

Waste management: jobs, resources, environmental, climate and health protection

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Author: Wolfgang Pfaff-Simoneit

Editor: Stefan Zeeb, Policy and Sector Division Water and Waste Management

Sustainable waste and resource management is of crucial importance for achieving fundamental development objectives. It is an important precondition for sustainable economic and orderly urban development. The sector provides enormous employment opportunities even for lower-skilled workers. Waste management makes a crucial contribution to urban hygiene, preventive health protection, environmental protection, greenhouse gas mitigation and efficient use of resources. 10-15 per cent of a country's national greenhouse gas emissions could be avoided by effective waste management and recycling¹.

The development of sustainable waste management systems thus holds great potential for achieving economic, ecological and social progress. The establishment of sustainable waste management systems, however, poses a great challenge and a time-consuming process. Nevertheless, KfW Development Bank plans to intensify its engagement in the sector and is developing new approaches to mobilise the potential of the sector for quantitative growth.

"Sustainable waste management is of crucial importance for

- Health, quality of life and income of people, particularly of the poor and marginalised population,
- The protection of the environment and the efficient and sustainable use of natural resources, and

- The mitigation of greenhouse gases and, thus, the protection of the climate."²

The core messages of the recently published BMZ strategy paper entitled 'Waste as a Resource' clearly underline the importance of the sector for qualitative growth: the establishment of sustainable waste and recycling management systems is an indispensable element of development processes that aim to achieve sustainable economic, ecological and social progress.

A precondition for sustainable economic development

Sustainable economic development and quantitative growth are unthinkable without proper waste management. Raw materials and energy are major cost factors for the manufacturing sector, particularly in developing countries. The economies of many industrialising and transition countries are already in a situation in which the inadequate supply of raw materials and energy on the one hand and the contamination of the environment as a result of uncontrolled waste disposal on the other hand are hampering economic development³. The insufficient resource and energy efficiency of production processes is putting enterprises at risk of losing their competitiveness. Waste is a source of raw materials and energy that must be tapped through intelligent waste and resource management.

In the long term, inadequate management of waste deprives enterprises of their production basis if production facilities and employees are contaminated by improperly managed waste. Market shares in industrialised countries, especially in Europe and the USA, are at



Tin can collection in Egypt.

Source: KfW Photo Archive / photothek.net

risk of being lost if enterprises are unable to meet the clients' demand for compliance with environmental standards. Tourists are put off by rubbish dumps and prefer holiday destinations with environmentally sound waste disposal systems. Rubbish dumps and inadequate waste management signal to potential investors that the public administration is not very competent and not efficient. They prefer to invest their money where they encounter professional administrations.

Orderly urban development and preservation of the natural resources

Sustainable waste management is an important element of preventive health care. It is indispensable for orderly urban development and preservation of the natural resources.

Waste that is improperly disposed of compromises urban hygiene and poses health risks to the population. It forms breeding

¹ Model calculations by the German Federal Environment Agency for Mexico, Turkey and Tunisia show reduction potential of 10 % to 16 % See: Dehoust, G., Schüler, D.; Giegrich, J.; Vogt, R.: Klimaschutzpotenziale der Abfallwirtschaft - Am Beispiel von Siedlungsabfällen und Altholz; Federal Environment Agency (publisher) Reihe Texte 6/2010.

² Federal Ministry for Economic Cooperation and Development: Ressource Abfall; BMZ Strategy Paper 3 | 2012.

³ Asian Development Bank, Institute for Global Environmental Strategies (Hrsg.): Towards Resource-Efficient Economies in Asia and the Pacific - Highlights, Manila/Philippines and Kanagawa/Japan 2007.

grounds for carriers of diseases and is a source of food for rats and vermin, creating ideal conditions for the spread of pathogens. This affects the poorer segments of the population most of all.

Wild rubbish dumps pose a threat to water bodies, soils, nature, landscapes, flora and fauna and contaminate drinking water resources, rivers, lakes, coastlines and oceans. Landfill gas, fires, smoke and odours pollute the air, which has negative impacts on human health. Rubbish dumps use up and contaminate the land and usable areas, compromising the visual appearance of towns and landscapes.

Blockage of canals and drainage facilities causes flooding in built-up areas even with average precipitation, particularly in the usually lower lying poorer districts. Uncontrolled rubbish dumps pose a risk to drinking water supply facilities and contaminate irrigation channels. Without orderly waste disposal, other infrastructure facilities cannot be sustainably operated either. Residues from the filtering of exhausts from power plants and industrial combustion facilities (clinkers, ashes, filter dust) or from wastewater treatment (sewage sludge, screenings, grit slurry) have to be properly disposed of, as does waste from slaughterhouses, construction sites, markets, schools, hospitals and much more. In short: Orderly urban development is not possible without proper waste management.

Cities in focus

As centres of economic development and population growth, cities face waste problems in a high degree, and health impacts are especially severe. The fast-growing mega cities and urban agglomerations in industrialising and developing countries must find

solutions to their enormous waste problems. Already 40 % of Africa's population lives in urban areas. In Asia the number of urban dwellers will almost double from 1.5 billion to 2.6 billion people by 2030. The municipalities, which are usually in charge of waste disposal, however, are hardly able to cope with the complex task of managing the waste. Waste disposal "devours" a large share of their scarce funds. Municipalities in developing countries are already using 20 % to 50 % of their municipal budget for waste collection and street sweeping alone. Nevertheless, a considerable portion of the urban population is not receiving reliable waste disposal services. Considerable parts of the waste is not being disposed of at all and remains near homes, which occurs mostly in the growing shantytowns.

The informal sector – a motor of resource efficiency

Traditionally, waste has been an important source of income for the poor population. Recycling of paper, cardboard, metals, textiles, leather, bones etc is ever-present in developing countries. Roughly one per cent of the urban population lives on and from waste⁵. However, their work is inefficient and performed under highly unhygienic and dangerous working conditions, usually by poor and marginalised groups of the population. These people otherwise have hardly a chance to achieve regular income in formal employment. In most cases, the whole family has to help out to secure its livelihood. Child labour is the rule, with all its negative consequences.

Jobs

The establishment of sustainable waste management systems is of crucial importance for a green economy. Waste management in general and recycling in particular create



Waste collector in Egypt.

Source: KfW Photo Archive / photothek.net

considerable employment opportunities including low-skilled workers. Even illiterate persons can be productively employed in collecting and sorting waste. This opens up occupational and income opportunities for disadvantaged groups of the population, contributing to achieving MDG 1 - reducing poverty.

The challenge in developing countries mainly consist of integrating informal waste collectors into formal waste management concepts. The hygiene situation, income opportunities and recycling quotas can be considerably enhanced by improving cooperation. However, to achieve this it is necessary to build trust among all stakeholders – political decision-makers and the administration as well as the informal sector. Where this has been successfully implemented, parents no longer depend on help from their children and allow them to go to school. This gives children a chance for an education and a better life.

In Denizli, western Turkey, this approach of integrating the informal sector has been applied by granting licences to the informal waste collectors who can now work for the municipality. As a result, the recycling of reusable materials (mainly paper, glass and plastic) has been continuously expanded. The activities are now economically so attractive that private enterprises are becoming involved

"At a global scale, the waste management sector makes a relatively minor contribution to greenhouse gas emissions, estimated at approximately 3-5 % of total anthropogenic emissions in 2005. However, the waste sector is in a unique position to move from being a minor source of global emissions to becoming a major saver of emissions. Although minor levels of emissions are released through waste treatment and disposal, the prevention and recovery of wastes (i.e. as secondary materials or energy) avoids emissions in all other sectors of the economy. A holistic approach to waste management has positive consequences for GHG emissions from the energy, forestry, agriculture, mining, transport, and manufacturing sectors."⁴

Sustainable waste and recycling management reduces emissions that harm the climate particularly through

- Avoidance of methane ('landfill gas'), which is particularly harmful to the climate
- Recycling – reducing greenhouse gases through efficient use of resources
- Use of waste to produce energy - substitution of fossil fuels

⁴ UNEP / IETC 2010: Waste and Climate Change: Global trends and strategy framework; Osaka/Shiga 2010.

⁵ Medina, Martin: The informal recycling sector in developing countries, GRID LINES No. 44, October 2008, PPIAF / The World Bank.

and new formal jobs are being created.

Protecting natural resources

Further approaches aim to not only recycle 'traditional' reusable materials but to reuse as large a share of the waste stream as possible. Packaging, electric and electronic scrap, plastics, construction waste, refrigeration equipment and much more contain valuable and even rare resources that would otherwise have to be imported at a high cost. Organic wastes such as kitchen waste and food leftovers, garden waste, tree- and bush-clippings, market and slaughterhouse waste, sewage sludge, agricultural waste such as slurry, dung and harvest residue can be used to produce biogas and soil conditioners. Waste with high calorific value, separated and processed, can be used to generate electricity, for example in cement factories, thus substituting fossil fuels.

Global challenges call for more sophisticated waste management concepts

The primary goal of the waste management projects financed by KfW Development Bank is to create the fundamental structures for proper, reliable and sustainable waste disposal. The institutions thus established, the personnel trained and the planning and funding instruments are to give the partners a solid foundation on which to further develop the waste management systems to a circular economy. Besides strengthening recycling through the inclusion of the informal sector, the main investment is a landfill built according to European standards in which waste is disposed of in an environmentally sound manner. Emissions, particularly leachate and landfill gas, are captured and treated as far as technically and operationally viable. This is a significant improvement compared to the usual disposal of waste on uncontrolled waste dumps, but ultimately only a compromise between what is economically viable and ecologically desirable.

The global challenges, particularly the demographic trend in the developing countries, the shortage of resources and climate change make it necessary to give these objectives significantly greater priority. In future, inte-

grated and recycling-orientated strategies are to receive even greater weight so as to enable the partner countries to more quickly introduce advanced processes and technologies. Wherever possible, the aim is to leapfrog development stages and, in particular, unfavourable technical developments that have occurred e.g. in Germany.

However, the financial and implementing capacities of the partners are often not sufficient to make the technological and efficiency leap that would be desirable from an environmental, climate and resource conservation perspective. Therefore, the strategies and processes for waste recycling and processing must be adapted to the local conditions. Appropriate, cost-efficient organisational structures must be developed⁶, additional funding sources, particularly through the carbon markets and climate protection funds, have to be mobilised, and instruments must be developed to cover costs with tariffs after external financing ends in order to ensure the sustainability of the investments.⁷

Experience shows that the mere delegating of responsibilities and waste management functions to the municipalities, which is common in most partner countries, puts an excessive strain on these and impairs the development of the sector.

German Financial Cooperation considers itself called upon, beyond the 'classic' approach of supporting projects with municipal project executing agencies, to become involved in promoting the overall sector conditions as well.

Designing waste management concepts to create jobs

In addition to greater engagement on the 'macro level', labour-intensive projects aimed at protecting resources and the climate also require the development of adapted processes at the micro level. Capturing materials of the highest possible quality, that is, materials that are clean and have few impurities, is not only a precondition for the use of waste but also creates considerable employment

From the promotion of individual projects to the development of the sector⁸

On the basis of experience gathered in Tunisia, where German Financial Cooperation (FC) has been instrumental in developing the waste management infrastructure and implicitly participated in the development of the sector over the last 12 years, essential elements of this 'sector approach' are now to be applied in the development of the waste management system in Egypt. Together with German Technical Cooperation and with support from the EU, a programme has been agreed that comprises the establishment of waste management infrastructure as well as the development of the legal, financial and institutional framework as well as the planning capacities and instruments. The main element is to establish a state sector institution that combines the technical and regulatory competences at the state level and efficiently uses the scarce human and financial resources.

In another project in El Salvador, on behalf of the federal government German FC is supporting the implementation of the "National Waste Management Improvement Plan". An eco-friendly, resource-conserving and economically sustainable country-wide waste management system is to be introduced here by 2025. In addition to developing municipal infrastructure, the project includes the improvement of the management and control function of the sector ministry.

opportunities. Collection, separation and processing of waste and reusable materials provide enormous potential for employment and contribute to developing a green economy.⁹

Thus, the concept of waste collection and waste separation have decisive influence on the socially compatible design of waste management concepts. The collection and logistics systems in use in industrialised countries

⁶ Pfaff-Simoneit, Wolfgang: Sectoral Approaches in Solid Waste Management to Link Climate Change Mitigation and Development; ISWA Annual Congress 2010, Hamburg 15th – 18th November 2010.

⁷ Pfaff-Simoneit, Wolfgang; Nassour, Abdallah; Nelles, Michael: Fortschrittliche Abfallwirtschaftskonzepte in Entwicklungsländern – Finanzierbar? Umsetzbar? Nachhaltig? (Progressive Waste Management Concepts in Developing Countries – Fundable? Viable? Sustainable?) 15. DIALOG Abfallwirtschaft MV, University of Rostock, Schriftenreihe Umweltingenieurwesen der Agrar- und Umweltwissenschaftlichen Fakultät Band 31, 2012.

⁸ Pfaff-Simoneit, Wolfgang: Entwicklung eines sektoralen Ansatzes zum Aufbau von Abfallwirtschaftssystemen in Entwicklungsländern vor dem Hintergrund von Ressourcenverknappung und Klimawandel, Doctoral Thesis University of Rostock, Faculty of Agricultural and Environmental Studies, Rostock/Darmstadt 2012.

⁹ United Nations Environmental Programme: Green Economy Report - Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, PART II: Investing in energy and resource efficiency; Chapter 'Waste'; 2011 www.unep.org/greeneconomy.

were developed under the conditions existing there with the aim of making the collection as efficient as possible and saving labour costs. Wherever possible, manual labour is replaced by the use of machines and capital. In contrast, in developing countries labour is available at reasonable cost and a high employment impact is desirable from the point of view of development policy. The collection systems in use in industrialised countries therefore do not fit the reality of people's living conditions in developing countries. Rather, technically simple systems with a high degree of service based on the principle of home collection, which uses simple collection and transport techniques, are more appropriate. They achieve higher collection rates and

have higher employment potential. Therefore, the promotion of projects will also have to include the development of differentiated collection concepts and the establishment of the organisational and technical compatibility between technically simple primary collection systems and modern secondary collection and transport systems. To achieve this it will be necessary to implement model projects, evaluate and propagate best-practice examples and support the municipalities in their implementation.

Conclusion

The establishment of waste management systems that are aimed at protecting resources and the climate offers outstanding opportunities for aligning economic, ecologi-

cal and social objectives. Despite the enormous challenges involved, KfW Entwicklungsbank will intensify its engagement in the sector and develop new approaches to mobilise the potential of the sector for qualitative growth in the partner countries.

Further information:

Wolfgang Pfaff-Simoneit

Technical expert
Policy and Sector Division Water and Waste
Management
Wolfgang.Pfaff-Simoneit@kfw.de