

# Eva Ignatuschtschenko

## Electronic Waste in China, Japan and Vietnam

### A Comparative Analysis of Waste Management Strategies

#### Topic and Research Question

The thesis aims at contributing to a more comprehensive analysis of the e-waste challenge and responses to the challenge in three East Asian countries, namely China, Japan and Vietnam. The analysis focuses on the three countries as case studies, whereas each of their e-waste sectors shows different characteristics – Japan as a major e-waste export country, China as one of the world's major e-waste import countries and Vietnam as a country that mainly imports e-waste, but shows significant re-export of e-waste to China.

The primary research question of this thesis is:

*How does e-waste management in China, Japan and Vietnam differ with respect to progress made towards Integrated Sustainable Waste Management (ISWM)?*

The thesis does not aim to rank the three countries, but provide an inclusive and holistic analysis. As a result, similarities and differences between the countries' e-waste management approaches are identified, which allow for inferences with regard to national and regional patterns. To this end, the following secondary research questions are answered:

- Do e-waste management approaches differ according to the distribution of import, export and transit (re-export) countries?
- Can other patterns of e-waste management be identified or do specific national characteristics determine approaches in the three analyzed countries?
- Could there be an 'East Asian' way of e-waste management?

#### State of the Art

Although waste and waste management have been topics of research for many years, the specific focus on e-waste is a rather new phenomenon that has emerged in academic literature in the 21st century.

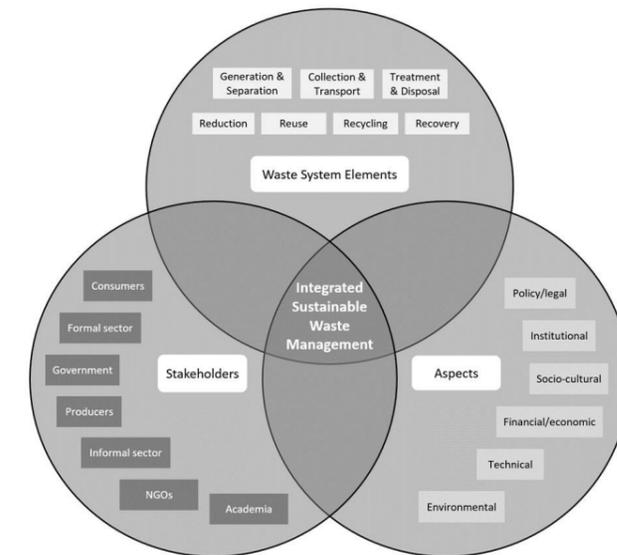
Comparatively rare examples of a more analytical approach towards the comparison of e-waste management in East Asian countries, focusing on the recycling of e-waste, include: Bo and Yamamoto, 2010; Chung and Kojima, 2010; Chung and Murakami-Suzuki, 2008; Lee and Na, 2010.

Apart from academic research, international organizations, such as ILO, UNODC or UNEP, are also

paying increasing attention to the issue of e-waste (Lundgren, 2012; UNEP, 2012; UNODC, 2013).

However, only very limited research has been conducted on the Vietnamese e-waste sector. Comparative studies often neglect the country entirely or include only general or aggregated information on Vietnam (Pariatamby and Victor, 2013; Herat and Agamuthu, 2012).

#### Methodology and Approach



The methodological framework is based on the concept of Integrated Sustainable Waste Management (ISWM), which consists of three interdependent dimensions. These dimensions refer to the three questions of who should be involved (stakeholders), what should be done (elements) and how should it be done (aspects).

From the production of waste to its final disposal or recycling, multiple *stakeholders* are involved in the process to varying extents, including the formal and informal sectors.

The *waste system elements* represent the technical constituents and measures of the waste management system. They indicate how waste is handled and where it remains at the end of the process. The waste management hierarchy serves as a benchmark for the prioritization of these elements, with disposal of waste as the least preferred measure.

The third dimension, sustainability *aspects*, provides different lenses that are necessary to develop a

sustainable waste management system. In addition to the technical management of waste, the political environment, the legislative and institutional framework, socio-cultural conditions, environmental and health aspects, as well as financial and economic factors, have an impact on the efficiency and sustainability of waste management activities.

#### Main Facts

All three countries show a distinct structure of *stakeholders* and their role and interaction within the system. The primary role of the government in all three countries – as regulator, coordinator and facilitator of e-waste management activities – is the only similarity. Overall, the comparison of the stakeholder landscapes shows that Vietnam and Japan are at opposing sides of the spectrum, whereas China shows similarities with both, mainly due to the government's efforts to develop a more integrated stakeholder structure.

Out of the three countries analyzed, only Japan applies all seven *waste system elements*. The most preferential elements, such as prevention, are among the most commonly applied measures, while the least preferential elements of the hierarchy are less commonly utilized. In this regard, compared to China and Vietnam, the composition and emphasis of the waste system elements in the Japanese e-waste sector are closest to the optimal ISWM framework. Nevertheless, one major shortcoming of the system is the prevalence of e-waste export. Similarly to the stakeholder landscapes, Japan and Vietnam represent the lower and upper ends as regards sophistication, diversification and adherence to the waste system hierarchy and the ISWM framework.

The analysis of the six sustainability *aspects* shows a similar pattern. While Japan is characterized by a generally highly advanced approach in relation to the ISWM framework, China faces challenges in the enforcement of laws and policies, in the technical and economic performance of the e-waste sector, as well as in the environmental and health impact of its e-waste handling practices, which is predominantly a result of the persistent informal e-waste sector. Vietnam shares many of these challenges, but shows an even higher dependence on the informal e-waste collection and recycling industry. Moreover, it differs from the Chinese approach in its insufficient and fragmented legal, institutional and structural e-waste management framework, which fails to recognize the distinct challenges associated with e-waste and instead applies general waste management processes.

#### Results

Dimensions/Aspects	Japan	China	Vietnam
Stakeholders	Similar		
Waste system elements	Similar		
Policy and legal aspects			
Institutional aspects	Similar		
Socio-cultural aspects		Similar	
Financial and economic aspects			
Technical aspects			
Environmental aspects	Similar		

Overall, the analysis shows that the Vietnamese e-waste management approach is least consistent with the ISWM model, whereas Japan complies to the greatest extent with the ideals of the framework. Chinese progress towards ISWM is mostly located between the two countries, with efforts being made to elevate the e-waste system towards ISWM. However, Japan's adherence to ISWM ideals, while generally high, is limited to domestically treated e-waste. Approximately one third of produced e-waste is exported to developing countries, where it is likely handled in less sustainable conditions.

As regards the secondary research questions, the results indicate neither a distinction according to import, export and transit (re-export) countries, nor an 'East Asian' way of e-waste management. However, even though correlations would need to be substantiated by broader studies, the analysis suggests that national development and characteristics have a strong influence on the e-waste management approach a country applies.

#### References

All references can be found in the full version of the MA thesis available at <http://othes.univie.ac.at/>.

#### About the Author

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Examination Date: 08/04/2016