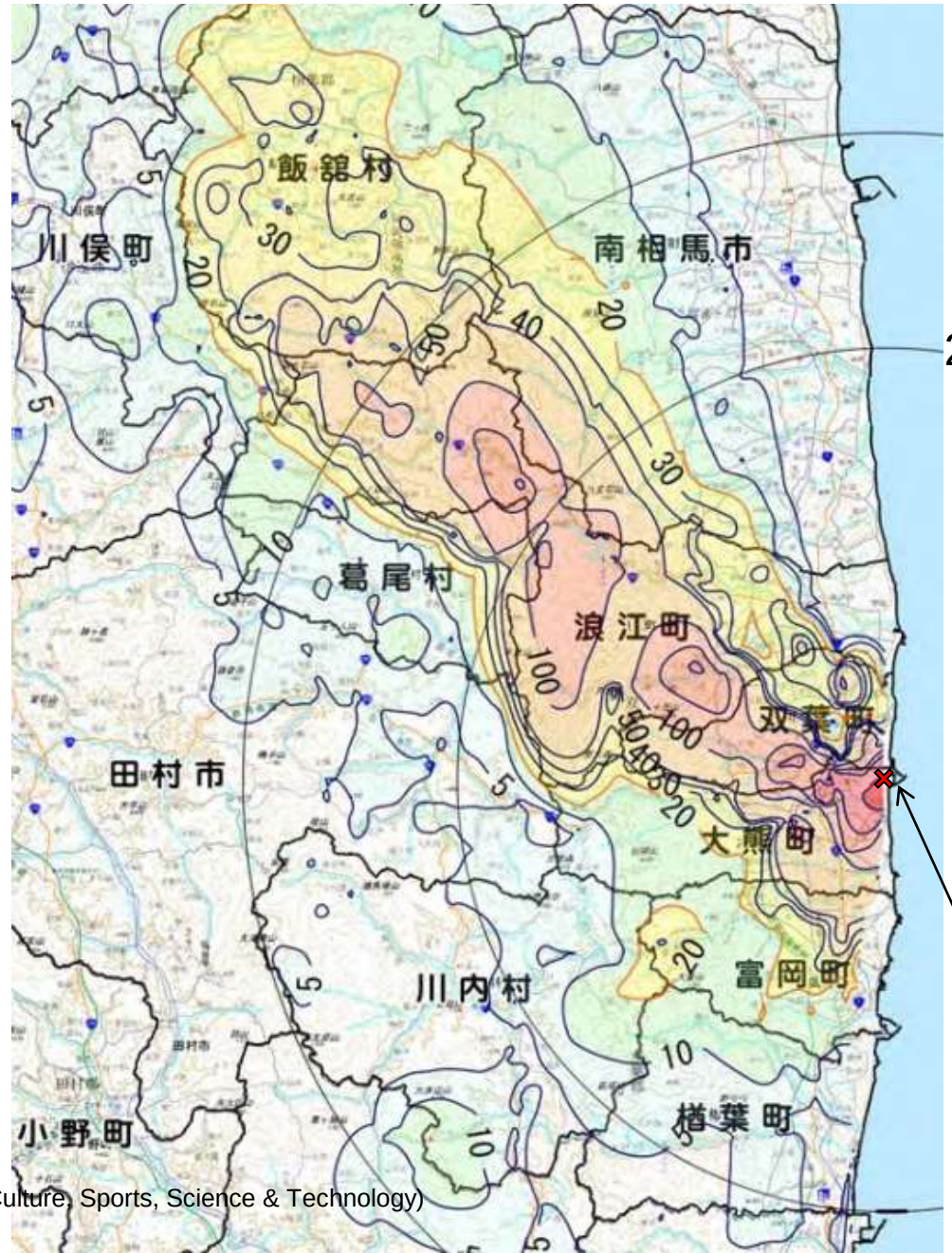
Remediation of Off-site Affected Areas

Shunsuke Kondo
Chairman
Japan Atomic Energy Commission

Highly Contaminated Areas



(Source: Ministry of Education, Culture, Sports, Science & Technology)

Measures for Remediation

- In order to decrease existing and potential annual exposures, we should pursue;
  - Reducing the number of exposed people
  - Modifying pathways of contaminant to a people
  - Removing existing sources by decontamination.
- Optimizing the intervention, we should consider avertable doses, radiological risks, environmental effects, risks to workers, economic costs, the generation of secondary waste, anxiety on the people affected, social disruption arising from the restriction, etc.
- The priority choices for the Government to pursue are

A) Restriction of inhabiting in the area where expected annual additional dose is larger than 20 mSv;

B) Strict shipping control for agricultural products, animal products and marine products through radiological surveys and

C) Step-by-step decontamination of the land.

Strategy for Decontamination

I. Reduce the size of the areas where estimated annual additional exposure is larger than 20 mSv through step by step decontamination activities.
   - As entrance in such areas is restricted, the Government should promote decontamination activities in cooperation with the municipal governments concerned.
   - If the municipal governments desire to decontaminate their area swiftly, the government should cooperate them to plan and promote the activities financially, dispatching experts.
   - Before removing the restriction of entrance, it is also necessary to restore safe operation of public services essential for living.

Strategy for Decontamination (2)

II. Reduce the annual additional exposure in the areas where it is currently below 20 mSv to below 1 mSv on a long term basis.
  - Realize at least 50% reduction of the annual additional exposure in such areas in two years and pursue further reduction incessantly.
  - Pursue exhaustive decontamination of children's' environment (schools, play grounds, etc.), aiming at reducing the annual additional exposure to 1 mSv as soon as possible and pursue further reduction incessantly.
  - Pursue regional decontamination in the case of highly contaminated areas and spot-wise decontamination in the case of relatively low contamination area, identifying hot spots such as those locations where sludge in the drains or gutters has collected.

III. In the area where annual additional exposure is below 1 mSv, focus decontamination activities on the hot spots.

Key Issues in Discharging the Government's Responsibilities for Decontamination

- Assure the fund for decontamination.
- Promote radiological surveys relevant to area characterization and confirmation of the achievement of decontamination.
- Prepare remediation technologies and infrastructure, and support the optimization of remediation strategy and plan.
- Assure safety of activities and safe management of waste.
- Cooperate with local governments in the planning and execution of remediation activities.
- Ensure public participation in all activities associated with remediation processes, standing close to the people living in the affected areas and sharing their anxiety.

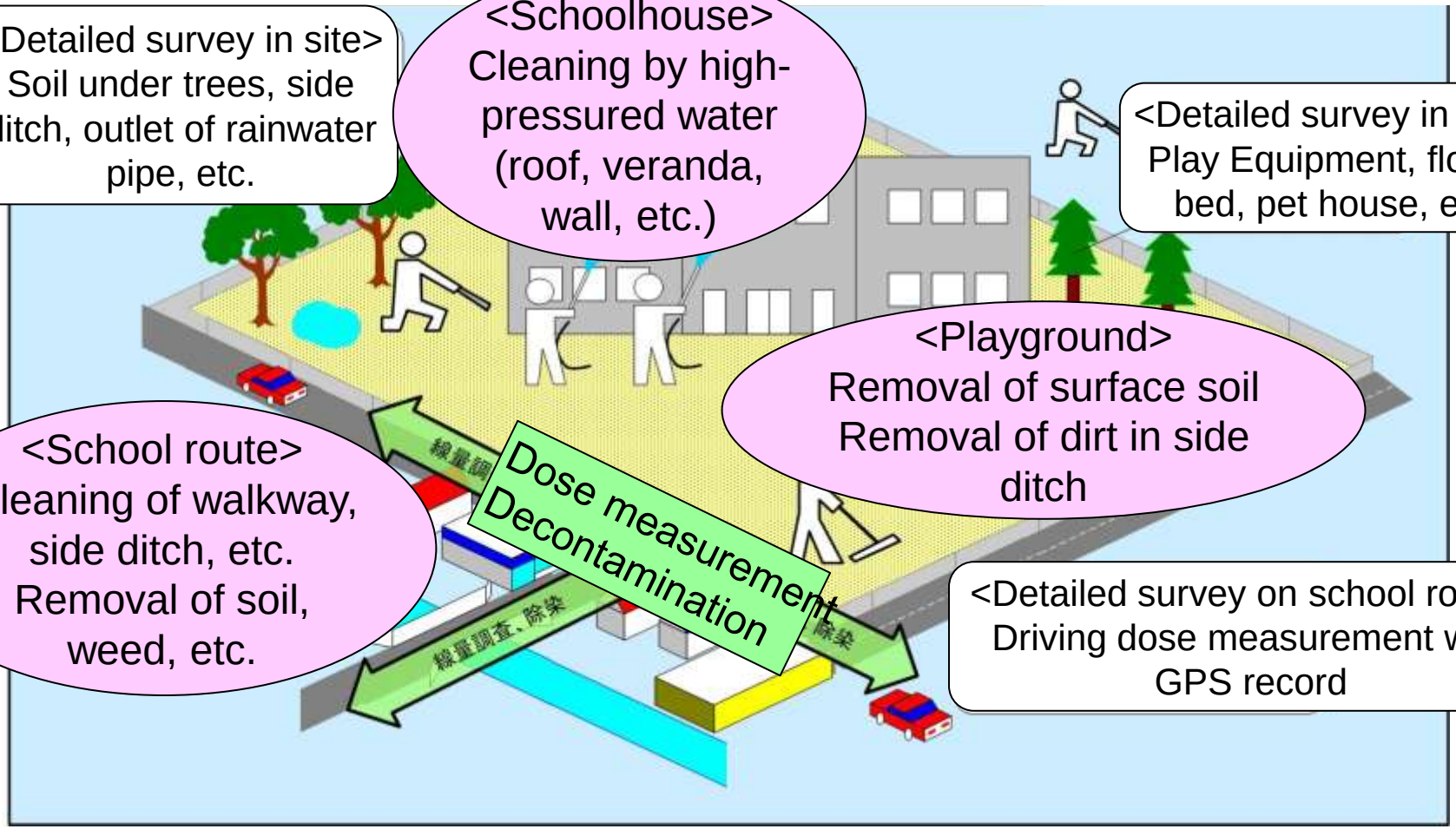
Current Situation

- Evacuation Area (>20 mSv/y)
  - The Government is to start at least one demonstration decontamination project in every municipal area with a view to demonstrating decontamination approaches and establishing safety guideline for their widespread implementation.
  - Based on the results of such projects, the Government will plan and promote a large scale decontamination activity before the end of the year in cooperation with the municipal governments so that people can return to home as soon as possible.
  - With regard to agricultural land, Ministry of Agriculture, Forestry and Fisheries has promoted activities to verify the effectiveness of various decontamination technologies to be applied to contaminated agricultural fields.

Current Situation

- Inhabitation Area (1-20 mSv/y)
  - Municipal governments are leading the planning and the execution of decontamination activities, setting goals, deciding the objectives and methods of decontamination, actors and places for temporary storage of decontamination waste.
  - Asking experts for advise, municipalities have been conducting activities to decontaminate housings and schools including play grounds, establishing "Decontamination guideline" based on such demonstration activities: the Government and professional societies also have presented instruction manuals for decontamination of residents' living spaces.

Activities to Reduce Dose Rate in School and School Route



(Source: Fukushima Prefecture)

Demonstration of Decontamination in School

(unit: μSv/h)

Decontaminated area	Decontamination		Decontamination methods
	Before	After	
Scupper on roof of school building	35	1.9	Removal of soil and fallen leaves, cleaning by scrubber and high-pressured water
End of rainwater pipe	40	4.2 3.7	Removal of soil and moss + water washing
Overgrown walkway	25	3.8 1.2	Removal of soil and grass + cleaning by high-pressured water
Side ditch	13	1.6	Removal of soil and grass

(Measured position: 1cm height from soil surface)

Dose measurement

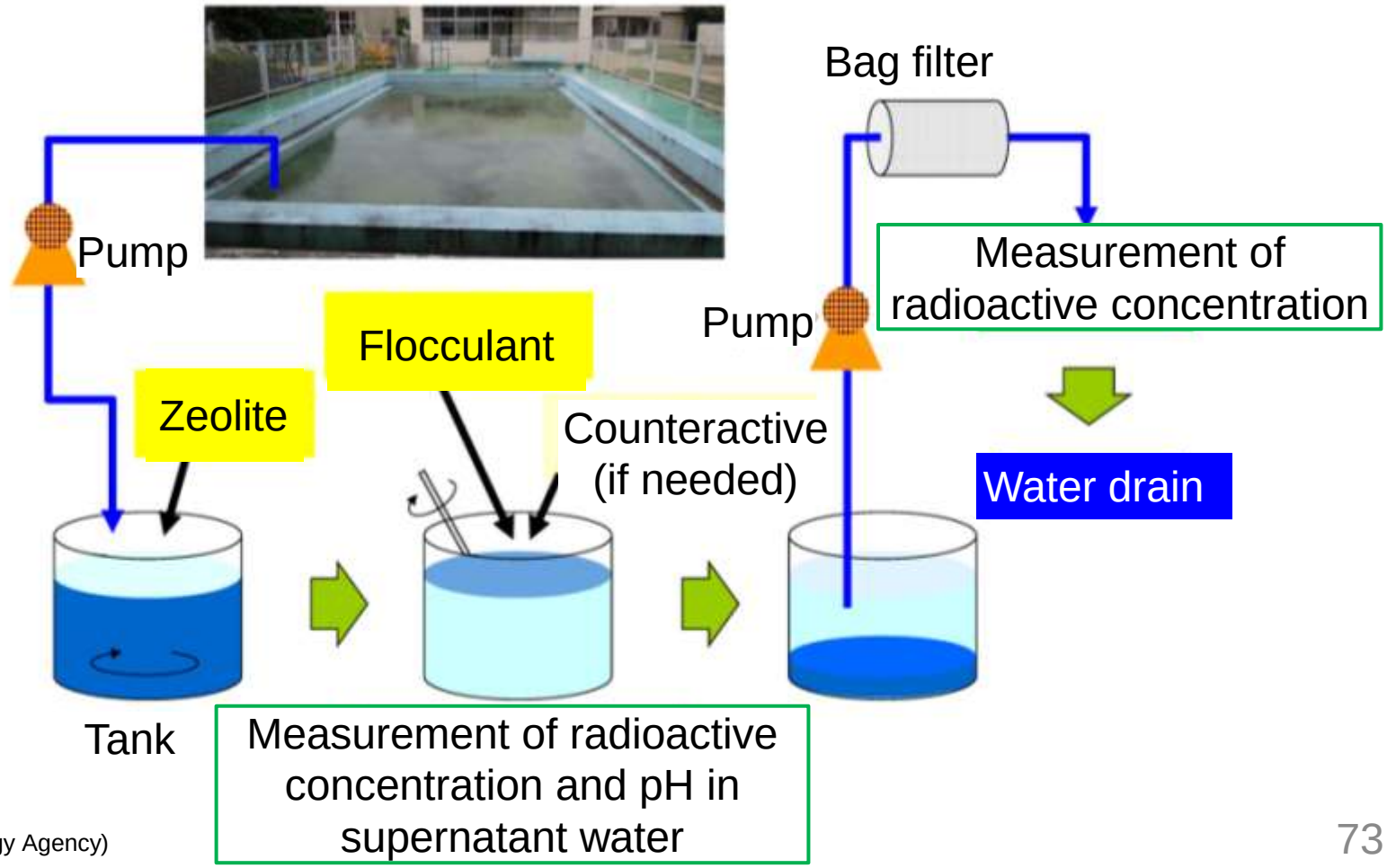
Cleaning by high-pressured water

(Source: Cabinet Office based on Materials in Atomic Energy Commission Meeting)

Decontamination of Swimming Pool Water

Decontaminating method of Swimming pool water

- Mixture of Zeolite and flocculant with pool water
- Precipitation and agglomeration of zeolite with suspended solids

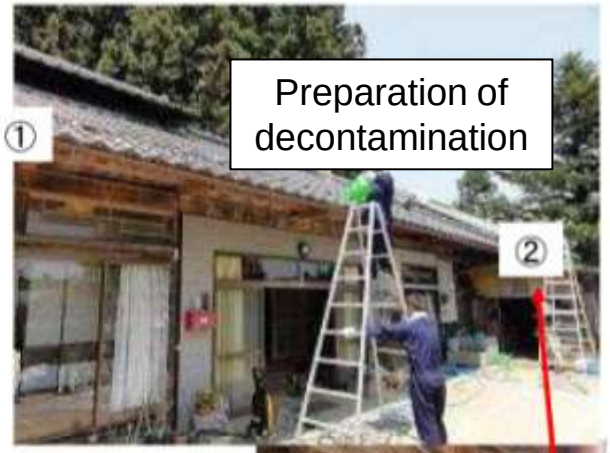


(Source: Japan Atomic Energy Agency)

Decontamination of Roof of Private House

Cleaning by high-pressured water

Cleaning by high-pressured water



Preparation of decontamination

Decontamination
(Back of rainwater pipe)
Before: 40-50 kcpm
After: less than 10kcpm

	Before	After
End of rainwater pipe near ①	45 - 65	14
End of rainwater pipe near ②	50 – 170	
Average	10 - 35	

(Source: Cabinet Office based on Materials in Atomic Energy Commission Meeting)

Generation of Contaminated Waste by Decontamination

Waste from School

Soil bag around waste for shielding

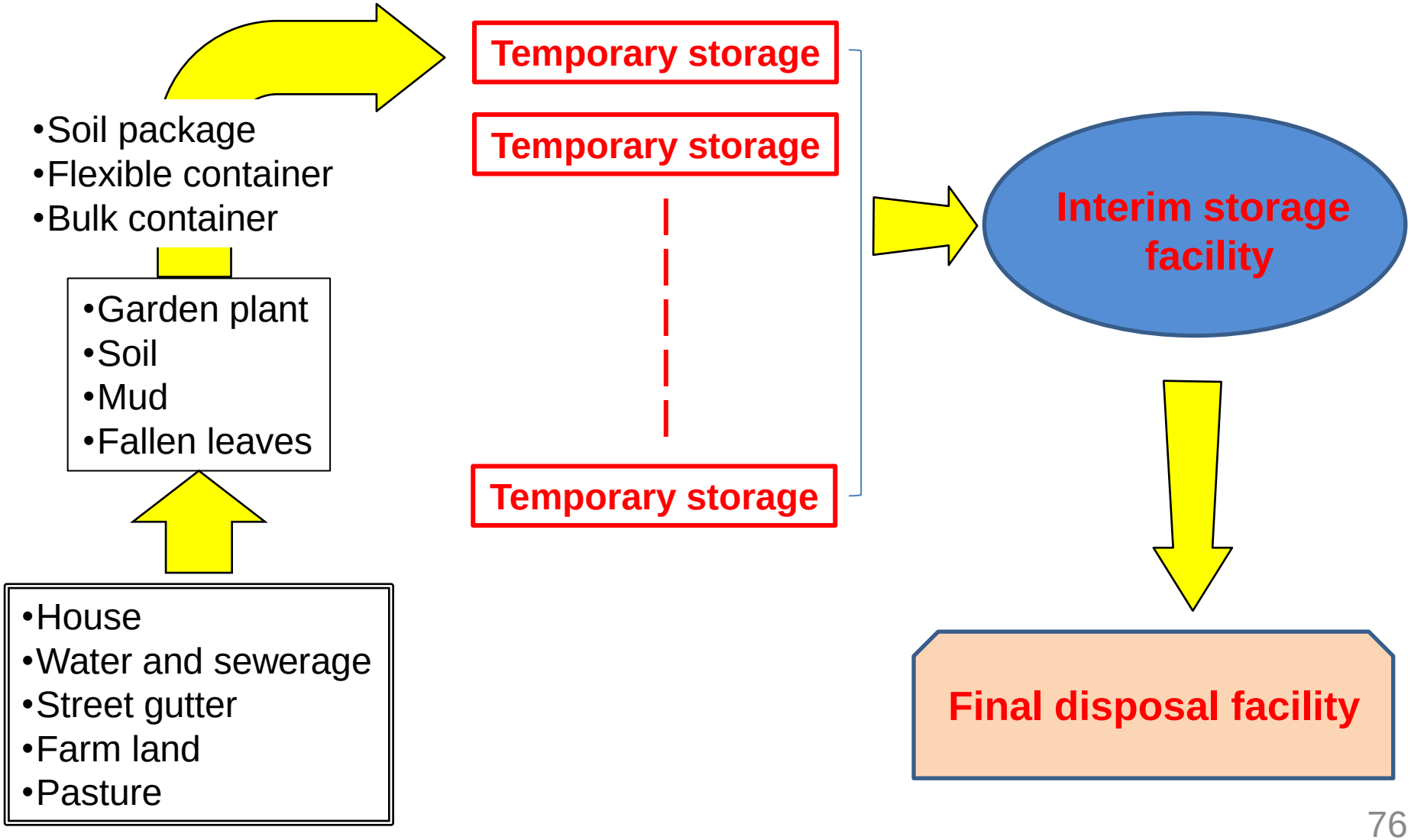
Waste from private house

Contaminated soil buried in playground

Waste from three private houses

(Source: Cabinet Office based on Materials in Atomic Energy Commission Meeting)

Concept of Managing Waste from Decontamination Activities



Conclusion

- Decontamination activities have been started in residential area and school area in particular, asking experts for advice.
- As for high dose area, demonstration decontamination activities have been started and the Government and municipalities hope that a large scale decontamination activities will be executed based on the knowledge and experience obtained in these activities.
- It is recognized as a matter of utmost importance to agree upon the locations for temporary storage of the waste including contaminated soil to be generated in these activities with municipalities beforehand.

I would like to express our deepest gratitude to you all for a wide array of support and suggestions.

As we should intensify the decontamination of highly contaminated area from now on, your continued support will be most helpful.