cepn

CENTRE D'ÉTUDE SUR L'ÉVALUATION DE LA PROTECTION DANS LE DOMAINE NUCLÉAIRE

MANAGEMENT OF CONTAMINATED GOODS IN POST-ACCIDENT SITUATION

Lessons learnt from Fukushima

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GENERAL INTRODUCTION

Following a nuclear accident…

- Clear **need to implement management strategies for contaminated goods** during days, months and years after the accident;
- 1st challenge: ensure the **quality of the products** and the **consumer safety**.

How to manage such situation?

Following the Fukushima accident…

- Consequences deeply affected the agricultural activities of the **Tohoku region**;
- This region was considered as the **'rice basket'**, the **garden** and the **orchard of Tokyo.**

OVERALL OBJECTIVE OF THE STUDY

From 2016 to 2018: Analysis of the management strategies, implemented in Japan, for contaminated goods

Based on the work performed within the PREPARE project, complete the document review.

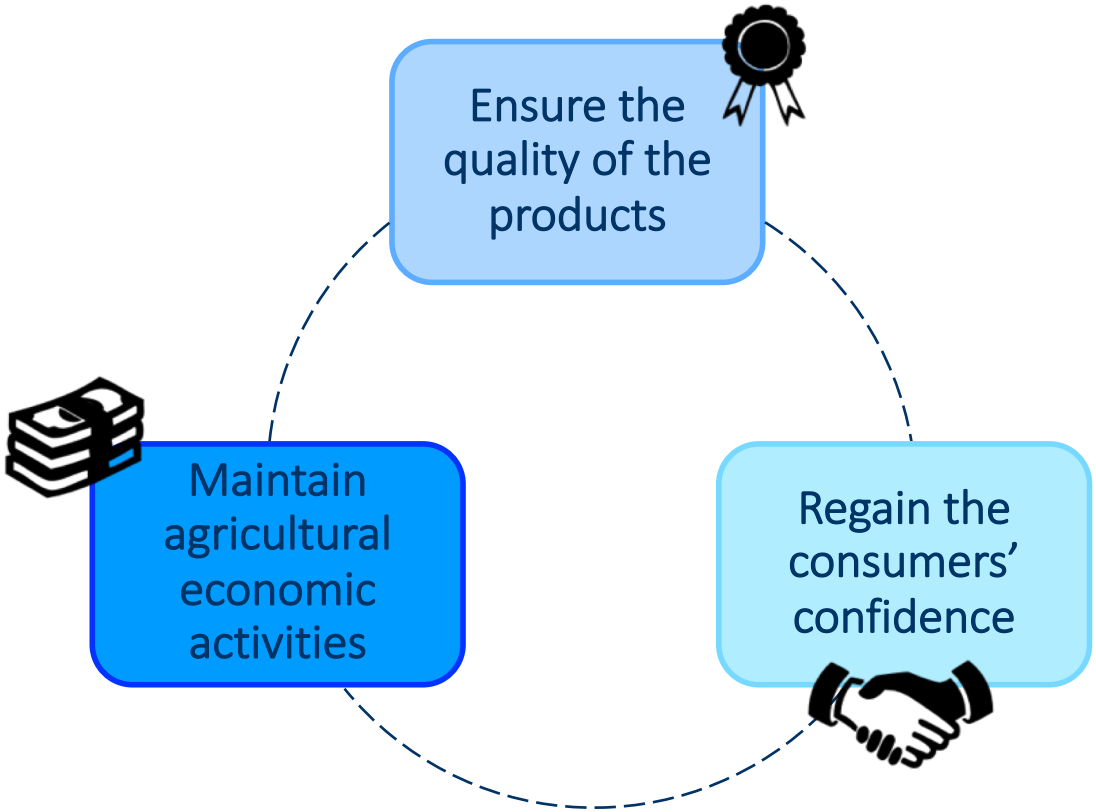
Sharing results and discussing with the NERIS WG ConGoo.

Interviews with various stakeholders involved in the management of contaminated goods: *Producers, fishermen, agricultural cooperatives, consumers, retailers, NGOs, etc.*

GENERAL OBSERVATION

Within the various agricultural sectors…

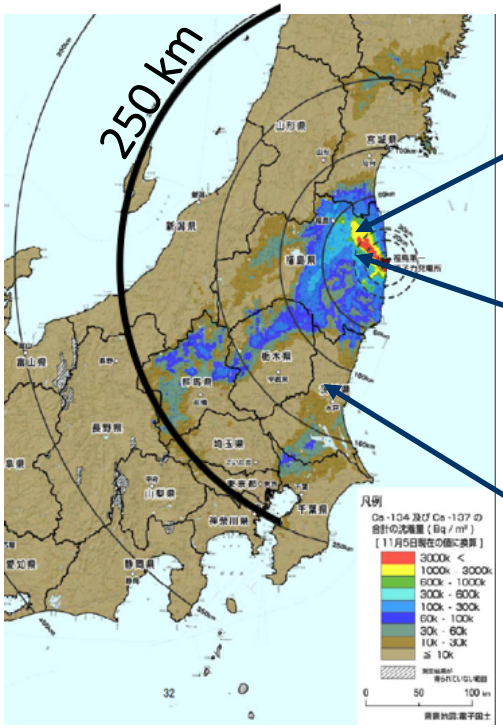
- **Emergence of different collaborations** between producers, agricultural cooperatives, retailers, consumers, *etc;*
- Implementation of **various management strategies** with 3 main objectives:



SOME REMINDERS ABOUT THE FUKUSHIMA ACCIDENT

Occurrence during early spring 2011

- **Vegetation was not developed** and **livestock was confined** in barns;
- **Most sensitive foodstuffs** *(leafy vegetables, milk)* have been contaminated immediately after the first deposits, sometimes far from the Fukushima NPP;
- **Progressive food restriction** in and around the Fukushima prefecture.



T. Homma (2015)

Tap water(I-131) : 965 Bq/kg
20 March (Iitate)

Fukushima pref. 3/21-5/10
Other pref. 3/23-27

Raw milk(I-131) : 1190 Bq/kg
16 March (Kawamata)

Fukushima pref. 3/21
Other pref. 3/21-5/10

Spinach(I-131) : 54100 Bq/kg
18 March (Hitachi)

Fukushima pref. 3/21
Other pref. 3/21

Ensure the quality of the products

Maintain agricultural economic activities

Regain the consumers' confidence

DRASTIC COUNTERMEASURES TO REDUCE CONTAMINATION

Depending on crop's types and contamination levels, different countermeasures were implemented

Fruit trees

High pressure washing of trees

Paddy fields & Farmlands

Fertilization with potassium

Removing of topsoil / Reversal tillage

Farming

Livestock confinement/ clean fodder

Main feedbacks…

- More than **17 millions m³ of waste** produced by countermeasures and decontamination;
- Sometimes, countermeasures have been **ineffective** *(anpokakis)* or even **counterproductive** *(death of cattle);*
- **A lot of efforts made by farmers**, who faced extra work and extra costs.

MONITORING OF FOODSTUFFS (1/3)

Maximum Permissible Levels (MPLs) in foodstuffs have been fixed by the Japanese Government

- Guidance levels of ^{134}Cs and ^{137}Cs have changed between 2011 and 2012;

	Reference level: 5 mSv/y	*Reference level: 1 mSv/y*
Foods	Provisionals MPLs (2011)	New MPLs (2012)
Infants food	-	50 Bq/kg
Milk and dairy product	200 Bq/kg	50 Bq/kg
Drinking water	200 Bq/kg	10 Bq/kg
Other food	500 Bq/kg	100 Bq/kg

- When the MPL is exceeded: restriction of sales and consumption throughout the concerned prefecture ;
- Lifting of restrictions when 3 consecutive measures are below the MPL.

MONITORING OF FOODSTUFFS (2/3)

Implementation of various control protocols…

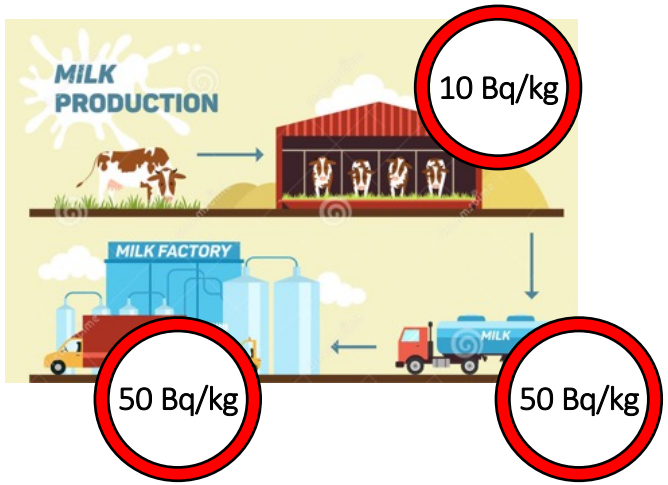
- Radiological controls implemented **all along the production chain** from the 'farm to the table';
- Setting up **systematic controls for emblematic products** of the Fukushima region *(rice, anpokakis)*;

Rice screening

… Using many derived criteria

To anticipate transfer phenomenon

To avoid the effect of dilution



To avoid artefacts from the screening methods

MONITORING OF FOODSTUFFS (3/3)

Product traceability is ensured

- **All results are kept** by the various actors *(cooperatives, retailers, etc.)*
- **Labels** have been created to ensure the **traceability** and to prove the **quality** of the products;

Fukushima anpokaki label

Main feedbacks…

- **Various radiological criteria** implemented, much **stricter than MPLs**;
- **Multiplication of actors** performing radiological controls *(farmers, cooperatives, retailers)*, **in addition** to official controls;
- **No sharing** of the results between the various actors.

THE LOSS OF IMAGE OF THE LOCAL PRODUCTS

The loss of image of local products has been a major obstacle to the agricultural recovery

- After the accident, **consumers lose confidence** in the local products;
- Each **MPLs exceedance** is considered as a **danger**.
- The **change of MPLs** between 2011 and 2012 **amplified this feeling**;

Two different trends

Emblematic products from the Fukushima region *(e.g. anpokakis, Café-au-Lait®, etc)* did not suffer from loss of image.

Products easily substitutable *(milk, rice, fruits, vegetables, etc.)* or **bearing the name of the Fukushima NPP** *(e.g. peach of Fukushima, beef of Fukushima)* suffer from a sustained image loss.

VARIOUS SALE STRATEGIES
(mainly in the Fukushima pref.)

Reduction of selling price

- One of the **main influence criteria** for the consumers;
- **Decrease of 10-20%** of the selling prices, still observed nowadays.

Circumvention strategies

- **Distribution of unsold products** to the neighbouring prefecture *(e.g. milk);*
- **Appellation withdrawal** *(e.g. beef of Fukushima)*.

Conversion strategies and improvement of the product quality

- Conversion to **organic farming**;
- Choice of **high quality materials** *(e.g. beef of Fukushima)*;
- **New manufacturing processes** *(e.g. anpokakis)*.

Ensure the quality of the products

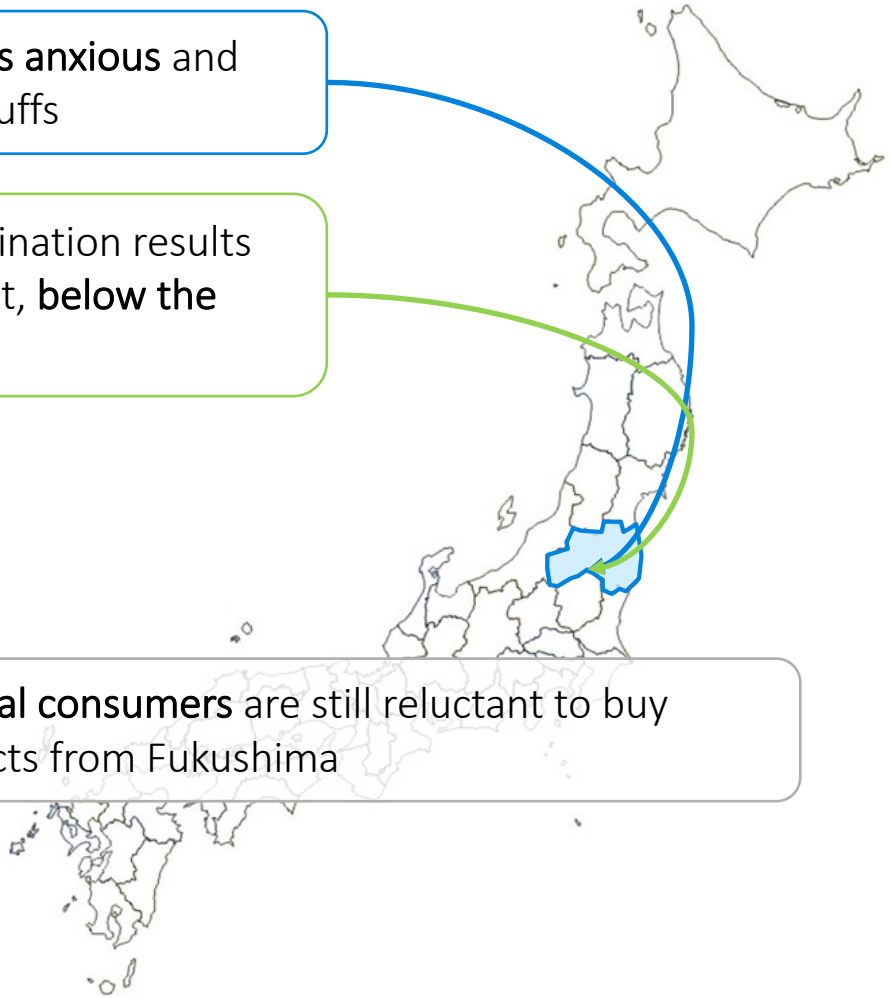
Maintain agricultural economic activities

Regain the consumers' confidence

Observation of different behaviours

Part of the population remains anxious and ignores local foodstuffs

Local consumers want contamination results **equivalent to 0 Bq**, or at least, **below the detection level**



External consumers are still reluctant to buy products from Fukushima

Ensure the quality of the products

Maintain agricultural economic activities

Regain the consumers' confidence

Innovative partnerships

- An old **Japanese tradition** (*teikei)* based on **local, healthy and supportive** agriculture;
- Products are sold at **'fair price'** in exchange of a **high quality food**;
- **Dialogues** between **consumers, producers** and **retailers**;
- **Direct sale stores** guarantee **the origin** and **quality** of the products.

+ **Relationship of trust** between producers and consumers;
+ **Help** to reduce the impact of the accident and **Strengthen** local community cohesion.

CONCLUSION

Exceptional means implemented to recover the territory

- **Complexification** of the foodstuff management system;
- **Multiplication** of the radiological criteria in each food sector;
- **Involvement of various actors** without pooling resources**;**
- **How long** will the radiological monitoring of foodstuff continue?

8 years after the Fukushima accident…

- In Fukushima prefecture, **consumers confidence has improved**;
- **Not true** for the consumers living outside. What can be the **evolution of their behaviours**?

What future for this territory?

- **A changing territory** with **economic reorientation** (solar farms, new technology industries, *etc.*);
- **What place is left** for agricultural activities?

THANK YOU FOR YOUR ATTENTION !