

Special Workshop on Indicators for Sustainable Consumption

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"Waste Statistics - useful indicators for Sustainable Consumption?"

1. Introduction

These days, a number of sustainability indicators are being proposed - If it is about a sustainable society, it is appropriate to use total environmental emission (of CO₂, SO_x etc), total energy usage, etc. These indicators include effects from activities in the production sector as well as in the consumption sector. If we want to isolate and analyse consumption, we need separate indicators. The level of household waste can be used as an indicator for such purpose, as it solely reflects the consumption activities in the household.

2. Household waste

In most countries, waste is categorised into "household waste", "commercial (trade) waste", and "industrial waste". Sometimes the boundary between each category is not very explicit, but usually these three types of waste are collected and treated separately, hence there are separate figures for tonnages of each category.

Most goods that enter households would leave the household as waste, and the retention time in the household for most goods is very short. Think about packaging for fresh food - it becomes waste almost as soon as it entered the household.

Household waste reflects the material consumption in the household; what is in the bin is what one has consumed. Moreover, the amount of household waste increases when items are not made use to its full potential. Unnecessary over-packaging will directly contribute to increase in packaging waste. If all the food purchased had been eaten, there would not be much food waste, but in reality there is quite a lot of leftover food in waste. This is an indication of an inefficient consumption, as I do not think households would gain any utility by wasting food. Less efficient material consumption practices generate more waste.

On the other hand, if an item has ended its useful life in one household but had uses elsewhere and it had been passed on, it would not appear in waste - this is called re-use, and it is a very efficient way of consumption. Waste statistics can also indicate levels of recycling which usually decreases the environmental impact of consumption.

We know that consumption levels in highly industrialised countries are in general beyond sustainable level. Occasionally we see statements that in order to achieve sustainability, we need to lower our consumption levels to that of some years ago, usually dating a few decades back. To some people the idea of reverting the society back some years is unacceptable, as it goes against the idea that the human society should progress. It would be useful if we could indicate that within the same country some localities are practising more sustainable consumption. People would accept that such localities enjoy similar levels of convenient life (wealth) as theirs, and lessons can be learned and applied to their own locality.

It is not easy to break down consumption statistics into local areas. Retail chains operate across local boundaries, and often there is no authoritative body monitoring the consumption or sales of certain goods in a particular locality. On the contrary, waste is usually dealt with in local units and statistics is available at that level. Hence there is possibility of using waste statistics to indicate differences in local consumption of goods. Waste statistics often show varieties among localities within a country - for example, league tables of local authority recycling have often been compiled in England. By looking at

local authorities with a more desirable track record on waste, it is possible to identify good practices within a country. This may provide clues and feasible options towards sustainable consumption.

In this presentation, I would like to look more closely in to household waste statistics, discuss what they actually indicate regarding environmentally sustainable consumption. I would also like to point out some problems with this statistics and make suggestions on how they can be improved. Probably, what I have found with waste statistics can be applied to other locally monitorable consumption such as use of water, and consumption of electricity.

3. Household waste statistics / Japan and England

3.1 Japan

Japanese waste statistics was started in the 1960s by the Ministry of Health and Welfare, now continued by the Ministry of the Environment. This is a very comprehensive survey with lots of survey items. Data from all 3200+ local authorities are gathered with almost a 100% response rate. As far as I am aware, there is no other survey in Japan that covers all the local authorities.

3.2 England

Waste statistics in England is available from multiple sources. They are CIPFA (Chartered Institute of Public Finances and Accountancy), Audit Commission (as part of Best Value Performance Indicators), and DEFRA (Department of Environment, Food and Rural Affairs). Each of these statistics cover all 400+ local authorities in England. CIPFA waste statistics started in 1974, and it is a very comprehensive survey with more than 200 items. However, there is a problem with response rates in this statistics. In the 1980s the response rate dropped to almost 50%, (the Compulsory Competitive Tendering legislation is said to be the reason). The Audit Commission started their Performance Indicators survey in 1993. Local Authorities are mandated by law to respond to their surveys; therefore the response rate is almost 100%. However, the survey items waste management is limited, and the only quantitative data available are waste arisings and total amount recycled (or recycling rate). DEFRA conducts a similar survey to that of CIPFA, but they have a policy of not publishing individual figures. Only aggregated figures (national and regional) are available.

3.3 How do they look?

Histograms and distribution maps (dotplot and choropleth maps) of statistics on waste arisings and recycling levels in both Japan and England will be displayed. In both countries, the statistics indicate a very big variance among local authorities in terms of the amount of waste and recycling.

Among waste researchers it has been argued that factors such as local differences in waste systems (frequency of waste collection, items for separate collection, etc), and local differences in income levels and lifestyles contribute to differences in levels of waste and participation to recycling. We would like to know what type of localities produce less waste, however it is difficult to deduct statistically significant factors. One reason for this is that the analysed units are hugely different in size. Tokyo special metropolitan district with a population of 10 million, and rural districts with less than 1000 inhabitants exist as a same single entry in the statistics, this leads to methodological problems with statistical analyses. On top of this, we can assume that there is also a big intra-city difference. For example, there is always a wealthier neighbourhood and a poorer neighbourhood within a city. There are households with higher and lower levels of waste, but in the statistical figures, all appears as an average for a city. When considering, for example, the relationship between wealth and life expectancy around the world, it makes very good sense to use GNP per capita as average income, and the national average life expectancy. Society as a whole being wealthy probably means more for the individual's health status than the

individual her/himself being wealthy. Hospitals and high quality healthcare cannot be maintained by an individual. However, in the case of looking at the level of waste and recycling in different areas within a country, the interest is more in the effect of individuals' income on their behaviour. The variation of waste arisings within a country (like Japan or England) maybe more influenced by factors attributed to individuals than those to the local authority.

Looking into the validity of the figures, we also encounter problems. There is a problem of measurement - the amount of waste should be measured with a weighbridge, but it is not always so. Sometimes it is "guesstimated" by the number of vehicles carrying waste to waste facilities. The amount of waste tends to be inflated, as contractors may be paid by amount of waste handled (Japan), to make cost per tonne appear lower (England).

Distinction between various fraction of waste is not clear. Some local authorities are more strict about collecting commercial waste separately than in others. There is no universal definition of bulky / civic amenity waste. Household, commercial, civic amenity, and bulky, are all classifications based on the operational aspect of waste collection, and thus care is required in making a comparison from place to place. An identical item (in material and context) may end up in a different category in different places.

4 Case Studies

Local authorities with low waste arisings and high recycling rates were examined as to what the figures in the statistics actually reflect. Selected cases are as follows: Mitsue in Japan (Nara Prefecture) which reported a waste arisings of 104g/day and a 100% recycling rate (1992). St Edmundsbury in England (Suffolk) with a recycling rate of 25.3%, which is one of the highest in England. The amount recycled per capita is 375g/day, which is also one of the highest in England.

4.1 Mitsue, Nara Japan

Mitsue (population 3030) is located in a rural area in Nara Prefecture. On the statistics it appears to have an ideal waste management with a very low waste arisings and a very high recycling rate. It turned out that Mitsue only provide collection of recyclable items, and that the reported figures on waste arisings and recycling were not based on weighbridge measurements. However, these figures cannot be simply dismissed as examples of statistical errors. Even if the numbers are not accurate, it appears that the residents are putting much effort into desirable waste management alternatives such as home composting and recycling. It could be said that the de-facto concept of waste management in Mitsue is to minimise the amount of waste dealt with by the authority (due to constraints on the available facilities), and to rely on residents to deal with their waste themselves.

Many residents chose to 'self dispose' of waste. This is to compost or to burn waste in their backyard. Composting is basically a method to "assimilate waste back to earth", and is considered to be an environmental option. The occurrence of genuine waste reduction cannot be denied either. Probably the efforts required for residents to treat waste by themselves make waste reduction efforts worthwhile.

It appears that Mitsue managed to keep on longer with the traditional ways of dealing with waste than in other places. As the amount of non-burnable waste increased, they decided to cope by introducing a collection scheme for recyclables. This established an ideal scheme that is based on composting and recycling. However, the increase of plastics (as well as other hazardous household waste) rendered it unfeasible. Plastics cannot be composted, cause problems when burned, and have also proven costly to recycle. It appears that urbanisation is another blow to the ecological approach. It was noted that the number of households engaged in agriculture is decreasing, and for the residents who do not engage in agriculture there is less interest, and less space to make compost.

4.2 St Edmundsbury, Suffolk England

St Edmundsbury (population 97000) achieved an outstanding recycling performance by introducing a separate kerbside collection for compostables. In 1992 the borough council was looking into ways to achieve the 25% recycling rate target that the government set in 1990 (DoE 1990). They conducted a waste composition analysis, and identified that 26% of total household waste is compostable: this was the largest single stream that could be diverted from landfilling. The council provided a second waste collection container for compostables and collected it fortnightly. Year to year comparison of statistics indicate that the amount recyclables collection increased drastically. However a reduction in the amount of non-recyclables collection was not observed. It is speculated that the collection scheme for compostables attracted items that were previously not put out as waste (dead leaves and twigs that were probably left as a pile in the backyard). With the council's initiative, recycling happened but not reduction, despite the latter is suggested to have priority over the former as described in the "waste hierarchy" concept. The case of St Edmundsbury suggests that indicators and targets need to be set carefully, and also the need of an indicator to reflect waste minimisation.

5. Transition Economies:

In transition economies we have seen that in some countries, resource productivity and environmental impacts from production has improved in the past decades. I was involved in a research work in conjunction with the European Development Bank*, which was featured in the environmental section of their annual report.

In addition to the levels of emission of pollutants such as SO_x, I tried to include waste statistics. It is pretty difficult to get waste statistics figures - sometimes it makes more sense to get a figure for the capital city only, as in the countryside people just bury waste somewhere and no-one knows how much of it is being disposed of. Unit of measurement can be volume or weight based, some places do not distinguish between commercial and household sources, so the figure is total municipal waste and not household sources only. The category "municipal waste" is tricky, as we don't know to what extent industrial waste is included in it.

Air pollution indices unanimously show a decreasing tendency, but for waste it appears that some places the amount of waste is decreasing, some are increasing. We can see that "de-coupling" of production and pollution can be achieved relatively straightforward by introducing cleaner and more efficient technology. On the other hand, it appears more difficult to break the link between consumption and its environmental impacts. Data suggest that as capitalist consumerism penetrates into the society, the amount of waste increases.

6. Conclusions

Consumption generates waste - the less environmentally efficient, the more waste it generates. The environmental impact of consumption can be reduced by a sound waste management. Waste statistics reflect the performance of waste management, and they can be an indicator for sustainable consumption. I have presented what the figures in waste statistics reflect in reality, with the intention of providing some insights into the use of the figures as an indicator, and also for achieving sustainable consumption. I have also pointed out some problems with the current statistics. It highlighted the need of better design of survey / standardised definitions for household waste statistics so that they can be compared widely.

* See: Ichikawa, Nobuko; Tsutsumi, Rie; and Watanabe, Kohei (2002) Environmental Indicators of Transition "European Environment" Vol.12:2 pp.64-76 John Wiley & Sons, Ltd. and ERP Environment