Empathy and Collaboration

Resurrection of Life and Industry in Fukushima

May, 2015

Resurrection of Fukushima, NPO

What we are doing in collaboration with villagers

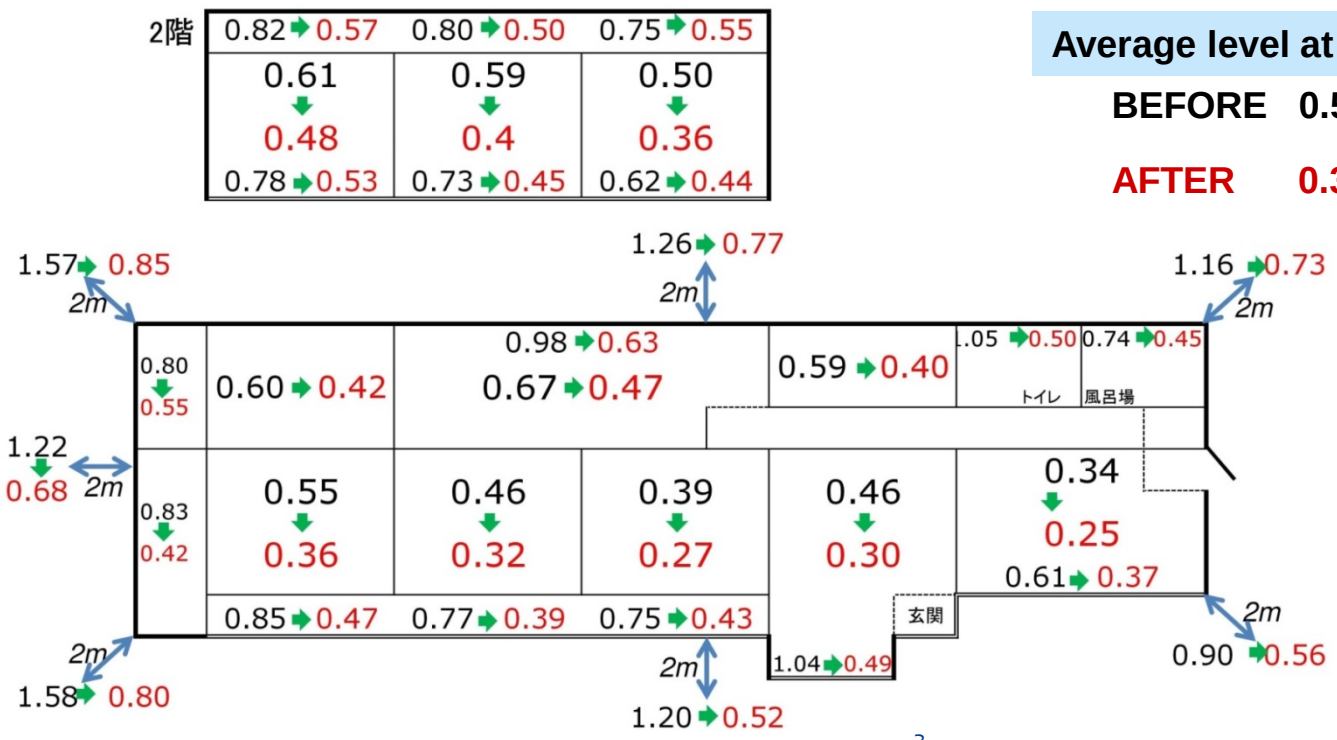
1. Efforts to secure living environment
2. Efforts to produce safe food
3. Examine the conditions of animals and plants
4. Examine radiation and radioactivity levels around the village
5. Secure electricity and heat
6. Provide social services to support healthy life
7. Jointly contemplate future vision of revitalized life
8. Jointly achieve future vision

1. Efforts to secure living environment

Radiation measurement at residential houses before and after decontamination

Measured at the center of each room, along the windows and walls, and around the houses and gardens

KM's house



Average level at center of the house

BEFORE 0.52 µSv/h

AFTER 0.37 µSv/h

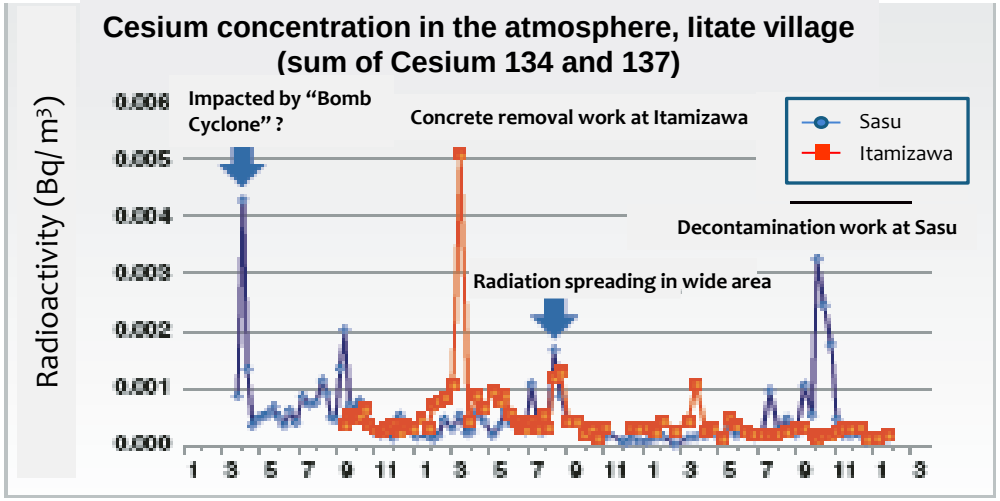
BEFORE; measured on July 13, 2014

AFTER; measured on March 15, 2015

Monitoring cesium concentration in the air

Collaborative project among villagers, volunteers, and the National Institute of Environmental Studies

No	Date/time	m^3	Bq/m^3		
			Cs-134	Cs-137	Total
No.1	Mar.20 14:10 - Mar. 31 11:46	7847.6	0.000328	0.000484	0.000812
No.2	Mar.31 11:50 - Apr.8 17:28	5926.2	0.00165	0.00233	0.00398
No.3	Apr. 8 17:40 - Apr. 14 11:00	4122.2	0.0005	0.000697	0.0012



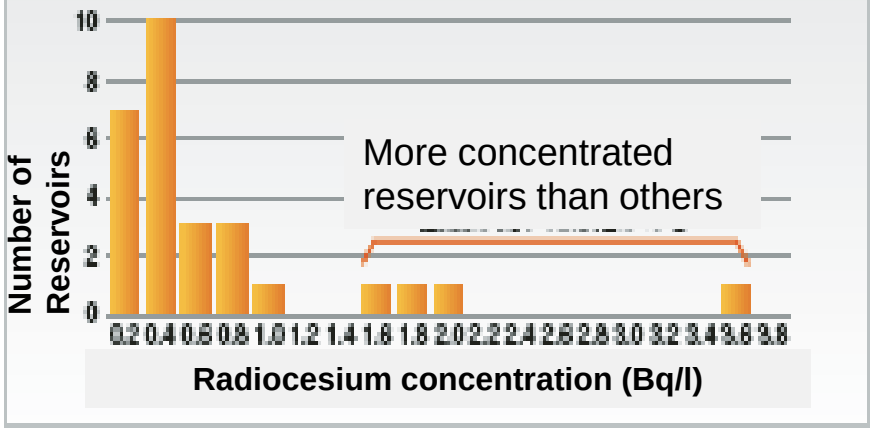
We have been monitoring cesium concentration in the air at the two locations, Sasu and Itamizawa.
A peak at just one location indicates change in a very local area, such as dusts stirred by decontamination work, etc. Peaks at both locations at the same time mean that widespread contamination might happen. The peaks on August of 2013 seem to be caused by the rubble removal at the nuclear power plant which spread very high contaminated dusts into wide area.
Through the monitoring data until now, the level of internal exposure by taking radioactivity into the body through breathing is estimated to be less than 0.001 mSv/year.

1. Efforts to secure living environment

Caution: cesium levels are higher in reservoirs

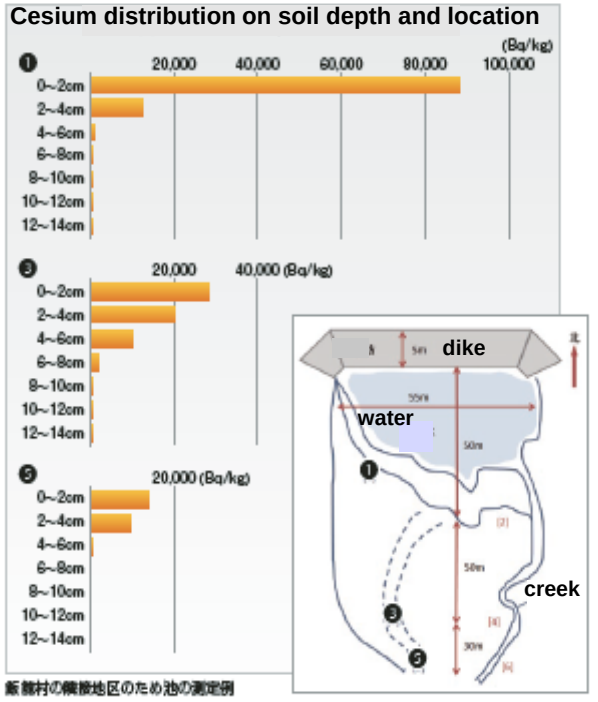
Average 0.58Bq/l of radiocesium was detected in the water at twenty seven reservoirs. It also revealed that cesium concentration in water is higher at several reservoirs than others, according to the survey in April/May, 2014.

Distribution of cesium concentration in water reservoirs



Cesium has accumulated at the bottom surface of soil within 4 cm deep

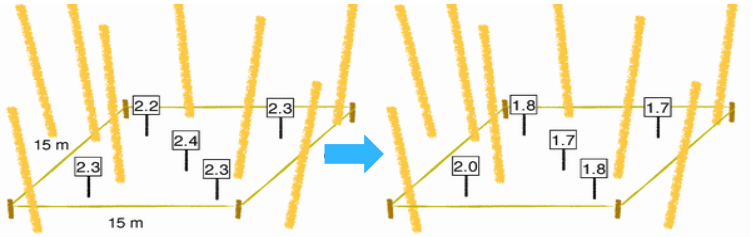
Cesium distribution on soil depth and location



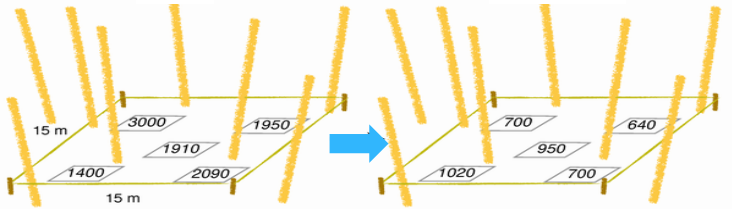
Decontamination of Forests

Experiment of decontamination by raking dead leaves in a broad-leaved forest

Before raking dead leaves **After** raking dead leaves



Radiation at 100cm above ground- μSv/h



Radiation at ground surface – count/min

Decontamination of residential houses

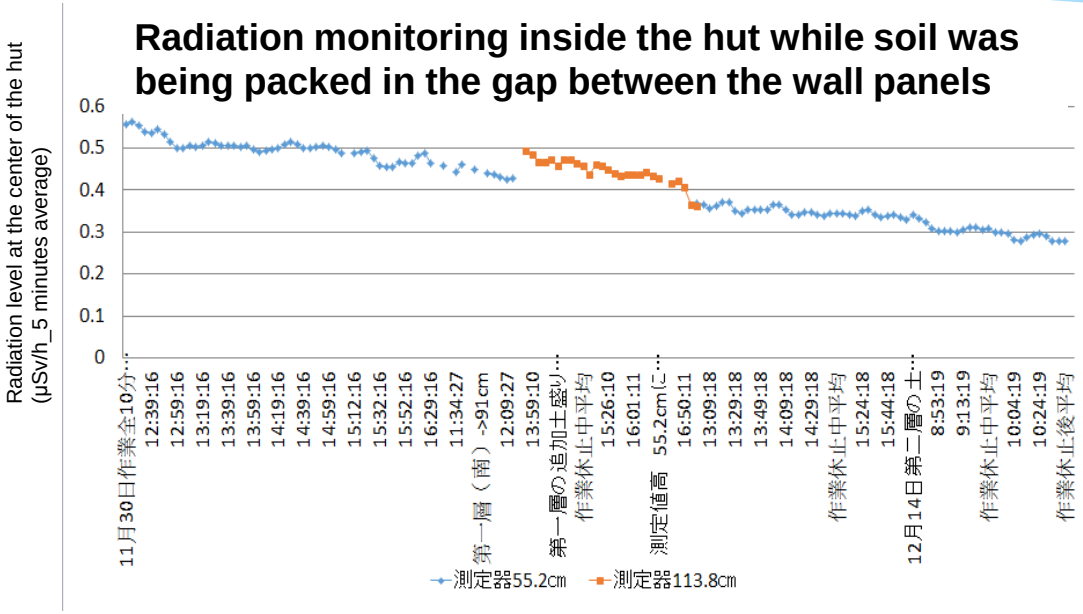
The woods behind a house may impact the radiation level inside the house

Pruning the woods behind the house

Upgrading the drainage path

1. Efforts to secure living environment

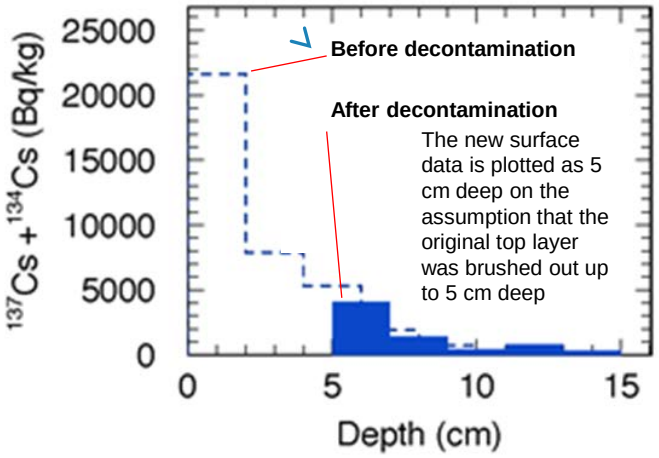
Building an experimental hut in preparation for a model house



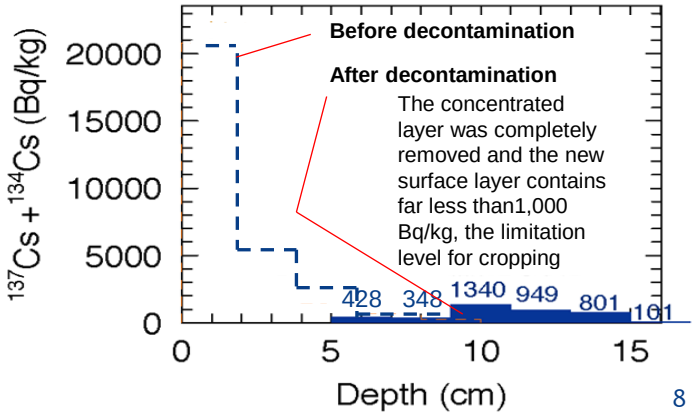
Building an experimental hut made of wood, stones, and soil in Iitate Village

Develop the decontamination process that farmers can do by themselves: Experiment of rice paddy decontamination (1)

- **Induce water into a rice paddy up to 5 cm deep and mix with the surface soil by using the traditional weeding tools for rice paddies, then push the muddy water out by using the brushes for tennis courts**



- **Scrape surface soil up to 5 cm thick by a backhoe**



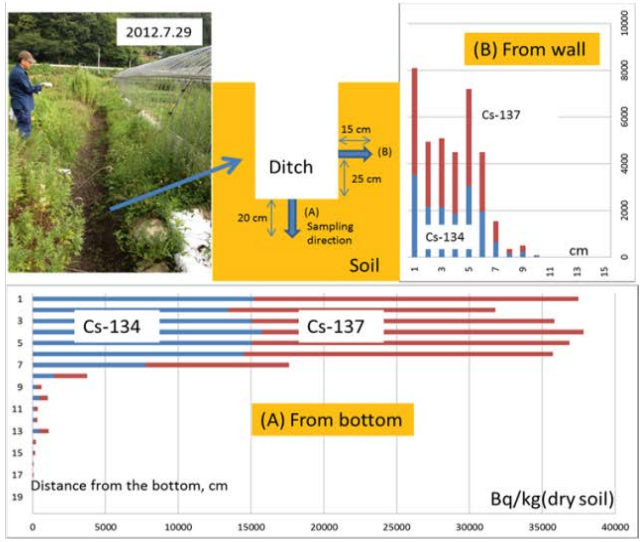
Develop decontamination process that farmers can do by themselves: experiment (2)

Collaborative project among villagers, volunteers, and Graduate School of Agriculture and life sciences of the University of Tokyo

Scrape surface soil up to 5 cm then bury them (frozen soil can be easily removed, which is applicable in the limited season)

Treatment of contaminated soil

The muddy water from the rice paddy was accumulated in a ditch. After the water was seeped and dried out, soil samples were taken at the bottom and side wall of the ditch, and radioactivity was measured at every 1 cm depth of each sample.



Once cesium is bound with clay particles in the soil, it does not move with water

Despite the ban against rice cultivation in Iitate village even on an experiment basis, we achieved experimental cultivation by making the agreement with the National Agriculture and Food Research Organization

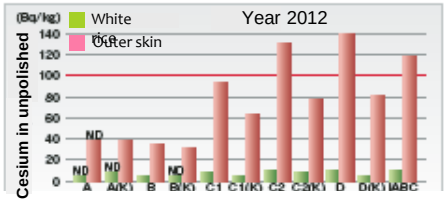
2. Efforts to produce safe food

Result from experimental rice cultivation

Cesium level in unpolished rice has been lower than 100Bq/kg* throughout the three consecutive years since the year 2012.

It was verified that cesium level in unpolished rice was lower when grown in potassium fertilized zone than non-potassium fertilized zone.

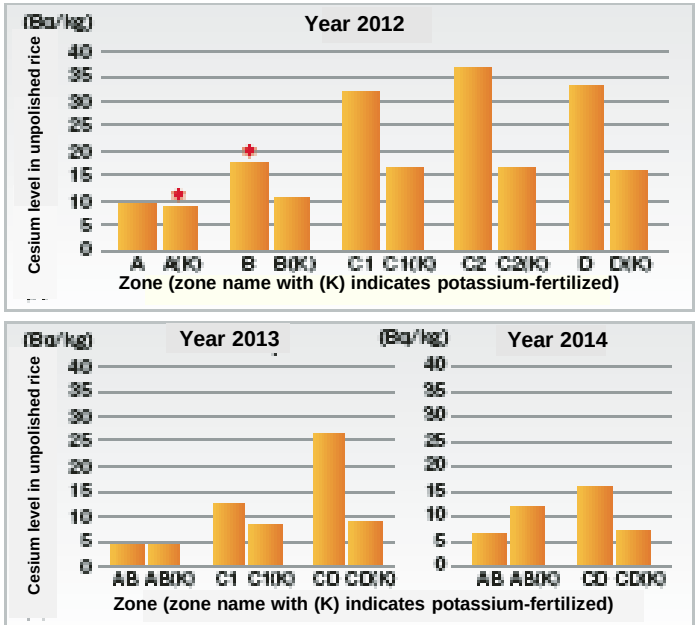
Cesium in unpolished rice is concentrated in the outer skin. Once rice is polished, cesium is removed together with the outer skin, and the level has dropped by less than 1/2



Zone (zone name with (K) indicates potassium-fertilized)

ND indicates that cesium 134 was less than the detection limit and the bar length itself indicates the value of the detection limit.

* 100 Bq/kg of cesium is the standard value (upper limit) for ordinary foods



★ indicates that cesium 134 was less than the detection limit and the bar length itself indicates the value of the detection limit.

All the rice experimentally harvested in 2012 and 2013 was disposed regardless of cesium level. The rice experimentally harvested in 2014 has no detected radioactivity throughout the inspection of all the individual packages by JA Soma.

2. Efforts to produce safe food

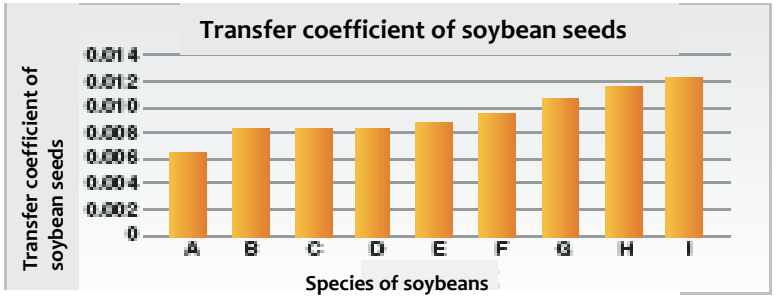
Drip irrigation in greenhouse

In cooperation with another NPO which works for improving food self-sufficiency by refluxing city dwellers to farm villages

2. Efforts to produce safe food

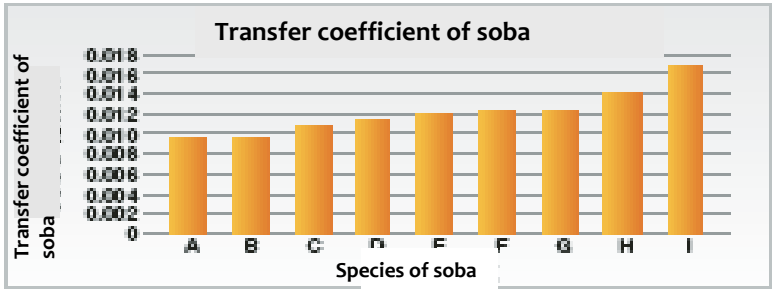
Cesium in Soybeans

The transfer coefficient* of soybean seeds varies by 1.9 times depending on the species (harvested in 2013)



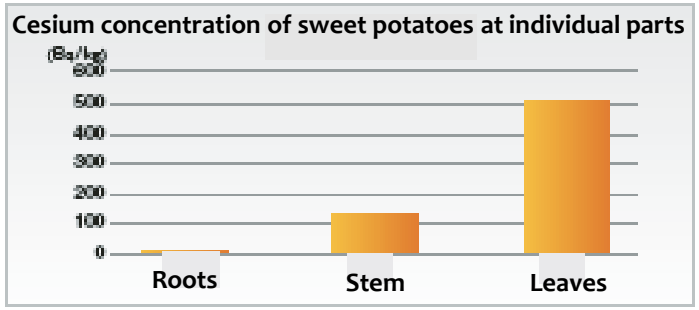
Cesium in Soba (buckwheat)

The transfer coefficient* of Soba varies by 1.7 times depending on the species (harvested in 2013)



Cesium in sweet potatoes

Cesium concentration in the leaves and stem is higher than the roots that is less than 10Bq/kg (harvested in 2013)

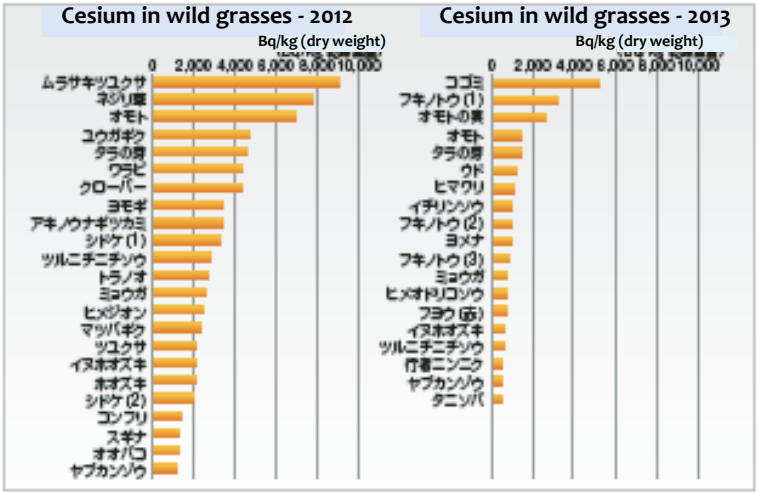


* ratio of cesium concentration of soil to plant, which indicates the tendency of cesium movement from soil to plants

3. Examine the conditions of animals and plants

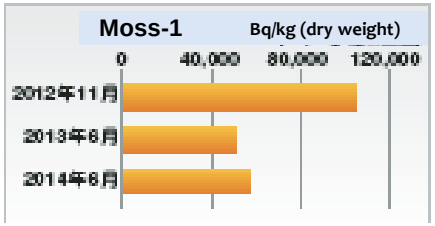
Cesium in wild grasses and moss

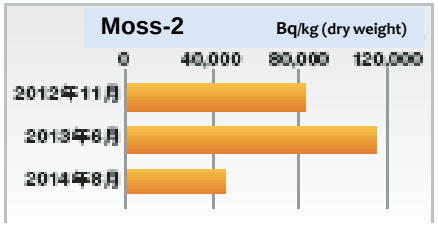
Cesium concentration in wild grasses differs on the species and places to grow (500 – 8,000 Bq/kg)
In general trend, the concentration in 2013 is 50% less than in 2012

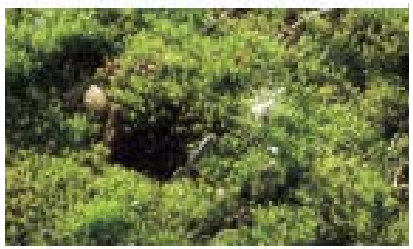


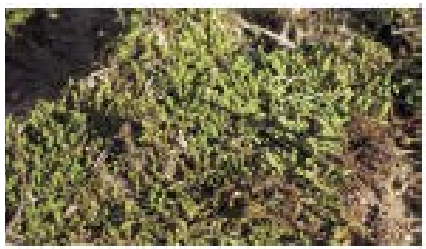
シドケ (1) とシドケ (2)、フキノトウ (1) とフキノトウ (2) とフキノトウ (3) は採取場所が異なります。

Cesium concentration in moss is 10 to over 100 times higher than wild grasses









Japanese rohdea

Seeds of Japanese rohdea

Spiderwort

3. Examine the conditions of animals and plants

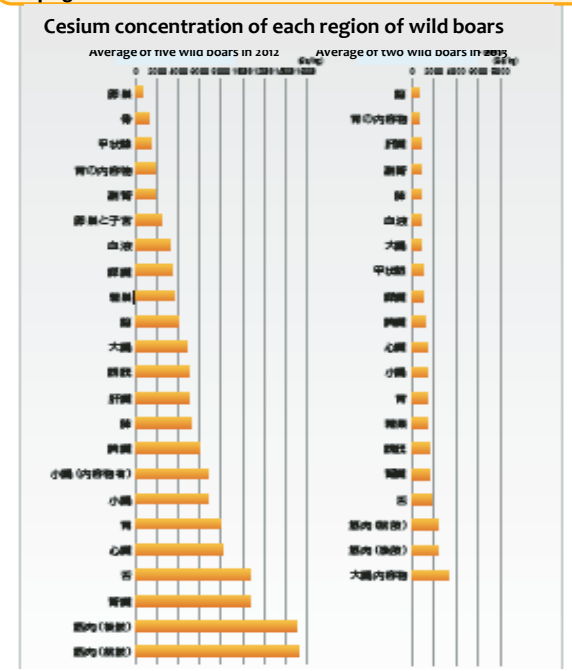
Wild boar project

In collaboration with villagers, volunteers, and Graduate School of Agriculture and Life Sciences of the University of Tokyo

- Monkeys and wild boars have been increasing in the village after all the villagers evacuated. Wild boars are messing up farmlands, which adds difficulty to the decontamination. In Europe, contaminated wild boars still roam around since Chernobyl.
- We have been capturing wild boars for dissection to measure cesium concentration in the internal parts of the animal.

Cesium concentration in wild boars in 2012-2013

Cesium does not concentrate at some specific organs but it is distributed throughout the body. Muscle is the most concentrated region for having over 15, 000 Bq/kg in 2012.



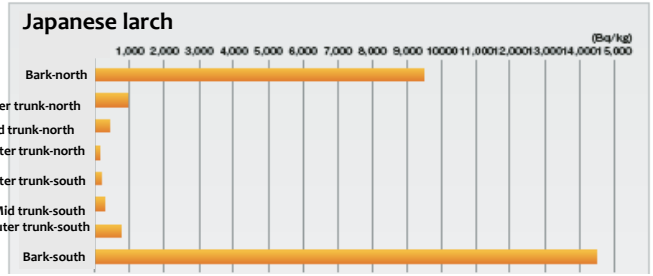
Since wild boars move in a very wide area, these data do not represent the place where the wild boars were captured. These data do not show the annual change because of few samples

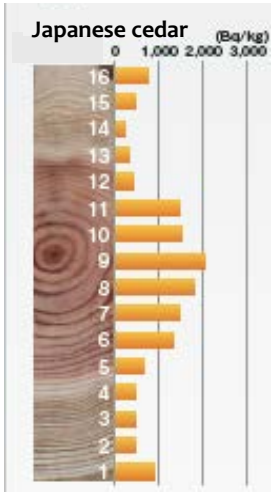
3. Examine the conditions of animals and plants

Wood to be used for lumber

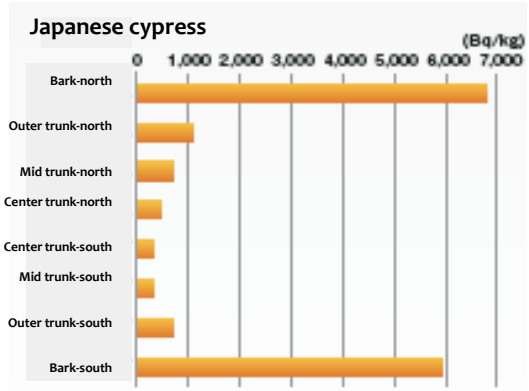
Cesium concentration in wood (Oct-Dec 2014)

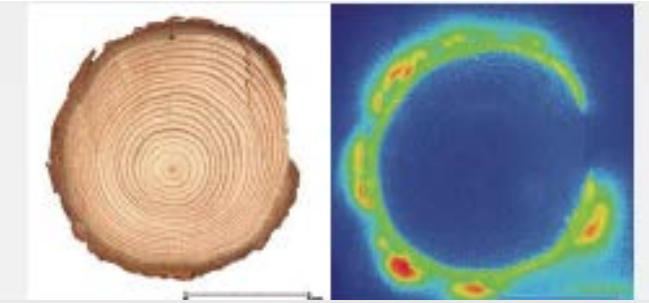
Cesium concentration in the bark was more than 10, 000 Bq/kg in 2012.
100 – 2,000 Bq/kg of cesium was detected at the trunks.
Cesium concentration varied on tree locations, species, etc.
Some trunks showed higher concentration at the outer part and others showed some at the center. The reason/mechanism is still not clear.





Note: bark was not included in the measurement scope





Photos of measurement sample and imaging plate

The imaging plate was exposed by the radiation from the sample, which shows the strong radiation at the bark

4. Examine radiation and radioactivity levels around the village

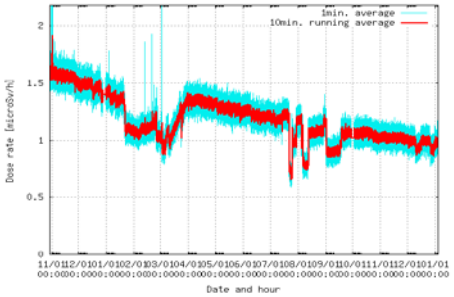
Radiation Measurement

Collaborative project among villagers, volunteers, High Energy Accelerator Research Organization, and the Graduate School of Agriculture and Life Sciences of the University of Tokyo

Developed radiation monitoring device

The device has incorporated GPS into a radiation meter so that the dose rate in combination with location data can be measured and recorded

Radiation monitoring at fixed points



Developed radiation mapping system

For the purpose of understanding the overall contamination picture, dose rate measured by villagers are plotted on the map

A set of weather data and radiation data is recorded and transmitted to a server via 3G network on a daily basis. A solar panel incorporated in the system is the power source.

4. Examine radiation and radioactivity levels around the village

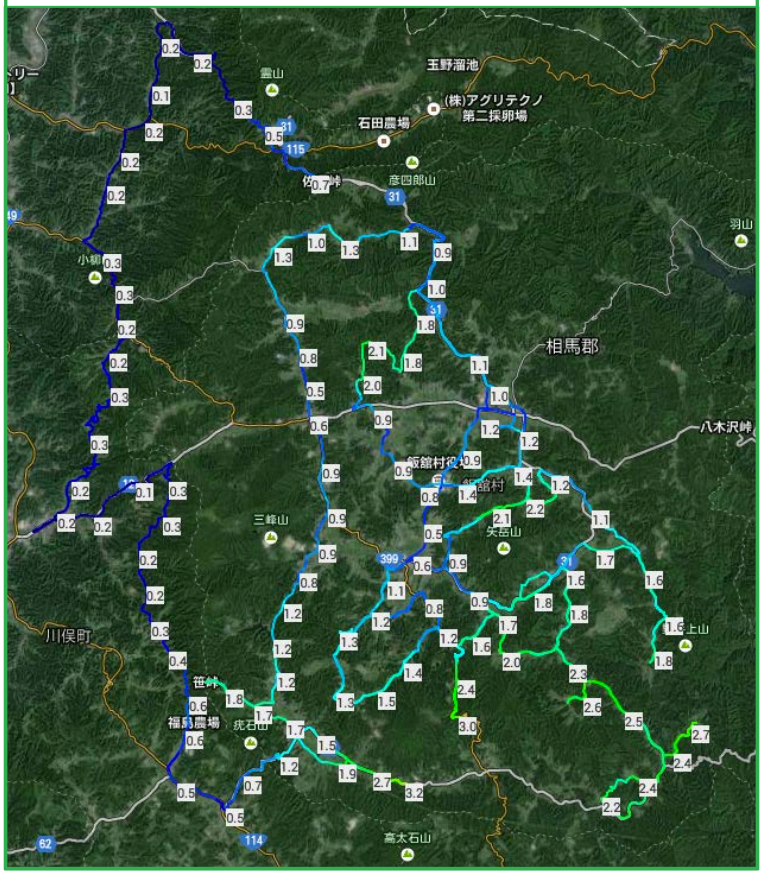
Special cars solely for radiation monitoring

Radiation monitoring of the entire village was started in 2012 without a specialized monitoring car.

A couple of the dedicated monitoring cars were implemented in 2014, wherein all the monitoring-related equipment is kept on stand-by. Using the cars, the volunteers and villagers have been collaboratively monitoring around the village on a regular basis.

The monitoring car with a driver who is from the Resurrection of Fukushima

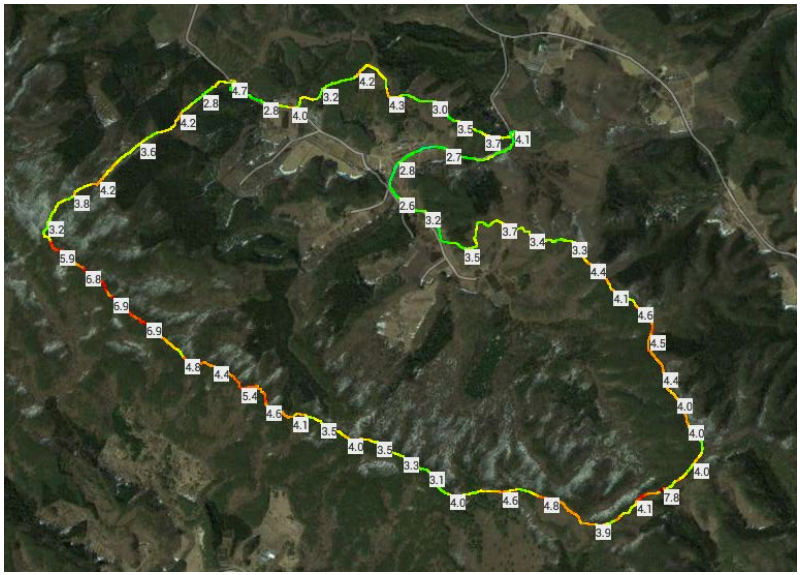
An air dose rate map around Iitate village, measured by using the monitoring car



4. Examine radiation and radioactivity levels around the village

Radiation measurement in farmlands and mountains by walking with the radiation monitoring instrument in the backpack

Dose rate measurement in a mountain

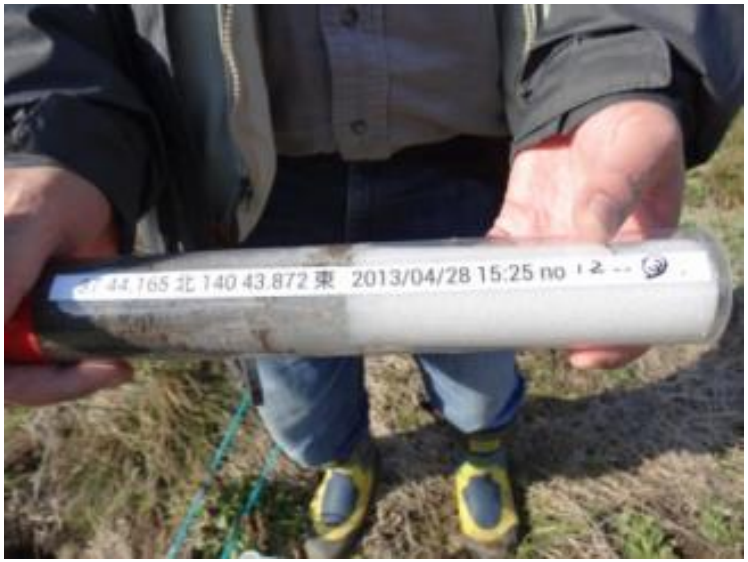


Air dose rate map of Makiba (Komiya)

4. Examine radiation and radioactivity levels around the village

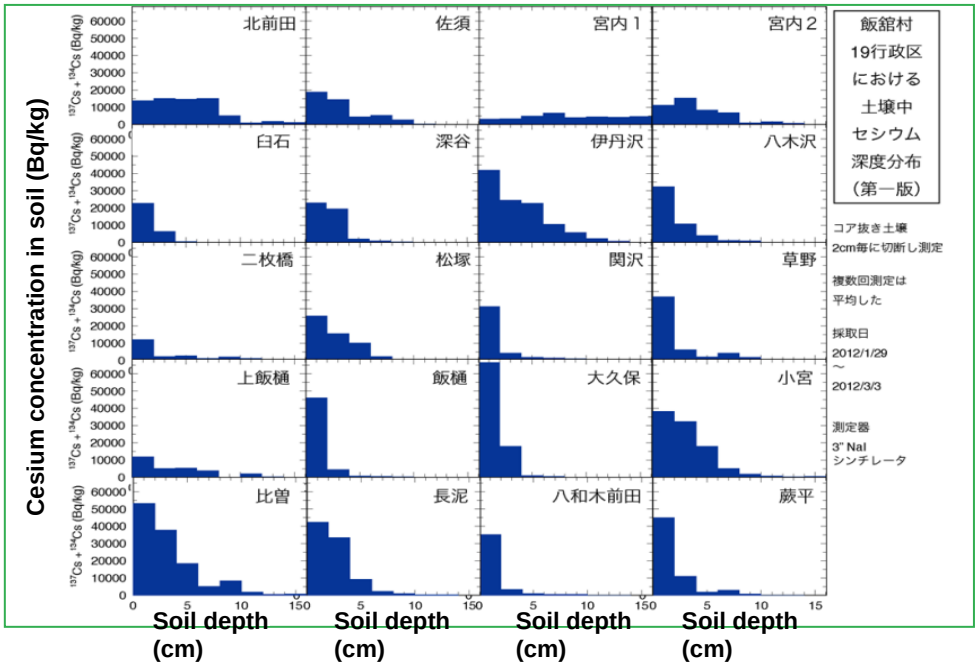
Radioactivity analysis of farmlands

Soil samples were taken at 20 locations in the village, each up to 15 cm depth and cut in every 2cm, then radioactivity was measured individually.



Soil sampling tool

Distribution of cesium in soil at 20 individual locations in Iitate village (the first edition)



Create electricity and heat

A lamp has been lit by installing a tiny hydroelectric power generator, symbolizing “hope of light”

Testing the Eco-stove with the natural fuels from the forests nearby

6. Provide social services to support healthy life

Efforts to provide health, medical and nursing care

Health and medical care team in the Resurrection of Fukushima comprised of medical doctors, nurses, social workers, counselors, supporters, etc. visits the suffering villagers

- Cozy foot massage club at Date Higashi temporary houses
- Medical counseling, manipulative treatment, foot massage, etc. at Matsukawa 1st temporary houses

7. Jointly contemplate future vision of revitalized life

Planted 250 Sakura trees in Kinichi Ohkubo-san's farmland

2013-14 ➡ decontamination (churning process) and experimental rice cultivation

2014 ➡ experimental cultivation of soybean and Soba

April 2014 ➡ planted 250 Sakura trees and observed clusters of dogtooth violet with 130 NPO members/students

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7. Jointly contemplate future vision of revitalized life

Talking over to the world

SGRA study tour, “Let’s go to Iitate village” had its three rounds (October 2012, October 2013 and October 2104)

People visited from Korea, Singapore, Norway, Taiwan, China, the Philippines, Spain, Germany, Hungary, Syria, USA, Japan, etc.

Observed the barricade blocking the road to Nagadoro district

Visited the temporary building for the three elementary school of the village

Meeting at a villager’s home

Swedish delegation for disaster survey

The NPO coordinated the tour around the village by the request of Embassy of Sweden

Meeting at Muneo Kanno’s home

Radiation measurement in a small forest behind a villager’s house

7. Jointly contemplate future vision of revitalized life

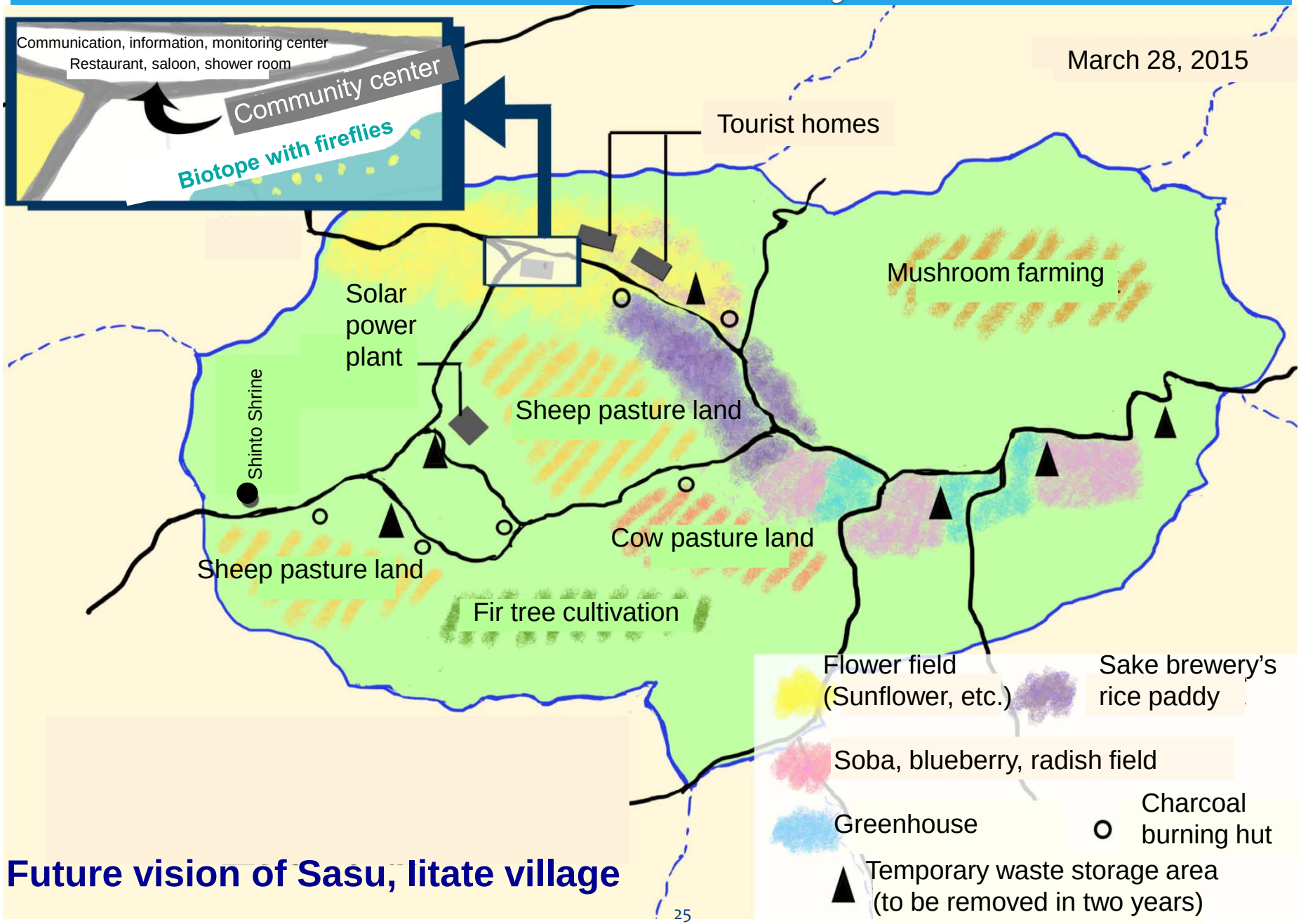
Open forums have been held seven times during the last four years for the interchange between the villagers and people from urban areas.

June 10, 2013

“Let’s talk with litate villagers for revitalization of Fukushima”

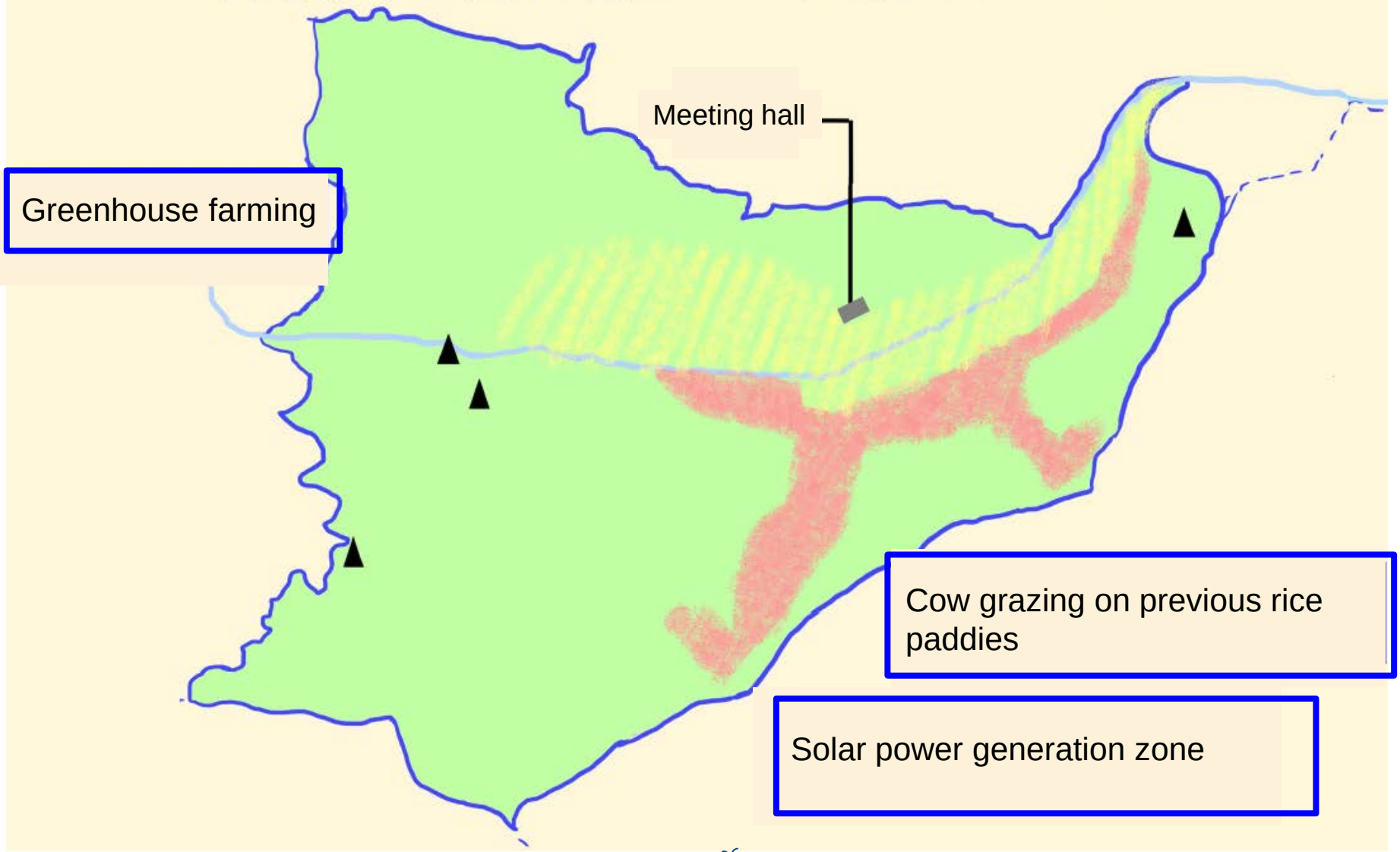
- Venue: Kogakuin University, Tokyo
- Live video on Ustream with over 6,000 viewers

8. Jointly achieve future vision



Future vision of Sasu, Iitate village

Future vision of Matsuzuka, Iitate village



Collaboration Agreement (draft)

飯舘村〇〇行政区と認定NPO法人ふくしま再生の会、東京大学福島復興農業工学会議との飯舘村における
農業復興に向けた連携・協力に関する協定書（案）

飯舘村〇〇行政区（＊＊＊＊区長）を甲、認定NPO法人ふくしま再生の会（田尾陽一理事長）を乙、東京大学福島復興農業工学会議（溝口勝教授）を丙として、甲乙丙の当事者は、次のとおり協定を締結する。
（目的）
第1条 この協定は、福島県飯舘村〇〇行政区における地域再生・農業復興に向けて、甲乙丙が相互に連携・協力して取り組むことを目的とする。
（連携・協力事項）
第2条 前条に基づく連携・協力の内容は、次のとおりとする。
（1）地域再生計画の総合的な推進・協力
（2）地域再生・農業復興に係る技術的助言
（2）地域の社会・産業・文化の発展への寄与
（3）地域づくりに向けた教育及び人材育成に関する取組みの推進
（4）相互に必要な情報の収集及び共有
（5）その他地域再生・農業復興に関し必要な事項
2 当事者間で土地・建物・設備等を貸借する場合は、別途契約を締結するものとする。
3 第1項に規定する連携・協力の実施に当っては、必要に応じ当事者間で協議するものとする。
（有効期間）
第3条 この協定の有効期間は、協定締結の日から平成30年3月31日までとする。
2 前項の期間満了の日の3か月前までに、甲乙丙いずれからも特段の意思表示がないときは、この協定の存続期間は1年間更新されるものとし、その後もまた同様とする。
（その他）
第4条 この協定に定めのない事項又は疑義が生じた事項については、その都度甲乙丙協議して定めるものとする。

この協定の締結を証するため、本書2通を作成し、甲乙丙それぞれ署名のうえ、各自その1通を保有する。
平成27年4月 ＊日　　甲　福島県相馬郡飯舘村〇〇行政区区長　＊＊＊＊
乙　認定NPO法人ふくしま再生の会　理事長　田尾陽一
丙　東京大学福島復興農業工学会議　教授　溝口勝

Before starting “Resurrection of Fukushima”

Encounter with Iitate Village

In June 2011, Yoichi Tao and his sixteen old friends visited the village and offered collaborative support.

Agreed points

- Accident of Fukushima No. 1 Nuclear Power Plant was obviously a man-made disaster.
- Nuclear Power Plant should have the technology to respond to accidents.
- Government should take necessary measures which can help villagers to go back to the village and work the earth with full confidence.
- We agreed to make investigations and experimentations using farmlands, forests, and houses the owners have evacuated.
- This is a world issue, not Fukushima’s only.
- We supply all the data to the villagers, society, and the village office and make proposals for revitalizing Fukushima.

Be onsite, sustainable, and collaborative

Brief overview of “Resurrection of Fukushima”

Objective

- Revitalize life and industries of disaster stricken areas destroyed by the nuclear power plant accident.

Operation

- Managed by volunteers
- Funded by membership fees and contributions
- Became a Specified NPO in July 2012
- Became an Approved Specified NPO in July 2014
- 257 individual members, 6 groups of corporate members (as of January 23, 2015)
- In cooperation with research institutes and university laboratories

Activity principle

- Be onsite, sustainable, and collaborative with victims

A variety of cooperation and collaboration

Cooperating universities and research institutes:

- Graduate School of Agricultural and Life Sciences/ Faculty of Agriculture, The University of Tokyo
- “Circle Madei”, a volunteer group composed of some people from the Faculty of Agriculture of Tokyo University and the civil society
- KEK, High Energy Accelerator Research Organization, Inter-university Research Corporation
- Obihiro University of Agriculture and Veterinary Medicine, Ibaraki University, Utsunomiya University, Tohoku University, and researchers from other several dozen universities
- The National Institute for Environmental Studies

Supporting Organizations:

- Mitsui & Co., Ltd., Environment Fund
- Secom Science and Technology Foundation

Cooperating organizations:

- Iitate Kyodosha LLC.
- An NPO which have been dedicated to cure childhood chronic diseases

Entrusted work:

- Monitoring operation in Iitate village trusted by Iitate village office since fiscal 2012

Empathy & Collaboration

The Resurrection of Fukushima: Characteristics & Keywords

Goal: Recovery of the area
Collaboration
Independent Volunteers
Vitality from the varieties of participants
Knowledge, technics, work experience, network
Breadth of vision
Flexible handling
Detailed care

Power for Recovery
Experience, knowledge, Tradition, culture, wisdom

Villagers

Collaboration against Scattering

Empathy & Collaboration

Resurrection of Fukushima

ふくしま再生の会

Non-Profit Organization

Specialists
Science & Technology

Universities/ Research Institute

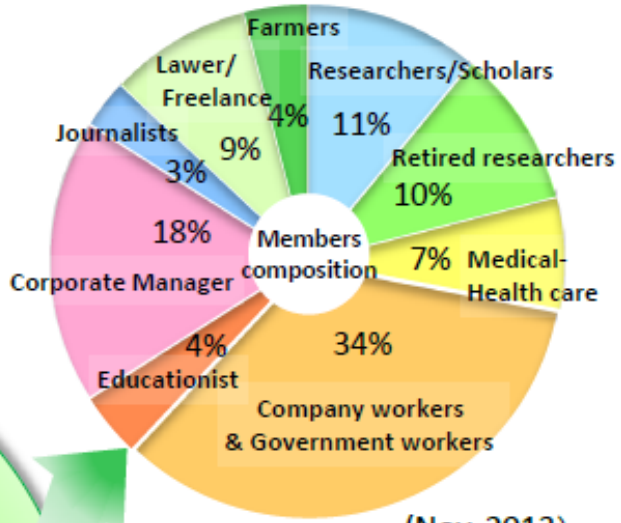
Interdisciplinary Collaboration

Public Service

National Prefectural Local

Overcome Sectionalism & Bureaucratism

Members



(Nov. 2013)

250 Members , 6 Corporate Members Board of Directors : 7 Directors & 2 Auditors

Resurrection of Fukushima, approved specified NPO

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