TRENDS

Construction of Water and Resource Recycling Systems for a Sustainable Future

Utilizing Strategic Thinking and Partnerships to Draw on Japan's Strengths

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Prompted by developments such as the Sustainable Development Goals and the 2015 United Nations Climate Change Conference, moves aimed at creating societies that will remain sustainable across future generations are picking up pace throughout the world. What then are the requirements for nations and companies in this situation? Amid global environmental problems, and in particular with increasingly severe problems relating to water, how to make the most of finite resources is a common and pressing theme when seeking to deliver both economic and environmental value. In this article, Professor Eiji Hosoda, a leader in the field of environmental economics who has served in a number of key roles that relate to recycling, speaks about useful strategies and partnerships that Japan should adopt if it is to make progress on the economic systems associated with water and with the recycling of resources.

Partnerships Vital to Achieving the SDGs

Measures for dealing with global environmental problems, most notably the United Nations Sustainable Development Goals (SDGs) and the 2015 United Nations Climate Change Conference (COP 21), play a pivotal role in the setting of international standards and market rules, and also have a major bearing on the success or failure of corporate activity. Looking at each of the 17 SDGs in turn, they seem self-evident at first glance, yet it is also clear that achieving them by 2030 in such a way that "no one will be left behind" will be extremely difficult.

The important thing here will be to achieve these goals through partnerships, something that is recognized in the goals themselves as Goal 17. As exemplified by Goal 12 (responsible consumption and production), societal challenges are interdependent and difficult to resolve in isolation. Clean water and sanitation (covered by Goal 6) is essential for life and this in turn is dependent on the other goals. In particular, the problems associated with water and recycling that are the topic of this article cannot be solved by a single company, or by local or national governments acting alone. In other words, what is needed is to form partnerships and to bring different stakeholders together to address multiple problems at once.

Graduated in 1977 from the Faculty of Economics, Keio University. After serving in the department as an assistant and associate professor, he was appointed a full professor in 1994 and was the dean of the faculty from 2001 to 2005. He has also served on the Central Environment Council and Policy Evaluation Committee at the Ministry of the Environment. He was appointed to his current position in April 2019. He has a doctorate in economics.

In order to form partnerships for resolving societal challenges, a number of different measures have proved necessary to bring together organizations and individuals motivated by the principle of competition under capitalist economics. Among such measures can be included the traditions of patronage and philanthropy, and also the practice of "environmental, social, and governance" (ESG) investing that has gained prominence in more recent times. The SDGs, in contrast, can be seen as an initiative that encompasses all of these and that is very easy for the general public to understand.

EU's Ingenious Strategy of Using Recycling to Boost Economic Growth

Strategies and philosophies that provide motivation are essential to the resolution of societal challenges. For example, the European Union (EU) in December 2015 adopted the Circular Economy Package, an action plan for encouraging recycling, reuse, and other ways of utilizing existing resources. The plan included targets for 2030 of recycling 65% of municipal waste and 75% of packaging waste, and of reducing landfill to a maximum of 10% of municipal waste. It also included targets that focused on services rather than goods, encompassing sharing, leasing, rental, and product services. In the way that it presents itself as a means of generating added-value from this work and using this value to facilitate the recycling of resources, I believe the plan has adopted a very clever approach.

One of the factors underpinning this plan is the EU's strategic approach to international standardization. Specifically, what this strategy reveals is the aim of using rules and standards to turn advanced forms of recycling to its own advantage, and by doing so to drive economic growth and employment creation. This prompts the questions of why and how the EU is able to take this holistic view in which the means of contributing to the well-being of humanity are built into economic strategy? Historically, the ways of thinking that have been the driving force behind change have underpinned nation-building in Europe, as clearly demonstrated by events such as the French Revolution, the Glorious Revolution and Puritan Revolution in England, and the people's revolution

embodied in the psychological world of Kantian philosophy and German idealism in Germany. In other words, one can conclude that the ingenuity with which the EU has devised its policies comes about from a depth of thinking and philosophies that have developed over a long period of time.

This makes it difficult for the government or corporate sector to imitate in Japan where the intellectual background is different. As in cases such as corporate governance in the USA since the start of the 21st century, simply replicating the institutions of societies where attitudes and structures are very different is unlikely to have much success.

Advisability of Recognizing Different Perceptions of Nature and Utilizing Experience and Past Successes

This difference in thinking about things also manifests in perceptions of and interactions with nature and in how problems are addressed. One example seen in Japan is how a perception of nature that is significantly different than that in Europe and USA has been an obstacle in dealings between the government and corporate sector on the one hand and non-governmental organizations (NGOs) and non-profit organizations (NPOs) on the other. Japanese people, for the most part, see their own existence as part of an evolving natural world, as expressed by "form is emptiness, emptiness is form" from the Heart Sutra of Buddhism. This makes it difficult for them to adopt an approach of standing outside the natural environment to identify problems and then working together to solve those problems by engaging in dialogue from opposing standpoints. The West, on the other hand, sees nature as something that exists separately to human beings and is capable of being controlled. This makes it easy for them to identify problems, develop a common understanding, and overcome opposing positions to reach a solution.

In the case of packaging recycling or the problem of waste plastic, for example, rather than working alone, European and American companies form flexible partnerships with NGOs, NPOs, and other organizations and act on the basis of clearly stated aims. This mobilization is something worth emulating. Allowing for differences in culture, I also believe that there is a need to look for new forms of partnership that are distinctively Japanese.

In Japan, there are examples from the past in which local residents prompted actions by government and companies to overcome issues with pollution, which posed major problems for society in the 1960s, including Minamata disease (mercury poisoning) and Yokkaichi asthma. These are particularly noteworthy as instances of how society was changed by citizen activism.

Moreover, past "reduce, reuse, recycle" (3R) measures in Japan have proved very successful in terms of how they have addressed the problem of waste material. Prompted by the illegal dumping of waste and the difficulty of acquiring sites for its final disposal, the concept of treating waste as a resource has emerged since the 1970s based on the idea that "waste mixed together is trash, sorting makes it valuable." This has led to the introduction of regulations and greater recycling. Targets have already been achieved and the quantity of waste disposed as landfill fell by about 74% from FY2000 to FY2014. This success means there is now more than a decade of capacity remaining for both municipal and industrial waste. Also worth noting is that Japan was 10 years ahead of Europe in adopting its Basic Law for Establishing the Recycling-based Society in 2000.

However, the sense of urgency within society at large has lagged somewhat since then, and in

certain respects, Japan has done no more than deal with individual problems, failing to pursue these measures in the holistic manner seen in the EU. While even in the EU there is a certain lack of evidence and realism as to whether or not recycling actually gives rise to economic growth and employment creation, adopting the right concepts is vital when it comes to creating a new type of economy and society. One can conclude that the key to future resource recycling lies in whether it is possible to expand activities globally by drawing on experience and past success in Japan to form partnerships with different stakeholders, while also seeking win-win solutions to both environmental and economic problems.

Japan in recent times has also seen moves to address environmental and economic problems through partnerships with companies and other organizations, especially by the younger generation of NGOs. I see this as a particularly encouraging development.

Connecting Advanced Technologies to Make them a Source of Strength

The greatest strengths of Japanese companies when it comes to recycling are their excellent advanced technologies. One example that has attracted attention recently is a practical technology for the extraction of ethanol from municipal waste that is recognized as a world-first. Along with sorting technologies that separate different types of waste in the most appropriate manner, other examples of recycling technology in which Japan can take pride include ways of recycling plastic bottles (PET) into new plastic bottles and of compounding reprocessed plastic. Japan also has technology that contributes to the reuse of resources in ways that include recycling water or reducing its consumption.

However, making good use of these advanced technologies requires that they be connected into a single system by means of a common platform or the Internet of Things (IoT). Successful examples of this can already be found in Japan in fields such as railway systems. Japan has successfully combined not only rolling stock and rails, but also things like coordination and control of rolling stock, automatic train control (ATC), and centralized traffic control (CTC) into a single system that can be offered as a package and deployed in other parts of the world. I believe that the idea of developing systems that connect different technologies in this way will be essential for business in the future.

A possible driving force in all this will be the problem of waste plastic. In recent news, the Malaysian government announced that it would be sending illegally imported waste plastic back to Japan and other source nations. Along with changes to international law relating to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, another development that has had a significant impact on this problem is a decision by China to ban the import of waste material, including plastics, having adopted a “Green Fence” policy of tighter border inspections since around 2013.

Japan, meanwhile, has had a rather low level of achievement with resource productivity (an indicator of the efficiency of resource use obtained by dividing economic indicators such as gross domestic product by the amount of resources introduced). Recycling rates have leveled off at only 21% for municipal waste and 50% for industrial waste. The increase in the remaining life of landfill sites has come to a halt while awareness of progress by relevant entities, including consumers, is currently falling. That is, while Japan

has largely overcome its waste problem, the next step of recycling still faces numerous obstacles. Accordingly, what is needed from now on is to revise the negative value represented by the current practice of making goods only to throw them away and to give thought to how this can be turned into positive value. Advanced technologies will inevitably be required to achieve this. We need to treat times like this as an opportunity to utilize Japan's technology.

Variability of Supply versus Demand for Water and Challenges for the Water Business

Another very important aspect of recycling concerns the problems posed by water. Japan has an average annual rainfall of more than 1,700 mm (mean rainfall from 1971 to 2000), roughly twice the global average. With fresh drinking water available at the turn of a tap, most Japanese people feel little sense of urgency with regard to water. If climate change leads to an alternation between droughts and floods, however, there is the potential for the balance of supply and demand to change significantly as the amount of usable water diminishes. Moreover, when virtual water is considered, Japan is heavily reliant on the water of other nations. Droughts elsewhere could become a problem for Japan.

The subject of public-private partnership in the water industry has become a topical one in Japan following revisions to Japan's Water Supply Act, and in debating the merits of this, I believe it is necessary to first take a good look at how the water business operates in other parts of the world. The talk currently is of the potential for commercial water businesses that seek to use market principles to resolve imbalances in supply and demand ("hydrocommerce"), or even the emergence of a "water NASDAQ." Should such developments eventuate there would be a need to prevent a shifting of the burden onto those in a position of weakness.

As a basic resource that is essential to human life, water is part of the commons and, as history has shown, water problems have the potential to grow into political problems or international conflict. Japan, too, has seen bitter disputes over water rights in different parts of the country. Village collectives for water use called *mizugumi* or *igumi* were established in recent feudal times and have since evolved into a means of protecting water through communal use. Rules on use of water by members of the collective were put in place and difficulties avoided so long as these were followed.

However, keeping such systems running becomes more difficult as the costs of their administration and monitoring rise. Moreover, the abuse of long-recognized customary water rights sometimes poses an obstacle to making the best use of water. An important question for the future will be how to utilize sensing data and analytical techniques to balance market principles with management of collective water use. That is, how to design the technology and practices will likely be a major issue for water problems in Japan in the future.

Key Lies in Soft Law, Philosophy, and Aesthetic Sensibility

One hint as to how to resolve these various problems is the work of Fusanosuke Kuhara, the man who established the Hitachi Mine of Kuhara Kogyosho (Kuhara Mining Company), the birthplace of Hitachi, Ltd. Kuhara is famous for the giant chimney in Hitachi City that he built to deal with smoke pollution from the mine. Along with the chimney, he is also said to have located

monitoring posts in the surrounding area and released weather balloons to take changes in conditions at high altitude into account in the control of mine operations. He also constructed facilities for the people who worked at Hitachi, including a hospital, school, and theatres. This can be described as an example of soft law, meaning a way of skillfully guiding people's actions without a legal mandate by the government (hard law). I believe that such voluntary initiatives and regulation by companies, along with industry guidelines and other soft laws, have the potential to be a major strength for Japan.

Accordingly, along with thinking strategically, I see a need for managers to nurture philosophies and ways of thinking as well as aesthetic sensibility. As noted by author Shu Yamaguchi, who has written about the relationship between the global elite and aesthetics, current times call for intuition and aesthetic sense more than logic and reason. A look at the businesspeople like Steve Jobs, Bill Gates, and Mark Zuckerberg who have transformed the world should make this clear. Intuition and sensitivity are essential to the creativity needed for making connections. In terms of coexistence with nature, the beauty of Japan also gives us numerous hints on how to proceed.

The classical economist John Stuart Mill talked about a wealthy society as being not one that is rich in goods, but rather one that has stopped growing but continues to progress. The level of knowledge rises, and even if things remain the same, progress is made by connecting those things in different ways. This philosophy is also evident in the Society 5.0 concept being pursued by the Japanese government. It is my belief that, if we can develop a form of corporate governance that is distinctive of Japan where teamwork is a strength, adopt a more macroscopic viewpoint, and combine technologies and goods in ways that deliver intangible benefits, Japanese policies and technologies will be better able to thrive in the water and resource recycling businesses.