

Roles of Scientists and Practitioners

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(CRDS/JST)**

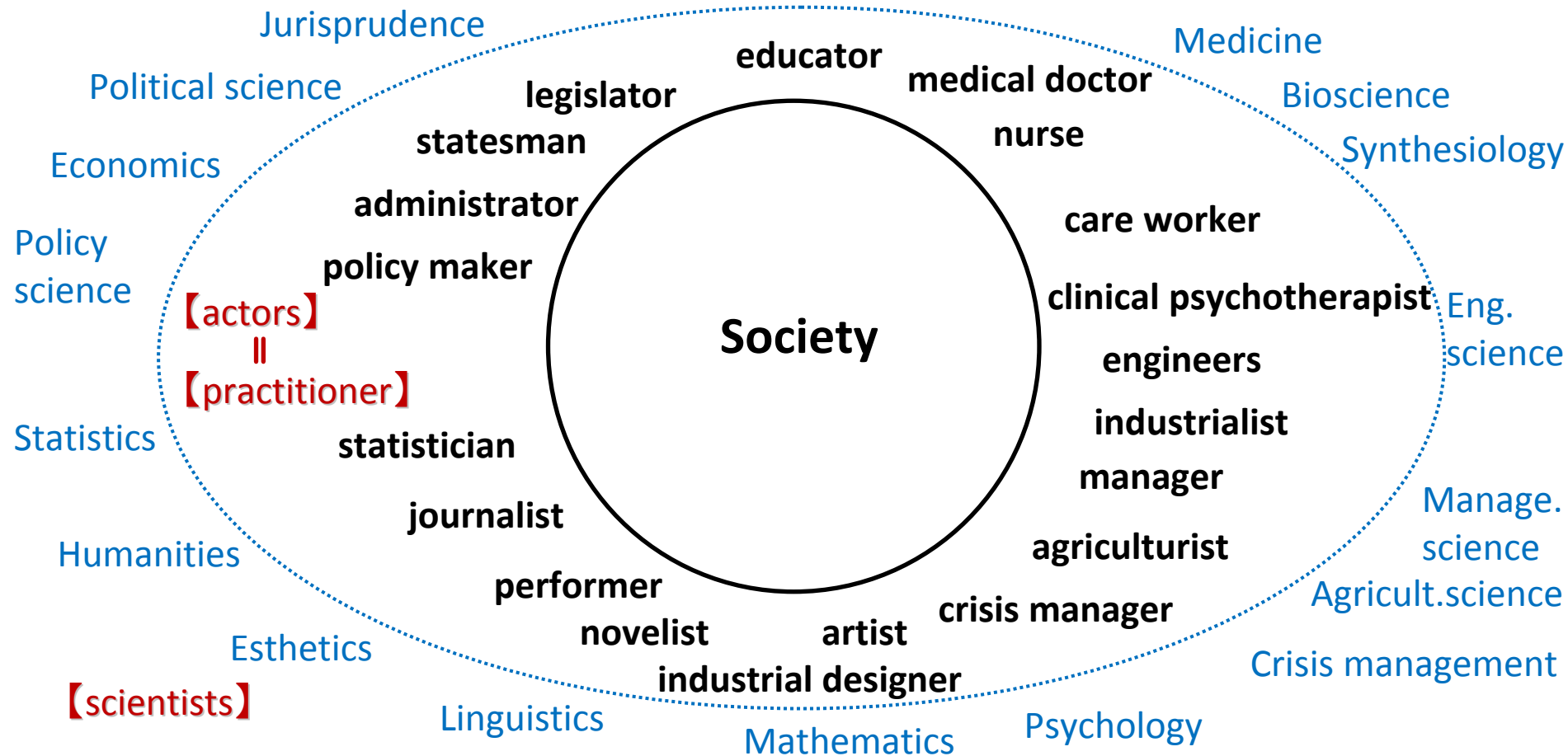
**JST Symposium on
Roles and Responsibility of Scientists in Society
October 5th, 2011 at GRIPS**

1. Advice

2. Research

Social Contribution of Scientists and Practitioners

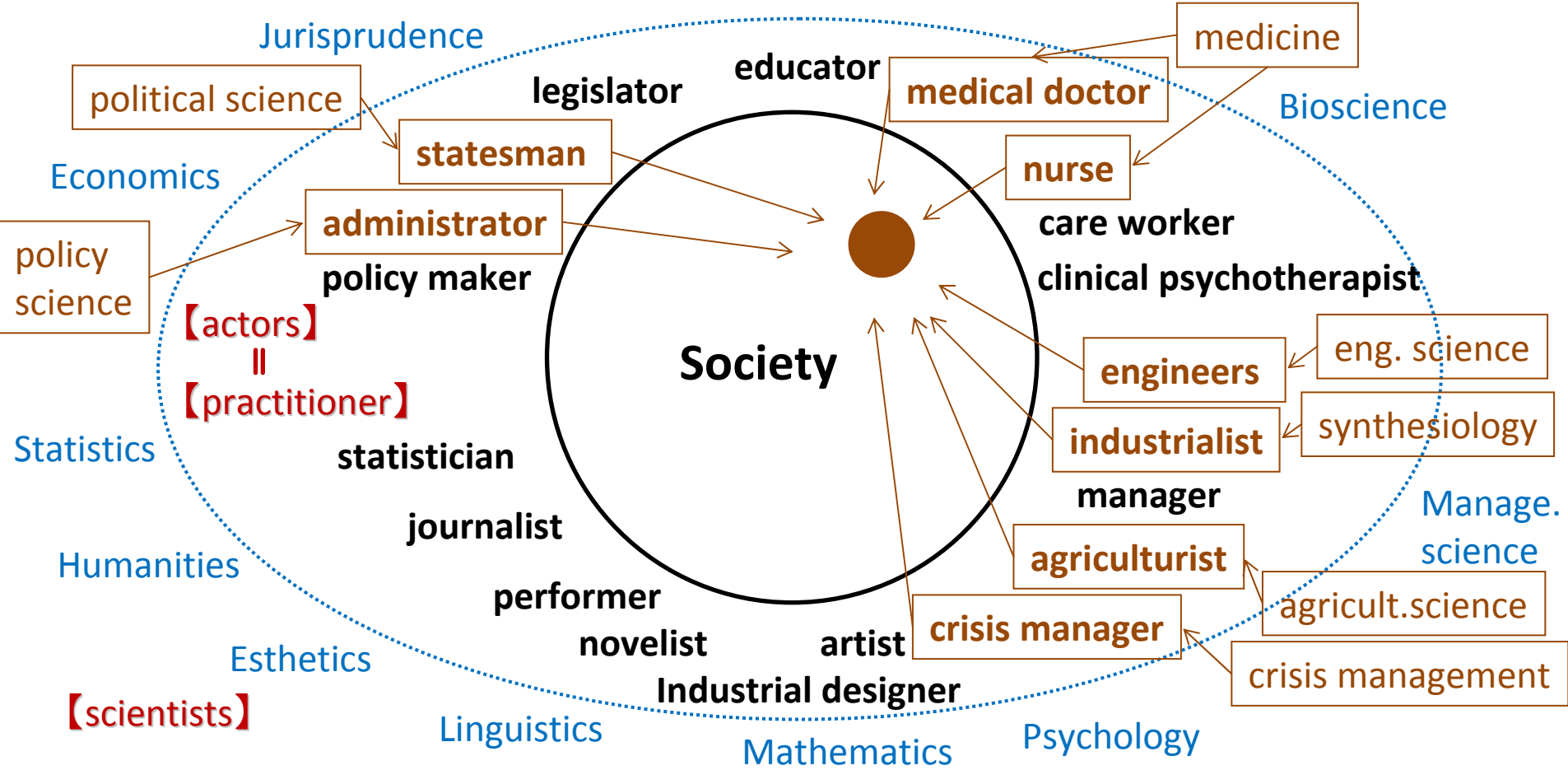
Scientists (researchers) create knowledge and offer it to practitioners.



Society is sustained by contribution of practitioners.

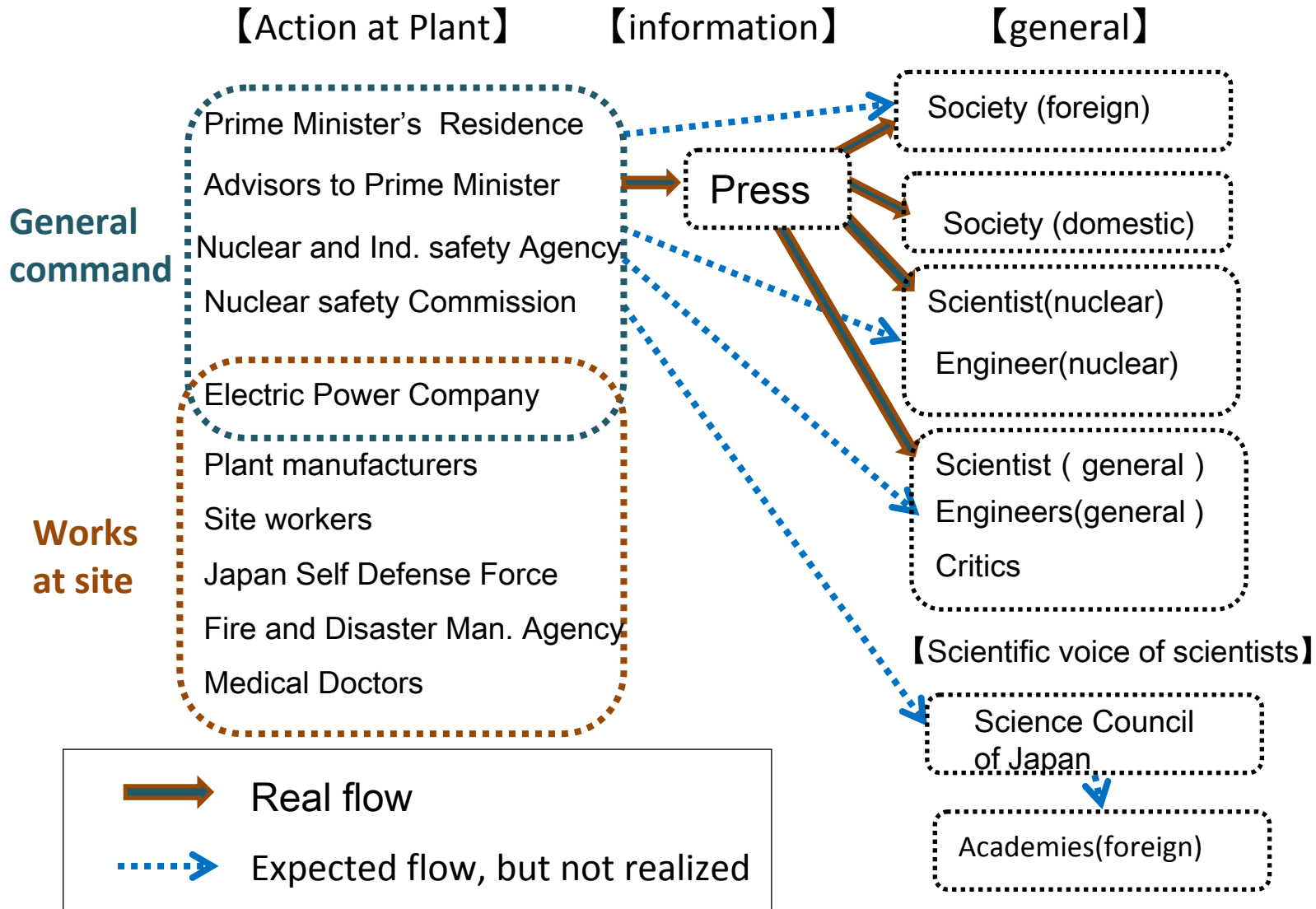
Actions on the Crisis

Scientists (researcher) collect knowledge and advice to practitioners.

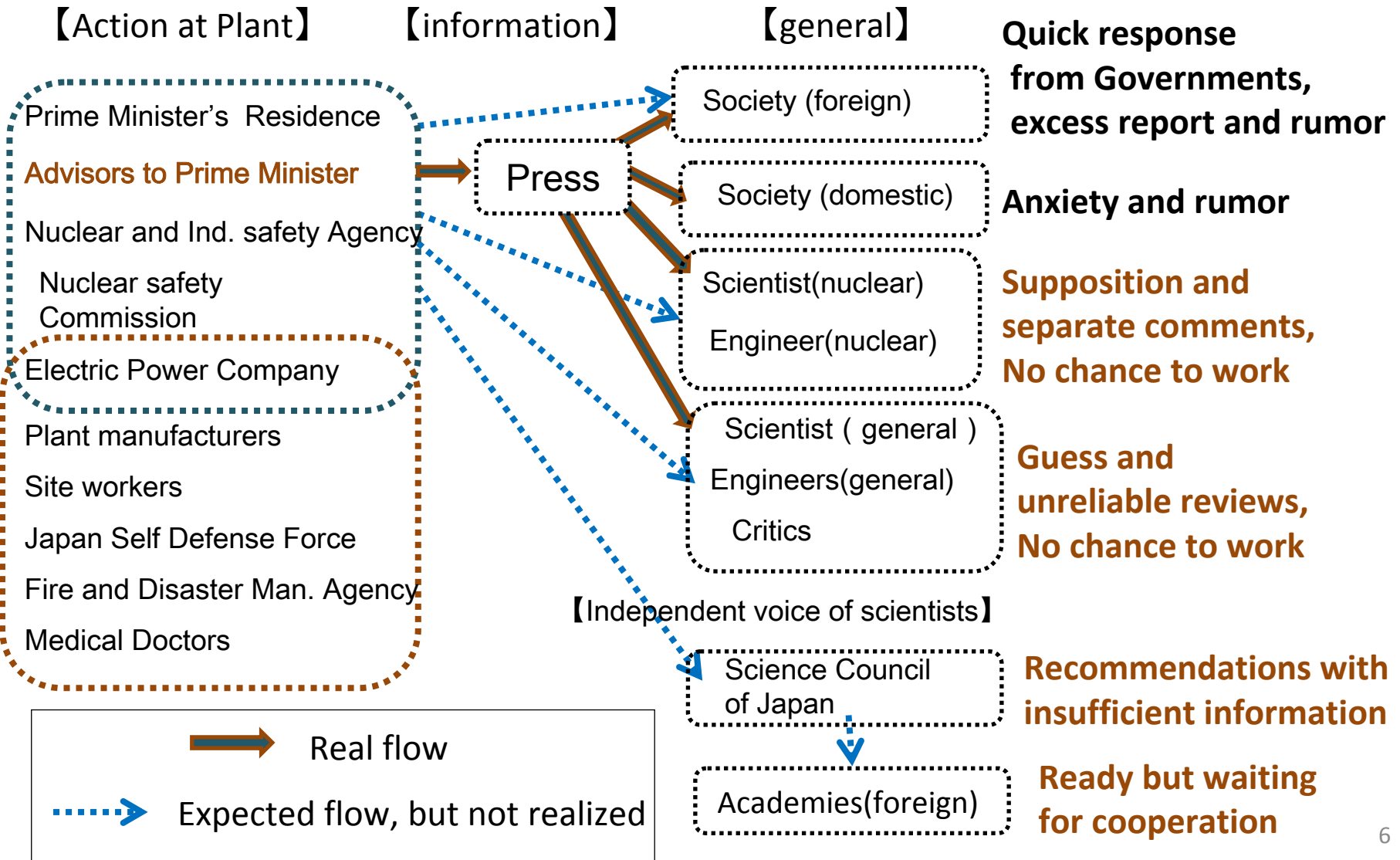


In crisis, practitioners cooperate beyond disciplines.

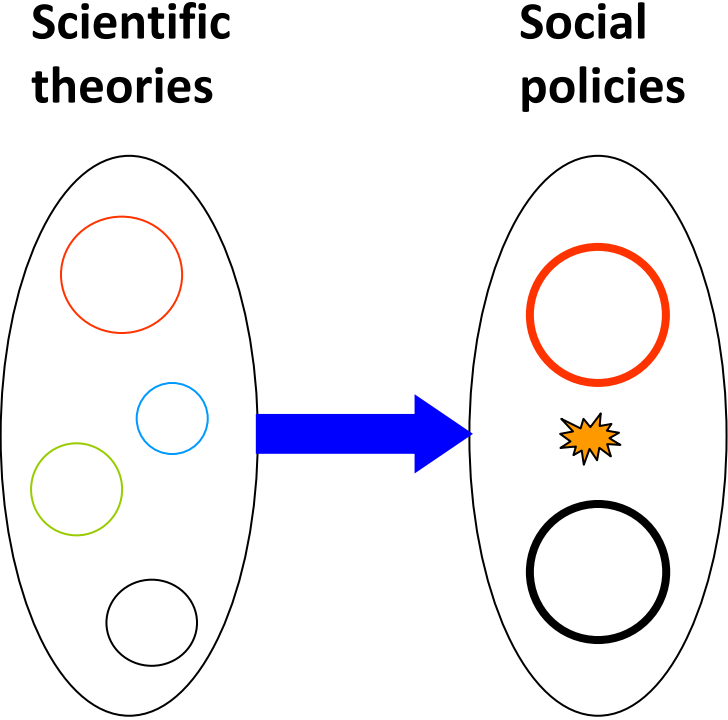
Information Flow at Fukushima



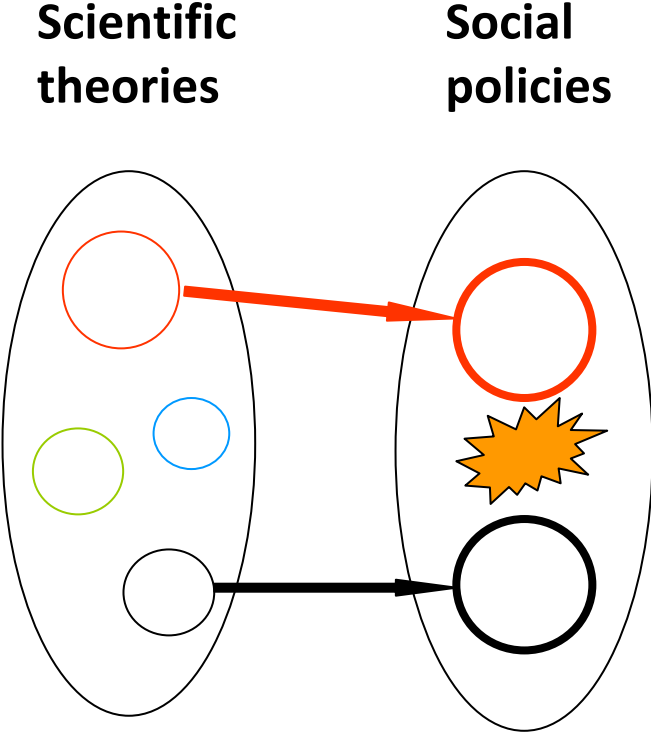
Difficulties in real cooperation



Neutral Advice \Leftrightarrow Independent Scientific Voice of Scientists

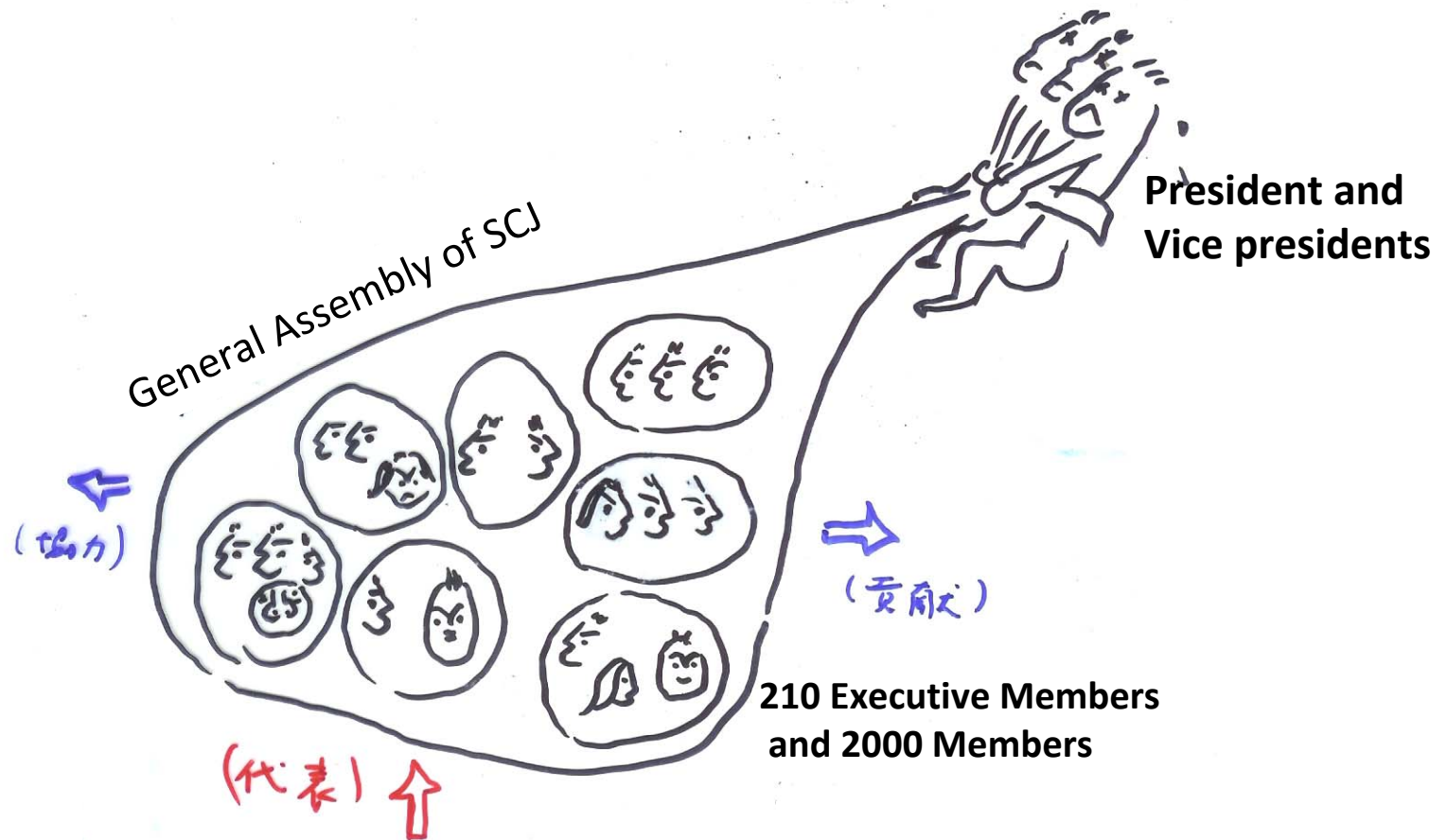


Authentic voice of scientist brings about sober dialogue among policies



Separate advices to policies intensify conflicts among policies

Independent, balanced and non-partisan voice of scientists Academy of Science(Science Council of Japan)




By law, Science Council of Japan is authorized to represent Japanese scientists of all fields: humanities, social sciences, natural sciences, bio sciences, engineering and medical sciences. It tries to develop science and advice to the government and society. 8

Scientist's Voice(1)

Science for Policy

Levels of Advices by Scientist

Science-driven

- 
1. Provide advice on scientific consensus, including conclusions and uncertainties, and the degrees of assurance about the unknowns (**neutral advice**)
 2. Advise on the potential impact that alternative or plausible outcomes may have based on scientific evidence
 3. Evaluate alternative policies and advise on the scientific pros and cons of each
 4. Recommend a particular policy with scientifically based agreement for it
 5. Advice derived from ideologically based argument or vested interests (**harmful advice**)

Policy-driven

(ICSU)

Independent, balanced and non-partisan voice by scientists

Policy decisions are ultimately in the hands of legislators. But science can and should inform policy formulation. What policy makers need from advisors, such as ICSU, **is authoritative statements which identify the limits of scientific knowledge that are relevant to the particular issue. Frequently, there will not be a consensus , but this equivocation in all its dimensions is necessary for the policy makers to understand.** ICSU could provide a major service by setting the different points of view ; on an issue in an objective way, and **it should not shirk controversial issues.** It should help clarify the issues and contribute to public debate about them. (ICSU, 1996)

Cases where Scientific Advices are (were) Needed

<i>Advices for political decision</i>	<i>Advices for salvation from disaster</i>
Organ transplant	HIV-infected blood product
Gene therapy	BSE
Reproduction therapy	Asbestos
Genetically modified food	Endocrine disruptor
Construction of dams	Ozone hole(predicted)
Utilization of resource	Global warming gas(predicted)
Development of energy	Plant accident

Scientist's Voice(2)

Policy for Science

Policies to protect science

Freedom of scientific research – rights and ethics

Rights: Freedom of selecting research subjects

Freedom of move, presentation and of establishing own theory

Independence of politics and religions

Mutual evaluation (peer review)

Ethics: Prohibition of plagiarism, falsification, appropriation and sabotage

Compliance with rules of intellectual property

Balance between researches of basic and applied

Policies to promote science

Request and petition

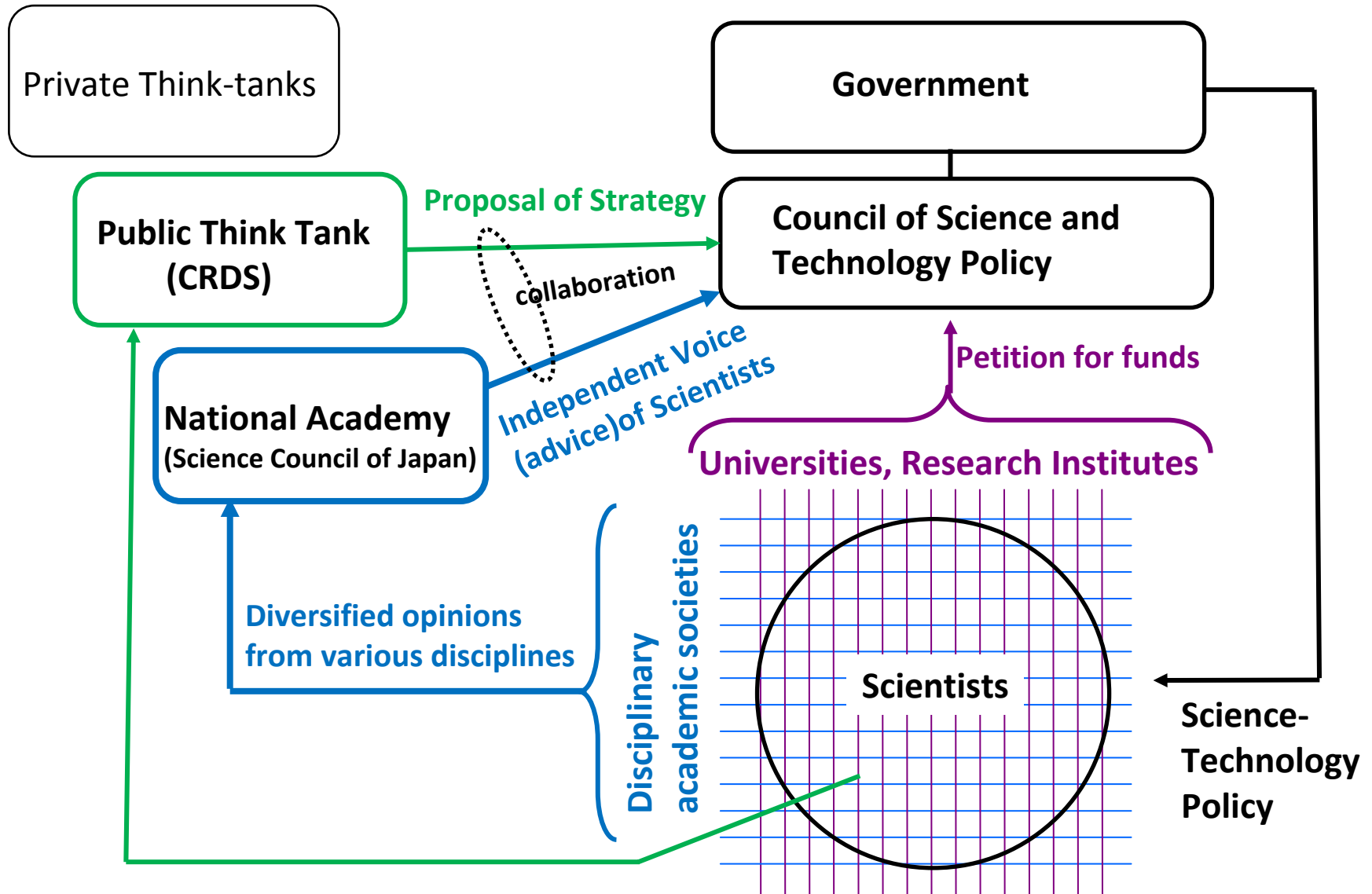
Total budget of scientific research

Allocation of budget (budget for personnel, facilities and buildings)

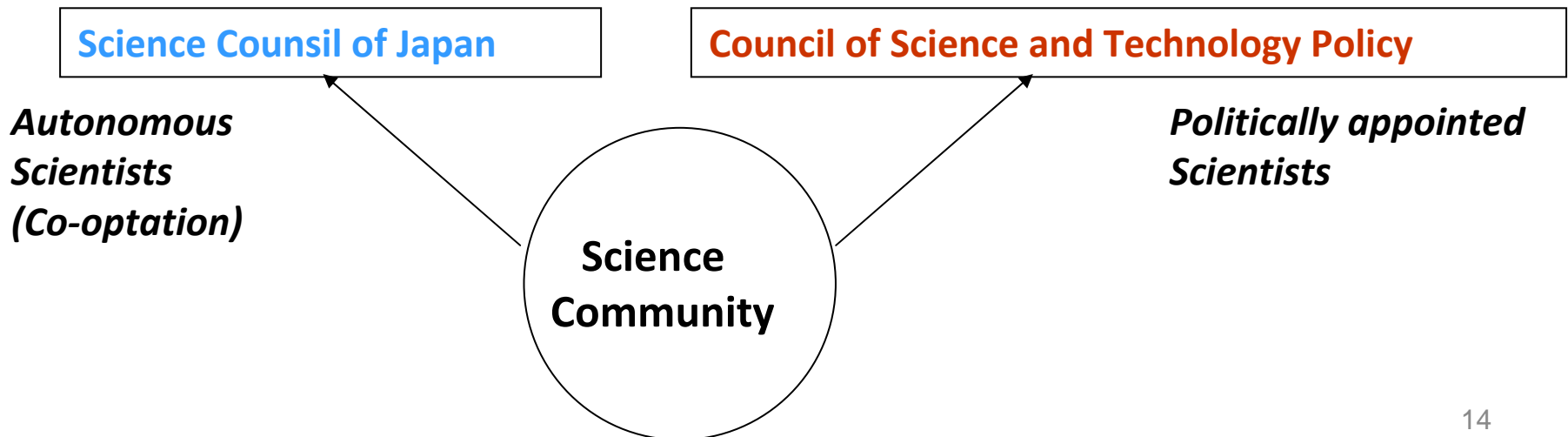
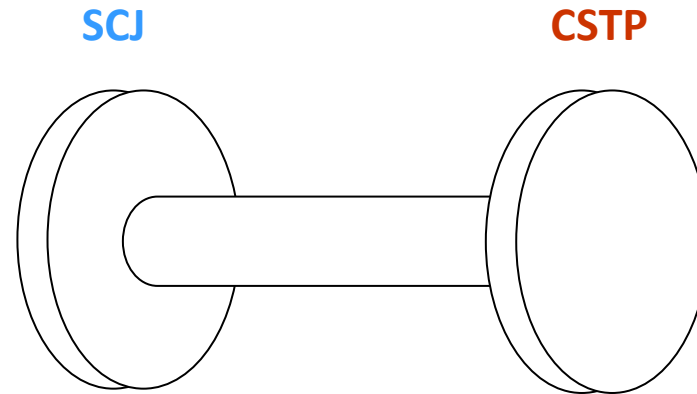
Priorities of research

Strategy and Decision-making for S-T Policy

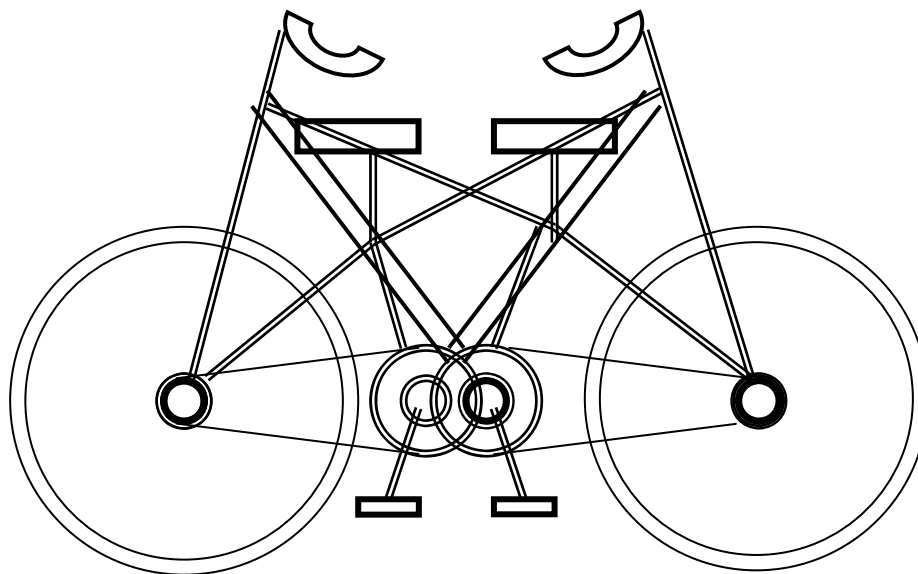
—Advices from National Academy and Public Think Tank —



Science Council of Japan (Academy) and Council of Science and Technology are two wheels on a shaft. (= They must cooperate.)



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Science Council of Japan

Council of Science and Technology Policy

*Autonomous
Scientists
(Co-optation)*

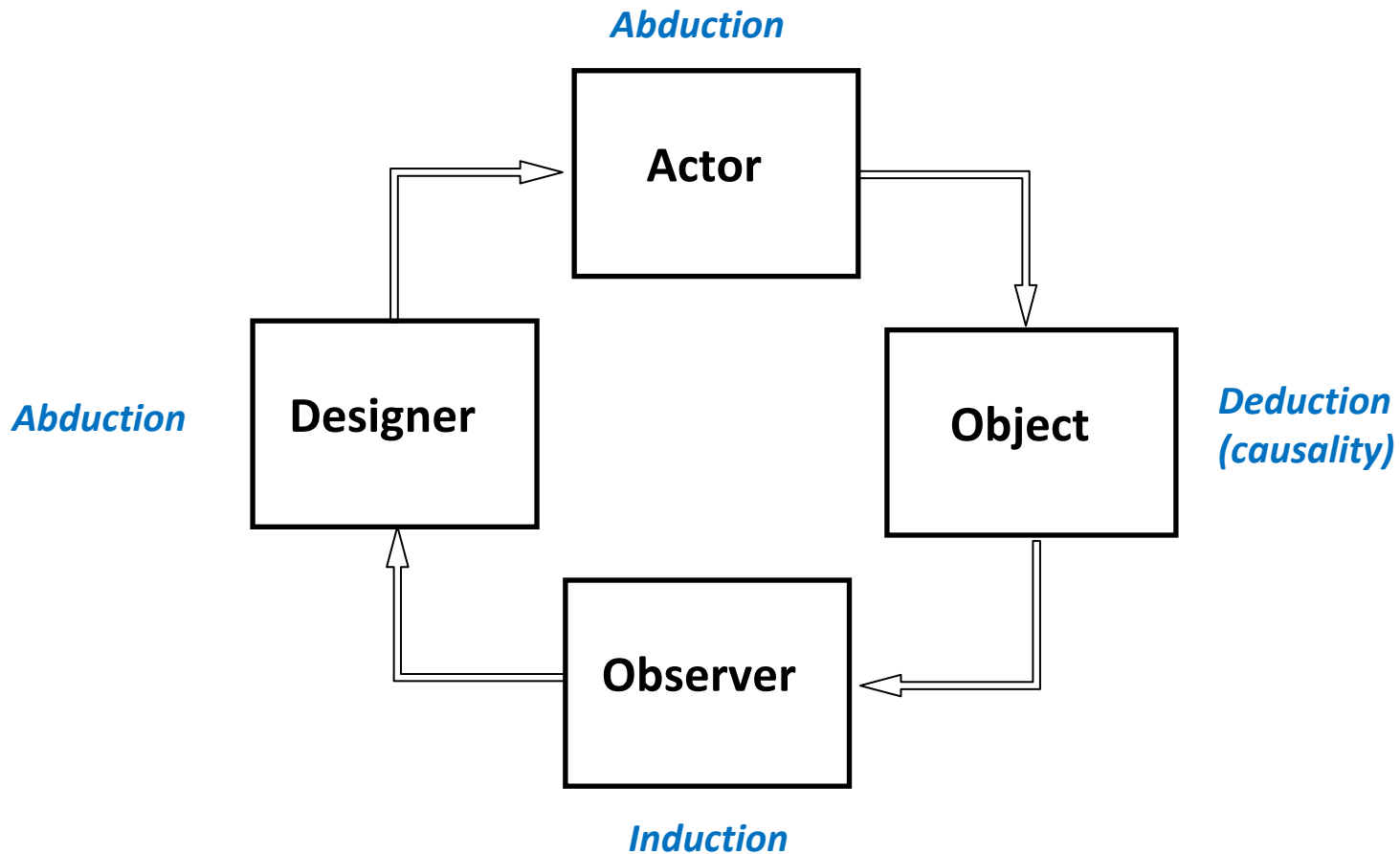
*Politically appointed
Scientists*

**Science
Community**

1. Advice

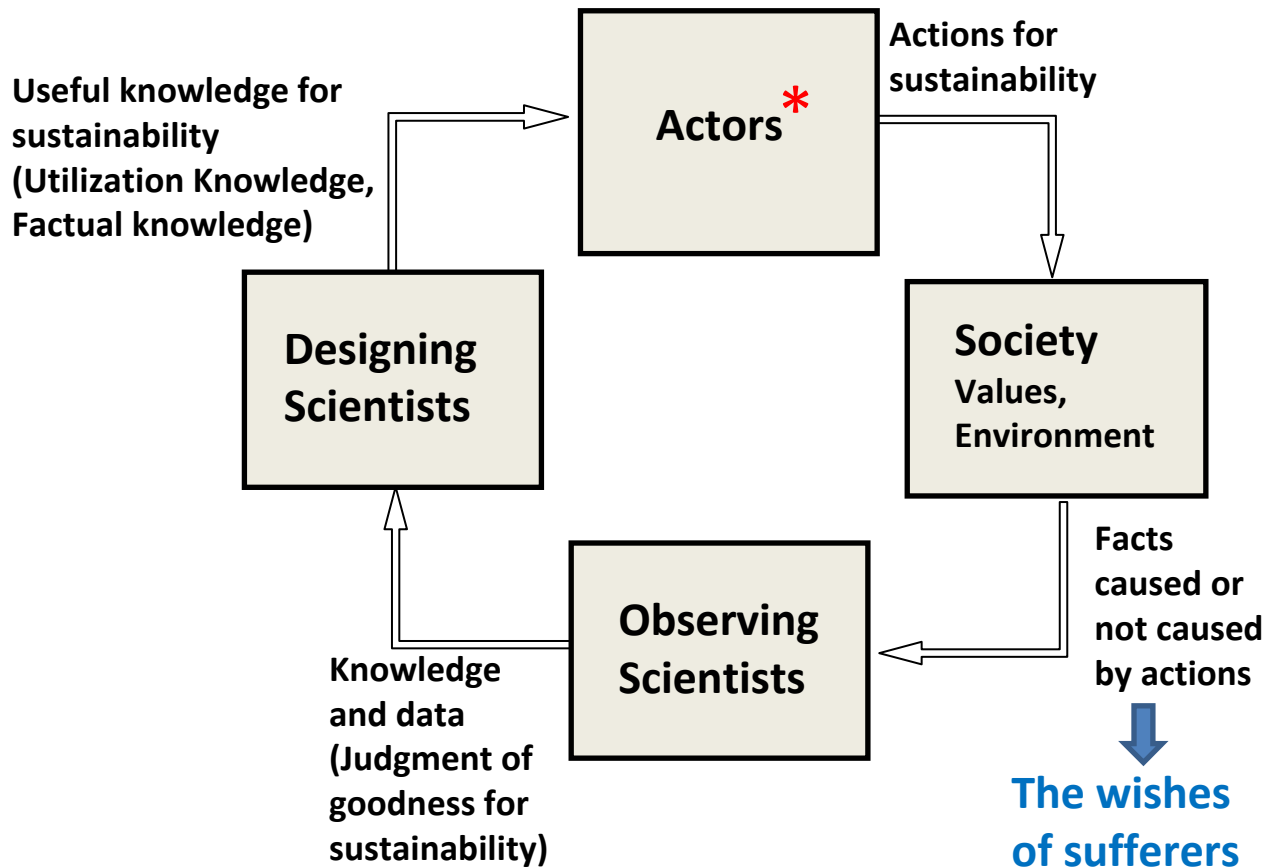
2. Research

A Proposal of Basic Loop for “Sustainable Evolution by Piecemeal Abduction”



Learning from Ferdinand de Saussure (Evolution of language),
Karl Popper (Piecemeal progress by social technology),
Charles Sanders Pierce (Abduction in creative thinking)

Role of Scientists for Sustainable Evolutions of science and society (**recovery from disaster**)



* Actors in Society

are:

statesmen,
policymakers,
business humans,
administrators,
engineers,
educators,
writers,
artists,
journalists,
etc...

who move society.

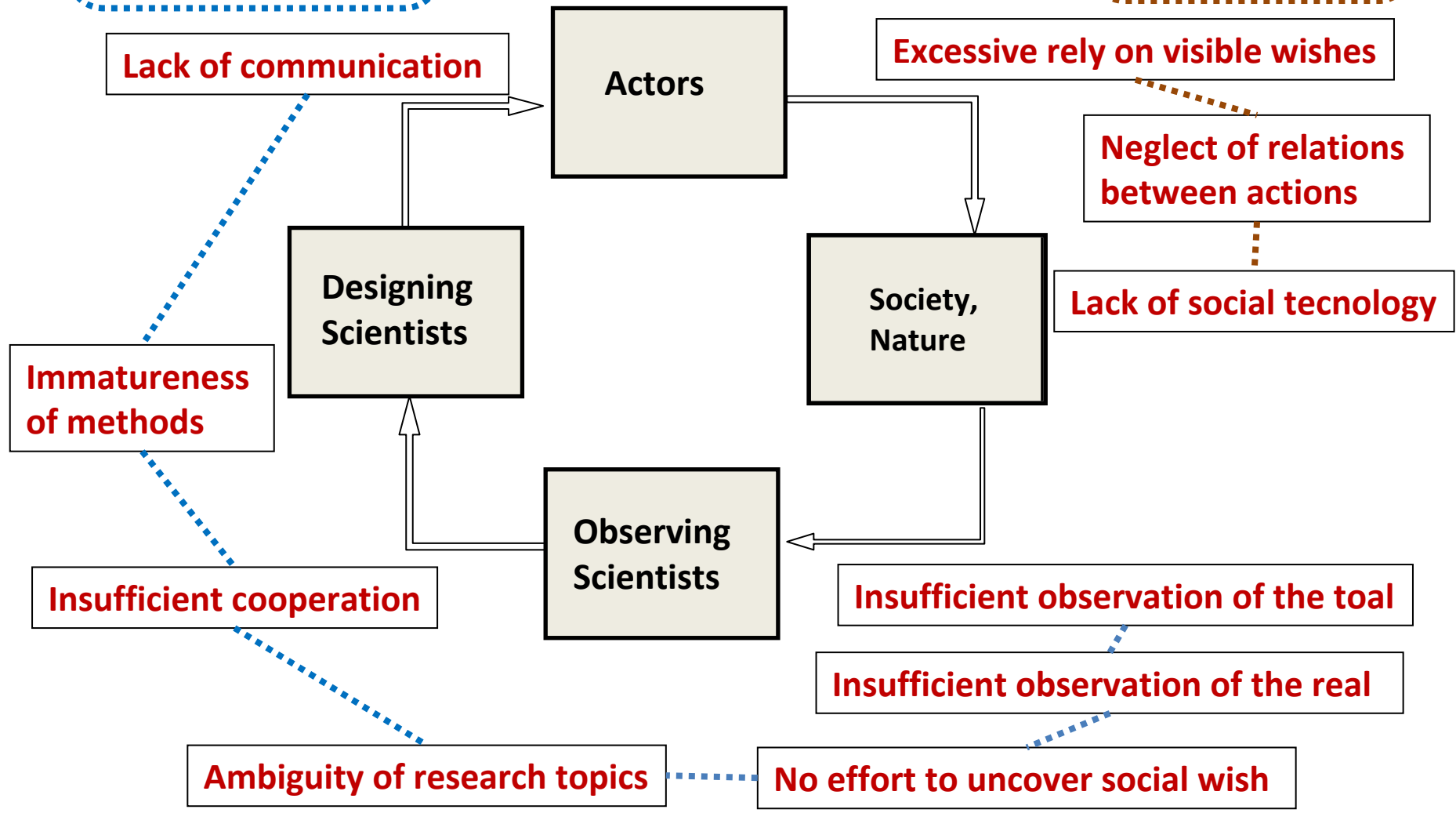
**The wishes
of sufferers**

C. S. Peirce: Abduction, F. Saussure: Evolutionary Loop, K. Popper: Piecemeal Technology

Reluctances to Circulate

Science Community

Society

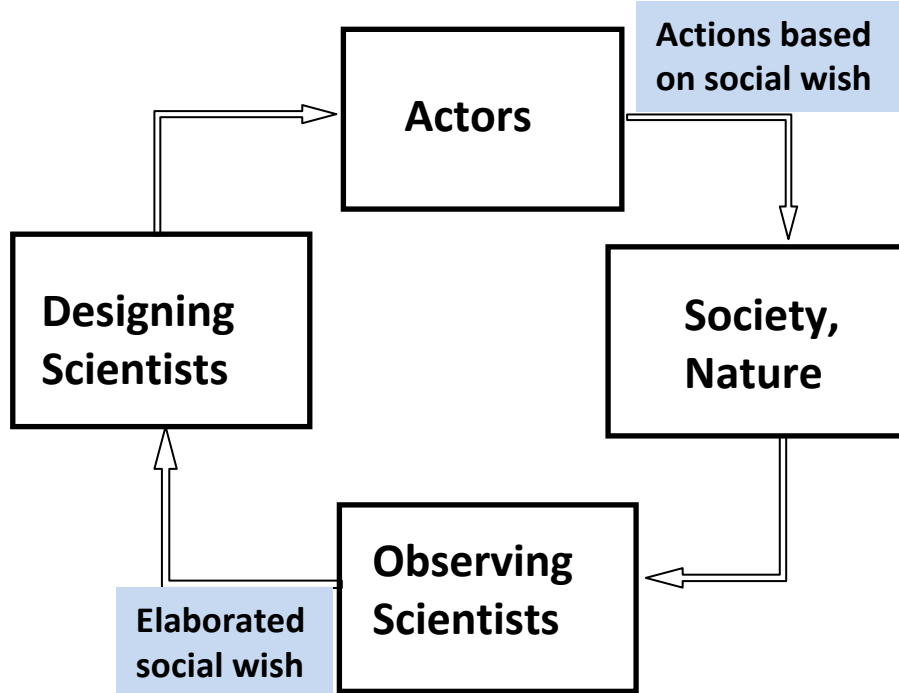


Necessary Conditions for Acceleration

Discovery of social wish is the key for acceleration

1. Organize a relevant evolutionary loop of four elements
2. Good communication between neighbour elements
3. *Observing Scientists*
 - Observation of the present state of nature and society
 - Observation of total of nature and society
 - No neglect of observed abnormalities
 - Discover social wish of 3rd level (invisible/potential wish)
 - Warning to society
4. *Designing Scientists*
 - Collaboration with and learning from observing scientists
 - Recognizing the essential role of designing scientists for the circulation
 - Develop science of design to improve the advices
 - Neutral advices to society
5. *Actors in Society*
 - Private enterprise: flexibility, social responsibility, challenge, altruism
 - Government: for the people, for the private enterprise, no useless conflict within politics,
6. *Society*
 - Social Technology

Social Wishes to Accelerate Circulation



Observation :

- (1) State of society and nature (abnormalities and unfavorable changes)
- (2) Panoramic observation of changes in society and nature.

GENERAL(MACRO) SOCIAL WISHES
to be elaborated scientifically

Wishes to progress changes toward sustainability such as

Concurrent growth of prosperity and sustainability,

Improvement of freedom and diversity, Higher safety,

Cooperation among people,

Favorable changes of human values, etc

Wishes to stop changes diverting from sustainability such as

Worsening of environment,

Increase of danger

Loss of equality,

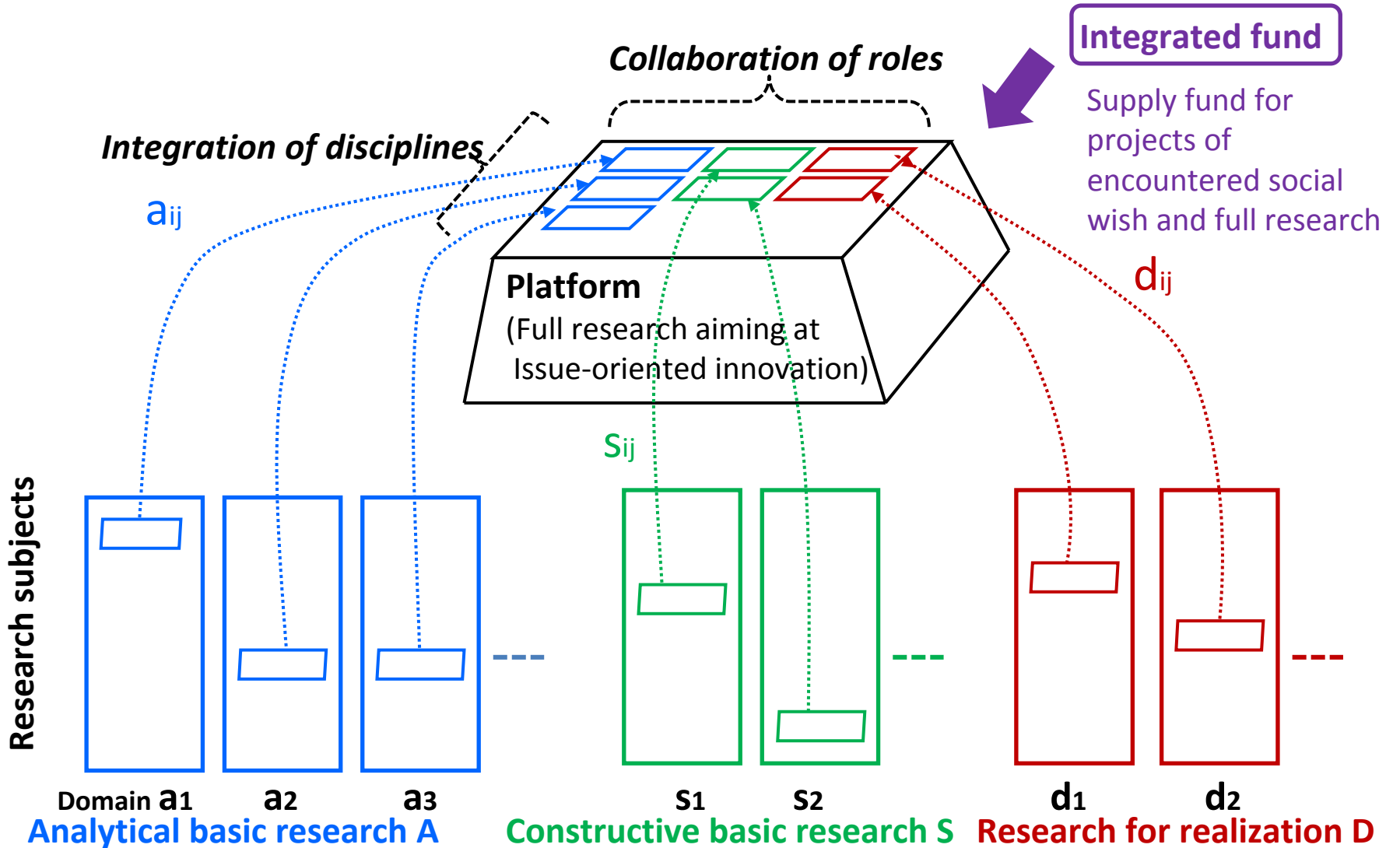
Social pressure on people,

Unfavorable changes of human values, etc

Some researchers(observing scientists) have been interested not only in properties of objects in the nature and society (so-called truth), but also in changes of nature and society to evaluate the progress/deterioration of sustainability of the earth. These researchers should be increased in the era of sustainability.

Full Research

Integration of disciplines X Collaboration of roles



Traditional Motivation of Research

Autonomy of research: Freedom for selection of research topics

Motive View	Intrinsic(personal)	Extrinsic(society/institution)
Panoramic (trans- disciplinary)	Equilibrium of Knowledge Remove of contradictions in own concept Integration of disciplines Reversibility of knowledge ---	Equilibrium of Society Coexistence of prosperity and sustainability Coexistence of cultures Remove of inequality ---
Individual (disciplinary)	Intellectual Curiosity Discovery of new things / phenomena Creation of new theory Solving contradictions in a discipline ---	Solving problems in a discipline Publicly known issues Privately hidden issues ---

Motivation of Research Sustainability Science

Autonomy of research : Topics based on social wish discovered

Motive View	Intrinsic(personal)	Extrinsic(society/institution)
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Autonomy of scientific research is protected when the research subject “social wish” is discovered by scientists themselves.

Acceleration by Encounter of Full Research and Social Wish

