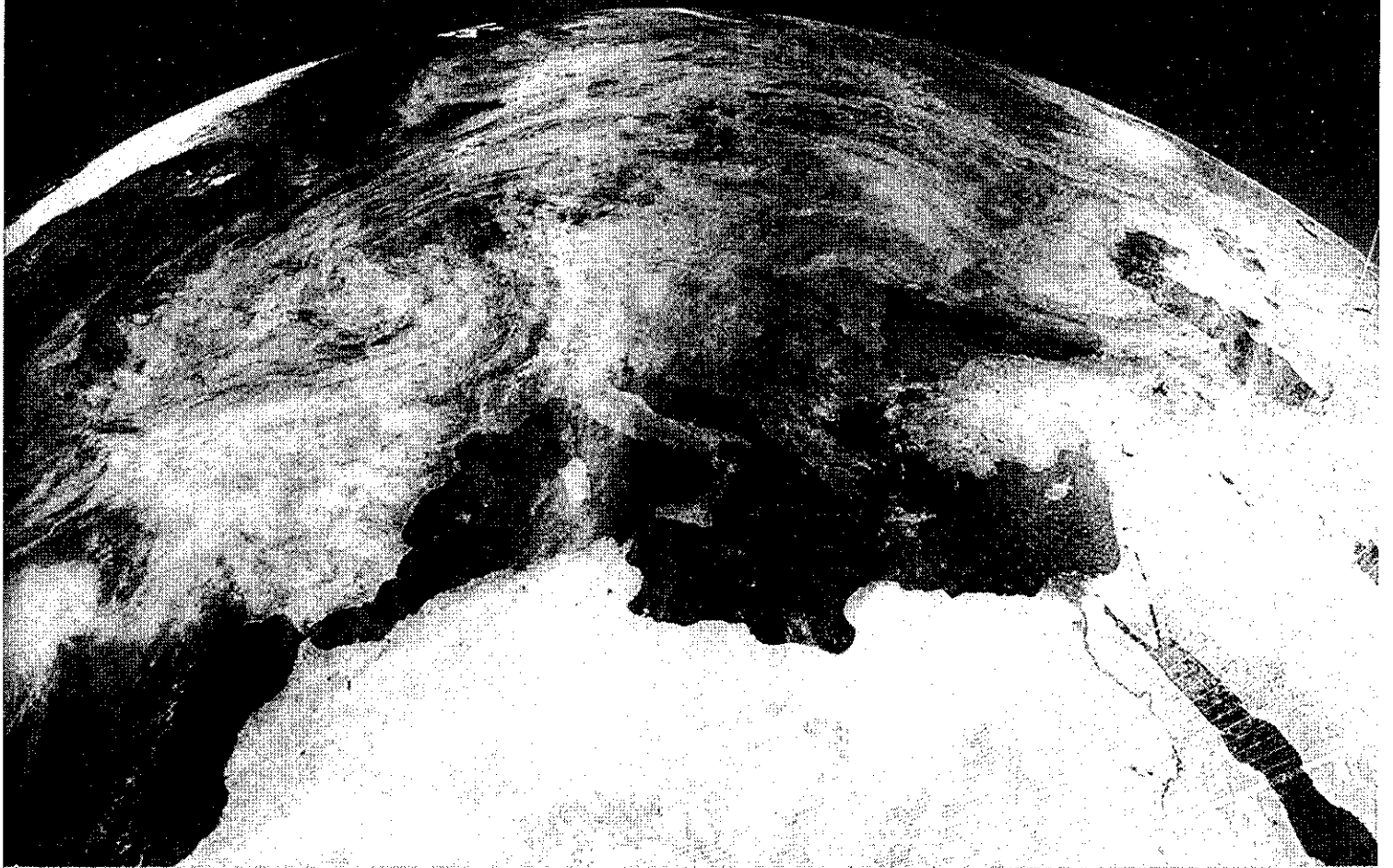


GLOBALISATION AND WASTE MANAGEMENT

Final Report from the ISWA Task Force





ISWA's objective is the worldwide exchange of information and experience on all aspects of waste management. The association promotes the adoption of acceptable systems of professional waste management through technological development and improvement of practices for the protection of human life, health and the environment as well as the conservation of materials and energy resources.

ISWA's vision is an Earth where no waste exists. Waste should be reused and reduced to a minimum, then collected, recycled and treated properly. Residual matter should be disposed of in a safe, engineered way, ensuring a clean and healthy environment. All people on Earth should have the right to enjoy an environment with clean air, earth, seas and soils. To be able to achieve this, we need to work together.

For information about ISWA, visit our homepage at www.iswa.org

FOREWORD

It is with pleasure and a certain sense of pride, that I introduce the ISWA Globalisation Task Force's Final Report, which covers a series of important issues regarding waste management.

The Task Force's interim report, in 2012, highlighted the links between globalised supply chains, consumerism, population growth, urbanisation, resource depletion and waste management. It underlined the crisis humanity faces in needing to stop open waste dumping and to bring collection services to half the world's population living that don't have them. Dumping and incomplete collection damages our health and environment. We underlined how a collective global effort is needed, such as in the fight against diseases (malaria, AIDS), in order to stop hundreds of millions of tonnes of waste polluting our water, soil and air. This requires co-operation between a wide range of stakeholders and above all funding.

In this, the Task Force's Final Report, we face a series of issues. We look at recycling of plastics and how the global supply chain is affected by recycling practices in developed nations that rely on market, particularly China, to ensure their sustainability. We search for answers to the growing challenge of informal sector workers, particularly in developing nations, and how to protect them through a transition to more formal structures, a highly contentious issue among waste professionals. And finally we examine the role of international co-operation in the development of waste management in economically poorer nations and find that the amount of international co-operation going to protect people's health and their environment from uncontrolled waste is almost nothing, a miserable record for the international co-operation community and one which must be changed in the near term.

This report has been elaborated by several authors and let me thank all of them for the integrity and intensity with which they faced these topics. I remind all readers that most of the work ISWA undertakes is voluntary and when paid, comes from the donations which ISWA members worldwide contribute to our association. So my thanks go to all ISWA supporters globally for making this report possible.



David Newman
ISWA President

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Globalisation is one of the major challenges for the long-term sustainability of waste management and vice-versa, appropriate waste management is one of the key conditions for sustainable globalisation.

The relationship between globalisation as a concept, waste management and sustainable management are complex and interrelated. The main challenge is to find a way to integrate the different dimensions of waste management in a sustainable way. This is a complex task because waste management is a multi-faceted activity that involves different stakeholders and interests. The main challenge is to find a way to integrate the different dimensions of waste management in a sustainable way. This is a complex task because waste management is a multi-faceted activity that involves different stakeholders and interests.

In order to address these issues, in September 2010, the ICAE, Euro, a part of the 'Top-Force' or 'Coalition' and Waste Management. The first force's aim is to provide a conceptual framework for the management of waste management. This is a part of the 'Top-Force' or 'Coalition' and Waste Management.

Global recycling markets and their impact on sustainable waste management

Megacities and waste management

The informal sector as a global stakeholder in waste management

International development co-operation in waste management

The main challenge is to find a way to integrate the different dimensions of waste management in a sustainable way. This is a complex task because waste management is a multi-faceted activity that involves different stakeholders and interests. The main challenge is to find a way to integrate the different dimensions of waste management in a sustainable way. This is a complex task because waste management is a multi-faceted activity that involves different stakeholders and interests.

Key Messages

There is a global waste management and resource system that should be further studied and understood

The current level of globalisation in the economy results in the creation of a global waste and resource management system, with important global flows of both materials and environmental impacts.

The plastic garbage patches in the oceans, the global recycling markets, waste trafficking and the global climate change impacts of waste management are some of the symptoms that highlight the importance and the impacts of this global waste management system.



Although there are a lot of tools available for analysing and understanding local waste management systems, we are just at the beginning of efforts to create the global waste management system operates and performs.

There is a need for further interdisciplinary research in order to create the scientific framework required for studying and describing the emerging global waste management system.

There is a globalisation footprint in every local waste management system

There are several links between the globalisation process and waste management systems. Those links represent the globalisation footprint in each and every waste management system.

The globalisation footprint affects in particular:

- The composition of solid waste, which follows clear patterns due to globalisation of the consumption culture and global trade effects. For example, the plastic content of municipal solid waste is often 10-15% by weight, even in developing country cities, and the quantities of waste electronic equipment are increasing rapidly.
- The recycling markets - Europe and North America are rightly proud of increasing their municipal solid waste recycling rates from around 15% or less to 45% or more over the last 20-30 years. However, they currently depend heavily on exporting those materials for recycling, particularly to China.
- The 'flip' side of this global trade in materials for recycling is its exploitation by criminals, modern waste management to protect public health and the environment is expensive, and there are big profits to be made from international trafficking of wastes, particularly for recycling.

- The resource value in waste also provides a potential source of livelihood for the poorest members of society. Therefore, in developing country cities informal recycling activities take place in parallel with the formal solid waste management system.
- The governance patterns, especially through the activities implemented by NGOs and the funding landscapes created by the global institutions (WB, Development Agencies etc.)

This global footprint should be taken into consideration when local efforts are made for a more sustainable waste management system. There is a need for further research to identify more specifically the globalisation footprint and create appropriate ways to qualify it.

The global footprint is particularly important in the emerging and existing megacities

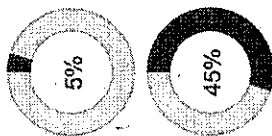
Megacities are the major national interfaces with the globalisation process in terms of the economy, culture and technology. Their links with the globalisation process are an integral part of their evolution and development and this is true for their waste management systems as well.

Especially in emerging countries, where the rapid growth of new urban centres is a key element of their economic and social development, the globalisation footprint in waste management can be one of two things. It could be a potential threat (e.g. in cases where waste trafficking occurs).

Or it could be a it is a potential opportunity (e.g. in cases where appropriate resource management systems across the loop for global flows or where international co-operation can accelerate the development of a sound waste management system).

In either case, since megacities are the most interconnected parts of the world, by moving millions of people and millions of tonnes of materials daily from one country to another, their waste management and resource systems also creating also global footprints due to the extent of their environmental impacts.

Europe and North America increased their municipal solid waste recycling rates from: 5% or less to 45% or more over the last 20-30 years.



The total merchandise trade grew from

\$0.3 trillion* in 1971 to

\$18.3 trillion* in 2011

*All \$ in US Dollars throughout.

The emerging global interconnectivity should be utilised for better waste management

The digital revolution has brought about incredible advances in technology that connect our lives seamlessly from web to apps to mobile. Ideas flow faster than ever, enabling us to share know-how, culture and scientific experiences in an instant.

This interconnectivity has not yet been fully utilised for better waste management utilised systems and this presents both major opportunities and major challenges for all stakeholder groups.

Although there are already several efforts in this direction, it is important to note that, currently, the interconnectivity between academics, institutions and other international stakeholders note that, currently, the interconnectivity lies in both the existing potential and the needs for waste management.

Global recycling markets

For millennia there has been a trade in secondary raw materials, principally metals but even glass cullet. More recently recyclable wastes, particularly paper and plastics, are being collected and processed in the developed countries and then transported to developing countries, particularly in

South-East Asia, now the workshop of the world. This trade has been driven by the need to meet recycling targets imposed by legislation in the EU, some US and Australian states and certain other countries.

When well-managed these transfers are of mutual advantage to both the exporting and importing countries. The exporters are able to sell materials and used goods for further processing and re-use. The importers benefit from cheaper raw materials or goods that can be used for social and economic benefit by local communities.

However, the exporter can also be open to the accusation of 'exporting pollution', if the environmental standards are lower in the importing than the exporting country. The international community recognised early on that the free trade in waste materials could place developing economies in an invidious position. Therefore, in 1976 and 1980s in the Basel Convention, a multilateral environmental agreement focusing on controlling the trans-boundary movement and disposal of hazardous and other wastes, was developed. It was agreed in 1986, and came into force in 1988 and has now been ratified by 180 countries.

The global production of plastics has skyrocketed to:

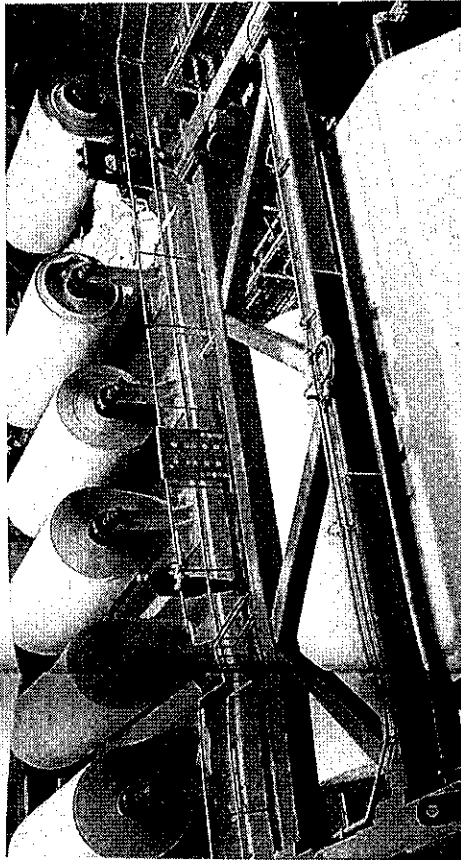
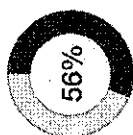
288 Mt in 2012



Of this, Asia is responsible for 40% by weight of the world's production. The annual volume of globally-traded waste plastics is:

15 Mt

which sounds a relatively small amount. Plastic scrap flows from Western countries with established recycling collection systems mainly to China, receiving around 66% of global imports.



Paper Trade—As economic development progresses, so the amounts of paper and tissue products consumed increase. However, in developed economies the amounts of paper consumed and discarded are declining. The amounts of cardboard are now increasing, both consequences of the digital revolution. In contrast, in transition and developing countries the use of paper products is consistently increasing and board use is also rising both for domestic consumption and for packaging for exported goods. Irrespective of the overall demand for paper products, recovered paper will continue to take a greater market share for sourcing of fibre in both developed and developing economies and global trade in recovered paper will therefore continue to strengthen.

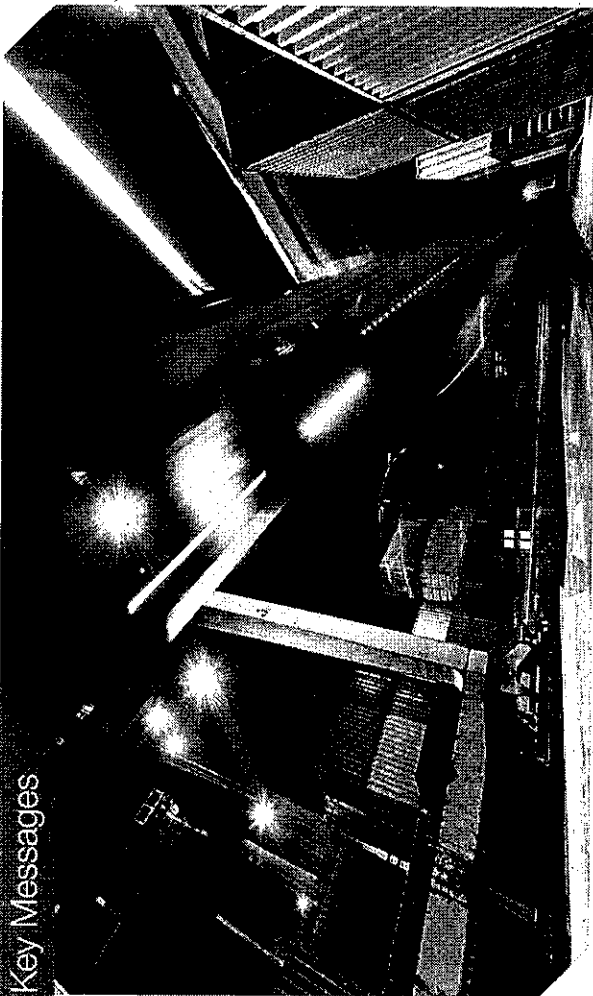


Plastics Trade—International trade in used plastics is prospering. With plastics global production skyrocketing at 288 Mt in 2012, there has been a shift in production from the West to Asia. In fact, Asia is now responsible for 40% of the world's production of plastics. The volume of globally-traded waste plastics is 15 Mt annually, which sounds like a relatively small amount. Plastic scrap flows from Western countries with established recycling collection systems mainly to China, which dominates the international market, receiving around 66% of global imports. Europe (EU-27) collectively exports almost half of the plastics collected for recycling, at least 67% of which goes to China.

Plastic scrap imports in China are rapidly increasing, as are domestic plastics (recycling and energy from waste). The poor quality of domestic recyclables necessitates quality imports for capital-intensive better quality manufacturing, while the inferior imports and domestic recycled plastics end up at either the low-tech, uncontrolled plants and maybe also ETV plants. While the Chinese Government is actively working to increase the quality of imported plastics and reduce the numbers of unregulated facilities (Green Fence Operation), the environmental benefits from Chinese exports to China are questionable given the dominance of uncontrolled reprocessing or manufacturing with very low environmental standards.

So is dependence on a single importing country a risk to the exporting countries who need to meet high, statutory recycling targets? The answer is 'Yes' in two senses. First, China may in the medium- or long-term become self-sufficient in high-quality secondary plastics. Second, the aim of achieving high recycling rates was to achieve sustainable resource recovery, balancing high standards of environmental protection, clean material cycles and resource utilisation; this is questionable when almost half of the collected plastics are exported to countries with lower environmental standards. However, a balance is required: quality, aggregated polymers, e.g. clean PET from bottles, are increasingly sought after from countries on the global market, with manufacturers in the US, Europe and China competing for a limited supply. So some export is normal — provided that a 'level playing field' in terms of environmental standards can be assured.

Key Messages



Waste Trafficking – is a truly international criminal action with a huge turnover and high profit margins. Consequently, individuals and organisations that are consequently involved in waste trafficking activities are criminals and should therefore be treated as such. Naturally, there are cases where waste producers or waste transporters break the law unilaterally. Even so, a large fraction of the illegal exports of waste is suspected to be the result of illegal actions that are committed consensually.

In the long-term, the risks related to handling of waste in receiving developing countries can be reduced by strengthening environmental regulations and enforcement capacities as well as by developing the physical waste management infrastructure in these countries. However, such processes are time consuming. In the meantime, the responsibility must be laid on the exporting countries in co-operation with the relevant international bodies.

Effective preventative actions must be based on international, cross-organisational and intelligence-based co-operation. The successful approach to achieving of this task is to pursue two parallel lines of activities, making it easier to what is light and at the same time making it harder to do wrong:

Megacities and Waste Management

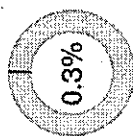
Although cities themselves occupy only 2% of the world's land, they have a major environmental impact. Megacities, with a population greater than 10 million, are growing in numbers – from 2 in 1950 to a projected 33 by 2025. They are also spreading out from the traditional developed world – currently to Asia and later in the century, also to sub-Saharan Africa. Megacities are likely to drain the Earth's dwindling resources, while significantly contributing to environmental degradation, and facing tremendous environmental challenges.

and threats to human health. In this framework, waste management is crucial for improving the everyday quality of life as well as securing the medium to long-term sustainability of megacities.

To implement, operate and maintain well-functioning waste management systems in megacities is a great challenge. Megacities are complex systems and their waste management systems cannot be expected to be simple. Therefore, it is important to have a thorough understanding of the characteristics and dynamics of megacities and how they will affect and interplay with the waste management system. There is no 'one size fits all' solution that can be implemented globally; every solution implemented has to follow the integrated sustainable waste management approach, addressing the physical elements as well as the governance issues of the waste management system.

\$510 Million

of development finance committed to SWM in 2012 represented only 0.3%



of overall development finance, equivalent to

\$0.09

per capita in recipient countries.

The illegal trade in waste is estimated at a value of between

\$10 billion

and

\$12 billion

annuity and generates very high revenues

Megacities, with a population greater than

10 million

are growing in numbers

2 in 1960

to a projected

33 by 2025

International Development Co-operation

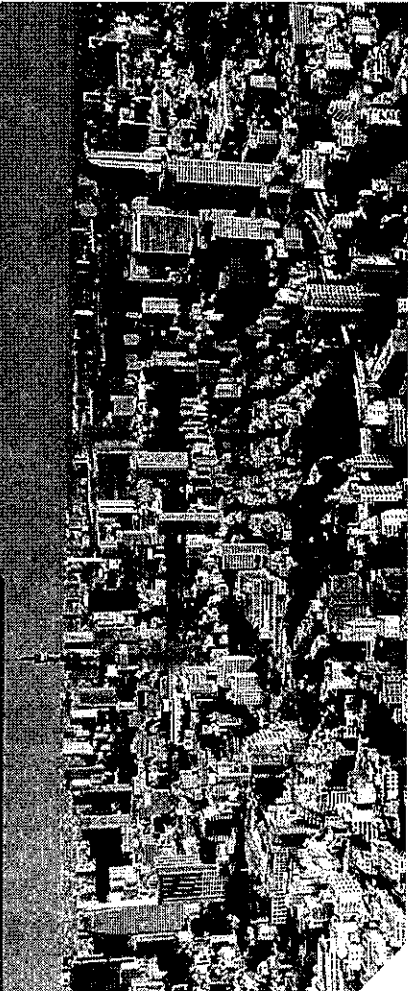
Many cities set improving solid waste management as one of their top three priorities, but the current levels of international development funding for SWM do not appear to reflect that assessment. The \$910M of development finance committed to SWM in 2012, less than 0.3% of overall development finance, equivalent to \$0.09 per capita in recipient countries. This relatively low level of funding may at least partially be a result of past problems with the readiness of cities and governments to meet donors' criteria for loan funding for SWM.

In turn, this has meant a considerable focus recently on grant funding for technical assistance to build skills and capacity, and to address the governance aspects that are a key part of an integrated and sustainable waste management system.

The top ten recipients of SWM-based development finance over the last 10 years have all been middle, rather than low income countries, and account for over two thirds of the total value of both grants and loans over \$4M. In descending order they are: China, India, Mexico, Turkey, Azerbaijan, Venezuela, Jordan, Tanzania and Argentina. Moving forward, there is a need to raise the political priority of SWM, both locally and on the development agenda, continue to focus grant funding on capacity building and good governance, raise the levels of loan funding available for infrastructure development, and gradually extend the region of grant funding to include the lowest income countries that need it most.

The Informal Recycling Sector

Some 20 million people around the world depend for their livelihood on informal recycling from municipal solid wastes. The main driver is poverty working conditions are often unsafe and unhygienic, and child labour is commonplace. This is primarily a social issue, but the informal recycling sector is often achieving notable recycling rates as well as providing a livelihood to significant numbers of the urban poor. Despite the considerable challenges involved, as detailed in this report, dialogue between the formal and informal sectors, and transition to a formalised recycling activity within a city's solid waste management system, is to the advantage of both. It allows step-by-step improvement in, amongst other things, living and working conditions, livelihoods and recycling rates, and the levels of environmental control. An integration will facilitate the transition from an unacceptable situation to the goal of a fully formalised waste management system.



Introduction

For millennia there has been a trade in secondary raw materials, principally metals but even glass, paper, and other recyclable wastes are being collected and processed in the developed countries and then transported to developing countries, particularly in South-East Asia, away from the workshop of the world.

When well managed these transfers are of mutual advantage to both the exporting and importing countries.

The exporters are able to sell materials and used goods for further processing and re-use which is difficult in the exporting countries due to high labour costs and often lack of demand, although the latter issue for recovered materials is now being addressed in several northern economies, mainly through a recognition by major retailers of their extended producer responsibility obligations.

The developing economies benefit from cheaper raw materials or goods that can be used for social and economic benefit by local communities. Although there are often local recovery systems for these waste materials, in many cases these local secondary materials are of lower quality than available through imports.

The international community recognised, at an early stage, that the free trade in waste can place developing economies in an invidious position, perhaps benefiting from a short-term financial gain but then being subjected to the longer term costs associated with the environmental and health issues resulting from the inadequate treatment and disposal. Therefore, in the 1970s and 1980s the Basel Convention, a multilateral environmental agreement focusing on controlling the transboundary movement and disposal of hazardous and other wastes, was developed.

It was agreed in 1989 and came into force in 1992 and has now been ratified by 180 countries. It has been followed by several other international and regional agreements to limit the movement of wastes to countries not capable of treating them in a sustainable way and thereby placing the responsibility for securing sustainable recovery and waste management on the waste producing and exporting countries.

In the past 30 years the global trade in recyclable materials, particularly paper and plastics, has grown substantially. This trade has been driven by the need to meet legislatively imposed targets in the EU, certain US and Australian states and certain other countries.

It provides the exporting countries with the means of achieving their targets by exporting materials to countries where demand is strong and recovery and disposal costs are lower. At the same time, the trade might subsidise the importing countries, since costs for collection and recovery of the traded materials are borne by consumers in the exporting countries. However, there is a risk that the exporting country is exporting pollution, when shipping materials to countries with lower environmental standards. These issues are explored in this report in more detail for the two examples of paper and plastics.

The Basel Convention has reduced the incidence of blatant dumping of hazardous waste. However, despite the international conventions there are still numerous instances of export of both materials, such as mixed municipal waste, and items, such as electrical and electronic waste and end-of-life vehicles to developing economies. Because of lax controls by both the exporting and importing countries, the trade persists. Occasionally this takes place inadvertently due to the complexity of the regulatory regime. But more frequently it is due to criminal intent on the part of the exporters, often increasingly based in the importing developing countries. In this report, this issue is addressed in this section on waste reworking.

Paper Trade

Besides plastics, paper is the other item of global trade in reclaimed wastes that has been investigated by the ISWA Task Force on Globalisation and Waste. This is in the context of the current perspective of supply push, whereby in contradiction to the normal trading logic for commodities there are now regional and national pressures which are pushing the recovery of waste, from MSW sources in particular, rather than the classical economic imperative of demand pull. With limited domestic demand compared to the ever-increasing targets set by the EU, certain US and Australian states, amongst others, the material is being exported to the rapidly industrialising and transition economies, mainly in South-East Asia.

The movement of cellulose fibre-based recovered paper on an inter-continental level goes back around 30 years, predominantly from the USA, initially it was the movement of recovered paper from the USA to SE Asia, mainly China. This was then supplemented by the movement of recovered paper from the EU Member states, initially Germany in 1992-94 but now predominantly the UK, to SE Asia. In addition, Australia and New Zealand are also dependent to a large extent on the SE Asian market.

There are considerable economic and environmental benefits for both first and third world economies for substituting pulp-based materials with recovered paper. These include a reduction of energy and water usage and importantly tapping into the urban mines in close proximity to the main markets for paper products. Overall around 20% cost and environmental impact reduction can be accounted for by use of recovered paper. However, the value of recovered paper should not be over-estimated as in trade terms it accounts for only 15% of the total value of paper products traded internationally. Overall the total value of paper products traded internationally amounts to 1% of global GDP.

There are also further issues, such as the costs and benefits in environmental terms of sending paper to countries using long distance, often reverse, logistics systems. In the UK WYAP (Waste Recycling Action Programme) provided a comprehensive LCA life cycle assessment in 2008 covering this issue. It showed that the environmental effects of this transport were only 8-10% of the total environmental impacts of the total recycling process. Overall there was therefore a considerable net benefit for sending this material for recycling rather than disposal or energy recovery.

The current and likely further development of exports, from the EU in particular, with the current pattern of export flows is one that is of concern, not only to the exporters of the EU and USA but, especially, the importing countries. Therefore, the implications of the likely adjustment of the EU's targets for the revised WFD and also the Packaging and Packaging Waste Directive in 2014 have to be considered. Even if they are not increased, the pressure of supply push becomes greater under the current targets. There is also a need to closely examine the extent to which the importing countries are likely to substitute their own domestically generated resources. There is considerable uncertainty on this aspect because of the policy and waste planning strategies being adopted by the importing countries, such as China and India.

Also there is the issue of the likely future demand and supply profile for newsprint, a key component of waste-recovered paper exports in the recovered paper exporting countries. Currently there is a downturn in the demand for newspapers in the developed world as consumers turn to the internet and advertising moves away from print-based media. Does this aspect also need to be factored into future thinking about the international trade in recovered paper?

Background

The market for recovered fibre

The economic and environmental perspectives

The impact of international trade

The potential future of the market

Assessing the future

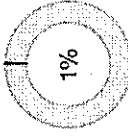
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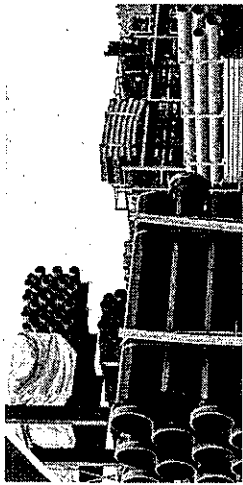
Global Recycling Markets

Plastics Trade

Plastics are emblematic materials, transforming our everyday life for over 60 years, delivering unprecedented functionality. Plastics global production, mainly from fossil raw materials, has skyrocketed: from 1.5 million tonnes (Mt) in 1980s to 285 Mt in 2012. Sustainable consumption and production, and the circular economy, require minimising the use of virgin materials and greenhouse gasses emissions, while delivering clean material cycles. To this end, globalised trade in waste plastics is a major option.

Recycling operations depend profoundly on production and consumption. A shift in plastics production from the West to Asia has occurred: 40% by weight of world production is now in Asia, with 20% each in Europe and North America. China is the largest individual country at 24%. The drivers were increasing local demand and lower costs - mainly labour, but also lower environmental and health and safety costs, due to the initial absence of regulations and/or their implementation in both manufacturing and reprocessing. This regional shift also drives the demand for used plastics.

The annual volume of globally-traded waste plastics is around 15 Mt, less than 5% wt. of the new plastics production in 2012. Such a small percentage suggests that to-date international trade is a minor means to extract their resource value. Europe collectively is the major exporter, with the world's top 5 country exporters being Hong Kong SAR (re-exporting imported material to China), USA, Japan, Germany and the UK. The top world importers are: China at \$2.1B and the SAR Hong Kong at \$1.6B, followed by the USA, the Netherlands and Belgium. Plastics scrap flows from Western countries, with established collection systems mainly to China, which dominates the international market, recycling around 55% wt. of global imports. Europe (EU-27) collectively exports almost half of the plastics collected for recycling (3.1 Mt, worth of €1.7B), corresponding to 12% of the entire post-consumer plastic waste arising. Europe depends entirely on China to absorb its exports (at least 67% of European exports end up in China). ASEAN countries (esp. Vietnam, Malaysia and Indonesia) re-export reprocessed imports and conventionally collected plastic scrap to China.



Plastics recycling in China

Between 2006 and 2012, plastic scrap imports in China increased from 5.9 Mt to 8.9 Mt, whereas locally sourced plastics currently recoveries (recycling and energy recovery) is almost double that amount. There is no conclusive evidence on the fate of imported material when it reaches China. Indirect wider evidence suggests that recent investments in modern centralised manufacturing and reprocessing facilities are self-weighed by thousands of small manufacturers/reprocessors using low-tech equipment and pollution practices, often family-run, without any environmental protection controls. The domestic recyclates are perceived as of poor quality; hence good quality imported material is necessary for capital-intensive, better quality plastics manufacturing, while the inferior imports and domestic recycled plastics end up at the low-tech, uncontrolled plants and maybe also energy from Waste (EiW) plants. The Chinese Government has been working to increase the quality of imported plastics and reduce the numbers of unregulated facilities; evidence can be seen in the recent Green Fence Operation (GFO) for a 'step change' in the quality of imported plastics by adopting a 'zero tolerance' approach to contamination level of imports and closing down unlicensed operations.

Market complexity and vulnerability

As with any globalised market, global plastic scrap has an inevitably complex market, vulnerable to disruption, as seen when prices crashed for secondary raw materials during the 2008-9 financial crisis and the 2013 GFCO. Key factors are: oligopoly, especially for Europe, with China the main global importer; prohibitions relating to export / import of waste; susceptibility to virgin raw materials and local fluctuations; 'reverse leakage' logistics; high search and transaction costs; inconsistency of container leads sought by shipping lines; difficulty to quality control the exports; material quality information asymmetry between buyers and sellers.

Summary Answers from the Task Force's Work

Frequent Questions

How much of the plastics collected for recycling in Europe is reprocessed?	46% wt. of the overall quantity collected for recycling, which is 12% wt. of the entire plastic waste arising in Europe. In contrast, Europe-27 exports only 1.2% of its primary plastics products to China.
Is reprocessing of plastics a viable business in Africa and Asia?	87% wt. of exports go to China directly or via the Hong Kong SAR. Overall dependency is even higher, if the exports to intermediate reprocessors (e.g. ASEAN countries) are added. Such a dependency may not be sustainable in the long term.
How do the export markets differ?	The global market experienced two recent shocks: the 2008-09 global financial crisis, and when the Chinese Green Fence Operations started in 2012. However, in both cases the market recovered / adapted relatively quickly.
Why does China import secondary plastics when it already produces its own plastic scrap?	China needs affordable secondary plastics to meet the increased demand for plastic scrap. Part is supplied from the international market, and part from local recycling. But the local quality of much of the plastic products being manufactured in China means that the local recycled plastics is also of poor quality, and not suitable for use in the larger, modern factories manufacturing goods for export.
Will there continue to be imports of secondary plastics?	Recent projections (Pöyry) forecast an increased global demand for plastic scrap (85 Mt by 2020) with subsequent increase of globally-traded secondary plastics, fuelled by China's expected growing demand (predicted at 49 Mt in 2015). So quality secondary raw material imports will be needed, at least until the Chinese manufacturing base for the domestic market is upgraded, thus increasing the quality of domestic recyclates.
What about the quality of plastics for export to China?	The Chinese Government is working to chip down on poor quality imports (lower contamination, increasing preference of single (or sorted) polymers) and eliminate unregulated facilities - so export of mixed plastics is likely to become more difficult.
Do the importers have to be concerned about the quality of plastics they import?	The shift of the manufacturing base to Asia was driven by lower costs, which initially included lower costs due to absence of environmental and health and safety controls. Plastics product manufacturing and reprocessing in China was originally dominated by a large number of small, unregulated facilities with no rules for operation, no quality standards and no inspection. Investment is occurring in larger manufacturing plants, which are subject to increasing quality and environmental controls, and the Government is working to eliminate unlicensed factories. But this change will take time, and currently unless the exporter undertakes their own audit trail, the level of environmental control over imported plastics will remain uncertain.
Is dependence on a single importing country a risk?	Yes, for two reasons. First, China may in the medium- or long-term become self-sufficient in high-quality secondary plastics. Second, advanced recycling collection schemes in Europe / N. America etc. were created applying to achieve sustainable resource recovery. However, this is questionable when almost half of the collected plastics are exported to countries with lower environmental standards. Global plastic recycling markets in themselves may not lead to the required balance between environmental protection, clean material cycles and resource utilisation.
What are the recycling standards necessary to allow processing capacity in non-recycled plastics?	Yes, over-dependence on a single exporting country is risky. However, a balance is required. Quality, segregated polymers, e.g. clean PET from bottles, are increasingly sought after commodities on the global market, with manufacturers in the US, Europe and China competing for a limited supply. So some export is normal - provided a level playing field in terms of environmental standards can be assured.
What about quality of plastics for export to China?	Segregate further and near the source to prepare a higher quality feedstock for recycling. Or develop innovative processes and invest in local capacity for mixer plastics recycling. Or consider waste to energy - high efficiency combined heat and power (CHP) plants can be a sustainable solution for the non-recyclable plastics (e.g. thermoplastics), particularly in countries that have high dependence on landfill disposal.

Table 1: Does it matter that Western plastics recycling is so dependent on a single export market (China)?
[See ISWA full report online: Global Recycling Markets - Plastics Waste, Author: Wolk]

Global Recycling Markets

Waste Trafficking

The trade in waste and secondary raw materials provides waste producers with the opportunity to export their waste and materials to markets where demand is high and recovery costs are low. However, export of waste to countries with insufficient legislative, institutional and physical environmental infrastructure often results in crude handling and low-yielding recycling procedures.

As an example, some electrical and electronic waste exported to China is processed and treated in backyards or small, primitive workshops. Processing often includes methods such as manual disassembly, cyanide leaching and uncontrolled open burning for the purpose of extracting the valuable metals. Residuals without value are usually dumped. Similar handling has also been reported to take place in other Asian countries such as India and Pakistan as well as in West African countries such as Nigeria.

This type of handling endangers the health of the recyclers and residents living near the sites and causes harm to humans living further away from the sites and the environment through contamination of soil, water and ecosystems. In addition, the use of ineffective methods for recycling and recovery means poor resource management and loss of valuable resources that contribute to the depletion of the planet's natural resources. Finally, exporting waste for unsorted and unacceptably treatment creates an uneven playing field that impairs sound market mechanisms and hinders the establishment of infrastructure needed for environmentally sound solid waste management throughout the world.

International and regional legislation

In order to prevent these unwanted effects, legislation regulating trans-boundary movements of waste, such as the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal, the OECD Council Decision on the Control of Transfrontier Movements of Waste Designed for Recovery Operations and the European Waste Shipment Regulation, has been implemented. The present legislation has been criticised for being overly complex and as a consequence, resulting in complicated administrative environmental and customs procedures.

Unrestricted waste export damages public health and the environment

Complexity and ignorance provides an opportunity for criminals

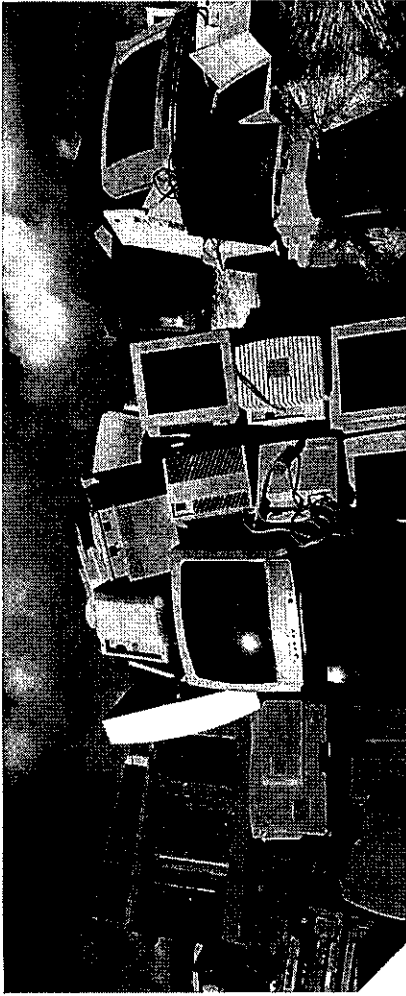
Despite the regulations, large amounts of waste are shipped illegally or in non-compliance with regulations. Naturally, there are cases where waste producers or waste transporters break the law unintentionally, for example by producing incorrect transport documents or misinterpreting existing law. A vast majority of all waste producers are believed to act in good faith but they face complexity in determining what should be the most appropriate means of meeting their obligations. Therefore, criminals and criminal organisations are able to take advantage of the complex regulations and the producers' lack of knowledge or lack of care.

A large and profitable illegal trade in waste

A large fraction of the illegal exports of waste is suspected to be the result of illegal actions that are committed consciously. The illegal trade in waste is estimated at a value of between \$10 and \$12 billion annually and generates very high revenues for the criminals involved in the trade. The most profitable markets among others: the use of incorrect classification, false classification of waste products or un-checked items as re-usable products and other kinds of fraudulent shipment declarations.

Barriers for effective enforcement

Most enforcement activities today are reactive in nature and rely on voluntary co-operation between environmental agencies, customs and police networks in a number of countries. Such co-operation is restrained by lack of coordination, priority, interest, resources and capacity. Furthermore, effective collection, use and exchange of intelligence are essential for effective enforcement. Delivering the intelligence material needed constitutes a huge challenge since it demands transnational and cross-organisational co-operation between a large number of players.



Activities

Making it easier to do right

- Information and awareness raising about the problems related to waste trafficking, improper handling in the receiving countries and criminal methods used
- Making information and consulting on the rules and regulations related to waste handling and trans-boundary shipments of waste easily accessible to waste producers and co-ordinated
- Making the regulations of trans-boundary waste shipments more clear, understandable and co-ordinated
- Making it easier for waste producers to identify and get in contact with serious, law-abiding waste brokers and handlers, for example through a certification system
- Promote the liability of producer responsibility to ensure that second-hand items exported from first world countries are either repaired for waste treatment back to the exporting countries or that these companies exporting such goods set up treatment facilities in the receiving countries.

Making it harder to do wrong

- Introducing measures to secure better traceability of exported waste, by requiring exporters to produce completion certificates to be returned to the waste producers
- Providing training and education for inspectors at the relevant authorities as well as providing the resources needed for efficient and effective enforcement of the legislation
- Establishing better coordination, on national as well as on regional and international levels, between the authorities waste trafficking related crimes
- Using intelligence-based methods to establish the criminal motivation, organisation and methods used as well as to turn the enforcement activities from reactive to proactive
- Establishing a formal international body for the coordination of enforcement and intelligence initiatives related to the fight against waste trafficking
- Changing the regulations, making it harder for exporters to claim end-of-life products as products instead of waste and at the same time makes it easier for the inspectors to identify a shipment as consisting of products or waste.

Table 2: Activities to be pursued in the fight against waste trafficking.

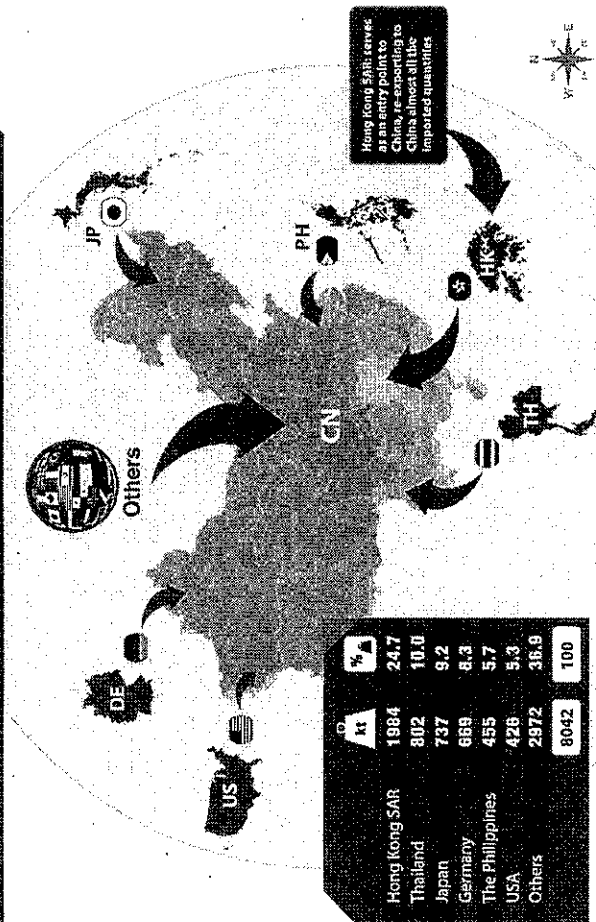
See ISWA Full report *Global Waste Trafficking - Challenges and Actions to be Taken* Authors: Appelqvist and Cooper

It is important to state clearly that waste trafficking is a truly international criminal action with a huge turnover and high profit margins. Consequently, individuals and organisations that consciously are involved in waste trafficking activities are criminals and therefore should be treated as such. Therefore, it is necessary to fully integrate the fight against waste trafficking as a key aspect when it comes to establishing a sound, global system for resource and solid waste management.

In the long term, the risks related to handling of waste in receiving developing countries can be reduced by strengthening environmental regulations and enforcement capabilities as well as by developing the physical waste management infrastructure in these countries. However, such processes are time consuming. In the meantime, the responsibility for securing sound and environmentally friendly export of reusable items, secondary raw materials and other types of waste must be laid on the exporting countries in co-operation with the relevant international bodies.

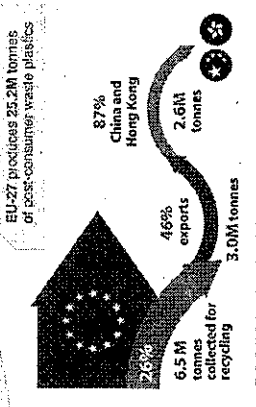
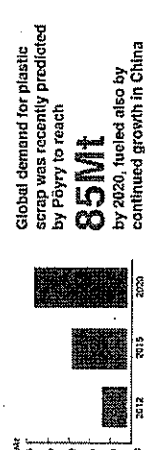
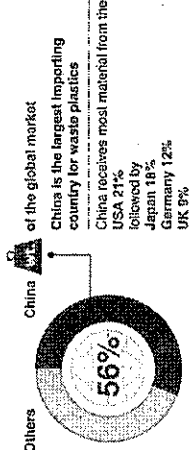
Effective preventive actions must be based on near-absent, cross-organisational and intelligence-based co-operation. The successful approach to achieving of this task is to pursue two parallel lines of activities: making it easier to do what is right and at the same time making it harder to do wrong.

Sources of Waste Plastics Imported in China in 2010



China is the dominant global player (importer)

Along with Hong Kong SAR this activity accounts for the **49%** of the global financial activity in plastic scrap imports

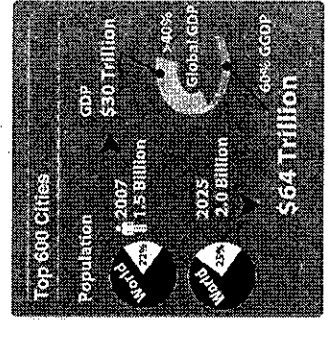
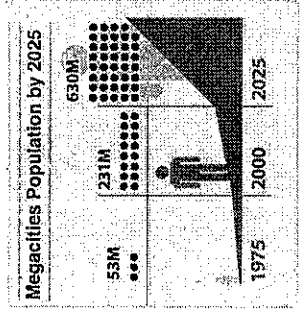
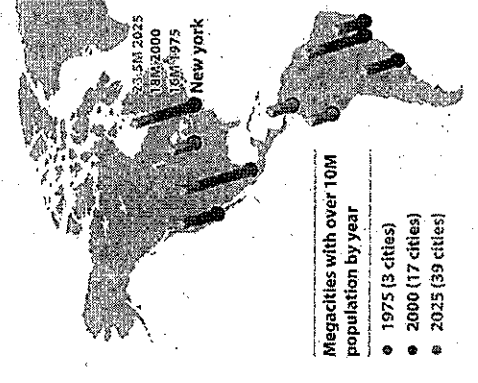


Europe (EU-27) exports **86%** of all the post-consumer plastics collected for recycling. **57%** wt. exported to China + Hong Kong SAR

2005 to **2012**
Between 2006 and 2012 plastic waste imports in China increased from **6.1Mt** to **8.8Mt**

Copyright: ISTAT Background Research, Euromonitor Geographic Database

Megacities and Urbanisation





The governance of megacities is often complex with multiple administrative organisations and jurisdictions. It is common to encounter the co-existence of several authorities with similar or even identical responsibilities, but with little or no coordination and co-operation between them. It is not uncommon to encounter strain on financial and fiscal abilities as well as lack of transparent and accountable decision-making processes. As a result, many megacities cannot cope with the rapid expansion and carry out municipal tasks such as spatial planning and waste management. Furthermore, urban planning and infrastructure provision in many megacities tends to be reactive instead of proactive.

A particular feature of megacities is the symbiosis of two extremes in the same shell. On one side, there is extreme wealth, on the other huge socio-economic differences, widespread poverty, slums and a thriving informal sector. However, the two sides are not clearly separated from each other, but combined economically, socially and even spatially. Consequently, uniform approaches to waste management in megacities will not work. Any successful waste management system has to be a patchwork of different logistical, technological, organisational and administrative solutions.

Megacities often represent the most dynamic economic growth of their regions. As economies grow, so does waste generation per capita. Combined with population growth and continued migration to the cities, municipal solid waste generation in many cities is forecast to double between 2005-2025. Waste composition is also changing - packaging, electronic goods and other consumer products are increasingly being found in the waste.

Megacities used to be mainly regional centres, but nowadays, they are transforming into global hubs and interacting between their regions and the global flows of goods, people and ideas. The waste management systems of megacities are more than local systems. Global trade influences the supply of goods and materials and local waste management practices determining their transformation into waste and recyclables.

From regional centres to global hubs

Effective waste management requires the capacity to manage finances and services in an effective and transparent manner and work effectively with communities. Underlying issues relating to management structures, contracting procedures, labour practices, accounting, cost recovery and corruption have to be taken care of.

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Although cities themselves occupy only 2% of the world's land, they have a major environmental impact. Megacities are likely to strain the Earth's banding resources, while significantly contributing to environmental degradation. Megacities face tremendous environmental challenges and threats to human health. In this framework, waste management is crucial for improving the everyday quality of life as well as ensuring the medium to long-term sustainability of megacities. On the other side, many emerging megacities in developing countries are

also innovation hubs and their local markets involve non-industrial but promising approaches for waste and resource management. To implement, operate and maintain well-functioning waste management systems in megacities is a great challenge. Megacities are complex systems and their waste management systems cannot be expected to be simple. Therefore, it is important to have a thorough understanding of the characteristics and dynamics of megacities and how they will affect and interplay with the

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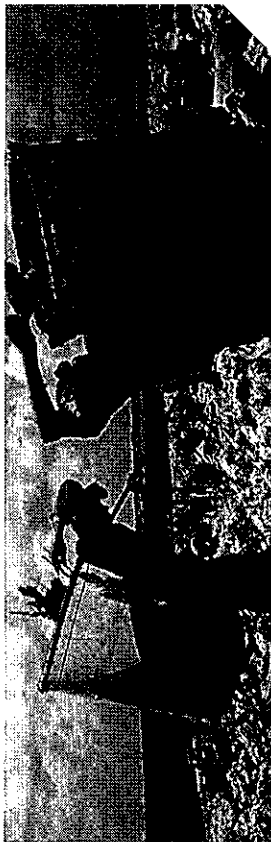
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Table 3: Main challenges and suggested solutions for waste management in megacities

The Informal Recycling Sector



It is estimated that some 20 million people around the world depend for their livelihood on informal recycling from municipal solid wastes (Linzer and Lange, 2013) – at the same order as the total employment in the formal waste industry. Working conditions are often unsafe and unhygienic, and child labour is commonplace. The main driver is poverty. So this is a broader development issue that has to be properly addressed, not just one for the solid waste management (SWM) sector.

In many developing countries, the informal recycling sector achieves notable recycling rates. If the activity were suddenly to cease, then waste quantities requiring collection, treatment and disposal by the formal city system would increase, which could in turn further strain budgets that often are already inadequate to extend collection coverage to un-served communities to protect public health, and to eliminate uncontrolled disposal to protect the environment.

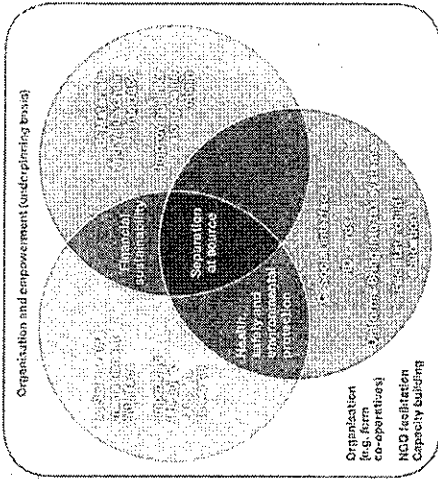
However, poor working conditions, child labour and uncontrolled dumping of residual wastes are neither environmentally nor socially acceptable and undermine the position of the formal, legitimate waste industry. Therefore, a sustainable approach to address the present situation has to be developed and pursued.

Despite the considerable challenges, the transformation of a city's informal sector to a formalised part of the overall solid waste management system is in everyone's interests. The recyclers can then work under cleaner conditions, earn a better livelihood and educate their children. Recycling rates can potentially increase and in addition, the transition can facilitate environmental control, reducing littering and dumping of residual wastes as well as bring the 'informal' sector inside the legal and tax systems.

Many international agencies and NGOs have been active in promoting the inclusion of the informal sector within formal solid waste management systems. GIZ funded a seminal 3-year sector development programme (Jonusis et al., 2011) – the International Finance Corporation and Inter-American Development Bank are also active – the informal recycling sector has been prioritised in new joint EU-African research and innovation agenda on waste management. Global brand owners are also active, on both packaging waste and waste electrical and electronic equipment (WEEE). Active international NGOs include the Bill and Melinda Gates and Clinton Foundations, the local NGO Urban was presented with the prestigious Human Rights Special Mention Prize of the French Republic, by the French Ambassador on 26 March 2014, for its success in giving a voice to the poorest of the poor, India's waste pickers and kabatrs.

The GWA Task Force convened an international workshop in Buenos Aires in June 2011, bringing together the formal and informal sectors in waste management, NGOs and other stakeholders. This led to a seminal paper which integrated background scientific and social science research with the work initiated in Buenos Aires. It introduced both a systematic framework – or typology – for classifying and analysing possible interventions to promote the transition of the informal recycling sector to a formal part of a city's SWM system, and a simple tool – matrix – for use in selecting a balanced set of interventions (Wais et al., 2012). The aim of the framework (see Figure 1) is to allow the design of a specific set of interventions tailored to the local situation.

Figure 1 – Analytical framework
This shows the systematic, developed analytical framework developed by the Task Force to aid the design of initiatives to facilitate transition into a formal part of an integrated SWM system in a specific city. Potential interventions are allocated to four categories: the uncatching organisational aspects and lines primary interfaces. Some of the interventions, which span several categories, are among those highlighted in Table 4 below as key challenges.



Key Challenges

Organising the informal sector into a formal entity

Improving the working conditions of informal recyclers

Separation at source

Child labour

Environmental concerns

Waste picking

Formalisation

Messages / Proposed Solutions

The informal sector needs to be encouraged and facilitated to organise themselves – e.g. into cooperatives, microenterprises or other legal entity – enabling them to engage responsibly with municipalities and other stakeholders. The facilitation role of local NGOs is often important, as is capacity building and making available access to affordable micro-finance.

A key component of many successful schemes has been the issuing of identification cards (and uniforms) to the people doing the recycling, ready identification facilitates access to communities. Some countries have also allowed people to register 'waste picking' as their official employment (e.g. Brazil), which brings them inside the law and the tax system.

A key concern is the unhygienic and unsafe working conditions of much current informal recycling. Safe and dignified working conditions need to be promoted.

Separation for recycling should increasingly take place at source rather than from mixed waste, which would immediately help to address the current issues of workers' health and hygiene. Itinerant waste buyers are active in many countries, which is a system that can be further built on and expanded. Source separation will increase both the quality of recycled materials and recycling rates, thus diverting wastes from landfill and improving livelihoods of the recyclers.

Child labour needs to be addressed, by working with informal recyclers to ensure that children go to school, and that recycling activities by children under the legal age of adulthood in the country are reduced and eliminated.

Environmental concerns need to be addressed, with littering around sorting points and illegal dumping of non-recyclable residues being controlled and environmental standards for the sorting and processing of recyclable wastes and for the subsequent reprocessing of recyclates being raised.

Waste picking at the working face of a modern landfill is unacceptable, as is deliberately setting fire to the waste to recover metals.

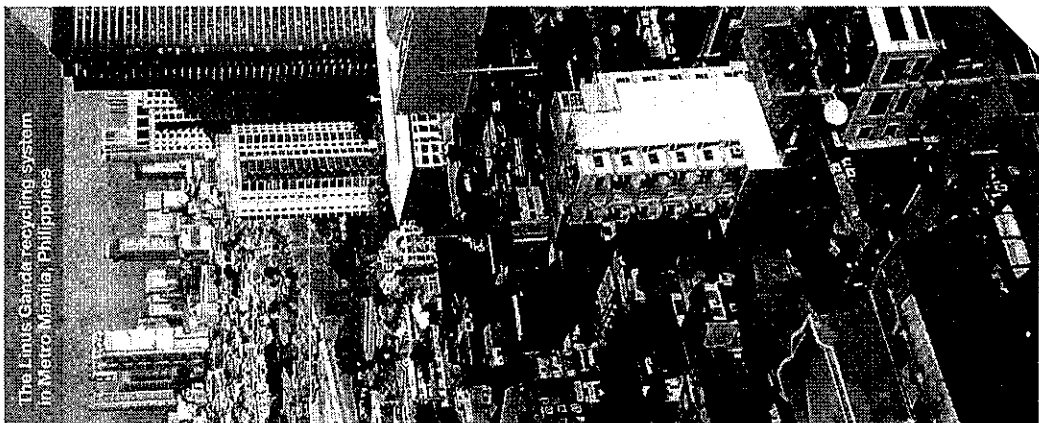
In order for a city to plan for improvements to the SWM system, the authorities need to understand all the waste flows, including both the formal SWM system under their control and the informal recycling system - which will be facilitated by a transition to formalisation.

Table 4: Particular challenges and proposed solutions for integrating the informal recycling sector

The Informal Recycling Sector

Case Study

The Linus Ganda recycling system in Metro Manila, Philippines



- A local NGO, the Women's Belkarian Movement, set out to improve recycling in Metro Manila by facilitating co-operation between the existing informal sector, local and national government and the established recycling industry materials value chain. The system is known as 'Linus Ganda' (watah translates as 'Clean - Beautiful').
- They helped to establish a network of cooperatives among waste dealers (known as 'junk-shops'). Junk-shop owners in Quezon City registered themselves as Quezon City Environment Multi-Purpose Co-operative with the Co-operative Development Authority (CDA) in 1993; the other 16 cities in Metro Manila followed in 1994. In 1999, the 17 cooperatives formed a federation, called Metro Manila Federation of Environment Multi-Purpose Co-operatives.
- Each junk-shop employs between two to six full-time itinerant waste buyers (known as 'eco-aidas').
- The eco-aidas collect recyclables on fixed itineraries at set times.
- The new Linus Ganda system provided the eco-aidas with purpose designed handbags or bicycle carts, and also, T-shirt uniforms and ID cards. This in turn facilitated the negotiation of access to gated communities from which they had previously been excluded due to security concerns.
- There was much work with both the general public and the materials value chain to extend the range of saleable items collected, in order to increase value added and the revenues earned.
- The co-operatives work closely with the city authorities. For example, the cooperative is a member of the Quezon City Solid Waste Management Board, and several co-operatives work with their allies to implement formal sector recycling programmes in schools and shopping malls.
- The NGO worked with the junk-shops and local financial institutions, to negotiate access to affordable micro-finance for working capital, and
- There has been continuing work over the years to build and maintain public awareness and acceptance.

The results have been remarkable. Municipal solid recycling rates across Metro Manila increased from 6% in 1987 to 37% in 2000, two thirds of the total in both years being clear space separated materials collected by the eco-aidas. In 2001 there were 674 junk-shop owners in Manila and 2000 buyers, covering all 17 cities within Metro Manila and a population of some 12 million. A National Framework Plan for the Informal Waste Sector in Solid Waste Management was adopted by the Philippines Government in 2009 (SWMPF-2009).

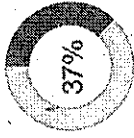
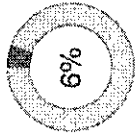
A note on terminology: Why the 'informal sector'?

In general usage within the development community, the term 'informal sector' is often taken as synonymous with the 'black economy', and thus something that needs to be eliminated to develop good governance and a sustainable tax base for the economy. However, within the waste sector the term is also used to describe organisations, such as Linus Ganda, where a transition has already begun towards becoming a formalised part of the overall SWM system and they do pay their taxes.

In practice, there exists a broad spectrum, from completely uncontrolled and untaxed informal activities outside of any law at one extreme, through to more formal legal and tax-paying organisations towards the other end. Similarly, there is a broad spectrum, from criminal activities completely outside of waste regulations and of environmental and health and safety laws, through to compliant and controlled activities.

One could make an argument to adopt an alternative term for the more formal and controlled end of the spectrum, such as 'the small-scale entrepreneurial recycling sector'. However, the term 'informal recycling sector' is commonly used across the waste sector to span a whole range of different levels of formality and in the transition to formalisation. Therefore this report has continued with that usage.

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International Development Co-operation

Rapid urbanisation and increasing global consumerism are driving unprecedented levels of waste generation in low and middle income countries. This rising tide of waste represents an increasing environmental, social and economic burden, particularly for the poorer parts of society. In many parts of the world waste collection is still limited to more affluent areas and communities, disposed via open dumping is still widespread, and many of the world's poorest people depend on informal recycling activities to survive. International development co-operation has the potential to play a key role in the face of this challenge, helping to build the local capacity, governance and infrastructure necessary for effective SWM.

An estimated \$4 billion was committed to development co-operation in SWM between 2003 and 2012. The proportion of development finance for SWM has more than doubled from 0.12% over the 10 years. However, this is still only a tiny proportion of overall development finance. Considered in terms of the population of the countries receiving SWM development finance in 2012, it equates to just \$0.03 of SWM development finance per capita. This compares with per capita levels of \$2.43 in the water and sanitation sector, and \$31 for all development finance.

In financial terms, the majority (70%) of this support has been in the form of lending from development banks, amounting to \$2.8 billion over the 10 years 2003-12. This has provided access to capital in low and middle income countries and helped develop much-needed SWM infrastructure, particularly collection systems and engineered landfill capacity.

Grant-funded support is the other key element of development co-operation, amounting to an estimated \$1.2 billion between 2003 and 2012, comprising over 3,000 grants. Around three quarters of total grant funding has been used to increase local skills and capacity and to provide other technical assistance on issues such as the informal recycling sector, private sector participation, cost recovery, awareness raising and climate change. The remaining grant funding has been used to fund the purchase of refuse collection vehicles and containers, and to provide SWM in the aftermath of natural disasters or as part of conflict-related relief efforts.

Following the failure of a number of high profile SWM infrastructure projects at the preparation stage, there was a general move amongst the major donors active in SWM in the early 2000s to a approach focused on increasing local capacity and skills. Since that time, the systems-based approach of Integrated Sustainable Waste Management has become increasingly established in development co-operation, an approach that seeks to ensure that both the physical and governance issues of SWM are addressed in an holistic way. Lending for infrastructure development has also picked up again since 2006, with total lending on SWM increasing from an average of under \$100 million between 2002-06 to over \$340m in 2012.

The geographical spread and distribution of SWM loan funding between 2003 and 2012 is very uneven, one country (China) received 12 loans with a total value of \$610 million (65% of total development finance lending for SWM). The top ten countries for SWM-focused development finance are all middle income countries, and account for over two thirds of the total value of both grants and loans over SWM (in descending order: China, India, Morocco, Turkey, Azerbaijan, Vietnam, Venezuela, Ukraine, Tunisia and Argentina). Overall, low-income countries appear to have received significantly less financial assistance - only ten Sub-Saharan countries received grants or loans of more than \$4 million, together accounting for less than 5% of the total.

The Issue and the need for action

Current scale of international development funding in SWM

Loan and grant funding

Distribution of lending

Analysis of trends

Many local governments still improving solid waste management as one of their top three priorities, but the current levels of international development funding for SWM do not appear to reflect that assessment. This may at least partially be a result of past problems with the readiness of recipient governments to meet donors' criteria for loan funding for SWM - which in turn has meant a considerable recent focus on grant funding for technical assistance to build skills and capacity, and to address governance and institutional issues.

The development finance that has been targeted at SWM over the last 10 years has mainly gone to middle income countries, with a small number of countries receiving a large proportion of the assistance committed to the sector. This may be because middle-income countries are better able to access and absorb development finance but it is certainly an issue that needs to be considered carefully to ensure that development finance on SWM is targeted appropriately.

Moving forward, there is a need to raise the political priority of SWM, both locally and on the development agenda, continue to focus grant funding on capacity building and good governance raise the levels of loan funding available for infrastructure development, and gradually extend the reach of that funding to include the lowest income countries that need it most. Table 5 illustrates the key challenges faced by international co-operation activities in SWM.

Messages / Proposed Solutions

Action will be needed on many fronts including: in the development of appropriate institutions building local skills and capacity; ensuring stakeholder engagement and inclusion; and sourcing capital to finance new infrastructure. A set of this also needs to be underpinned by good information and data to enable effective planning and delivery.

The proportion of overall development finance targeted at SWM is very small. In the context of rapidly rising quantities of waste and increasing urbanisation in developing economies, it is important that the levels of loan funding for SWM are increased to help provide the essential infrastructure for managing waste.

More than 70% of SWM development finance is grant funding aimed at building capacity. This level of focus should be maintained - a clean city requires not only good technical infrastructure but also good governance. Indeed, the cleanliness of a city - the state of its SWM system - could be promoted as a proxy indicator for good governance, which has a much higher profile than SWM on the development agenda.

Development finance in SWM over the last 10 years has gone to those countries most able to use the funds rather than to recipients who perhaps need it most, with middle income countries accounting for the majority of SWM-focused development finance. Future efforts need to target low-income countries more effectively, identifying those most in need of assistance on SWM and helping them to use the funding and support for greatest benefit.

SWM was not identified as a 'primary' issue with a specific Millennium Development Goal (MDG), nor is it likely to have a specific Sustainable Development Goal (SDG). But prioritising SWM does allow numbers of MDGs/SDGs to be tackled in an integrated way. There is also potential for using SWM itself (i.e. a clean city) as a proxy indicator for good governance. SWM needs to be recognised as a key element of international efforts to reduce poverty and environmental degradation.

SWM is a cross-cutting issue impacting on many aspects of the economy and society. It is thus often viewed as just one of many 'secondary' issues, rather than being singled out as a political priority in its own right. Further international efforts need to make the case that solid waste management is not just necessary and beneficial, but that it is essential.

Table 5: Key issues in development co-operation for solid waste management (SWM)

See SWA toll report online: A Review of Development Co-operation in Solid Waste Management. Available: www.swa-toll.com

An estimated

\$4 billion

was committed to development co-operation in SWM between

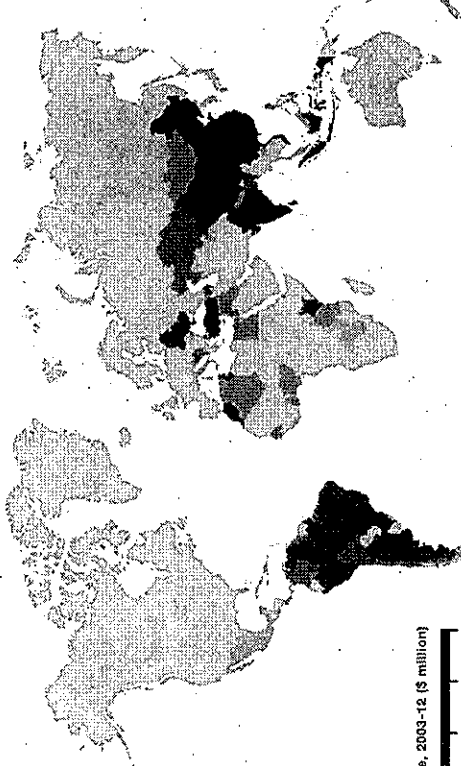
2003 and 2012

The proportion of development finance for SWM has more than doubled from 0.12% to 0.32% over the 10 years.

0.32%

0.12%

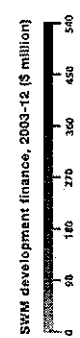
International Development Co-operation



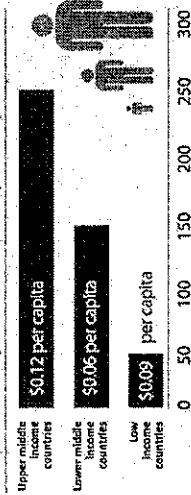
Top ten countries
receiving SWM development
finance between 2003
and 2012

China	540
India	303
Morocco	271
Turkey	242
Azerbaijan	221
Vietnam	213
Venezuela	140
Ukraine	96
Algeria	84
Malaysia	81

Top 10 total \$ **2,219**
Rest total \$ **1,073**



Total SWM development finance, 2012 (\$ million)



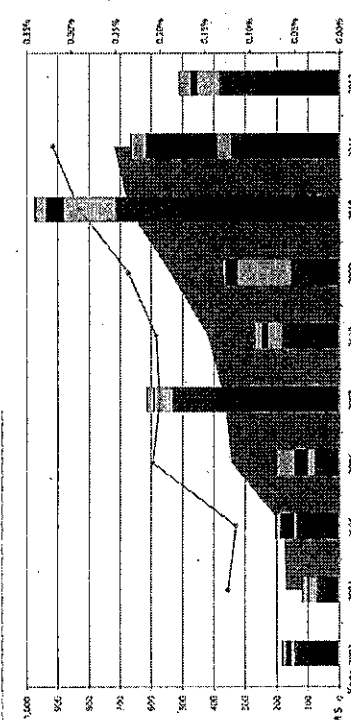
2012 total development finance

\$ 230 Billion

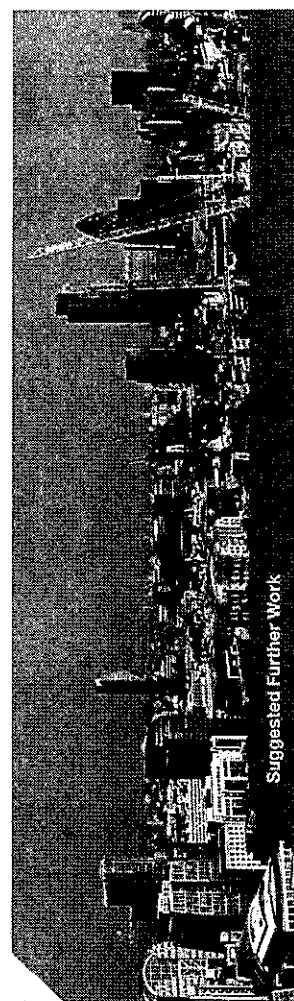
2012 SWM development finance

\$ 510 Million

SWM Development Finance 2003 - 2012



This data is based on an analysis of OECD development finance data (collected May 2014)



Suggested Further Work

<p>General</p> <ul style="list-style-type: none"> To improve the availability, comparability and reliability of data on solid waste management (SWM) systems around the world – if you don't measure it, you can't manage it effectively. To promote the cleanliness of a city – the performance of its SWM system – as a key 'proxy' indicator for the quality of governance in the city. 	<p>Megacities and Waste Management</p> <ul style="list-style-type: none"> To develop further systematic descriptions and appropriate indicators of waste management in megacities that will incorporate their complexity and their global nature. To promote and support bottom-up approaches, strategic planning, continuous feedback loops and waste prevention initiatives, as a means to manage rapid growth rates in waste arising as the populations of emerging megacities continue to grow and living standards rise.
<p>Paper Trade</p> <ul style="list-style-type: none"> To profile the recent trends of recovery of paper and board from households in economically advanced, transition and developing economies in order to determine likely future trends for the generation of this recoverable waste stream. To assess the different systems for collection of paper and board from households in economically advanced, transition and developing economies in order to determine the optimum means of reclaiming this material. 	<p>International development co-operation</p> <ul style="list-style-type: none"> To raise the profile of SWM amongst both Governments and donors and international agencies, to help ensure that it is recognised as a fundamental element of development co-operation and has a key role to play in alleviating poverty and reducing environmental degradation. To share and improve the quality of data available on SWM development co-operation to allow its effectiveness to be evaluated and to help plan its delivery.
<p>Plastics Trade</p> <ul style="list-style-type: none"> To promote transparency on the quality of exported plastic scrap and documentation of its final fate within the importing countries, and in particular China as the major global destination. To understand where the line lies between sustainable and unsustainable global recycling plastics markets, quantifying the perceived or actual environmental benefits underpinning the logic of collection and export for recycling. To explore options for more local systems closer to the 'head' Northern waste arisings of plastic scrap, focused around close-loop and other high value applications. 	<p>Informal recycling sector</p> <ul style="list-style-type: none"> To assess SWM investment needs in low and middle income countries, to allow a proper evaluation of the way in which SWM international development is targeted and delivered. To develop a much better understanding of the full economic costs and benefits of SWM in a developing world context, including external economic costs (e.g. health and environmental impacts), so as to provide the evidence base to donors and development banks for funding and supporting development co-operation in SWM.
<p>Waste Trafficking</p> <ul style="list-style-type: none"> To investigate further, and understand the drivers behind, modern operations for and players involved in waste trafficking, as well as to map frequently used waste trafficking routes. To promote and support the establishment of a formal international body for the co-ordination of enforcement and intelligence initiatives related to the fight against waste trafficking. 	<ul style="list-style-type: none"> To develop further case studies showing successful integration of the informal recycling sector into formal waste management systems.

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Key Events, Presentations and Documents of the Task Force

Events Timeline

<p>International Workshop Integrating Internal Sector Recycling into Waste Management in Developing Countries - Chile</p>	<p>ISWA Special Session A Global Perspective on Current Developments in Solid Waste Management</p>	<p>ISWA BEACON Conference: WasteMET Asia - ISWA Beacon Conference on Globalisation, Urban Metabolism and Waste Management</p>	<p>Task Force Special Session at 2013 ISWA World Congress</p>	<p>Concluding Task Force Special Session at 2014 ISWA World Congress</p>
22-23 June 2011, Buenos Aires, Argentina	8 May 2012, Munich, Germany	3-4 July 2012, Singapore	17-19 Sept 2012, Florence, Italy	8-11 Sept 2014, Sao Paulo, Brazil

Main Reports (MR), Documents (D) and Presentations (P)

Overarching

- P** Manropoulos A, Wilson, D.C., Cooper, J., Veils C.A., Appalqvist, B. (2012). The globalisation footprint in waste management. ISWA World Solid Waste Congress, Session 12, 17-19 September 2012, Florence, Italy.
- MR** Globalisation and Waste Management - Phase 1, Concepts and Facts. Hotchkiss World Congress special report, 2012 (prepared for General Assembly 2012).

Global Recycling Markets

- MR** Veils C.A. (2014). Global recycling markets - plastic waste: A story for one player - China. Report prepared by Fuelcity and formatted by D-Waste on behalf of ISWA Globalisation and Waste Management Task Force. International Solid Waste Association, Vienna, September 2014.
- MR** Waste Trading, Challenges and Actions to Be Taken. Appelqvist, B. and Cooper, J. 2012.
- P** Presentation of plastics report in ISWA Congress Vienna Veils C.A. and Wilson D.C. The dependence of plastics recycling on global markets. In Vienna 2013 ISWA World Congress, 2013, Vienna, Austria, Session 33, International Solid Waste Association.
- P** Presentation of plastics report in British Plastics Federation (BPF) Report 2013.

Informal Recycling Sector

- MR** Veils C.A., Wilson D.C., Rocca C., Shafiq S.R., Manropoulos A. and Chesonon C.R. (2012). An analytical framework and tool (InfRec) for integrating the informal recycling sector in waste and resource management systems in developing countries. Waste Management & Research, 30(8) Suppl.: 43-66. See: http://www.sagepub.com/content/30/8_suppl/43.full.pdf.html doi:10.1177/0734242X12454934.

Speakers and Participants at Task Force Events

Informal Sector Recycling International Workshop

22-23 June 2011

Chair: Costas Veils, University of Leeds, UK (at the workshop time, Imperial College London, UK).

Participants:
 Pablo Schamber, National Institute for Policy Training, Argentina.
 Sergio Sanchez, El Amnecer de los Carneros, MTE, BSA, Argentina.
 Cristina Lescano, El Ceibo cooperativo - BSAs, Argentina.
 Ana Cordi, Adviser at Environmental Secretariat, Argentina.

Andreas Ferrarazzo, Fundación Ciudad, Argentina.
Soledad Garavelli, APES, Argentina.
Lucia Fernandez, WIEGO, France.
Janya Sang-Aun, Institute for Global Environmental Strategies, Japan.
Aashish Chaturvedi, GIZ, India.
Jose Renato Monteiro, Web-Recol, Brazil.
Carlos Silva Filho, ABRELPE, Brazil.

Alberto Bianchini, ISWA, ABRELPE, Brazil.
Viviana Bassato, Ministerio de Desarrollo Social, Uruguay.
Orndina Rocca, Imperial College London, Italy/UK.
Björn Appelqvist, ISWA WGRFM Vice-Chair, City of Copenhagen, Denmark.
Jeff Cooper, ISWA President, UK.
Antonis Manropoulos, ISWA STC Chair, CEO D-Waste, Greece.

ISWA Special Session

8 May 2012

Speakers:
Jeff Cooper, ISWA President.
Antonis Manropoulos, ISWA STC Chair.
Hermann Koller, ISWA MD.

Vivick Agrawal, W3 Collection and Transpensation Technology.
Bettina Kamuk, Chair W3 Energy Recovery.
Maarten Goornhuis, Chair W3 Recycling and Waste Minimisation.

Dink R. Punt, Interdisciplinary Unit for Sustainable Economy, Universidad Carlo Cattaneo.
Patrick Dorvil, European Investment Bank.
David Newman, ISWA Vice President.

ISWA BEACON Conference

3-4 July 2012

Speakers:
Dimitris Kallampalcos, Professor, Mining Engineering, National Technical University of Athens, Greece.
Arab Hoballah, Chief of the Sustainable Consumption & Production (SCP) Branch, Division of Technology, Industry and Economics of the United Nations Environment Programme (UNEP), France.
Antonis Manropoulos, ISWA STC Chair, CEO D-Waste.
David Newman, ISWA Vice President & C&C Managing Director (Council of Italian Compositors), Italy.

Paul Brunner, Professor & Head of Waste and Resources Management Group, TU Vienna, Austria.
Costas Veils, Lecturer in Resource Efficiency Systems, University of Leeds, UK.
Masaru Tanaka, Professor and Director, Sustainability Research Institute, Tohoku University of Environmental Studies, Japan.
Mia Kodwo, Head of Research and Development Department of Zonitron and a consultant in The Institute of Sanitation and Waste Management (ITISWA), Ghana.
Ong Seng Eng, Director, Waste & Resource Management Department, National Environment Agency, Singapore.

Praedat Moddik, Executive President, Environmental Management Centre LLP, India.
Carlo Ratti, Associate Professor of the Practice, Director, SENSEABLE City Laboratory, MIT, USA.
Michael Batty, Professor of Planning, University College London, UK.
Derek Greedy, President, CWM, UK.
Hermann Koller, Managing Director ISWA, Austria.
Nickolas J Themelis, Director, Earth Engineering Center, Columbia University & Chair, Global WTRT Council, USA.

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