WASTE to WEALTH

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Used materials or waste is conventionally defined as something unwanted and has no economic value. However, there is a new way of looking at our waste stream nowadays. Instead of seeing used materials as waste in need of disposal, used materials are seen as valuable resources. A pile of "waste" sometimes represents jobs, financial opportunities, and raw materials for new products.

Waste can be source of living for many peoples, in many ways. This includes business activities such as recycling and composting of waste materials, generating energy from waste, as well as converting waste to other useful resources. In general, the possible "wealth" generated from waste can be categorized into the following:

1. Recycling of materials from waste – Recover useful materials
2. Composting of waste – produce composts or fertilizer
3. Landfilling of waste – generate landfill gas (for electricity)
4. Incineration of waste – generate electricity
5. Other specific technologies to convert waste to useful materials (such as converting rice husk to charcoal, sludge to bricks etc.)

Waste Recycling

The most common understanding of creating revenue from waste is through resource recovery or recycling. The definition of recycling is to pass a material through systems that enable that material to be reused. The entire waste recycling activities involve the collection of waste materials, as well as separation and clean-up of those materials.

In general, the overall flow for waste generated from various sources such as households, commercial entities and industries can be summarized in Figure 1.

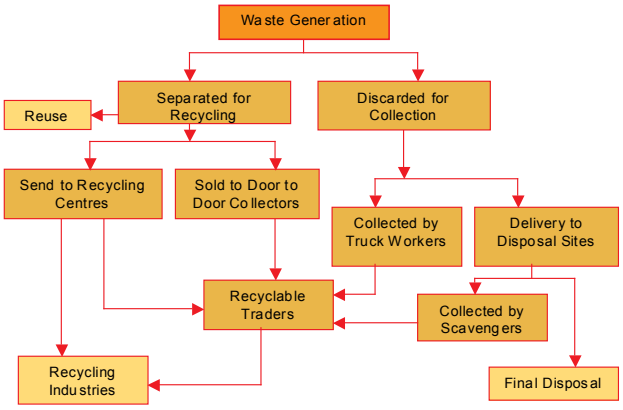


Figure 1: Overall flow for waste generated

It is clearly shown that waste that is recyclable is being collected or recovered at many stages before being finally disposed at disposal sites such as incinerator, landfill site, composting or other disposal facilities. The waste is collected or recovered from the waste stream because of the values of the waste materials, such as aluminium, plastics, papers and cardboard etc. The recovery of these waste materials has become not only a source of living for many peoples, but has also created several important trading and industrial activities.

According to the report entitled "Wasting and Recycling in the United States 2000", on a per ton basis, sorting and processing recyclables alone sustains ten times more jobs than landfilling or incineration. According to the report, some recycling-based paper mills and recycled plastic product manufacturers employ 60 times more workers on a per ton basis than landfills. The report also adds that each recycling step a community takes locally means more jobs, more business expenditure on supplies and services, and more money circulating in the local economy through spending and tax payments.

In Malaysia, the entire recycling system involves several important players, right from primary recyclable collectors (scavengers, waste pickers, door-to-door collectors), recyclable agents, traders, middlemen, junkshops, recycling centres, and finally the recycling industries. The entire recycling system has created jobs and opportunities involving significant numbers and wide range of players including individual players as well as multinational companies. The recyclable materials collected are not only traded domestically but also exported to foreign countries depending on the demand and prices of the materials.

Based on the waste composition analysis and current average market prices of the major recyclable materials, some general estimaties on potential value of recyclable materials in the waste stream of Malaysia are shown in Table 1:

Waste-to-Energy

Waste that is not possible to be recycled is finally disposed off to landfill sites, combusted in incinerators or treated in other facilities such as

Table 1: Values of Recyclable Materials in the Waste Stream

Composition	Percentage (%)	Amount (tones/year)	Market price (RM/kg)	Values (Million RM)
Papers	17.1	1,026,000	0.20	205.2
Plastics	9.1	546,000	0.30	163.8
Glass	3.7	222,000	0.05	11.1
Aluminium	0.4	24,000	2.00	48.0
Scrap Metals	1.6	96,000	0.50	48.0
Other non-recyclables	68.1	4,086,000	-	-
Total	**100.0**	**6,000,000**	**-**	**476.1**

Note: 1) Waste composition data obtained from Ministry of Housing and Local Government (2005)
2) Total waste generation was estimated at 6 million tones per year
3) Average market prices were based on prices at recycling centre as of September 2005; actual prices at recyclable agents, middlemen and end buyers (industries) are usually much higher

anaerobic digester, plasma, refuse-derived fuel (RDF), pyrolysis etc. Energy in the form of electricity can be generated from waste through decomposition or combustion process of wastes.

The concept of waste-to-energy has been implemented in many countries but whether or not the plant is profitable is very much dependant on the operation and capital costs of the facility.

Waste Composting

Composting is defined as the biological decomposition of the biodegradable organic fractions of waste under a controlled condition. The composting process produces fertilizer or soil conditioner for farming or agricultural use. Wastes that can be composted are organic wastes, such as food residue, yard waste, agricultural waste, animal droppings etc.

In Malaysia, composting is not common for municipal solid wastes but some agricultural waste such as palm oil empty fruit bunches is turned into composts by mixing with palm oil mill effluent (POME). Besides, some composts are also produced by mixing sawdust and chicken manure. The prices of compost in Malaysian markets range from RM180 to RM1,000 per ton depending on the demand and compost quality.

However, in recent years, many R&D studies have been done especially to carry out composting of food waste in Malaysia, for the reason that a big portion of municipal waste in Malaysia consists of food waste (>60%). The technologies tried include biotechnology by using microorganisms, vermin compost (using worms), semi-aerobic composting and high speed fermentation system etc. These technologies expect to produce high quality compost products which command consistent and good market prices.

Table 3: Export Earnings from Recyclable Products in New Zealand (2000)

Business	Export Earnings from Products Made from Recyclable Materials	Export Value (NZ$)
Rubber recycler and manufacturers	Currently exporting safety matting (mainly for agricultural sector) with a value of $15,000/year and about to start exporting over $100,000 a year to South Africa, Australia and the UK. Potential for future growth	$15,000
Plastic recycler and manufacturers (4 companies)	Exporting processed plastic from industrial waste in resin form, mainly to Australia. Currently exporting about 200 tonnes/month, worth about $1.8 million a year. Potential for growth.	$1.8 million
	Exporting about $4 million in the 1999 (80% of their products) to the US, Canada, Japan, UK, Australia, South America and Europe. Manufacturing matting products for flooring, using recycled flexible PVC, and rubber from car tyres. Insufficient PVC in New Zealand so currently importing scrap and virgin materials.	$4 million
	Manufacturing guttering accessory made from recycled plastic. Have started sales to Western Australia and are exporting to the US markets, which could be easily amount to $250,000 per year	$250,000
	Exporting over $1,000,000 / year of products made from recycled plastics. Developing further products and markets. Big potential for growth.	$1 million
Power Organics	Just started exporting. $20,000 of liquid product to Australia this year. Expected to export about $200,000 next year.	$20,000
Manufacturer of toilet tissues from recycled papers	Exporting toilet paper made from 100% recycled papers to Rarotonga and US Samoa, valued at about $180,000 annually.	$180,000
The ark-computer recyclers	Not currently exporting a great volume of refurbished computers. However, working to secure three granulators, one each for Auckland, Wellington and Christchurch, which will allow rendering of any surplus and un-usable e-wastes to a more compact form. This can then be exported to a processing plant in the US to be re-processed	-

Waste to Wealth: Some Case Studies

1) Recycling in New Zealand

In 2000, nearly NZ$70 million was earned through the export of recyclable commodities in New Zealand, as shown in Table 2 below:

Many products are made in New Zealand from materials collected from the waste stream. This includes post consumer waste and post-industrial waste that are collected in a variety of ways. Listed below in Table 3 are a number of businesses manufacturing and exporting products made, either entirely or in part, from recycled materials.

Table 2: Quantity and Values of Recyclables Collected in New Zealand

Category	1999		2000	
	Quantity (T)	NZ$	Quantity (T)	NZ$
Plastic	4,802	1,857,029	6,597	2,644,948
Paper	35,495	4,850,167	101,202	21,707,816
Glass	-	53,812	-	161,868
Ferrous and non Ferrous Metals	105,343	36,613,830	107,688	44,633,726
Total Commodities exported	**145,640**	**43,374,838**	**215,487**	**69,148,358**

2) Landfill-Gas-to-Energy in Seattle, USA

The landfill-gas-to-energy project in Cedar Hills Landfill in Seattle was established in October 2001, with a capacity of 27 Megawatts-hour. The project reduces energy costs and reliance on energy markets for electricity, generating revenue through sale of landfill gas, and meeting a growing consumer demand for energy produced from renewable sources.

The project could generate electricity to provide power to 16,000 households besides powering the landfill itself. About USD$400,000 per year of revenue is expected from the project through the sale of landfill gas. In addition, the authority expects to save USD$80,000 annually on energy bills because the new landfill gas to energy plant will power the landfill's extensive gas collection system instead of using energy that the authority now purchases on the open retail market.

Landfill Gas-to-Energy Project: Gas Vents at Cedar Landfill for Methane Gas Recovery

Conclusion

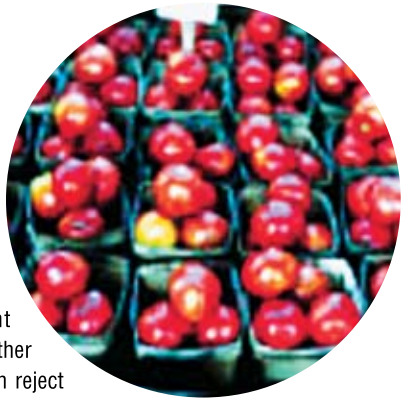
Waste management has the dual function of resource recovery and final disposal, and revenues can be earned from both stages through recovery of recyclable materials or conversion of waste to energy. Waste can be a source of living for many peoples, right from a small scale as a recyclable collector to large scale recycling industries. Recycling has developed into a major export earner for countries like New Zealand. There is also great potential for the recycling industry to be developed in many other parts of the world, such as Ohio which boasts a USD$22.5 billion recycling industry or Germany where the waste and recycling industry is bigger than either the telecommunications or steel industries.

In short, waste is not something that is merely unwanted anymore. People are now looking at it as a resource for business and opportunities. One can turn waste into wealth and now Turning Waste into a Resource Makes CENTS. ■

World Trade and Trade-Offs

■ Kamsiah Md Ali

World GMO Treaty Pits EU Against its Trade Partners



Reuters News Service reported that Europe looks on course for another clash with its top trading partners over genetically modified (GMO) foods as negotiations get under way for the gradual enforcement of a treaty to control global GMO trade. Europe's sceptical stance on GMOs has long poisoned its trade relations with biotech-friendly countries like the United States, Canada and Argentina, where consumers shrug off claims from green groups that these products may pose risks. In Europe, genetically modified maize, soybeans and other crops and their products are shunned as "Frankenstein Foods" by most consumers, leading retailers to keep them off shelves. This puts a dent in world trade and prompted the GMO-growing trio to file suit against the EU at the World Trade Organisation for its policy, begun in 1998, of not accepting imports of new GMOs, which ended last year.

The battleground now switches to a UN treaty, the Cartagena Protocol, that came into force in 2003 and aims for more transparency and control in international GMO trade. It has been signed by 116 countries but not the United States, the world's GMO giant. Negotiations on implementation and enforcement have moved slowly, with the next meeting set for Montreal in late May and early June. The Protocol obliges exporters to provide more information on GMO products like maize and soybeans before any shipment to recipient countries, to help them decide whether to accept it. Crucially, it lets a nation reject GMO imports or donations, even without scientific proof, if it fears they pose a danger to traditional crops, undermine local cultures or cut the value of biodiversity to indigenous communities. The biotech industry complains the treaty will create costs running into millions of dollars for testing export cargoes for the presence of gene-altered grains. In the meantime, those countries that have not signed the treaty are struggling to make their voices heard.

Source: http://www.planetark.com/dailynewsstory.cfm/newsid/29926/story.htm

Biogas Bonanza for Third World Development

The United Nations Development Programme (UNDP) 1997 Report, Energy After Rio: Prospects and Challenges identified community biogas plants as one of the most useful decentralized sources of energy supply. Unlike the centralized energy supply technologies, such as power plants based on hydroelectricity, coal, oil or natural gas, that have hitherto been the only choices open to rural communities, biogas plants do not require big capital to set up, and do not pose environmental problems that excite public opposition. Instead, in most cases, they offer solutions to existing environmental problems, and many unexpected benefits besides.

The organic materials needed for producing biogas in an anaerobic digester are readily available in developing countries. These include firewood, agricultural wastes and animal wastes. Many countries have large cattle and buffalo herds producing tonnes of manure. Traditionally, these wastes are carefully collected in India and used as fertilizer, but the increasing scarcity of firewood has forced many villagers to burn dung-cakes in cooking their food. As biogas plants yield good quality sludge fertilizer, the biogas fuel and/or electricity generated is an additional bonus. And this has motivated the large biogas programmes in a number of developing countries like China, India, Nepal, Sri Lanka and Vietnam.

Source: http://www.i-sis.org.uk/BiogasBonanza.php

Carbon Trading Bonanza

The United Nations Framework Convention on Climate Change has set up a Clean Development Fund, and the World Bank has put together a Carbon Finance Unit to allow rich countries, which are pumping more carbon into the atmosphere than is allowed under the Kyoto Protocol, to buy emissions that poor countries prevent through conserving forests or promoting renewable energy. An article in the Nepali Times pointed out that Nepal's successful biogas programme not only brought farmers a non-polluting fuel, conserved forests and provided high quality fertilizer for crops; it can make the rest of the world pay hard cash for not burning firewood to release carbon dioxide into the atmosphere.

About 85% of the fuel used in Nepal comes from biomass sources like firewood, animal manure and agricultural residue. The others are kerosene, diesel or liquefied petroleum gases. Nepal's biogas programme is internationally regarded as a model for successful use of alternative energy for the rural Third World. Nepal has now overtaken China and India in the number of biogas plants per capita. Each of its 125 000 functioning digesters prevents five tonnes of carbon dioxide equivalents from being pumped into the atmosphere every year. This 'saved' greenhouse gas is what rich countries are buying to offset their own emissions, and is worth US$5 million. This money can be invested back into clean energy that would make Nepal eligible to trade even more carbon offset to rich polluters.

Source: http://www.i-sis.org.uk/BiogasBonanza.php

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is controlled as it is prescribed as a scheduled waste under the Environmental Quality (Scheduled Wastes) Regulation 1989. In order to regulate the emissions of dioxins and furans from incinerators, a new regulation is in place that will stipulate the allowable standards or levels of emissions not exceeding 0.1 ng/Nm3 TEQ. Previously, these standards or levels were prescribed only as part of the Environmental Impact Assessment Report approved conditions.

National Implementation Plans

Each Party to the Stockholm Convention is required to develop a plan for implementing its obligations and submit the plan to the Conference of the Parties within two years of entry into force of the Convention.

A pilot project funded by GEF was initiated to assist 12 countries in the world in the development of their National Implementation Plans (NIP) and to strengthen national capacities for managing POPs and meeting their obligations under the Convention. Malaysia is one of the 12 countries currently involved in the development of the NIP.

Conclusion

There are a small number of chemicals that cause adverse effects on human health, environment and wildlife. Reducing or eliminating the risks of such chemicals is vital for sustainable development. However, developing countries lack or have limited capacities to manage hazardous chemicals. It is therefore through global action, by way of legally binding instruments, that international safeguards can be catalysed. The Rotterdam Convention and the Stockholm Convention are two such major global treaties that can spur us in achieving the sound management of chemicals which have a negative impact on human health and the environment.

Challenges to Eco-Labeling Arise in World Trade Talks

According to an Oct 21 Environment News Service report, consumers may lose the chance to make environmentally informed choices, if plans to ban energy efficiency and recycling labels succeed during World Trade Organization talks. A proposal to outlaw energy efficiency labeling is up for discussion at the World Trade Organization's ongoing negotiations. More than 200 similar free trade measures have been put forward and if successful, could deny consumers' access to environmental information on a wide range of products. Countries including Korea, the United States and China are claiming that eco-labeling damages their competitiveness and acts as a barrier to trade.

Countries including Korea, the United States and China are claiming that eco-labeling include:

- labels which show whether a product is recyclable, such as the triangle logo found on plastic bottles
- labels which show whether a product, such as paper, has any recycled content
- labelling which indicates sustainable sourcing, such as dolphin-friendly tuna
- safety testing on imported foods, like compulsory testing for lethal toxins in shellfish
- tax breaks for fuel efficient vehicle engines
- fines for manufacturers, when testing shows their products fail to meet their energy efficiency claims
- labels which show the energy efficiency rating of appliances such as washing machines, fridges and irons

Source: http://www.ens-newswire.com/ens/oct2005/2005-10-21-04.asp.

The European Union Greenhouse Gas Emission Trading Scheme (EU ETS)

In January 2005 the European Union Greenhouse Gas Emission Trading Scheme (EU ETS) commenced operation as the largest multi-country, multi-sector Greenhouse Gas emission trading scheme world-wide. Allowances traded in the EU ETS will not be printed but held in accounts in electronic registries set up by Member States. All of these registries will be overseen by a Central Administrator at EU level who, through the Community independent transaction log, will check each transaction for any irregularities. In this way, the registries system keep track of the ownership of allowances in the same way as a banking system keeps track of the ownership of money. The Commission provides guidance on the application of VAT to emission allowances.

The European Commission's DG Environment has commissioned McKinsey & Company and Ecofys to monitor and review the EU emissions trading scheme (EU ETS) during 2005 and 2006. The purpose of the review is to provide a fact base in order to analyse the functioning and design of the system with respect to a number of specific issues.

Source: http://europa.eu.int/comm/environment/climat/emission.htm

The Digital Dump: Exporting Re-Use and Abuse to Africa

A new investigation by the toxic trade watchdog organization, Basel Action Network (BAN), has revealed that large quantities of obsolete computers, televisions, mobile phones, and other used electronic equipment exported from USA and Europe to Lagos, Nigeria for "re-use and repair" are ending up gathering dust in warehouses or being dumped and burned near residences in empty lots, roadsides and in swamps creating serious health and environmental contamination from the toxic leachate and smoke.

Much of the waste ends up being discarded along rivers and roads. Often it's picked apart by destitute scavengers, who may face dangerous exposure to toxic chemicals in the broken equipment. The importers sell the working machines. Then they pay workers a pittance to burn the plastic casings and wire insulation in broken machines and strip out sought-after materials such as gold and copper. The low-tech recovery process could expose workers and the local environment to lead, cadmium, mercury, and other hazardous materials used to build electronics. Workers can also be exposed to carcinogenic compounds called dioxins that are byproducts of incinerated plastics.

Activity Highlights (Year 2005) Department of Environment, Malaysia

DATE	PLACE	EVENT
DECEMBER		
6-8	Jakarta, Indonesia	Workshop on the Development of Key Indicators for Clean Air, Clean Water and Clean Land and Awards to Promote Environmentally Sustainability in ASEAN Cities
7-9	Phillipines	The Asia-Europe Meeting (ASEM) Oceans Initiative
8-14	Batam, Indonesia	6nd Meeting of the Regional Scientific and Technology Committee of the UNEP/GEF Project UNEP/GEF 5th Meeting of the Programme Steering Committee
12-16	Senegal	7th Convention of Parties (COP) to the Vienna Convention 17thMeeting of Parties to Montreal Protocol

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Conclusion

Both environmental degradation, trade liberalization and poverty alleviation are urgent global issues that have a lot in common, but are often treated separately. Attention should focus on the gains in the livelihood conditions and prospects of the poor that can be achieved by expanding the activities of export-oriented, small-scale enterprises and non-traditional agro-export production and processing. Human activities are resulting in mass species extinction rates higher than ever before, currently approaching 1000 times the normal rate. Human-induced climate change is threatening an even bleaker future. At the same time, the inequality of human societies is very much evident.

Sources: Poverty facts and statistics; Loss of Biodiversity; Climate change and global warming.

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Footnotes

[1] See the World Commission on Environment and Development Report (WCED 1987).

[2] There are other emphases as well, such as sustainable human development.

Consider the following:

- The United Nations 1998 Human Development Report reveals that: globally, the 20% of the world's people in the highest-income countries account for 86% of total private consumption expenditures - the poorest 20% a minuscule 1.3%.
- To highlight this inequality further, consider that approximately 1 billion people suffer from hunger and some 2 to 3.5 billion people have a deficiency of vitamins and minerals.
- Yet, some 1.2 billion suffer from obesity.
- One billion people live on less than a dollar a day, the official measure of poverty.
- However, half the world — nearly three billion people — lives on less than two dollars a day.
- Yet, just a few hundred millionaires now own as much wealth as the world's poorest 2.5 billion people.

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