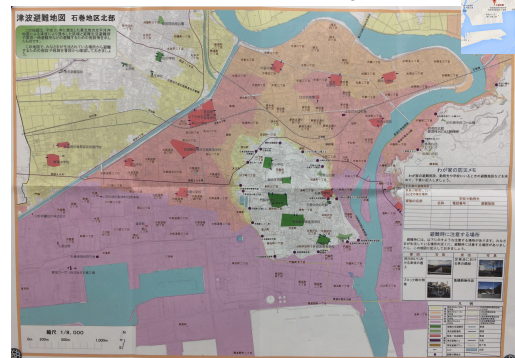


**2014.1 Opening a Community Meeting House in Kamikama**



<http://is-maki.com/archives/4676>

**Ishinomaki City Government's Tsunami Evacuation Map**



**Tsunami Evacuation Action Plan for Kamikama**

- Principle:
  - Do not underestimate danger of earthquake and tsunami
  - Agree on evacuation rules in advance
  - Evacuate to North inland above Kitakami Canal
  - Evacuate on foot in principle
- Concrete Evacuation Rules
  - Agree on by-time zone evacuation rules
  - Countermeasures for the people who requires assistance
  - Establish supporting system
  - Collect information of these people (who are they, where they live, family structure, what kinds of assistance needed, etc.)
- Drill
  - Conduct a drill based on actual evacuation routes
  - Conduct a drill for the people required assistance

**Community Organized Tsunami Evacuation Drill and Disaster Management Drill**





## Role of Schools for Enhancing Community in Post-Disaster Phase

*What kinds of DRR education is needed for the affected and survived children in Ishinomaki-city, Miyagi, Japan?*

### Sendai Framework for DRR

Paragraph 19 (k) states that

*"in the post-disaster recovery, rehabilitation and reconstruction phase, it is critical to prevent the creation of and to reduce disaster risk by "Building Back Better" and increasing public education and awareness of disaster risk".*

*Disaster education is one of packaged educational activities offered by International NGOs and U.N. agencies in the post-disaster period.*

## Reconstruction and DRR Mapping Program

- Started as "Reconstruction Mapping Program" in 2012, one year after the 2011 disaster, at one elementary school in Ishinomaki located at 1 km away from the coast in the east side of the City
- The school was re-opened at the same place before the disaster and in mid-April 2011, although the building was inundated 1 cm above the first floor, and many houses in the southern part of the school district were washed away
- The program is implemented at **formal educational curriculum**, periods of integrated studies by the fourth grade students

[Goals of the Reconstruction Mapping Program]

- To make the children **face their experiences of the disaster** through walking around the school district where the reconstruction and recovery process is currently underway;
- To **keep records of reconstruction in the community** by children themselves
- To **help children to find positive aspects** of their community and deepen their affection to their community;
- To **motivate children to be involved proactively in a process of reconstruction** as a member of the community.

## Expansion as "Reconstruction and Disaster Prevention Mapping Program" in Ishinomaki City

SY2012-  
SY2013

SY2014-  
SY2016

SY2017

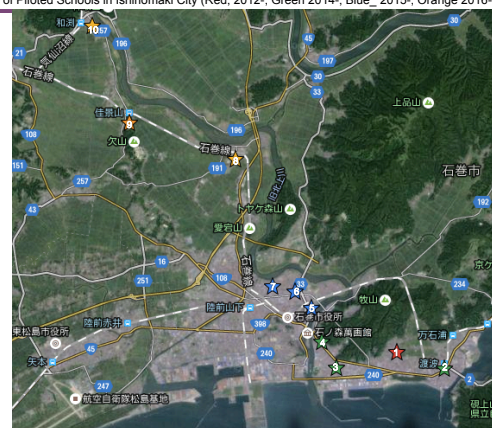
-Piloted at one ES.  
-Developed a **teaching plan and worksheets**  
-Evaluated the impact through observation and questionnaire surveys

-Expanded to neighboring schools to wider area  
-To be implemented at 7 ES and 3 JHS by 2016  
-Preparing a **teacher guidebook** for implementation

-Aiming at implementing at all the ES and JHS in Ishinomaki City

27

Location of Piloted Schools in Ishinomaki City (Red; 2012-, Green 2014-, Blue\_ 2015-, Orange 2016-)



Google Map

## Application of Town-Watching and Map-making to a Post-Disaster Education Program

School situation

- ❖ Tsunami-affected schools in Ishinomaki could not deal with tsunami, earthquake or disaster at school in the first year from the 2011 disaster.
- ❖ In 2012 one of the schools wanted to conduct something positive to think about future of their community.

Psycho-social recovery aspects

- ❖ School clinical psychotherapist supported the idea that learning and expression activities could help children to change their perception toward their difficult experiences at the disaster if it is carefully designed

Town-watching and map-making could be an experiential learning opportunity for children to learn about their community and to express their experiences and feelings with others if carefully designed

## Reconstruction Mapping Program



Guidance

Town watching

Map making

Presentation

- ✓ Read a map
- ✓ Understand the purpose of the program
- ✓ Decide each role in a group during town-watching

- ✓ 45min.x2 classes
- ✓ Divide the whole districts into 12 areas
- ✓ Find places and things according to classification
- ✓ Interview with local adults

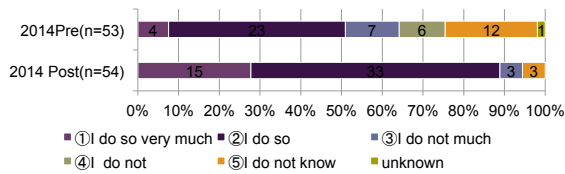
- ✓ Put finding points into each area map
- ✓ Prepare for information cards, interview cards
- ✓ Decide a title of each map

- ✓ Present to the pupils at the 3<sup>rd</sup> and 5<sup>th</sup> grades, parents, and the community

## Findings from the Pilot Case

- Confirmed the program help to motivate children to participate in reconstruction of the community

### Do you want to contribute to the reconstruction of your community?



## Issues Identified during the implementation and expansion

- How to localize the Program at each school context in different degrees of damages, impact by, and progress of reconstruction from the 2011 disaster?
- How to grade up town-watching and map-making process for junior high school students?
- How to make a transition from recover/reconstruction to mitigation/preparedness phase in the program at the tsunami affected schools?

-- Continue to upgrade the program by supporting long-term implementation and through partnerships among schools, board of education, teachers and university researchers.

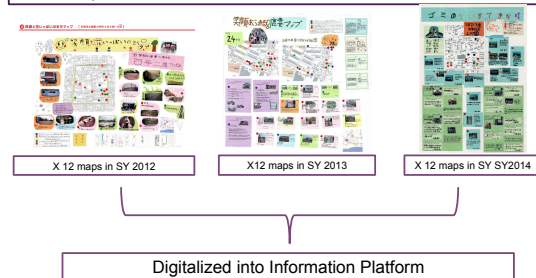


### S Junior High School in 2015

- [Purpose]**
  - To get to know about their own community to live in safe and secured environment through the program
- [Learners and Period]**
  - Period of integrated studies by the seventh grade (10 hours+3 days field work)
- [Features]**
  - Propose own ideas on how to strengthen resilience of Ishinomaki in the map
  - Collaborated with local high school to learn about altitude and tsunami hazard by using iPad
  - Adding a lecture from the City's crisis management unit
  - Presented the outputs at the city-wide disaster risk reduction symposium

## Issues for Sustainability

- How to utilize produced maps to deepen understanding of the future students at the school about their community's reconstruction and disaster preparedness? -- Proposing a digitalized database, called "Disaster Recovery Information Platform"



Search by year, area, classification categories, etc.



## Conclusion So Far

- Town-watching and map-making as experiential learning helped children to face the disaster affected community to increase children's interest and motivation to participating in the recovery process.
- Process of mapping during implementation is confirmed important as as well as a produced map as output because the mapping process could involve stakeholders in community
- Mapping could have a potential for children to understand a disaster cycle from recovery to preparedness phase in their own community if the program is continued. Also, it would be effective to add information of both progress of recovery and actual damage by the tsunami disaster on the map as years go by.
- Digital information platform could help to preserve the paper-based information in a data base and for the future elementary school children to compare their community situation in current and the past.