Decontamination of the Living Environment: Current Status and Challenges

Fukushima City

Fukushima City's "Hometown Decontamination Program"

- The first version of the Program was issued on September 27. Updated version is under preparation (statutory undertaking).

- Priority: Two perspectives considering the degree of urgency:

(1) By district

Prioritize districts with relatively higher radiation dose:

> **→ Highest priority districts:**
> **Onami (2.9μSv/h max.), Watari (3.1μSv/h max.)**

(2) By purpose and frequency of use

Prioritize places most frequently used by citizens, such as school routes and parks (irrespective of dose rate)

Fukushima City's "Hometown Decontamination Program"

Targets

(1) To reduce, within two years, the spatial dose rate in the living environment to 1μSv/h or less

(2) In districts where the 1μSv/h criterion is already met, to reduce the special dose rate by 60% from the present level within two years

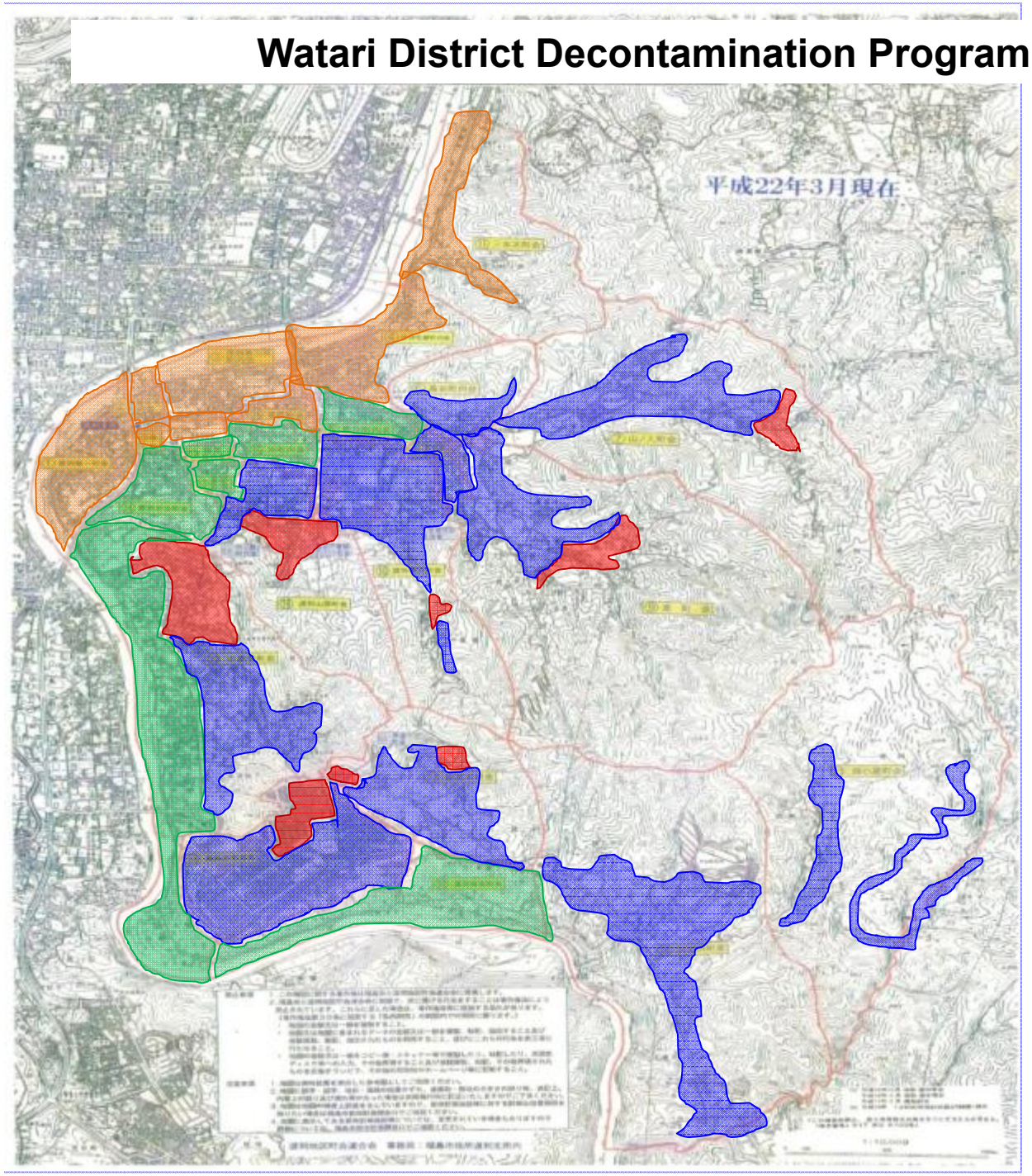
(3) For the future, to maintain the annual exposure dose of 1mSv or less (0.23μSv/h or less)

Decontamination Program and the Status of Progress

Sept 27: Fukushima City's formulation of the Hometown Decontamination Program

	Fiscal 2011						2012	2013	2014	2015	2016
	10	11	12	1	2	3					
Onami district	**140 households**			**240 households**							
Watari district				**730 households**			**6,300 households**				
Relatively higher dose area							**Total: approx. 110,000 households**				
Relatively lower dose area											
Farmland				**Fruit trees**			**Rice & vegetable fields**				
Forest land							(To be decided)				
Public facilities	**All elementary & junior high schools, etc.**			School routes, gutters, parks, municipal district offices and other public facilities							
(Cost)	**8.2 billion yen**						(To be decided)				

Watari District Decontamination Program (conceptual)



Fiscal 2011
1st decontamination campaign (Feb. to Mar.)

Planning for fiscal 2012 (conceptual)

2nd decontamination campaign (from Apr.)

3rd decontamination campaign (from Jul.)

4th decontamination campaign (from Sept.)

Policy on decontamination priority

- Start from districts with higher radiation dose
- Start from districts with higher altitude

Uniqueness of Decontamination in Fukushima City

○ **Chernobyl**

→ No full-scale decontamination was conducted.

○ **Futaba-machi, Namie-machi and other municipalities of Fukushima Prefecture located inside the Alert Zone**

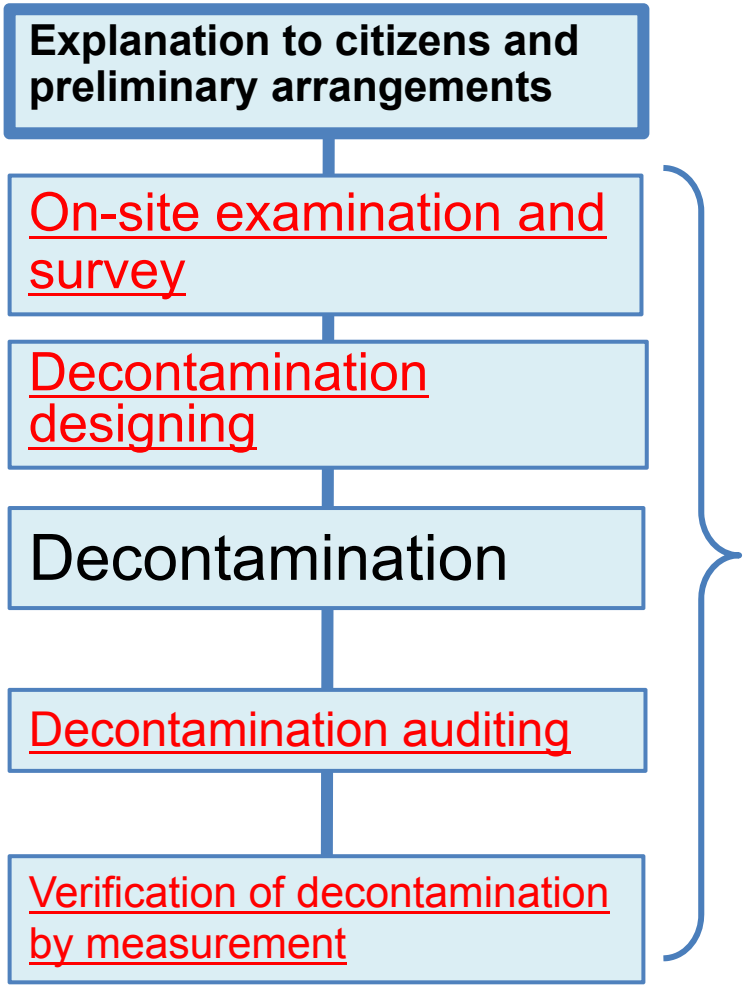
→ Citizens are evacuated from their hometowns.

○ **Fukushima city (other municipalities outside the Alert Zone)**

→ - **<u>Citizens continue to live there.</u>**

- Factories, shops and farmlands remain in service.
- Huge infrastructure, a great number of households

Living Environment Decontamination Procedure



- City employees must ensure the sufficiency of explanation to citizens.

- Any decontamination project that covers several hundred households or more will require the outsourcing also of designing and auditing tasks (possibly to different parties).

- Smooth outsourcing and implementation of decontamination tasks will require standardization such as the use of a standard format for cost estimation.

Explanation to local citizens (1)

Understanding the psychology of citizens

- Citizens are tired of radiological concerns. Repetitive blows have produced mistrust.
- **“Why must we, the victims, undertake decontamination?”**
- Discontent with the national government and TEPCO has escalated into discontent with municipal governments.
- We must maintain a sympathetic attitude upon explanation to citizens.
- We must discuss and work with them on the spot.

Explanation to local citizens (2)

- Deciding temporary storage areas
- Organizing a district-wide orientation gathering
- Organizing orientation gatherings at the level of neighborhood associations
- Conducting questionnaire surveys covering every household

At the level of each neighborhood association:

- Discussing with citizens about the decontamination schedule (several meetings)
- Publicly announcing the schedule
- Calling for the participation of local volunteers

On-site survey

- Radiation dose survey in each district
  - Conducted by the city government with cooperation from neighborhoods associations, etc.
- Discussions with the chiefs of neighborhood associations, etc.
  (setting up local decontamination committees, etc.)
- Discussions with property owners about decontamination of national roads, prefectural roads, etc.
- Understanding about water flows and water systems
- Preparing a provisional decontamination schedule

Decontamination

Decontaminating roofs and walls of residential houses

- High pressure cleaning equipment + brush and detergent
- Decontamination effect on places such as tiled roofs is approx. 20%.

Surface soil from gardens

- If the dose level is high, the surface soil layer has to be removed with 5cm thickness.
- The operation often requires the use of machinery.
- The decontamination effect is as high as 70-80%.
- Introduction of foreign soil is also effective.
- As a general rule, excavated soil has to be buried in the garden; however, some ground water condition may prevent burial.

Decontamination

Decontamination of farmland and forest land

- Decontamination of farmland and forest land is required to decontaminate farming communitie
- The forest land requires cutting of branches and removal of fallen leaves and leaf mold in approx. 20m radius zones around homes.

- Farmland is an agricultural production facility, but has the risk of becoming a source of radiation.
- The decontamination of disused farmland near human dwellings is identified as a challenge.

Decontamination

Support from volunteers

- In nine days of October and November (Saturdays and Sundays), 573 volunteers, in total, participated in decontamination activities.
- About 90% of the volunteers were from outside the Fukushima Prefecture (they came from all over Japan from Hokkaido to Okinawa)
  They participated in weeding, transportation of foreign soil and the removal of fallen leaves.

- For both volunteers and local citizens, mutural exchange and gratitude are of psychological importance.
- Information on seeking for volunteers was not readily available.

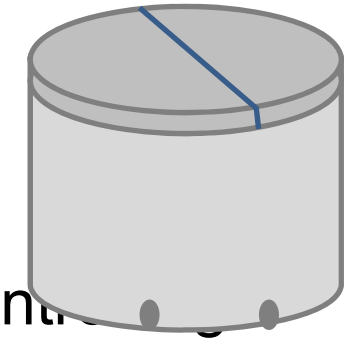
Challenges for the City

(1) Establishing organizational preparedness for as statutory undertaking

(2) Responding to the demand for quantity and speed

Challenge (1): Management of Soil from Residential Areas

- Securing of temporary storage areas
- It is not possible to carry all excavated soil into the temporary storage areas.
- Burial in gardens involves problems on landscape and ground water purity.
- Development of storage containers for residential use
- Preparation of temporary storage area cont



Challenge (2): Securing Contractors

- Lack of decontamination service providers

→ The city's civil engineering spending in fiscal 2010 was 10.3 billion yen. Projects with larger scale than this are unlikely to be undertaken solely by contractors within the city.

- To accept such major contracting, the industry will need to develop its preparedness capable of undertaking tasks including the design of decontamination program.
- To allow the bidding of companies outside Fukushima Prefecture, the development of tools such as standard format for cost estimation will be necessary.
- We should establish a mechanism that promotes the hiring of local citizens including evacuees.

Challenge (3): Reexamination of Decontamination Methods

Example: decontamination of roofs

• Fall prevention measure is required (Occupational Safety and Health Act)

• Decontamination effect is low in spite of difficulty and time-consuming nature of the decontamination work.

Challenge (4): Cost of Decontamination by Citizens

○ **We cannot discourage the citizens who wish to conduct decontamination on their own.**

○ **Legal status of decontamination activities by neighborhood associations and citizens:**

- Whether or not the decontamination activities are based on the municipal statutory plan?
- Compatibility with the city's decontamination schedules
- Scope and method of the cost reimbursement

Challenge (5): Involvement of the National and Prefectural Governments

○ Decontamination is now defined as statutory undertaking of the city.

- Planning → Requires consultation with the national government

- The city government is responsible for the decontamination of residential houses, offices and private lands.

○ The national and prefectural governments provide support to municipal governments.

○ <u>However, the involvement of national and prefectural governments is likely to become intense concerning</u> costs and methods, <u>which may disturb the decontamination initiatives by the city and citizens</u>.