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Heinz Schandl: sense and sustainability

CSIRO's Dr Heinz Schandl has a background in sociology and economics. As he explains to *ECOS*, his research focus is not so much on the role of the individual in sustainable development, as the social structures or institutions that determine how we interact as individuals.

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Dr Schandl's research is designed to inform policy in the area of sustainable consumption and production. He is lead author of two recent reports: ***Resource Efficiency: Economics and Outlook for Asia and the Pacific*** , commissioned by the United Nations Environment Programme (UNEP), and *Material Use and Resource Productivity in Latin America and the Caribbean*.

Dr Schandl's previous work has included an analysis of climate impacts in Australia; an analysis of consumption patterns and resource use by Australian households; research on the skills and knowledge required to transition to a low-carbon economy; and research into mining and sustainable development in New South Wales and Queensland.

Can you explain the concept of resource efficiency?

Resource efficiency is a way to link environmental issues and economic activities. The UNEP, which commissioned [the two aforementioned] reports has, over the past 10 years, increasingly recognised that to guide sustainable development, it is important to link environmental issues and economic activities. That means you need environmental indicators that better link to economic processes. We call these 'pressure indicators'.

Until our reports, there was no data on pressure indicators in the UNEP database. So, in that sense, the Asia–Pacific resource efficiency report broke new ground in understanding pressure indicators. It really looked at the materials, the energy use, the water and land use, but also the emissions and waste that come when you do economic activities.

When I say natural resources, I mean an aggregated figure for all the resources used in an economy within a year – things such as biomass, timber, construction materials, oils and fossil fuels. When you sum it all up and compare it to the economic output, you then get the figure for national resource efficiency. The figure is measured as kilograms of natural resource used per dollar produced.

What are some examples of how this research has, or could be, applied in the real world?

I think this question is somehow inspired by the idea that we do research first and then we look for applications in the real world. But, that's not how the Asia–Pacific report came about.

The Asia–Pacific office of the UNEP realised they were lacking information on the amount of resources that were being used in these countries – and in the region as a whole – and they wanted to have a kind of a baseline. They wanted us to answer questions such as:

How big is the region, in terms of natural resource use?

Do these resources come from within the region, or has the region started to become a net importer of natural resources?

Most importantly, how will resource use trends look in the future? How big a resource user will the region be, for example, by 2050?

The UNEP wanted to put this information forward to trigger policy debate in the region – and within countries – with the aim of using scientific information to inform debate on big issues such as food security, water security, supply security of strategic materials and climate change.

Do you know if the findings or methods in these reports have been taken up at the policy level?

We made the data that underpins the report available for free on the web. From the download statistics, we can see that this data are being widely used by academics as well as policy makers and government agencies.

To give you an example, China is one of the countries that has established a comprehensive policy looking at the whole cycle of resource use: all the way down to waste and emissions. They call it the 'circular economy law'.

Obviously, when you put in place such a law, you need targets and you need to be able to evaluate how far you get with your new policies. China has been looking for indicators to help them make those assessments.

At a January conference in Beijing, the Chinese National Development and Reform Commission – a kind of super-ministry also responsible for the five-year planning process – invited us to present our report. They saw it as one of the major underpinnings of their new indicator system to measure the progress of their circular economy.

Another key term used in these reports is 'materials intensity'. Can you explain this, and why it is an important indicator in terms of sustainable resource use?

Let me go back a little. In the 1970s, a major report titled *Limits to Growth* was launched. This report argued that economic growth will be detrimental to our environment and resources, and that the result of focusing too much on economic growth as a global society will be a collapse of the Earth system.

Since the '70s, the debate has moved on. With the new concept of sustainability or 'sustainable development' that emerged in the 1990s, we started to look at the quality of economic growth.

We can think about an economic growth that comes with a lower environmental impact, because of higher efficiency in the way we use natural resources. This is encapsulated in the idea of material intensity. We know now there is quite a spectrum of how many resources we actually need to produce one dollar of economic output, or one unit of product and service.

So, in a way, materials intensity is a big hope, because it speaks to the technological potential to consume and produce at a much lower environmental impact.

The potential for doing so is very large in some sectors, such as the transport sector. Moving from the private transport systems to public transport systems has the potential to reduce the resources and emissions intensity of mobility in the order of 70–80 per cent.

Your report notes that in the Asia-Pacific, population growth is no longer the major driver of environmental pressure. What has replaced it?

The idea that technology and innovation will always help us to solve our environmental problems is commonplace in our political debate. What underpins this is that if you look at the global economy over the last century, then you can see that globally, resource intensity has improved. Resource intensity is like an indicator for the ability to actually improve and use technology successfully.

But, if we look at Asia specifically, we see a different trend. Since the 1990s, Asia has become less resource-efficient over time. And, this has started to impact on global resource efficiency. So, around the year 2000 – for the first time over the past 100 years – the

global economy became less resource-efficient.

What is behind this trend is that economic activity has shifted from very resource-efficient countries, such as Japan, to less resource-efficient countries, such as China. In Japan, to produce $1 of economic output, about 0.5 kg natural resources are used; but in China, producing $1 of economic output takes about 10 kg of natural resources.

One thing I have always looked at in my research is what I call the industrial transformation. This is because as a sociologist, I'm interested in the co-evolution of social structures with the way we use resources, and what kind of resources we use.

So, think of an agrarian society – mainly based on land use and biomass – transitioning to an industrial society. You can see that the agrarian society starts to use and incorporate resources not previously used: mostly fossil fuels and minerals, and a much higher amount of ores. The new technologies that underpin this resource use are actually more material- and emissions-intensive than previous technologies.

In Asia and the Asia–Pacific, this process of industrial transformation is very powerfully underway; and it's happening at a scale and speed that has never been experienced before in human history.

Furthermore, basically all the aspirations are set for consumption patterns that are familiar to those in the developed world. Even in the smallest villages in north-east Thailand, you will find at least one TV set setting aspirations for middle-class lifestyles. And, national policies are set to enable new infrastructure and new manufacturing capacities to meet this demand.

On top of this, some of these countries have started to become the manufacturing base for global consumption. China, to a large extent, has produced and has become the workshop for the world. It's only more recently started to pick up in terms of domestic consumption.

Population does increase resource use and emissions, but consumption is now more important, because of the large number of new middle-class consumers.

Technology has always been seen as a way of offsetting some of the growth in resource use and emissions that comes from growth in consumption and population. But, in the Asia–Pacific region, technology does not mediate but positively contributes to growth in resource use.

Pressure on the environment and resources will continue to grow as up to three billion consumers join the middle class in the next 20 years. This consumer consumption will be underpinned by a large amount of resources, waste and emissions that occur both in production and in consumption.

The two reports present a fairly sobering picture of resource efficiency in these regions. Did your work on these reports also lead to more positive findings?

After the resource efficiency work, UNEP invited us to help them with a study looking at existing policies and capacities for sustainable consumption and production in Asian developing countries.

We ran extensive dialogue with policy-makers and government agencies to assess the state of policy development and the capacity to implement policies, and to evaluate and assess policy outcomes.

There were two very inspiring findings. First, at the national level, many of these countries have a well-established suite of policies in place to deal with the problems. Some of their policies are more advanced than those we have in Australia. Second, the knowledge base of national policy-makers is very high.

The biggest bottleneck, however, is capacity at the provincial and city level.

Who has inspired and motivated you in your career?

As you can see from my biography, I originally come from Vienna, in the heart of Europe. I have gained much inspiration from many great scientists I have interacted with in the tightly knit European research community.

At the Institute of Social Ecology in Vienna, I had a great director in Marina Fischer-Kowalski, a sociologist who moved into the emerging field of sustainability science.

Also, of course, you get inspiration from people you've never met.

One person whose work has greatly inspired me is the German sociologist Niklas Luhmann, who passed away in 1989. He had an interesting career – he came originally from law and moved into sociology.

One of his books, *Ecological Communication*, talks about the difficulties modern society faces in effectively dealing with ecological problems, because of the way in which society is structurally and functionally differentiated: the kind of interdependencies and blind spots that occur and are not dealt with within the organisations and structures we have created.

Do you have a favourite quote?

Economics is all about how people make choices. Sociology is all about why they don't have any choices to make. James Duesenberry, 1960

This quite provocative, and a little overstated, quote comes from an economist whose work investigated how consumption is more of a social than an individual choice phenomenon.

I think this is a very programmatic statement for my discipline, and it is especially relevant in Australia. This is because of the way in which Anglo-Saxon political philosophy begins with the individual most of the time, and underestimates the importance of the collective or of social structures in providing guidance for individuals.

In my own research, this question about social structure is obviously linked to the environment. So, you could say what I'm after is actually a conceptual and analytical framework that bridges both society and environment. You may call it a social-ecological system.

But, I always insist that the starting point of analysis should not be the individual, but rather at a much higher aggregate level: looking at social structures or institutions that determine how we interact as individuals.

Heinz Schandl was in conversation with ECOS's Michele Sabto