

The 2nd International Network for
Government Science Advice Conference:
Science and Policy Making: towards a new dialogue

Cool Heads in Crisis: Based on Japanese Lessons

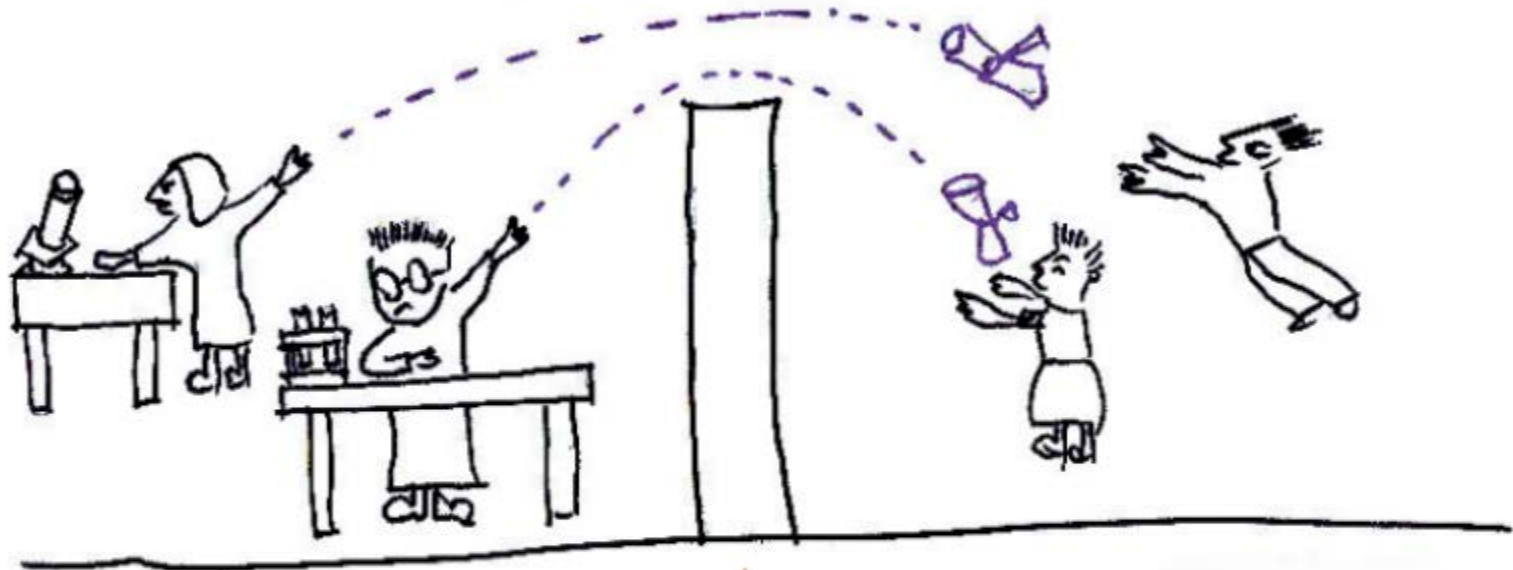
30 September 2016

Satoru OHTAKE

ESRI of Cabinet Office and JST/CRDS

Traditional Relation between Science and Society in Japan (One way and separated)

Knowledge in scientific papers

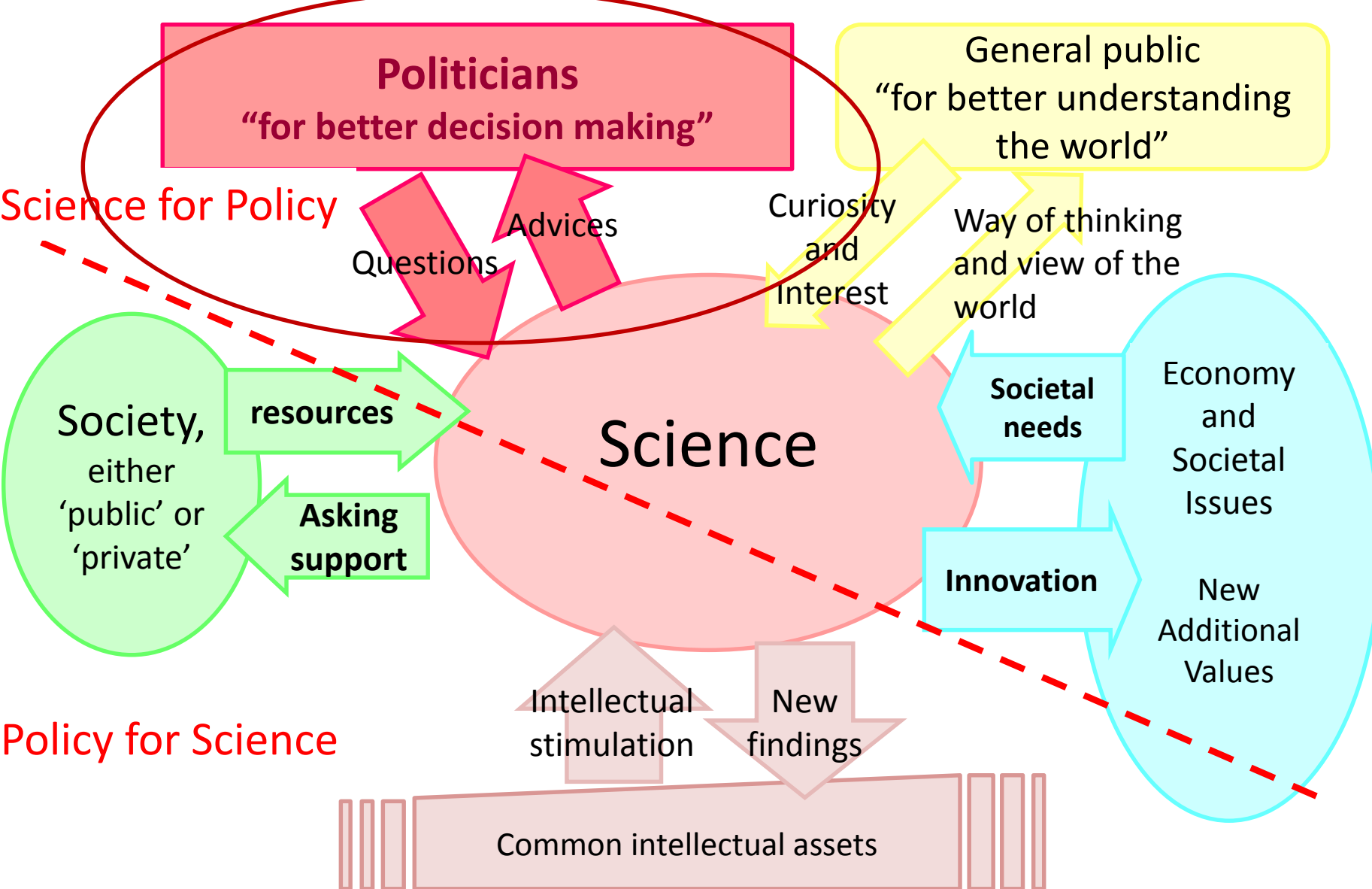


Scientific community
= Discipline-divided research

Society
= Discrete use of knowledge
by people not possessing
an overhead view

thick dividing wall

Relation between Society and Science



11th March, 2011



What happened in Japan in 2011

- * Great earthquake beyond the understanding of mechanism of recent seismology, series of tremors happened by shifting seismic centers.
= Incompletion of science at that time
- * Tsunami killed ten thousand people.
= Alert system failure + lost past lesson
- * Nuclear plant accident
= Man-made disaster by the operator.
While emergency counter-measures in a same type of nuclear reactors near the seismic center worked and no accident happened.
- * Radioactive contamination caused by the nuclear plant
= Confusion brought by less systematic science advices

Problems

- * Seismology:

- * There was a gap between advocacy and public expectation.

- (Ex) Scientists tell us “we are sure that big earthquake of level 7 will happen with 70% probability within coming 30 years”:

- Is this a ‘prediction’ that society pragmatically want?**

- * Tsunami:

- * There might be a possible role of science to remind a forgotten risk.

- (Ex) **One field activity of a professor in a community saved 3,000 pupils’ lives.**

- * Radioactive contamination:

- * Individual scientists advised individual politicians non-systematically with less holistic scope.

- * People were confused and worried by fragmented information.

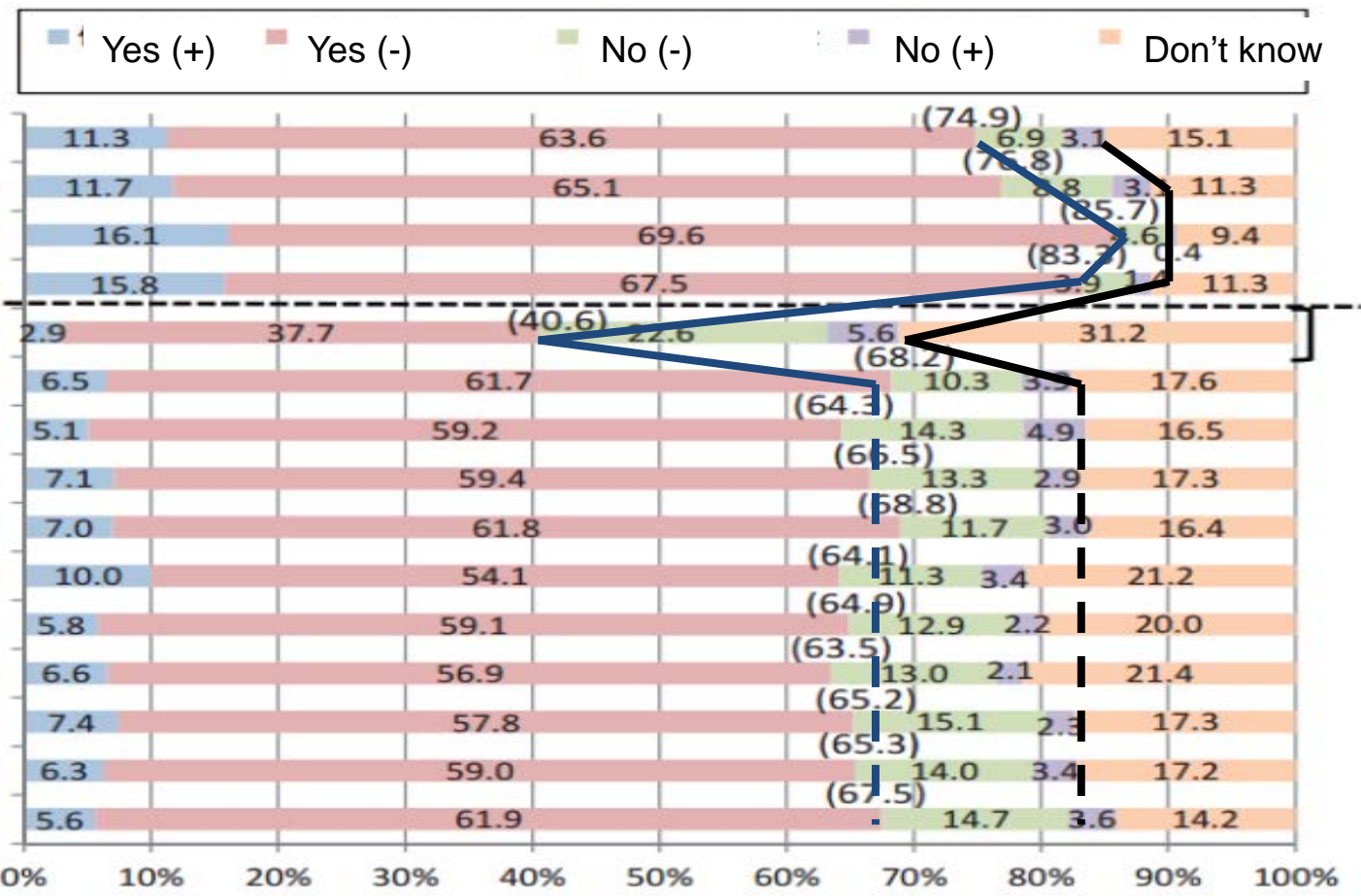
As a result...

- * Interest and expectation in science of Japanese public did not significantly changed. They stayed 'pro-science'.
- * However, public trust to scientists and engineers was lost by 10~20 points after the earthquake.

Do you trust scientists or their explanation ?

Before 3.11

After 3.11

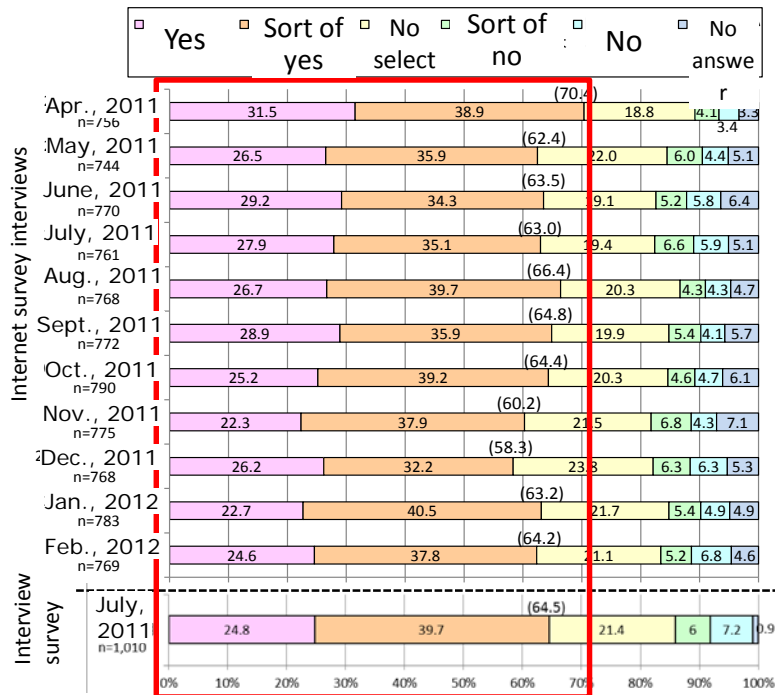


As a result...

- * Interest and expectation in science of Japanese public did not significantly changed. They stayed 'pro-science'.
- * However, public trust to scientists and engineers was lost by 10~20 points after the earthquake.
- * Appropriate communication between science community and society did not realized.
 - * Public did not think that scientists announced their opinions on nuclear power plant accident properly, while they wanted to hear scientists' opinion on nuclear power plant accident.

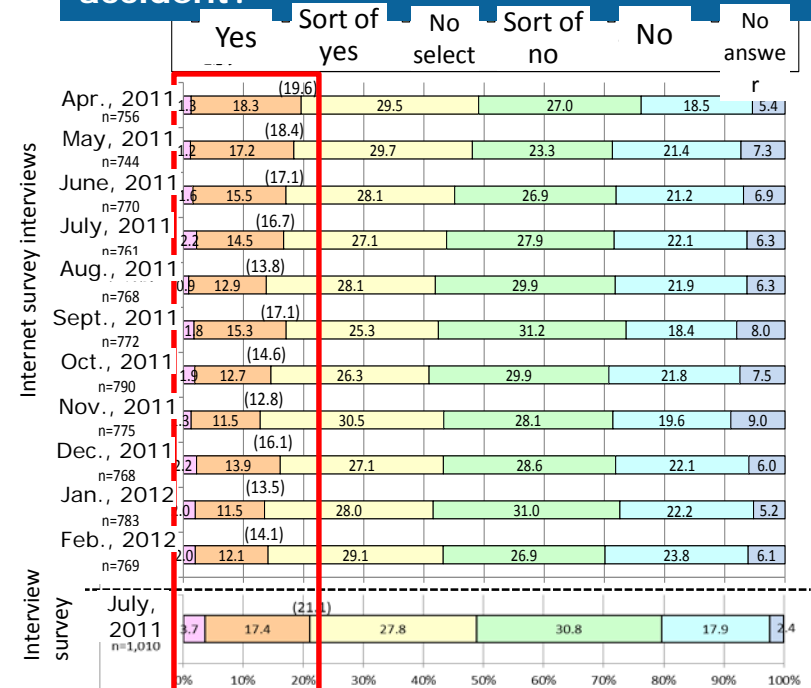
Citizens demand, but scientists do not respond

Do you want to hear scientists' opinion on nuclear power plant accident?



More than 60% of citizens want to hear scientists' opinion on nuclear power plant accident

Do you think if scientists announced their opinions on nuclear power plant accident?



Fewer than 20% of citizens think scientists expressed their opinion on nuclear power plant accident

Source: Study from about the change of public awareness of science and technology (National Institute of Science and Technology Policy: August 1, 2012 Science and Technology Council meeting materials) from processing

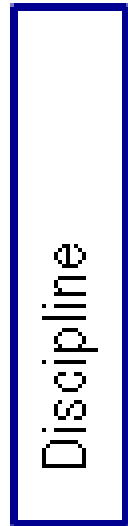
Some features in Japan

- * Democratic society
 - => People have right to decide through politicians.
- * Well-educated public:
 - Senior high school graduate: 97%, university graduate: 56%
 - => People can understand what scientists tell with certain level and do not believe statement simply with the reason experts address it.
- * Advanced information and Communication Technology
 - => People can get scientific information timely and widely.
- * Now in **Responsible Research and Innovation era**, where all the stakeholders should be responsible for science with proportion to their commitments respectively.
- * 'Co-creation' by experts with other stakeholders are needed.

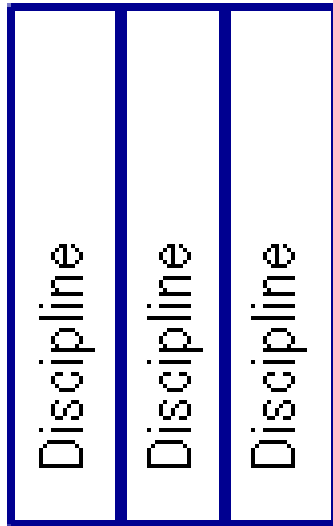
Lesson we learned toward science advices with cool heads in crisis

- * Preparedness in boarder meaning is necessary.
=> Well prepared counter measure to the crisis is not enough.
- * For science community or scientists:
Social literacy able to communicate with public; awareness of importance of co-creation, especially public engagement and transdisciplinarity; change mind set to 'no society, no science' from 'science, then society'

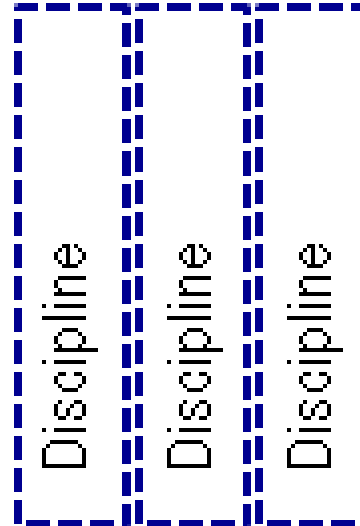
~disciplinary



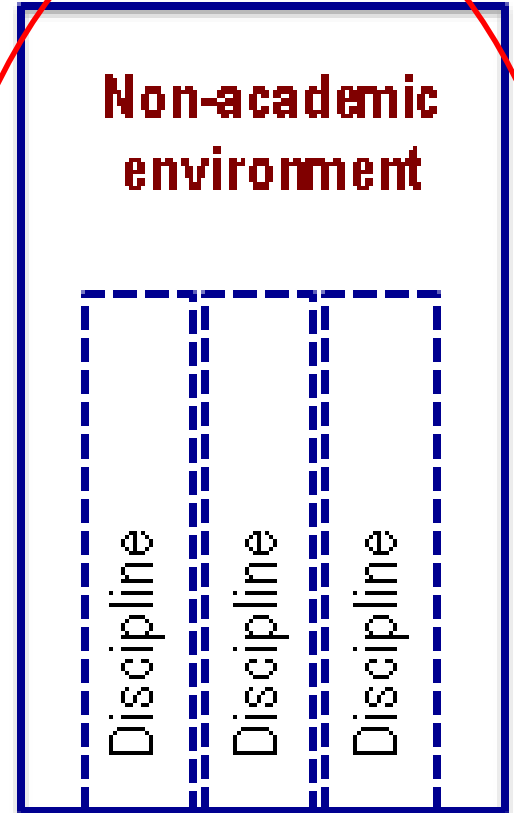
MONO



MULTI



INTER
(within & beyond
fields of science)



TRANS
Science Advices

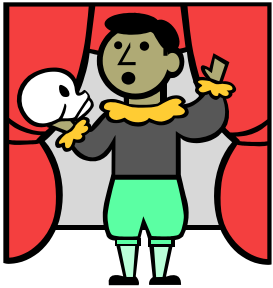
Bunders et al, 2009

Lesson we learned toward science advices with cool heads in crisis

- * Preparedness in broader meaning is necessary.
=> Well prepared counter measure to the crisis is not enough.
- * For Science Community:
Social literacy able to communicate with public; awareness of importance of co-creation, especially public engagement and transdisciplinary; change mind set 'no society, no science'
- * For Society:
Science literacy need to know science is hopeful, but has risk and benefit and never be perfect
- * For Policy makers:
Deeper understanding in typical natures of science: uncertain, imperfect and human nature of scientists
Science provides sometimes solution, but in most cases options.

Two Cultures and Science Advice(SA)

**Policy makers : (Majority) Social
Science and Humanities**



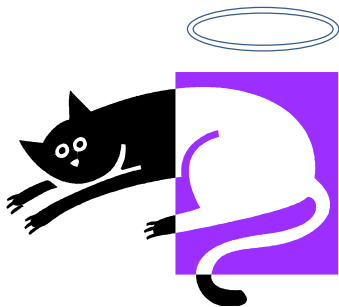
**Hamlet's question
"To be or not to be"**

Decide and take (one) action
← Science advice is one of basis

< World of Reality >

Dos : be aware that science is not almighty
Don'ts : use science as an excuse

**Science Advisers : Natural
Sciences**



**Schrödinger's cat
"Half alive, half dead"**

Science
Advice

Dos : make effort to provide practical solution
Don'ts : distort or neglect the fact

< Depth of Sciences >

Uncertainty
by nature of
sciences

Imperfection of
today's
sciences

Differed
opinions by
Individual
scientists

'Don'ts' list

- * For scientists:

 - 'Policy for science' action pretending 'science for policy'

 - => Taking clear position whether advocator or honest broker

- * For public:

 - '100% of safety or not'

 - 'I understand it, but I don't like it. So I oppose it'

 - => 'I don't like it, but I understand it. So I think about it'

- * For all:

 - Public engagement through science advice process may invite 'populism'.

 - => Independent, evidence based and respected

What followed then in Japan

- * Discussions took place to establish more effective science advice mechanism in the government.
 - * Cabinet Office summarized the report on STI policy promotion, highlighting the role of a chief science adviser in December 2011.
 - * In Ministry of Foreign Affairs, Advisory Panel on Science and Technology Diplomacy summarized the report including the creation of Science Advisor to the Minister on May 2015.
- * Science Council of Japan revised the code of conducts including the proper attitude of scientists to provide advices in January 2013.
- * Ministry of Foreign Affairs appointed one eminent scientist as the science and technology adviser in September 2015.
- * Effort is continuing to improve the quality of science advices of existing advisory bodies including Council of Science, Technology and Innovation and to enhance the public engagement in science like renovation of Science Agora to be like AAAS annual meeting or ESOF.

A beautiful green garden next door: Well-designed and well-worked system

- * British science advice system
 - * One science adviser in each department in addition to Chief Scientists
 - * Network of advisers in crisis:
 - = SAGE(Science Advice Group in Emergency)
 - * Establishment of National Risk Register and the list of experts
- * System worked well to provide necessary advice for British in Tokyo on the occasion of the nuclear accident in 2011.
 - * Evidence based advice with open information and trust worthy
 - * Trust of people realized
 - * Successful in other cases: Volcano ash, flooding, Ebola, etc.

Conclusion

Cool heads in crisis needs daily efforts to encourage

- * public willing to understand science is not perfect today, has risk and benefit to be considered, but essential to modern society,
- * science community to understand the meaning of ‘science with and in society’ and to grow champions working as honest and skilled brokers as well as eminent scientists in generation wide,
- * scientists eager to communicate with public to make clear the limit of today’s science,
- * and policy makers to communicate scientists with their questions, interest and patience.

Building trust between public, policy-makers and science will realize cool heads in crisis.

Thank you very much for your
attention.