

Innovation and Institutionalization of Technology Assessment (TA) in Japan: Dealing with Nanotechnologies

Royal Society- Science Council of Japan: New and Emerging Technologies
Workshop 22&23, September 2008, London

Tatsujiro Suzuki

Visiting Professor, Graduate School of Public Policy

The University of Tokyo

tatsu@pp.u-tokyo.ac.jp

This research project is sponsored by Research Institute for Science and Technology for Society (RISTEX), Japan Science and Technology Agency (JST). The project is coordinated by Science, Technology and Public Policy (SciTePP) Research Unit, Graduate School of Public Policy (GRASPP), the University of Tokyo



1

Objective

- To review and analyze the past and current practice of technology assessment (TA), and identify the barriers of institutionalization of TA in Japan.
- To develop an innovative TA technique applying the Problem Structuring Method and test its effectiveness through implementing TA for nanotechnologies.
- To propose innovative approaches to, as well as techniques for, the TA that is appropriate for the 21st century and a recommendation for their institutionalization in Japan.

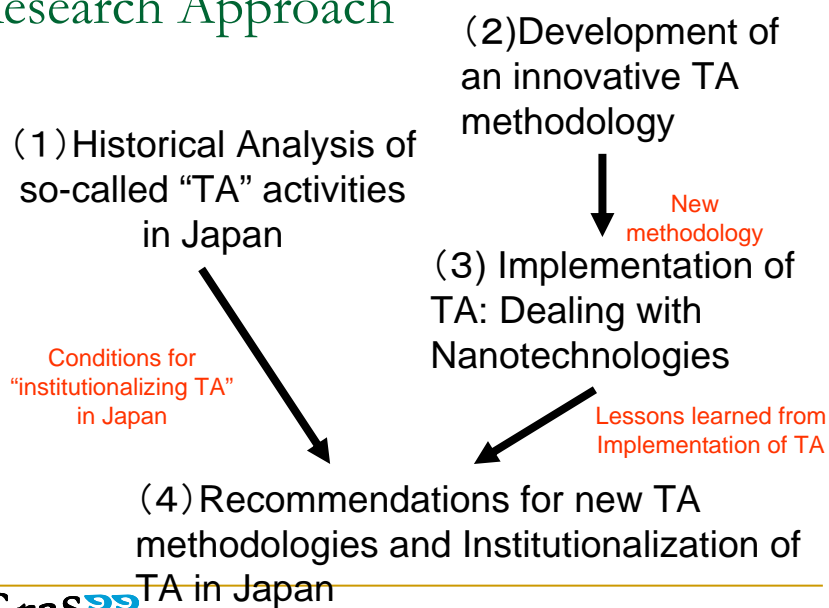


2

Working Definition of TA

- Technology assessment (TA) refers to institutions and practices which **support problem-definition (agenda setting) or decision-making** for the development of technology and society by anticipating societal impacts of **emerging technologies that are difficult to be governed by conventional research, innovation and legal systems** at an early stage of the technology development.

Research Approach



TASK 1: Institutional analysis on the past and current practice of “fragmented” TA in Japan

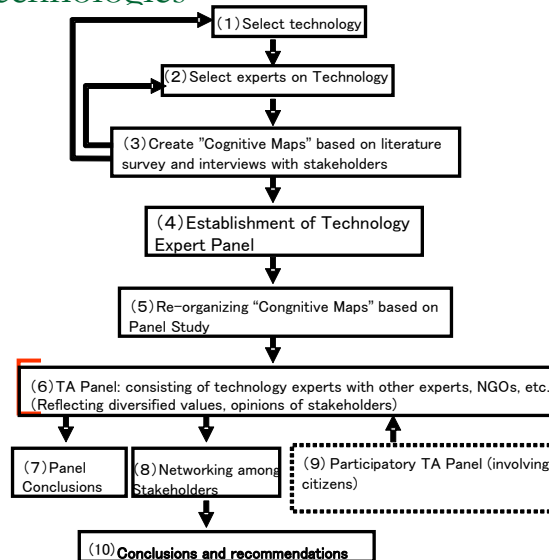
- How "fragmented" TA was implemented in Japan? Why did it happen? What were the consequences of "fragmented" TA (instead of comprehensive TA)?
- Why has TA never been institutionalized in the Japanese policy-making processes, while it could be in other countries? And what were the consequences of such "lack of institutionalization" of TA in Japan?
- What were the experiences of TA in other countries, with regard to comprehensive TA and institutionalization?
- What are the possible preconditions for institutionalizing TA in Japan?

TASK 2: Review and Development of Innovative Methods of TA

- Need for new methodologies for TA
 - Dealing with “diversified” value systems and stakeholders
 - Uncertainties in both development paths and societal impacts of technology innovation
- Review of innovative methods for TA in other countries;
- Explore and identify key conditions of new TA; and
- Develop a new method of TA by incorporating Problem Structuring Method;

TASK 3: Applying the newly developed TA techniques to nanotechnologies

- **Target Applications**
 - Clinical testing/medicine
 - Energy conversion/storage
 - Food processing
- **Selection Criteria**
 - High social needs.
 - Relatively clear application.
 - Near commercialization.
- **TA Panel**
 - Step by Step approach
 - Involving various stakeholders.
- **Output**
 - Lessons for Institutionalization



7

Technology Assessment Pilot Project- Dealing with Nanotechnologies (1)

Three applications are selected

- Clinical Testing (ex. "Lab-on-a-chip")
- Food packaging and/or Food additives, supplements
- Energy storage and conversion (ex. "super-capacitor" vs. "Zero-energy house")

For each field, we are now conducting interviews with key scientists, engineers using "problem structuring method"

- Framing the issues
- Finding (not missing) important stakeholders
- Sharing and comparing perceptions

8

Technology Assessment Pilot Project- Dealing with Nanotechnologies (2)

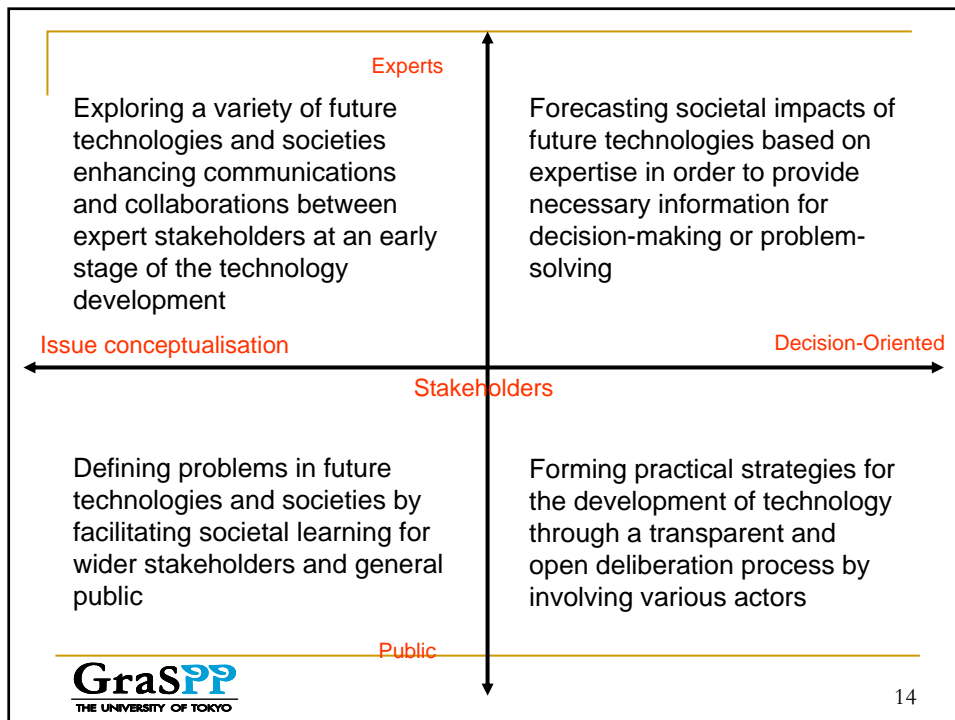
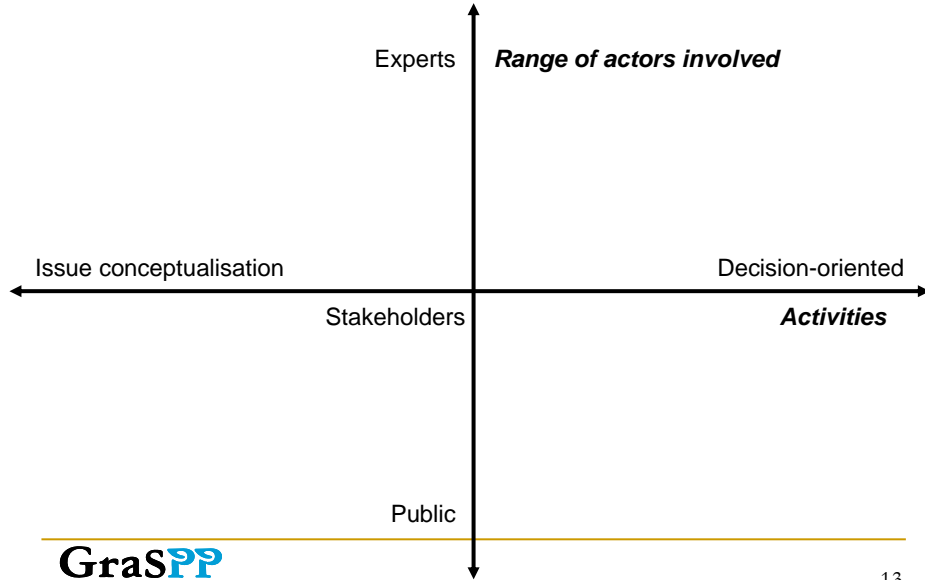
Quick TA report on “MWCNT Toxicity”

- Responding to recent safety concern over “multi-walled carbon nano-tube (MWCNT)”
 - It may show similar toxicity of Asbesto
- Test product from the project to show:
 - TA is a useful social tool to clarify issues (where consensus exists or not)
 - Dedicated TA institution is also useful in providing “unbiased” and “reliable” information for effective social decision making

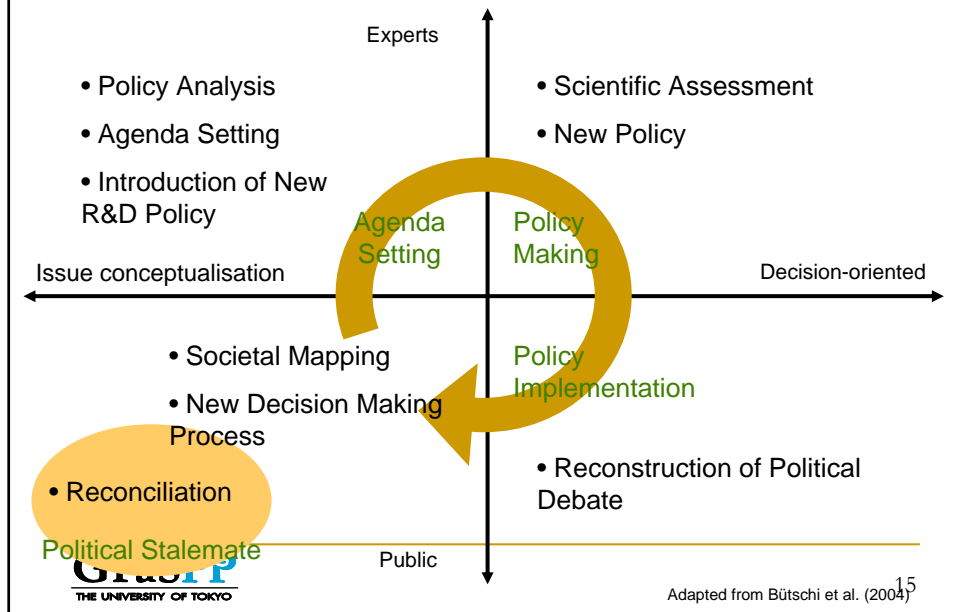
TASK 4: Proposal for Innovation and Institutionalization of TA in Japan

- Based on the outcome of Task 1 to Task 3, we will make proposals and recommendations for innovation and institutionalization of TA in Japan
- Recommendations for Social-decision making process
 - How to structuralize “comprehensive TA” with “fragmented TA activities”?
 - How to link and coordinate “government sponsored TA” with “voluntary, private-sectors’ TA activities”?
 - How to build up “partnerships in TA” among key stakeholders and institutions?
- Recommendations for Institutionalization of TA and social infrastructure of TA
 - Who should implement TA?
 - Who should sponsor? How to develop TA expertise?
 - How to assure “independence” of TA? (with fragile financial resource and expertise)

Taxonomy of TA



Objectives of TA



Important Characteristics of TA organization

Accountability →Trust	Independence	Political/Technical independence
	Quality	Interdisciplinary, professional credibility, fairness, transparency, good peer review system
Political Feasibility	Communication capability	Presentation, writing skills, media, moderator
	Optimum size	Low budget pressure, minimum political risk, flexibility,
Policy Orientation →Authority	Networking	Information, intelligence, external resources
	Timeliness	Responsiveness, quick output
	Link with Policy Making Process	Institutional setting, personal connection

Lessons from the European Parliamentary TA (PTA) Institutions

- Variety of PTA institutions:** varieties can be observed in institutional settings, structure of the board, funding sources and objectives etc... “OTA model” did inspired and stimulated the creation of the European Parliamentary TA Institutions. However it was not adopted as such.
- All PTA institutions strived for survival:** Many PTA institutions started on provisional bases and had to adapt to find the client and meet its needs. Institutions may change from its original characteristic in the course of adaptation. Need for flexibility.

European Parliamentary TA (PTA) Institutions

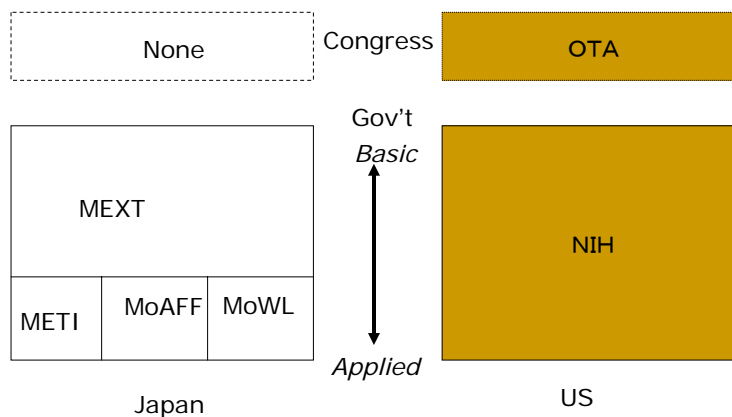
	STOA	Rathenau Institute	UK POST
Year of est	1987	1986 as NOTA, renamed Rathenau in 92	1989
Institutional settings	Initially launched as a “project” under CERT, extended its mission to cover all the committees in 1988. from 2004, stationed within DG Internal Policy DG A	KNAW (the Royal Netherlands Academy of Art and Sciences)	Initially set up as a charity, parliamentary funding started in 1993, became permanent institution in 2001.
Structure of the board	STOA panel: 15 MP	Rathenau Board: 7 members recommended by KNAW and Advisory Council of Government Policy, appointed by the Min of Education and Science	POTS Board: 14 MP, 4 Non-MP from scientific communities)
Funding	Parliament	Min of Education and Science	Two Houses
Objectives and clients	Provide parliament with TA and options, organize forums for discussion	Inform parliament, government and public by (1) TA, (2) since 2004, Science System Assessment (SciSA)	Inform parliamentary debate by publishing POST notes, supporting select committees, organizing discussions etc

Brief History of Japanese TA

- Various concepts and TA-like activities since the 1970s
- Industry groups introduced the concept of TA to Japan (1969)
 - > TA as voluntary process management
- STA (1971-78) and MITI (1971-84) conducted case studies, but limited the subjects to their jurisdictions
 - > TA as R&D project evaluation
- Failed attempts to establish a parliamentary TA organisation
 - Politicians' passive attitudes in the 1970s
 - Bureaucratic resistance in the 1990s

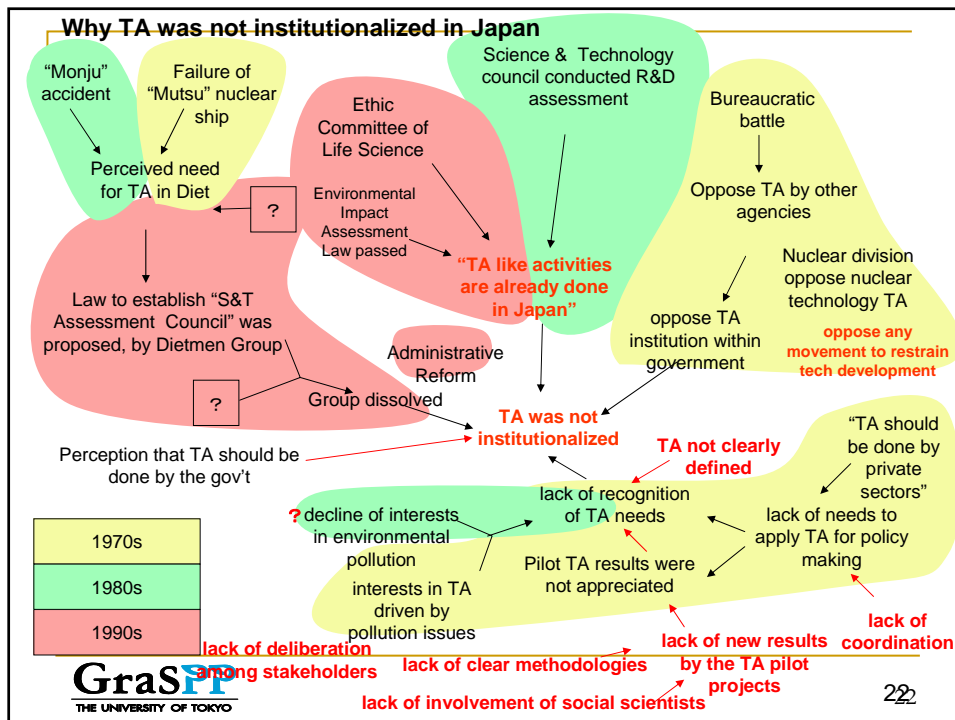
Implications(1): No comprehensive assessment organization in Japan?

(A case study of Medical Technology)



Implications (2): Biased or Fragmented Analysis? Case studies in Japan

- Advanced Medical Technology: Case of “transplant technology”
 - Only ethical implication was assessed.
 - Need for assessment of broad societal implications
 - Target of technology was also limited to most advanced technology
- Nuclear Power Technology: “Nuclear Fuel Cycle”
 - Comprehensive analysis of nuclear fuel cycle technology was done by Japan Atomic Energy Commission (JAEC) in 2003
 - But the analysis was somewhat biased to reach expected conclusion (JAEC itself is not likely to deny existing policies)
- Renewable Energy Policy: “Renewable Portfolio Standard(RPS)”
 - It was assumed there is a consensus to promote renewable energy
 - However, the discussion of “promotional policy” revealed significant gap in positions among stakeholders
 - No comprehensive, objective assessment has been done



Why TA has not been institutionalized in Japan

■ Fragmented TA

- Fragmentation is not necessarily wrong, but a core organization is needed to minimize the diversification of concepts, support TA networks and increase the significance of TA activities
- Lack of assessment of “alternatives”

■ Lack of independency

- Cross-sectoral issues and unwanted results were avoided in voluntary, self-evaluative exercises

■ Ad hoc basis

- Little incentive for the institutionalization of project-based TA exercises in the “unwritten” political culture

Implications of Institutionalization of TA in Japan

■ Comprehensive Assessment

- Environmental assessment, risk assessments etc. are only part of TA
- How to deal with “uncertainty” and “unquantifiable” societal implications? – **Efforts to setting a broad framework (scoping) is important**
- Need for identifying and **assessing “alternatives”**

■ Unbiased, Independent, Balanced Assessment

- TA done by stakeholders often leads to “biased” assessment – may not be “trusted” by other stakeholders or by the public
- How to deal with **“multiple interests” of diversified stakeholders?** --Balanced assessment may help building social trust

■ Dedicated TA organization as “social infrastructure”

- Need for **“constant” and “timely” assessments**
- Little incentives and opportunities exist to develop necessary human resources without a dedicated TA institution

KEY QUESTIONS TO BE ANSWERED

Who will be the client?

Who will provide funding?

Who will conduct TA?

Schedule

