

Communication & Risk: How can we improve communication of radioactivity and its associated risks with the public?

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- Fishing villages were damaged by earthquake, tsunami, and nuclear accident.
- I have been helping them rebuild their livings.



Ishinomaki



Ishinomaki



Ishinomaki



Ishinomaki



Onagawa



Onagawa



Kessennuma



Kesennuma



- Our bitter experience
 - Communication was very difficult.
 - Trust to the authority was lost easily.



- How can the government and scientists regain the trust of public?

What happened after nuclear accident

- Government and media did not have enough knowledge about risk of radioactive.
- Government and scientists hesitated to release uncertain information.
- Everything was uncertain after unexpected accident.



What happened after nuclear accident

- Official information was limited and often too late.
- Which makes Japanese public frustrated.



The case of “SPEEDI”

- System for Prediction of Environmental Emergency Dose Information, which should be used in case of accident.
 - Cost was more than \$100mil.
- Japanese Government simulated dose under variety of conditions using SPEEDI.
- Government did not open the result of SPEEDI because of uncertainty.

Output of SPEEDI



内部被ばく臓器等価線量

日時 = 2011/03/12 06:00 -
2011/03/24 00:00 の積算値

領域 : 92km X 92km
核種名 = ヨウ素合計
対象年齢 = 1歳児
臓器名 = 甲状腺

【凡例】

線量等値線 (mSv)

1 = 10000

2 = 5000

3 = 1000

4 = 500

5 = 100

(評価)

本試算は、福島第一原子力発電所の事故発生後、連続して一日中屋外で過ごすという保守的な条件を仮定して、甲状腺の被ばく線量を試算した

- The result of SPEEDI was not shared with local administration.
- Many people evacuated to radio active pathway.
- After strong criticism, government admitted their mistake and open the result in May.
- This delay led to widespread mistrust.

Scientists hesitated to communicate with public

Message of Meteorological Society of Japan

2011 年 3 月 18 日

日本気象学会会員各位

日本気象学会理事長
新野 宏

このたび発生した東北地方太平洋沖地震とこれに伴う津波では東北地方・関東地方に未曾有の被害が生じました。これらの地域にお住まいの皆様のご無事をお祈り申し上げますと共に、被害に遭われた皆様には心よりお見舞い申し上げます。また、困難な状況の中、救援・復旧に総力を注がれている皆様に深い敬意を表します。

今回の災害は、私達に2つの重大な教訓を与えたと思います。第一は、災害は想定を越えた激しい現象によって起きること、第二は日頃から十分な防災訓練や対策を行っていても現実の現象の前では十分機能しないことがあることです。二度とこのような災害を繰り返さない防災体制や防災教育をいかに構築していくかは、当学会が関わる多様な気象災害においても共通の課題であり、私達は今一層真剣に取り組んでいく必要があると思います。

今回の地震災害の影響は、今後も長く継続していきます。避難所に避難されている方々

“ Release of **uncertain** information by the member of the Society may **confuse** public and disturb information disclosure of the Government.

MEXT has reliable forecasting system for radioactive and will give appropriate advice.

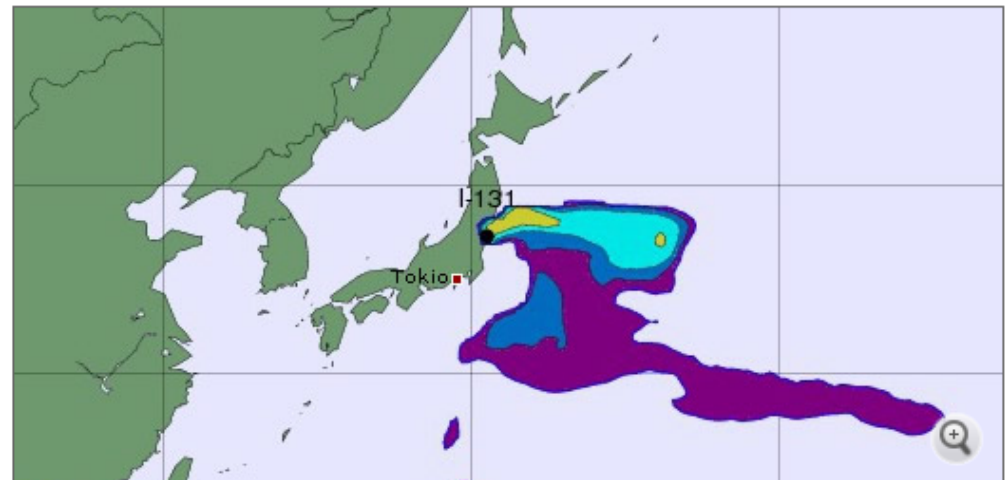
The basic of anti-disaster is release of **reliable sole information** and act based on it. The member must keep it in mind and react appropriately.”

Other societies were about the same

Silence of scientists frustrated public

- Even if it was based on the good will to help the troubled government, it discouraged the voluntary risk communication.
- Japanese public checked website of Austria.

Animation: Windprognose



SPIEGEL ONLINE / ZAMG

Accumulated radioactive emission

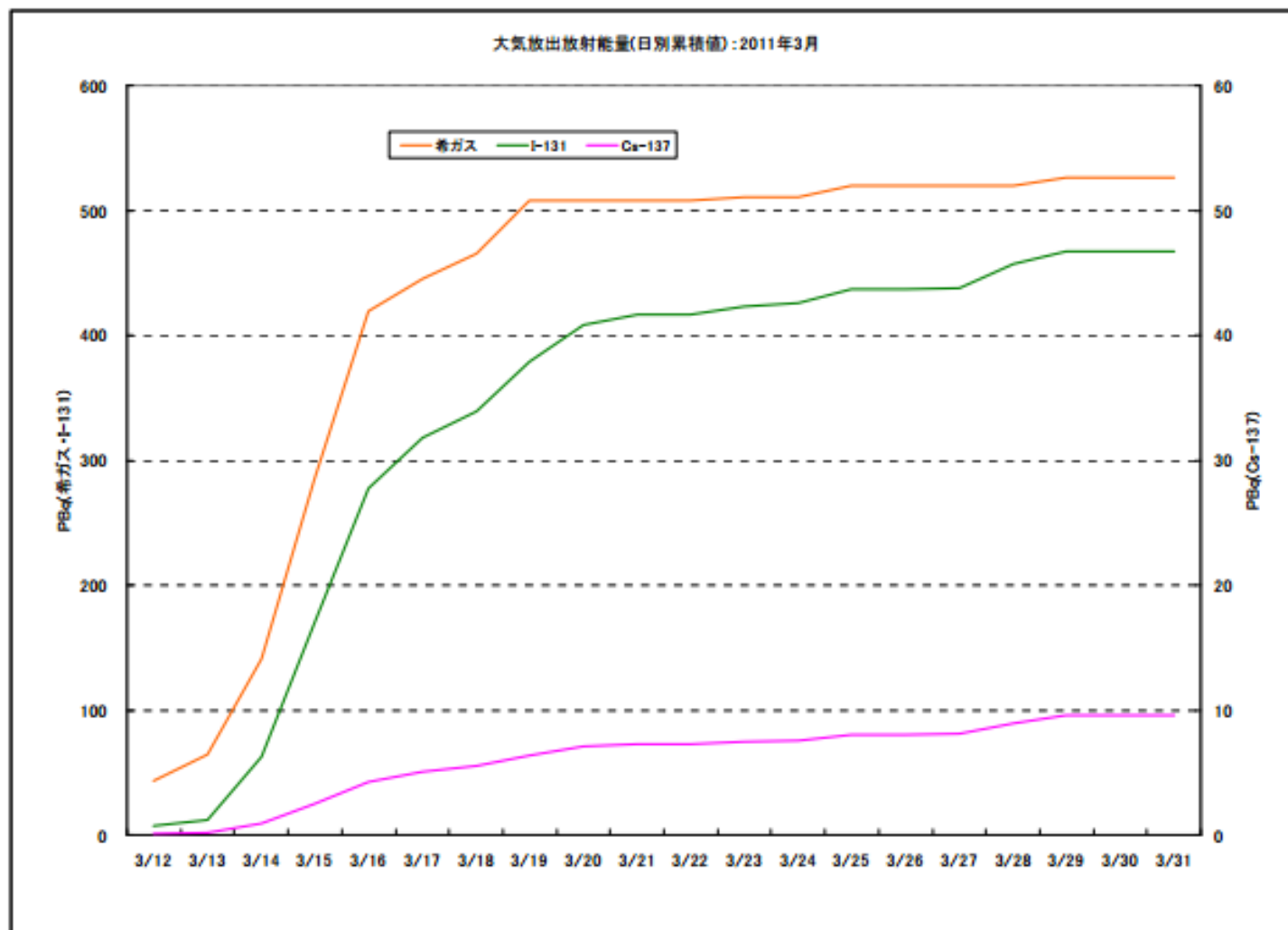


図 27 経時変化 (放出量の累積値)

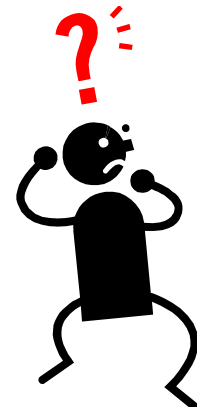
- Japanese public were disappointed to Japanese government and Japanese scientists, who did not give them information they needed.



Is there reliable sole information ?

- Uncertainty will not disappear.
 - The volume of emitted iodine and cesium is still uncertain.

Time will not tell all tales.



- Authority and scientist must communicate with public based on uncertain information.

‘Uncertain information’ should be open ?

Open it



- ☐ Misunderstanding
- ☐ Confusion
- ☐ Confusion will be temporal
- ☐ Credibility is OK

Close it



- ☐ Lack of information
- ☐ Confusion
- ☐ Credibility was damaged
- ☐ Long lasting stress and distrust

Closing information is risk and cause confusion

Another mistake by authority

- Fisherman's cooperative of Ibaragi prefecture declared safety of their seafood 2 April 2011.
- Highly contaminated fish were found **two days later**.
- Shizuoka prefecture declared safety of their green tea.
- **The next day**, contaminated ($>1000\text{Bq/kg}$) Shizuoka green tea were found at France.

Safe declaration backfired

- Credibility of “Safe declaration” was lost.
- Measurement of radioactivity of food needs special equipment.
- Many Japanese still avoid food from eastern Japan, even if authority said the risk was low.
- Poor risk communication damaged food industries



Chain reaction of distrust

Government said 'Japanese nuclear power plant is safe'.



The result was severe accident



Government said 'Japanese food material is safe'.



People become suspicious

Chain reaction of distrust

Government said 'Japanese nuclear power plant is safe'.

The result of the accident

Govt food



The result will be severe health damage?

My personal experience

What I have done.

- I am specialist of fisheries management.
- Almost no knowledge about radioactivity
- I was worried about risk of food contamination, because of my children.
- I learned about the risk for my family personally.

Wide range of knowledge was necessary

1. Physics
 - Basic knowledge of radioactivity
2. Oceanography, Meteorology
 - How radio actives moves
3. Ecology
 - Biological accumulation and migration
4. Fisheries
 - Fishing and eating
5. Medicine
 - Human risk of radiation exposure

Share knowledge with public

- I collected information by personal communication.
- I got a rough picture in April.
- I saw many mothers were worried about food for kids.
- I decided to share knowledge by internet.



Communication with public

- I talked to consumer
 - Coop Miyagi
 - Raddish Boya
 - Daichi wo mamoru kai
- Most people accepted information with uncertainty, if explained carefully.
 - They did not claim perfect information.



What I tried to do is:

- Give public the background information to determine they will eat fish or not.
- I did not show them conclusion.
 - did not say “safe” or “unsafe”.
- Help to choose standard by themselves.

Authority	Standard	What to eat
Japanese government	5mSv/y	Everything in store
ICRP(normal)	1mSv/y	Species and places to avoid
Anti-nuclear group	0.1mSv/y	Species and places to avoid

Collaboration between scientists

- Voluntary network of scientists
 - on SNS (twitter)
- Collaboration on risk communication.
- Next time, we can act more quickly



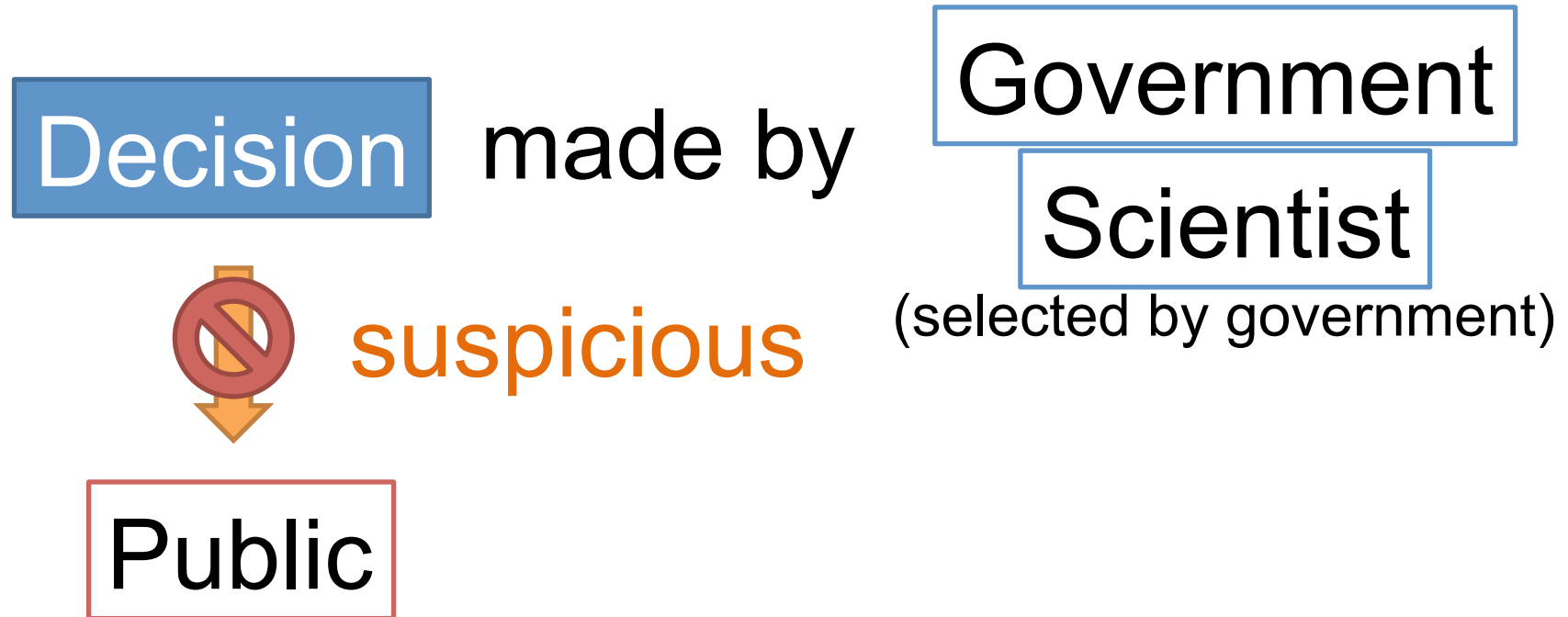
**The next step:
What we should do?**

Japanese decision making before 311

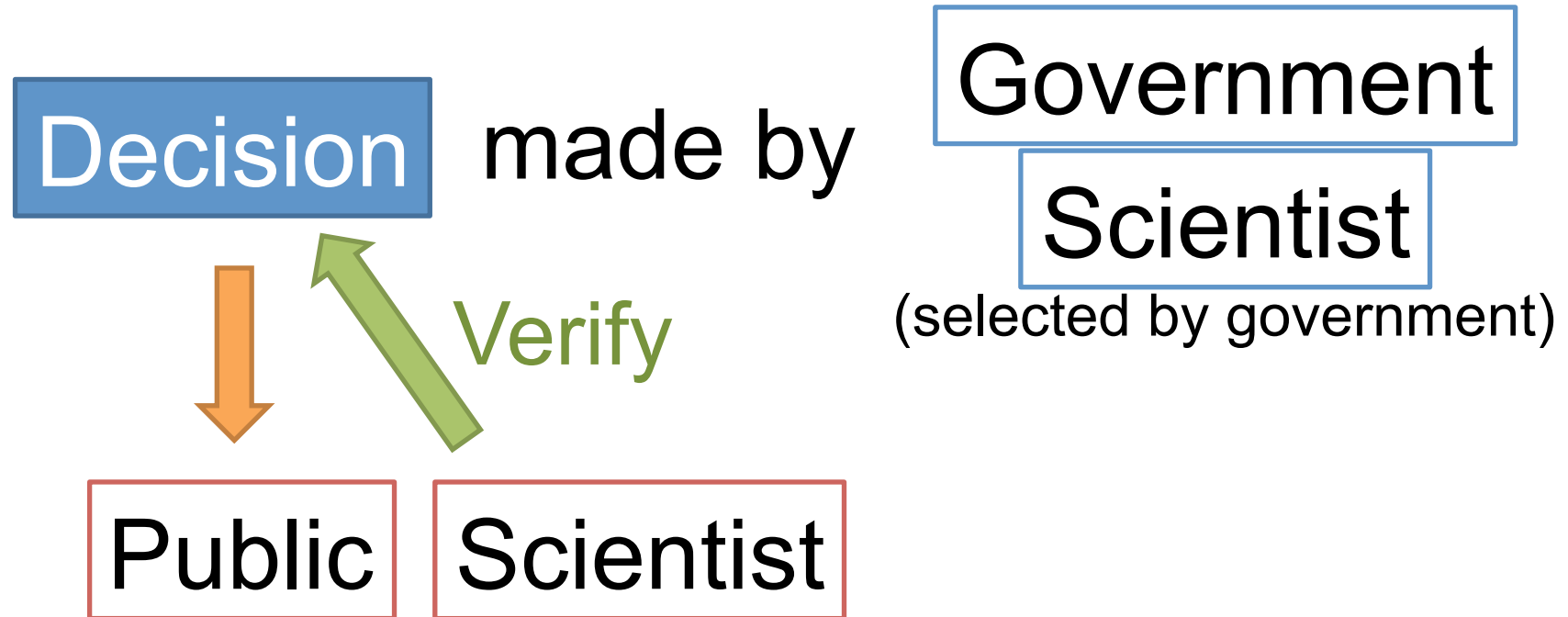


The key element is credibility of government and scientists.

Japanese decision making after 311

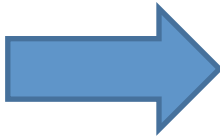


How to recover this system



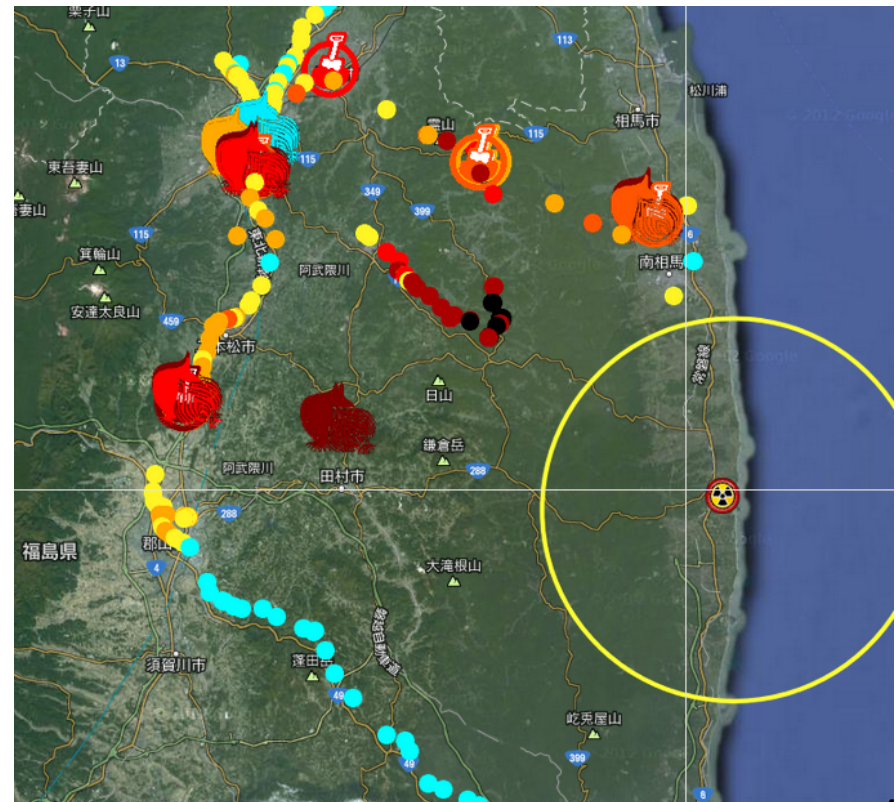
Public needs the help from scientists to verify the decision made by the government

Problem of Japanese risk communication

- What do you do if the only doctor is quack?
 - Follow him
 - Ignore him Risk
- Quack doctor's credibility can not be improved by himself.
- Second opinion of another doctor is necessary.

Greenpeace helped Japanese government

- Greenpeace measured air dose rate around Fukushima.
- The result were consistent to that of government.
- It contributed to regain credibility of Japanese government.



Who can give second opinion?

- Expertise
 - Scientific background
- Trustworthiness
 - Independent to Japanese government

Japanese public needs **scientific NGOs**, which verify the decision made by the government, and makes alternative, if necessary.

- Scientists of other countries can help a lot.
 - because these scientists are clearly independent to Japanese government.
- Public colloquium will be a good opportunity.

Conclusion

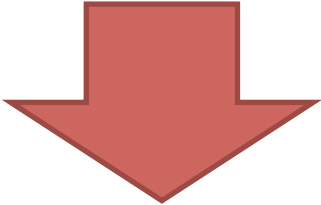
- Japanese government and scientists hesitated to release uncertain information.
- The official release of information was very limited and often too late.
- This made Japanese public frustrated.
- Losing trust made risk communication more difficult

Conclusion

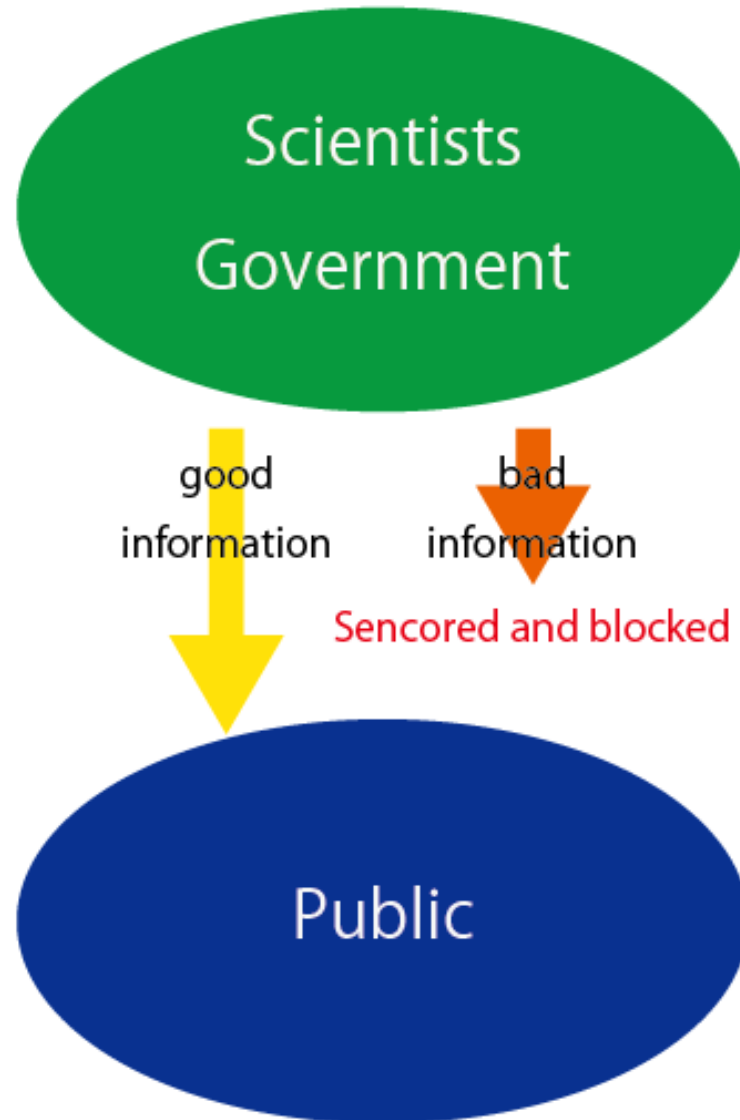
- Authority had to communicate with public even if their information was uncertain.
- Scientists network helped risk communication.
- We need to grow scientific NGOs which will give “second opinion” to public.

We scientists have lot of things to do.
Don't be shy!!



- Scientists role has changed:
 - Educate public to follow the decision made by government.
- 
- Help public verify the decision made by government.

Government tried to public under control



- It is difficult to hide bad information forever.
- Sooner or later, it becomes open.
- Credibility of authorization will be critically damaged by the delay.
- Risk communication of many fields became difficult.

Second opinion for Japanese public?

- Environmental NGO
 - Budget is independent to government
 - Hire many specialists
- 政府関係者が調査に同行
- 同じサンプルを国にも提出

- There is no single reasonable decision for all based on sole reliable information.
- Because
 - Wide range of uncertainty
 - Diversity of value

- Greenpeace applied ocean monitoring around Fukushima power plant by way of Holland government.
- Japanese government rejected.
- They missed the chance to regain their credibility.

Measurement of food material

- Local administration and food industries are involved.
- There is no transparency in the process.
- Public is just informed of the result