From an interview with Dr. Kazuhiko Takeuchi, Director & Professor Integrated Research System for Sustainability Science (IR3S), University of Tokyo Knowledge Coordinator Seeking Harmony between Nature & Society

By Japan SPOTLIGHT Editorial Section

### What Is Sustainability Science?

Q. Could you start by describing what led to the establishment of the Integrated Research System for Sustainability Science and what role it seeks to play?

Takeuchi: It has been a while since the Brundtland Commission proposed the concept of sustainable development, which came to be spoken of as a direction in which the international community should seek to move. Efforts to properly systematize it academically, however, are more recent. Since the start of the 21st century, many scholars around the world have begun to talk about a shift from science for sustainability toward sustainability science.

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both global and social.

When you think about a sustainable society, social change is unlikely to occur unless people change their lifestyles. The issues underlying sustainability, therefore, are found not so much in social systems as in individual thinking and norms. I am convinced how important these things are and hope to address them by, for example, including within the framework of sustainability science the philosophy of coexistence that is being studied at Toyo University.

It's important that we ground our discipline in a view of nature that sees man as part of nature rather than separate from it. When we present things this way we find agreement with researchers both in the Western world and in developing countries. In this sense, our goal of leading the world is somewhat different from trying to drive things forward with

More than a decade has passed since the

University of Tokyo formed an intercollegiate network named the Alliance for Global Sustainability. With the Massachusetts Institute of Technology (MIT) and the Swiss Federal Institute of Technology (ETH), and then later Chalmers University of Technology, this four-university partnership has been a forum for initiating scholarly discussion.

And then, six years ago, sustainability science in Japan moved beyond the University of Tokyo through our cooperation with other leading universities that were interested in the subject — including Kyoto University, Osaka University, Hokkaido University, and Ibaraki University — as we sought to further establish the field as a science in this country.

One of our major goals is not only to establish the discipline in Japan but also to draw the discipline forward globally as a world leader. This is what has motivated us to work so hard up to this point.

## Q. Could you talk a bit more about this concept of sustainability? The terms environmental sustainability and sustainable growth come to mind, but I have the feeling you're talking about a broader concept.

Takeuchi: I understand the concept to mean maintaining the resilience of mankind and the durability of its supporting systems,

the latest science; rather, we want to lead by spreading our unique, deep-rooted perspective globally.

# **Q**. When you talk of a "unique perspective" do you mean, for example, a Buddhist perspective?

**Takeuchi:** I think it might be better to talk of an Eastern view of nature, although this is certainly not something limited only to the East. The people of Africa, for example, are quite in agreement with our way of thinking and see the need to come up with a new development paradigm that understands man as part of nature rather than pushing forward with development that sees the two as separate.

You could call this Buddhist but trying to position a Buddhist way of thinking as a global universal creates certain difficulties when trying to work in harmony with the international community while remaining respectful of diverse views.

**Q.** Some people in the West seem to have what could be called a very strong Caucasian-first mindset, or perhaps they just unconsciously presume the superiority of Western civilization. Will sustainability science be a force that changes this way of thinking? **Takeuchi:** I think one of the major features of sustainability science is its potential to change the nature of the received social systems that have pushed materialism to its limits. In this sense, then, I suppose it could have the impact you suggest. At the same time, though, our lives are grounded in material civilization. We're not arguing for an immediate return to the Edo period effective tomorrow. But I do think that pondering what such a thing might mean, and assessing the positives, leads to a new perspective in working to eliminate the causes of the problems that have been generated so far.

Take the issue, for example, of whether automobiles are bad. Instead of declaring that automobiles are bad, identifying the problem as a matter of the energy-intensive systems used in today's automobiles opens up possibilities for change by switching to something more energy efficient, something that does not use fossil fuels. When looking at the switch from fossil fuels to renewable energy it does not take long to recognize that truly renewable energy, the kind that really should be produced, comes from the natural resources available in each region. Wind power, for example, requires strong winds, biomass requires trees, and geothermal of course requires subterranean heat.

While conventional systems call for using up resources that have been brought in from somewhere else, if we can move the conversation toward the use of resources already available in each region, and toward designing communities within the limits of their capacity, it would signal a shift toward a truly sustainable society.

As the evils of modernization, and the notions that man and nature are separate and that man can control nature, are questioned more and more, I think society may shift naturally toward our way of thinking.

#### **Can Economic Growth Be Balanced** with the Natural Environment?

Q. Coming at this from a slightly different perspective, the inescapable truth is that we rely on convenience in our lives and it would be very difficult to break free of capitalism. We need to achieve economic growth in a way that minimizes unemployment and reduces disparities in wealth.

The Club of Rome has espoused similar ideas but it seems we need to think of something that will bring about a confluence of economy and environment, of man and nature, and integrate the richness of human endeavor and economy. What do you think?

**Takeuchi:** I think there are two topics here. The first is the notion of the green economy, which was an extremely important theme at the recent Rio+20 Earth Summit. The issue is how to achieve economic growth without bringing about negative impacts on various human systems. This is an important issue for Japan but an especially important one for developing countries. If developing countries, particularly those experiencing rapid growth, were to follow the same path advanced countries have taken we would soon exceed the Earth's capacity.

I had the opportunity to speak at Rio+20 about protecting biodiversity and the economy. The agriculture, forestry, and fisheries industries in developing countries have typically been run like largescale plantations seeking to maximize production. While this may seem efficient and highly productive at first, in actual practice it has tended to destroy the environment, ultimately causing erosion and triggering desertification. In economic terms, too, it leaves no options when production of a single product causes the collapse of its market price.

What we propose as an alternative is a system that prioritizes biodiversity and the cultivation of multiple products. While none of them may be very profitable on their own, adding value could enable any to be sold for a higher price, making stable overall management possible. This is the way of thinking proposed by the Convention on Biological Diversity and COP10. I again had the opportunity to speak at COP11, now underway in Hyderabad, and was simply amazed at the number of countries taking part. There seems to be a great deal of interest in the topic. We really do need to build a new economic system.

The other topic is the need to redefine wealth. The king of Thailand has spoken of a "sufficiency economy" and I think we do need to reexamine the idea of measuring growth through material indices.

Again turning to automobiles, motivating people to constantly replace their cars with newer models helps to sustain automobile production. Automobile ownership itself is saturated so it is impossible to sustain production without such replacement. The system's existence takes this as a precondition. It is sustained, in other words, by the constant arousal of material desire. Therefore I think we first have to ask ourselves whether this is really acceptable.

Cambridge University Professor Partha Dasgupta, who leads a group I've recently become close to, made an inclusive wealth index jointly with the International Human Dimensions Programme (IHDP) and the IHDP gave a presentation at the Rio+20 Earth Summit on their inclusive wealth index. When evaluating wealth only in material terms, a country like Brazil with its accumulated material wealth and improved education system appears to be experiencing very robust growth. Its GDP suggests a nation growing quickly even as its natural capital is diminished. But under the inclusive wealth index, which takes natural capital into account, Brazil is shown to be barely growing at all. We need to think about whether this really is true wealth.

Under the inclusive wealth index Japan actually does rather well because Japan has not done too much damage to its natural environment. Two-thirds of our land area is covered with forest. Certainly the switch to man-made forests has degraded their quality, but among the advanced nations of the world (with the exception of sparsely-populated Scandinavia) Japan is unusual in that its percentage of forest cover has remained nearly unchanged — has barely declined at all — over the last century.

Japan leaves its forests untouched and imports lumber from overseas. It also imports food. There's something seriously wrong with a social system that considers this perfectly natural just because it is cheaper in economic terms. Essentially, Japan's natural capital is being protected by the loss of natural capital overseas. Japan, though, could actually be self-sufficient in what it uses. With lumber, in particular, we could supply 100% of our own needs and even export by raising standards a bit. Of course, there's some export underway even now.

The real question is whether people will be willing to pay a little more for quality products, whether lumber or agricultural produce, that are made at home. If this way of thinking takes hold I think society as a whole will begin moving in a sustainable direction on its own.

# What Should We Do to Change the Social System?

# **Q.** Doesn't changing social systems in the way you've described require finding a way to convince everyone to do so?

**Takeuchi:** We could talk for thousands or even tens of thousands of years about the need to work together to make society what it ought to be and it wouldn't do any good. The important thing is to find solutions that both producers and consumers really believe will make things better, more comfortable, more meaningful, and more satisfying for themselves.

Japan is becoming a society of old people. Japan today has many elderly people in good health yet the system provides them with pensions on which to live. I think it is critical instead to create a society in which such people, even if they don't receive much income, are able to spend their later years productively and take part in society for as long as they stay healthy. What's important is that such people form a group that generates a new sense of values. The population of Japan, and particularly that of its farming and fishing villages, is going to continue to decline. Looking at this as a new frontier, however, opens up possibilities for solving the issue of industrial hollowing out that we face today. I think there's something wrong when all people can talk about is how the movement of large factories overseas is going to bring about industrial decline in Japan.

We have to create a situation in which people live in accordance with a dispersed national land-use structure encompassing not only industries like agriculture, forestry, and fisheries but also tourism and energy. People say there are no places for young people to work but there are — they're just in rural areas rather than big companies. In order for Japan to remain a truly rich nation beyond the middle of the 21st century we have to change the structure of society as a whole.

Q. When painting a picture of such a future, do you see a need to persuade people through econometric models that quantify concepts like GDP and wealth, using them to illustrate how wealth rises under green growth without increasing unemployment very much?



**Takeuchi:** Up until now, those who have prioritized development and the economy have used such indices to drive their companies forward, while those who have prioritized nature and the importance of individual values have argued that nature is irreplaceable and that values cannot be measured.

At the end of last month I put together the National Biodiversity Strategy as chairman of the group responsible, and one of the things I particularly emphasized was the importance of using indices wherever possible. The gap between doing so and not makes a huge difference in our ability to be persuasive and to check progress toward our goals. I think it's extremely important to use indices even while remaining fully aware of their limitations. Up until now our indices have been unbalanced. Economic issues can be converted into money, and climate change is one global environmental issue that can be converted into CO<sub>2</sub>, so both lend themselves to the use of indices. Biodiversity, however, is extremely difficult to index. No wonder CO<sub>2</sub> is at the forefront of international debate around the world. One result of this, however, has been deadlock in the climate change issue.

In other words, where a qualitative discussion is needed to build consensus around the prerequisite of a low-carbon society, people are focusing only on the quantitative discussion of CO<sub>2</sub> reduction. In creating indices we need to find a balance between what can be readily quantified and what can not.

#### Importance of Dialogue between Specialized Fields & between Academia & the Larger World

# **Q**. When considering future intellectual contributions of the System for Sustainability Science, do you envision the creation of balanced indices?

**Takeuchi:** I think the important thing is to clearly establish the relationship between various indices. Sustainability science as we conceive it today involves dialogue between academia and society through which academia presents society with new scenarios and visions. One key issue is whether society will accept these or not, and another is how society's appraisal will change the discipline itself. In other words, I would like to see a measure of co-evolution between scholarship and society. We are, therefore, very interested to engage proactively in dialogue both internationally and with various industries.

Another characteristic of our organization can be seen when looking at global environmental issues. The study of economics comes into play, of course, but so, for example, do the study of climate systems, which must evaluate climate change models, and the study of engineering, which must develop resource- and energysaving technologies to mitigate the effects of global warming. In the agricultural industry, too, we need to develop agricultural methods that don't produce CO<sub>2</sub>. But these issues involve many different related disciplines and no one has yet come up with a way to bring them all together as one big system. I think this is something we should try to do. There are a lot of indices out there: economic indicators, indices for the temperature rise caused by global warming, predictions of the increased rainfall it is likely to cause, and energy efficiency indicators in engineering and technology. In thinking about how to design the social systems of the future what we lack most is an understanding of how to combine these indices. I think we need to propose a system that can generate optimal overall solutions.

One of the things I've been involved with recently, for example, is the debate around geothermal development, a hot topic in the wake of the earthquake. Discussions are moving toward revising the regulations on the use of national parks to enable geothermal development even in restricted areas. There are people involved who know a lot about geothermal development, and there are people involved who know a lot about why the natural environment in national parks is important, but what has been missing from the debate so far is the ability for the two sides to talk to each other.

There are indices that show the potential of geothermal development and there are indices put forth by the conservation movement, but there ought to be a way to put them together to identify where the optimal solution is, that is, how to minimize the impact on the scenery and natural environment in the national parks while ensuring efficient geothermal development. I think sustainability science has a necessary role to play as a coordinator that translates and ties together the indices used by each field. As a cross-connecting discipline that relativizes and ties together the deep-digging disciplines, we made the decision not to put our organization under any particular department at the university but rather to report directly to the president. This positions us as an organization supported by the University of Tokyo as a whole, but there are operational challenges posed by the need to look at things overall in terms of the humanities/sciences divide.

There is an organization called the Intergovernmental Sciencepolicy Platform on Biodiversity and Ecosystem Services (IPBES) that asked researchers around the world what would be important when developing its IPBES Assessment. Of the roughly 1,500 researchers who responded, more than 80% said it was crucial to link together the natural sciences, social sciences and the humanities. Therefore, although biodiversity has previously been seen as something for the biologists to worry about, the goals of the Convention on Biological Diversity include not only stemming the loss of species but also making good use of biological resources and encouraging the fair distribution between advanced and developing countries of profits from genetic resources. These are issues directly related to the way people live. There is now international support for the idea that not only the natural sciences but the social sciences, too, are critically important.

## Cooperating with Organizations Overseas as a Global Leader

Q. As we've spoken I've gotten the impression that openness is a key concept for you: openness between specialized fields, openness toward society, and openness toward countries overseas.



This seems to be an extremely important aspect of academia's ability to play a leading role in society going forward. In closing could you offer some details about how you plan to cooperate with overseas organizations?

**Takeuchi:** In terms of scholarship, our field is centered on developed nations. Naturally, in order to maintain good relations we are engaged in constant interpersonal exchange. In my case, for example, I work together with organizations like Arizona State University, the University of Rome, and the United Nations University in managing the International Society for Sustainability Science. We'll be putting together a conference in Provence, France, next year with Aix-Marseill University and UNESCO, so these sorts of networks and the publication of our journal are one thing. In addition, we also cooperate with developing countries and hope to work closely with people at major universities in Asia and Africa. Prof. Max Price, vice chancellor of the University of Cape Town in South Africa, recently visited and we conducted a workshop together.

We also want to strengthen our coordination with UNESCO, FAO, and other programs centered on the United Nations. We've been developing relationships with the business community in Japan and hope to do so internationally as well. The executive vice president of Volvo and the CEO of Stena in Sweden have come to visit and we are talking about how to collaborate going forward. As I said at the beginning, we must remain connected to society and so I hope we can develop a strong relationship with the business community.