

INFORMATION FOR DECISION-MAKING

T. Murayama

Waseda University, Tokyo, Japan

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Summary

Since experiencing serious pollution in the 1960s and 1970s, Japan has tried to develop an environmental information system, as well as technological and legal measures for environmental protection. In 1993 Japan enacted the Basic Environmental Law, which covers not only domestic pollution, but also global environmental and biodiversity issues. The Japanese action plan, based on Agenda 21, tries to improve the quality and quantity of ‘information for decision making’ in two respects; bridging the data gap and improving information availability.

Several ministries and divisions collect information on human activities that generate environmental loads, and prefectural governments often implement real-time observation of major pollution sources of ambient air, noise, and water systems. This chapter describes the activities of the national government and outlines eight cases of the information systems of local governments. In addition, the author shows the situation of environmental reporting systems managed by private sectors. The Japanese government often responds slowly to new types of environmental pollution, such as that from asbestos and dioxin compounds. The author provides a recent example on the authorization of the Pollutants Release and Transfer Register (PRTR) system.

In response to the current situation, the author shows three methods for developing more efficient and effective information systems: the evolution of the process of information systems; developing more integrated indicators for describing environmental situations; and improving information disclosure in terms of legal and social concerns. Compared to the remarkable advances in technology, the development of an information infrastructure that contains a database and other information is still in progress. One of the principal reasons for this is that the social system in Japan is not sufficiently developed for the open disclosure of information.

1. Introduction

Since experiencing serious pollution in the 1960s and 1970s, Japan has tried to develop an environmental information system, as well as technological and legal measures for environmental protection. In particular, administrative authorities often set strict environmental standards, and tried to install real-time monitoring systems for fundamental indicators, such as concentrations of air and water pollutants. Private companies also came to construct systems by which they can monitor the condition of exhaust gases and discharged waters.

The recent rise of the information industry has enabled Japanese society to develop information technology (IT), and private companies related to IT have been driving the Japanese economy. In the next few decades, IT will be one of the most important

industries in Japan. Compared to the remarkable advances in technology, the development of an information infrastructure containing linked databases and other information still has a long way to go.

One of the principal reasons for the slow development of an information infrastructure is that the social system for the open disclosure of information is not sufficiently developed in Japan. Because the Japanese government system is traditionally hierarchical, it is quite difficult to change the social system quickly. The national government is especially unfavorable toward information disclosure. As a matter of fact, it was not until 2001 that an information disclosure system was enacted at the national level, although many local governments had already started to operate such systems. In addition, it is often difficult for citizens to gain adequate information for judging the condition of the local environment, mainly because private companies have relatively strong power over governments. This leads to a situation where information generated through various channels is not effectively used for constructing a sustainable society.

In this section, the author discusses past and present developments regarding information, the infrastructure necessary for creating sustainable development, and means of more effective utilization of information, including the legal system. The author notes that the current situation can readily be improved because of the recent rapid developments in IT.

2. Objective

In addition to the Basic Law for Environmental Pollution Control (1967), Japan enacted the Basic Environmental Law in 1993 and began to implement a broader environmental policy, including global environmental and bio-diversity issues. In the Japanese action plan, based on Agenda 21, the following agenda has been drawn up to improve the quality and quantity of ‘information for decision making’ (see *Agreement: Rio Declaration*).

2.1 Bridging the Data Gap

As the basis of decision-making to achieve sustainable development it is necessary to have deliberate and continuous collection and adjustment of accurate and appropriate information. Taking into account the above, the action plan emphasizes the importance of the following activities:

- In addition to continuously observing, monitoring, and surveying environmental pollution, observation and monitoring with a long-range perspective should be carried out through international concerted action and cooperation.
- Active promotion of surveys and research, as well as joint international research, including the development of high-performance sensors, forming the basic tools to obtain high-quality information.
- For sustainable development, the development of an indicator system, with which environmental factors can be appropriately assessed.
- Promotion of information gathering, which has been poor, despite its necessity for studying sustainable development.
- Active participation in planning and cooperation in international networks for the

development of environmental information.

2.2 Improving Availability of Information

To ensure the widespread availability of information necessary for decision-making, the action plan states that the following issues are vital: the provision of appropriate information regarding the state of environmental loadings, as well as policy measures and other activities regarding environmental conservation.

For this purpose, Japan has been carrying out the following activities:

- An annual submission to the Diet and publication of ‘Quality of the Environment’ (a white paper on environmental protection);
- Development of the sources of environmental information, and
- Development of methodologies for environmental indices, in cooperation with other OECD states.

In addition, Agenda 21 addresses the development of environmental information and its dissemination to local people, promoted by local authorities, while other actions, such as preparing databases on environmental conservation activities, are undertaken by the private sector.

As part of its international activities, Japan plans to increase, and provide information on, global resources to the UNEP/GRID (United Nations Environment Program/Global Resource Information Database). Research facilities in Tsukuba conduct activities related to databases regarding the global environment and information networks, in order to contribute to international and interdisciplinary research on the global environment. Japan has also put into practice recommendations from the Committee for the Earth Observation Satellite/International Directory Network (CEOS/IDN) for the purpose of distributing directory information, as well as the effects of earth science technology developments (See *International Cooperation*, and *International Institutional Arrangements*).

With respect to the above, Agenda 21 attaches importance to the implementation of the following activities:

- (i) Efforts for easing access to environmental information.
- (ii) Improvement of information systems as policy instruments for decision-making:
 1. Construction of databases, which include world socio-economic data, and promotion of the construction of a network of coordinated research programs on the global environment through the UNEP/GRID at research facilities in Tsukuba,
 2. Promotion and further enhancement of databases on environmental and other related information,
 3. Collection, improvement, and provision of information necessary for environmental conservation activities by private organizations, including

- foreign organizations.
4. Improvement and expansion of the satellite data gathering network, including expansion of this network into the Asia-Pacific region,
 5. International cooperation on technological developments as a way of improving geographical information on the entire Earth, and
 6. Promotion of the improvement of data that assists development, and improvement of the indicators for sustainable development, such as environmental resource accounting.
- (iii) Enhancement of the organizations that carry out the main functions of collection, improvement, and analysis of environmental information in national and local authorities, and which support privately conducted activities of this type.
- (iv) Improvement in the mutual use of environmental information, as well as improvement in the basic networks for providing related assistance.

In addition to the above points, it is important that transparency in the decision-making processes based on the information, as well as information disclosure systems, be improved.

Based on the PSR framework of the OECD State of the Environment reports, Hatano suggested a prototype classification of environmental information in Japan (see Table 1).

1. Information on human Activities	1.1 Basic Information: Population, Land Use, Economy and Finance 1.2. Energy, Resource Use 1.3. Transportation 1.4. Telecommunication and Services 1.5. Industry 1.6. Agriculture, Aquaculture and Forestry 1.7. Quality of Life
2. Information on Environmental Situation	2.1. Qualities of Ambient Air, Water and Soil Environment 2.2. Land and Natural Environment 2.3. Bio-Resources 2.4. Urban Environment 2.5. Waste 2.6. Quality of Public Health 2.7. Complaint and Opinion on environmental situation
3. Information on Response	3.1. Administrative Structure (National and Local Governments) 3.2. Law system 3.3. Environmental policy 3.4. Development and Improvement of Infrastructures, Environmental protection measures

	<p>3.5. Assessment, Monitoring and Surveillance</p> <p>3.6. Activities of Private companies, citizens and NGOs</p> <p>3.7. International Cooperation, treaties</p> <p>3.8. Research and Technology Development</p> <p>3.9. Integration and Dissemination of environmental information</p> <p>3.10. Education, Training and Human Development</p>
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(Prototype by Hatano (1996): Interaction of human environment and environmental information. *Journal of resource and environment protection measures*, **32**(9), pp.45-51)

Table 1 Structure of Environmental Information
(prototype by Hatano, 1996)

3. Information on pressures on the environment

3.1 Overview

Information on general human activities is collected by several ministries and divisions, including the National Land Agency (national land data), the Ministry of Health and Welfare (population and vital statistics), and the Ministry of International Trade and Industry (activities of private companies). In addition, the divisions covering environmental issues organize information on environmental pollution sources, paying special attention to the seven prescribed in the Basic Law for Pollution Control: ambient air, water, ambient noise, vibration, soil, odors, and ground subsidence. Prefectural governments often implement real-time observation of major pollution sources of ambient air. In contrast, the Japanese government often responds slowly to new types of environmental pollution, such as asbestos and dioxin compounds. In the following paragraphs the author provides recent examples on the authorization of the Pollutants Release and Transfer Register (PRTR) system.

3.2 Standardized Pollutant Release Inventories in Japan

Work in this area began when the Japan Chemical Manufacturers Association (JCMA) conducted a survey on the release of 13 chemical substances in 1992, and an equivalent survey for another 28 substances in the following year. After producing guidelines for such survey procedures, based on their experience with these surveys, the JCMA conducted surveys for more chemicals: 55 in 1995 and 152 in 1996. Although these surveys were the first trials to estimate the volume of chemical releases, the companies that participated in those surveys were members of the JCMA, and information on releases from each facility was not open to the public. (See *Protection and Promotion of Human Health and Environmentally Sound Management of Toxic Chemicals*).

3.2.1 Pilot project of Environment Agency of Japan (EAJ)

Following an OECD recommendation, the government commenced action in 1996, when the EAJ established a review panel for a Pollutant Release and Transfer Register (PRTR)

pilot project. That panel had four sub-committees: a comprehensive task force; one to edit a manual on estimating pollution release and transfer volumes; one on information processing and dissemination; and one on chemical use surveys. The sub-committees comprised about 50 people drawn from local government, industries, NGOs and universities.

The purpose of the pilot project was to identify the technical problems in implementing actual systems, as well as to build a common understanding among participating parties. Information relating to accidental releases was outside the terms of reference of the pilot project.

Some local areas in Kanagawa and Aichi prefectures, which contain many chemical facilities and local governments, and have implemented advanced management of chemical safety, were selected for this project. The chemical materials included were selected not only because they were already regulated, but also because of their toxicity with respect to carcinogenicity, mutagenicity, reproductive toxicity and chronic toxicity. In addition, possible levels of exposure, as estimated by domestic environmental surveys and past amounts of chemical use, were taken into account. Unregulated chemicals were divided into four ranks. As a result, 178 materials were selected at the implementation stage.

The results of the pilot project were published in May 1998. This was the first such study to be released by the national government in Japan. The review panel decided in principle to release to the public only area-wide data collected by the pilot project, not individual data. This was for three reasons: (i) the companies took part in this project on the condition that EAJ did not publish specific information on each facility; (ii) as Japan is currently developing an information disclosure act at national level, and this act is not yet finalized, such information disclosure was not considered appropriate; and (iii) the panel was afraid of an excessive response by the general public to the PRTR data as this was the first of its kind to be generated and published. In general, the information does not allow detailed mapping of impacts. Data were released for three relatively small zones in Kawasaki city, which experienced serious pollution incidents in the 1960s and therefore has a high degree of environmental awareness. This enabled its residents to get more detailed information than those of other cities.

3.2.2 Evaluation of the project

Based on his experience as a member of the EAJ review panel of the PRTR initiative, the author has identified three strengths of the approach adopted. First, the project dealt with a broad range of chemical producer and user industries, including not only manufacturers but also the steel, mining, electricity and gas, construction, medical institutions, and waste disposal industries. This contrasts with other advanced PRTR systems in USA and UK, where manufacturers were mainly selected as the targets. Second, the project collected data on chemical releases from non-point sources as well as point sources. Again, this contrasts with USA and UK, although a similar approach to that in Japan has been adopted in the Collective Emission Inventory System (CEIS) of the Netherlands. Third, the definition of pollutants was relatively broad; for example, it included NO_x and SO_x emissions and pesticide release data.

However, there are some matters still to be addressed. The lack of access to facility data contrasts with the situation in other countries, such as Canada, the Netherlands, USA and UK. There are slight differences in the methods of access. North American countries publish each facility's data, while some European countries, such as UK and the Netherlands, require citizens to request this information specifically. It is unlikely that the situation of not disclosing data on individual facilities will change through voluntary action. According to interviews with industries conducted by local governments, the peculiar Japanese circumstances, where all companies in the same industrial sector follow almost identical behavior, may make it difficult for an individual company to agree to publish data. Nevertheless, the National diet approved, in 1999, a law on PRTR system that gives individuals the right to request data from each facility; the effectiveness of the system may depend on the activities of NPOs and NGOs.

Japan has not yet established a credible database which allows assess to information on the toxicity of each chemical substance, unlike the Integrated Risk Information System (IRIS) in USA, and the International Uniform Chemical Information Database (IUCLID) in the EU. Accurate and up-to-date information on toxicity is very important for the analysis of release and transfer data. Without such information, any disseminated data may be of undue concern to the Japanese public, which has no sophisticated understanding of risk communication.

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Biographical Sketch

T. Murayama obtained his B.Sc. in 1984 from Waseda University, an M.A. in 1986 and Dr. of Eng. in 1989 from Tokyo Institute of Technology. After this he was a research fellow of the Japan Society for the Promotion of Science and a research associate of Tokyo Institute of Technology. He achieved his position as an associate professor of Fukushima University in 1994, and transferred to Waseda University in 2000. In 1994, he was honored with the Treatise Prize of the Society of Environmental Sciences of Japan. He is also affiliated as a visiting professor of the University of the Air, and a member of committees held under the auspices of national and local governments. These include the Technical Committee of PRTR (Japan Environment Agency), the Research Committee on Chemical Risk Communication (Japan Environment Agency and Ministry of International Trade and Industry). Since 1998, he has been on the editorial advisory board of an international journal, 'RISK: Health, Safety and Environment'.