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MANAGING THE GLOBAL WASTE IN THE 21ST CENTURY¹: As an anthropologist views it

*Dipak R. Pant*²

Key concepts

Cultural appropriation, Decentralized cooperation, De-materialization, Geo-economics, Habitat integrity, Human vulnerability, Multi-local approach, Place-brand, Productivity, Resource Efficiency, Resource-cum-waste management, Sustainability, Wellness.

1. Waste: matter, terms and concepts

1.1. Introduction

Human being, as other living organisms, produces biotic wastes (excrements) as part of body's vital processes and organic cycles; and discharges that on immediate surrounding landscapes where the waste quickly gets decomposed and inserted in the vital processes and organic cycles of the wider ecosystem. Unlike all other living organisms, human beings produce a lot more a-biotic wastes in their need-fulfilling processes and material-use cycles; and the material wastes discharged by modern human beings are not easily and quickly dissipated in the ecosystem. Modern human-made waste is an ever-accumulating material presence on the Earth. Waste is an ever-increasing threat to the human and animal health, to the integrity of ecosystems and landscapes. Waste management is an ever-increasing burden on the public finances and facilities.

Waste was not a problem in the early stages of human civilization when the population was small, scattered in small rural settlements and nomadic hordes. Life-styles and consumption were limited within the local confines of a subsistence economy based upon the resources of primary sector (agro-silvo-pastoral) available in close ranges. Human activities generated much less waste. Waste was generated within a very short supply-chain and was re-directed within a narrow material-flow circuit. The waste was mostly biotic (biodegradable) in Nature; so it was governed by environmental feedback loops, i.e., decomposition and re-cycling in Nature. Waste

has increased enormously since the advent of industrial development and urbanization. A major fraction of urban (municipal) waste and almost all industrial wastes are a-biotic (non-organic), non-biodegradable and are mostly harmful to the health of plants, insects, animals and humans. Waste is ever accumulating on the planet. Some organized and informed attention to 'waste' and some investments in waste management have been noticed among the institutions of advanced industrialized countries and international agencies; perhaps more attention and investment are needed.

"... "Waste" shall mean any substance or object ... which the holder discards or intends or is required to discard" - **EU Council Directive 75/442/EEC**, amended by **Council Directive 91/156/EEC** art. 1(a).

"... "Wastes" are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law. "Management" means the collection, transport and disposal of hazardous wastes or other wastes, including after-care of disposal sites" - **BASEL CONVENTION³ on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal** (article 2).

"Waste is generated at various stages of human activities, and its composition and amount largely depends on consumption patterns and on industrial and economic structures. Its impact on the environment and on quality of life is mainly related to air, water and soil contamination, but also includes space consumption, odours and aesthetic prejudice" - **OECD Environmental Data Compendium, 2006-2008** (p. 5).

From an anthropocentric point of view 'waste' can be understood as something that is useless for human purposes (e.g. desert sands, the ice in glaciers, shrubs in the savannah... etc.). From a cosmos-centric view-point, nothing is useless in Nature, and everything is there for a purpose as part of a gigantic web of things and beings (bio-cosmic complementarity).

From a critical-historical perspective 'waste' refers to something potentially valuable but not understood *a-priori*, and therefore, lost or missed ('wasted'). Inability to comprehend and use something properly turns that thing into 'waste'. After discoveries and innovations are made, it is understood in hindsight that something was wasted (e.g. the sun or wind as renewable energy; the dense fog of some coastal areas and lowlands as a new water resource; some previously unknown herbs or plants later found to be useful as food, fodder or as medical remedies...).

From an utilitarian-pragmatic stand-point 'waste' also means something (or part of a thing) that is discarded after its primary use; e.g. waste inevitably generated by households, offices, industries, hospitals etc.: unwanted, harmful or useless but inevitable materials that needs a careful handling and disposal. The basic ingredients for any careful handling/disposal are policy measures, normative disposition, financial and technological resources and human skills. Such

ingredients not easily available for the majority of human beings in most parts of the world. This is the central subject-matter of the current debate on ‘waste’. Current debate on the issue of ‘waste’ has four dimensions: economic-financial; environmental (ecosystem, public health); institutional (policies, norms) and social (life-style, awareness, civic compliance...).

1.2. Languages, cultural contexts⁴ and connotations

In two of the most widely used languages in the Western world, **English** and **Spanish**, the terms denoting ‘waste’ have Latin (old Roman) roots.

The **Spanish** term *basura* (“garbage”) is derived from **Latin** *versura* (“turned”, “swept”), related to two **Latin** verbs: *vertere* (“to turn, dump”) and *vertere* (“to sweep”). *Versare* (v.) means “to pour/to dump” in **Italian**, although the commonly used term for ‘waste’ in modern Italian is *rifiuti* (“something refused or rejected”). ‘Waste’ or ‘wasted stuff’ is *déchet* in **French**; *desechos*, *residuos* or *desperdicios* are other commonly used terms in **Spanish**; and, as *desperdício* or *perda* in **Portuguese** (the common term for waste in the modern **Portuguese** is *lixo* = garbage, trash, rubbish, refuse, litter).

In **English**, the word ‘waste’ is probably derived from the **Latin** *vastus* (vast, empty) equivalent to *inculta* = unused, uncultivated, empty, desolate, useless ...; usually referring to vast stretches (*vastus*) of land or space that are not cultivated or cultivable. In **Latin**, the verb *vastare* means “to lay waste”, “to render desolate”, “to devastate”, “to ruin”... Another **English** (North American) term for ‘waste’, applied to domestic refuse or garbage, since the early 1900s, is ‘trash’ (n.). ‘Trash’ means “anything useless or of little value”, originally perhaps, from a **Scandinavian** source (old **Norse** *tros*= “rubbish, fallen leaves and twigs”; in **Norwegian** usage *trask* = “lumber”; in **Swedish** *trasa*= “rags, tatters”). The term ‘waste’ also seems to have some influence from old **Frankish** (*wuasti*, *wuosti* and *wostin/wostinna* = “waste/wasteland”) and old **Germanic** terms (*wuosti*, *wostjan*, *waster*, *wušte*) with similar meanings. And these old **Frankish-Germanic** terms seem to be linked with the proto-**Indo-European** *wasto* (= “devoid of useful content, useless”), perhaps related to **Sanskrit** *vastu* (= “matter, thing”). Modern **German** term for waste is *Abfall* which means “dropped out, left over, trash” (*Abfallwirtschaft* = “waste management”).

In modern **Russian**, ‘waste’ is generically called *otkhod’y* (отходы). Russian equivalent of ‘municipal solid waste’ (MSW) is Твёрдые бытовые отходы (ТБО). But the most commonly used term for ‘waste’ is *musor* (мусор = “the result of throwing away stuff”, from the verb *мусорить* = “creating/throwing away useless stuff”). Many other Russian terms are used for specific wastes: (отбросы = “food waste”; *Ибумажный мусор*= “pieces of paper/plastic, litter...”; *жидкие отходы*= “liquid waste” or sewage). Other connotations are pretty much the

same as in English, like “wasting time/resources/opportunities/one's life” (тратить/выбрасывать).

The old **Greek** terms *phthisio*, *phthis*, *phthi*, *phthisis* (“decay, waste away, waning; loss, diminution...”) had several meanings. In modern Greek a variety of terms are used: “trash” (*aporrimata/απορρίματα*) or “garbage” (*Skoupidia/σκουπίδια*) or “rubbish” (*anoisies/ανοησίες*, means also “non-sense”, “futile”). As a noun, ‘waste’ is *spatalo* (σπαταλώ), *fthora* (φθορά), *achristos* (άχρηστος), and as a verb, ‘to waste’ is *mataiopono* (ματαιοπονώ). The contemporary common **Hebrew** word for ‘waste’ is *zevel* (“garbage”); it is a post-biblical word that originally meant “manure” or “dung”. The commonly-used words for ‘waste’ in **Arabic** *hadara* (هدارة-) and **Turkish** (*atık*) are relatively modern terms.

In classical **Sanskrit** there are several terms to denote ‘waste’. In the most ancient form ‘waste’ is usually coined as *vyartha* (व्यर्थ adj. = “useless, vain”) related to the concept of *vyaya* (व्यय v. = “to spend, to waste, to dissipate”; व्यय adj.= “liable to change or decay”). The most common Sanskrit term for refuse is *avakara* (अवकर, n.) which can be translated as “useless residual element” or “dirt”, closely related with the term *avaskara* (अवस्कर n.) which means “excrement” or “faeces”, derived from the verb *avakshiyate* {*avakshii*} (अवक्षीयते {अवक्षि}). Another commonly used term is *mala* (मल n. = “excrement”); most probably this is the origin of the modern **Nepali** term *mailaa* or *fohar-mailaa* (“garbage, trash, dirt, waste”). In Sanskrit, to denote ‘waste’ as something ‘useless/vain’ there is also *tucchadravya* (तुच्छद्रव्य n. = “trash, inferior matter, scrap, junk...”); to denote “harmful and useless residual” *kashha* (कष adj.) is commonly used, perhaps the modern **Hindi** terms of *kudaa-karkat* or *kacharaa* (“trash/garbage”) are derived from this. In contemporary **Tibetan**, there is a widespread use of *gey-nyig* (or *gad-snyigs*) for rubbish or garbage meaning literally the “stuff you would put only in a trash-can (*gad-kha*)”; obviously, it is not an old and textual (classical) Tibetan term.

In classical **Chinese** the verb ‘to waste’ is *làng-fè* (浪费) which implies a variety of meanings (like in classical Sanskrit). In the contemporary (simplified) Chinese the most commonly used term for ‘garbage’ or ‘trash’ is *làng-jī* (垃圾). Most probably, related to the classical Chinese term is the commonly used modern **Vietnamese** term for ‘waste’ (*lãng phí*). *Sēīya* is ‘waste’ in classical **Thai**, but the common contemporary term used for ‘waste’ (n.) is *dRāng*. Most modern Asian vernacular terms for ‘waste’ do not seem to be directly related with the classical terms such as *mu-da* (無駄) in Japanese, *khog* (sometimes also *uldegdel* = “left

over”) in Mongolian; *sampah* in **Indonesian** (*Bahasa*) as well as in **Malaya**. The terms related to ‘waste’ as we understand them today are modern concepts.

A similar situation emerges from a cursory look into some **African** contexts. In **Swahili** (spoken in **Kenya**, **Tanzania** and some other parts of **East Africa**) the common term for ‘garbage’ or ‘trash’ is *takataka* (n.); the generic term for ‘to waste/wasted/wasteful’ (v./adj.) is *kupoteza*. In **West Africa**’s modern vernacular *Creole* (a localized version of English mixed up with local dialects, known as *Kerio* in **Sierra Leone**) the term *poil* (perhaps related to English ‘spoil’) signifies both ‘to waste’ (v.) and ‘wasted matter’ (n.). But the most common word for ‘waste’ (in the common sense of ‘garbage/trash’), understandable to all ethno-linguistic groups of **Sierra Leone** (and also of the neighbouring districts of **Guinea** and **Liberia**), is *bormai*. *Bormai* literally means the main area in the town/village (usually, near the market area) where all wastes and refuses are thrown away.

2. Waste: global challenges

2.1. Urbanization, industrialization, waste

Waste is an integral part of the global supply chain and material-flow circuits that have expanded to a planetary/global scale and even beyond the Earth (obsolete satellites, abandoned space stations and other aero-spatial scraps are being flung into outer space). Majority of the humanity lives in urban areas. The urbanization leads to the expansion of modern consumer life-style among the people of all sections and strata which, in turn, demands more industrial products to satisfy the urban humanity’s needs and also a lot more wastes. Modern urban-industrial wastes are, largely, a-biotic (non-biodegradable) in character; they are un-governed by environmental feedback loops; they are accumulating *ad infinitum* on Earth, and the cost to handle and dispose them safely is likely to be higher and higher in the future. Therefore, waste management has become one of the most critical environmental and economic challenge of our times.

Global Urban Population

Urban Humanity	Total population (in thousands)	Urban population (in thousands)	Urban population (% of total population)	Average annual growth rate of urban population (%)	Population of agglomerations with 1 million inhabitants or more (% of urban population)
Area	2010	2010	2010	2005-2010	2010
World	6 895 889	3 479 867	50	1,9	38
More developed regions	1 235 900	928 853	75	0,7	38
Less developed regions	5 659 989	2 551 304	45	2,4	38
Least developed countries	832 330	242 769	29	4,0	35

Source: UN, 2011

Now, more than half of the global population lives in urban areas (UN, 2011), for the first time in history. Urban life-styles and consumption patterns are globalized. Most of the urban population lives in developing countries. In 2005-2010, the growth rate of global urban population was nearly 2% per year: around 2.4% per year in the less developed countries, where waste management is sub-standard; and around 4% per year in the least developed countries (LDC)⁵ where waste management is non-existent or hopelessly under-resourced.

Municipal solid waste (MSW) is growing at an even faster rate than urbanization. According to **World Bank** estimates, at the end of 2001, there were 2.9 billion urban residents in the world who generated about 0.68 billion tons of MSW per year, i.e., an average of 0.64 kg of MSW per person per day. Waste generation has nearly doubled in a decade. Today MSW is supposed to have increased to 1.3 billion tons per year, i.e. 1.2 kg of MSW per person/day, generated by the 3 billion city-dwellers of the globe. By 2025, the MSW is projected to increase up to 2.2 billion tons per year (i.e. 1.42 kg/capita/day) generated by 4.3 billion urban residents worldwide (Hoornweg & Bhada-Tata, 2012). The cost of managing the waste is expected to increase from today's annual US\$ 205.4 billion to about US\$375.5 billion in 2025; and the cost increase is likely to be most severe (more than 4/5-fold) in low- and middle- income countries (World Bank, 2012).

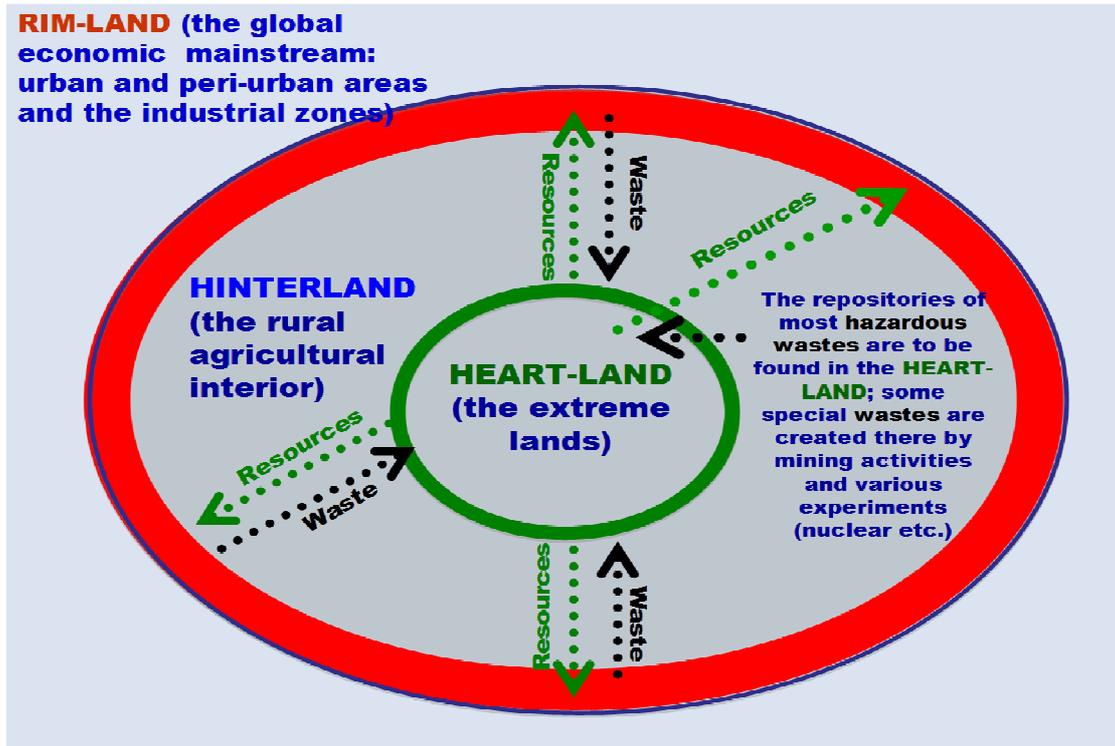
Urban Population and Waste Generation: Current Situation and Projections for 2025⁶

Region	Current available data			Projection for 2025 (from Annex J)			
	Total Urban Population (millions)	Urban Waste Generation		Projected population		Projected Urban Waste	
		Per Capita (kg/capita/day)	Total (tons/day)	Total Population (millions)	Urban Population (millions)	Per Capita (kg/capita/day)	Total (tons/day)
Lower Income	343	0.60	204,802	1,637	676	0.86	584,272
Lower Middle Income	1,293	0.78	1,012,321	4,010	2,080	1.3	2,618,804
Upper Middle Income	572	1.16	665,586	888	619	1.6	987,039
High Income	774	2.13	1,649,547	1,112	912	2.1	1,879,590
Total	2,982	1.19	3,532,256	7,647	4,287	1.4	6,069,705

Source: World Bank, Urban Development Series, No. 15, March 2012

Everybody agrees that the urbanites consume more resources and produce more waste (Hardoy, J. E., D. Mitlin *et al.*, 2001). Urban organizations tend to get rid of their waste as far away as possible from their own location because urbanites are usually more educated and better informed and do have more political bargaining power than the residents of rural and remote areas; they are usually successful in pushing away their waste to the rural and remote areas. So the heaps of waste tend to travel far away towards the less populated rural interior, to the hinterland which supplies many of the vital resources needed in urban areas: food, water, animal/forest products, construction materials etc. Landfills are located in peri-urban and rural areas; incinerators tend to be established farther away from the urban centres. Some other types of waste (hazardous and large-scale scrap) are taken even further away to the marginal and remote areas where tiny local communities bordering ‘no-man’s-land’, do not have enough information or bargaining power. These places are already home to other kinds of waste (the most hazardous types) generated locally by certain activities such as mining, lumbering, drilling/processing fossil fuels, and other special experiments and deposits (radioactive, toxic...). These activities are necessary to supply the resources that the urbanites desperately need, but the same urbanites would never allow such activities to go on in their own back yard⁷. The remote and marginal areas are also the repositories for hazardous wastes brought in from other areas.

Global Flow of Resources and Wastes



On the whole, resources (material and human) flow constantly towards the ‘rim-land’ usually located on the coast, lowlands and plains: the most populated areas with agreeable climate and topography and viable infrastructures. And the wasted flow towards the ‘hinterland’ (rural interior) and further towards the ‘heart-land’ (the remote, marginal areas such as highlands, tundra, taiga, steppes, deserts, savannah, swamps and marshes...).

2.2. Waste, environment and international crime

Poor management of waste is leading to pollution of soil, water and air, and to the degradation of landscape. It is having a major impact on public health, animal and plant health, environmental resources, landscapes, people’s sense of belonging to their place-system (important for social cohesion), human wellness and, indeed, on the economic prospects of many societies. In the past, societies which are now developed suffered large-scale human loss due to shortfalls in their environmental hygiene and their incapacity to manage their waste (mostly biotic and organic, but infectious). Until the 19th century, western Europe used to have large-scale public health problems (e.g. outbreaks of cholera); now, such situations can be observed in developing countries. In the industrialized societies many institutional and technical improvements have been introduced in the past decades, but there are still some pockets of

critical situations in public hygiene even in the developed world (e.g. parts of southern Italy); it is so certainly due to local weakness in institutions, law-enforcement and civic awareness, as well as (supposedly) due to corruption and clandestine (criminal and lucrative) operations in the handling of waste.

There is a global criminal dimension of waste management, which is quite difficult to measure accurately⁸. According to the official estimates of the Secretariat of the **Basel Convention**, the total amount of all types of waste subject to legal (i.e. officially reported) trans-boundary movements in the period 2004 – 2006 was over 10 million tonnes per year, with an increase of 15% in 2006 compared to 2004. Within that, the share of hazardous wastes subject to trans-boundary movements increased constantly over the three-year period, with a total increase of 22%. Hazardous waste represents 55% of all reported trans-boundary movements. Most of the waste is moved to places where it is recovered, recycled, re-used or disposed of. According to official records, it seems that only developed industrialized countries allow significant amounts of hazardous waste to be imported for final disposal, presumably because only these countries have the technical facilities to treat this kind of waste safely. But what about the other countries which import hazardous waste but may not yet have adequate technical and logistic facilities to treat it safely? And what about those who don't even bother to report such movements? The countries which gave information about the generation, shipment and disposal of hazardous waste represent less than 40% of the world's population and less than 60% of the global economy (Wielenga, 2010). Due to considerable discrepancies in "hazardous waste" definition in local terms and norms, local reporting systems, criminal behaviour, distraction and negligence of the public officials and many other factors, the data derived from the national statistics of many countries cannot be used to estimate the total amount of hazardous waste being generated and trafficked on a global scale.

Official information includes only reports on trans-boundary movements of controlled wastes compiled by loyal signatories of the **Basel Convention**, excluding illegal movements (for which, of course, there is no reporting). Some waste-management companies who claim to recycle waste just get paid to collect waste from a local authority and then sell it to an international broker (and thus get paid twice!) The international broker may then approach other brokers who may be agents of criminal organizations. International brokers are often based overseas and operate through associates based in the countries where the waste is generated. The two most common methods of illegal export are mislabelling containers to conceal the waste (particularly hazardous, industrial and electronic waste) and mixing waste with a legitimate consignment. Illicit trafficking and clandestine dumping of waste are some of the most profitable forms of criminal activity taking place throughout the world today, with billions

of dollars being made every year⁹. It is a serious problem that can affect international relations, security and normal (legitimate) trade.

According to **Interpol**, organized crime is responsible for a significant proportion of environmental crimes associated with waste trafficking and dumping. Waste-related environmental crimes are often committed hand-in-hand with other offences, such as fraud, corruption, money-laundering, human-trafficking and murder. Illegal waste-trafficking routes and transit stations necessarily coincide with those used for other illicit trades (drugs, weapons, endangered species, illegal migrants...). International criminal groups are believed to synergize, network and co-operate more smartly than the law-enforcement agencies of many governments, including those in developed countries. Clearly, there is an international dimension to waste-trafficking that makes it difficult to tackle. Perhaps stronger political will, stronger commitments and better international coordination are needed.

Besides, there are many other forms of waste-trafficking and dumping that are formally legal but could be considered as criminal, beyond the reach of international conventions and watch-dogs; a few examples:

- certain embedded waste (certain kinds of packaging or components) and hidden wastes (use of a formally declared and legally and traded apparatus partially re-fitted with waste items that are costly to dispose);
- many near-end-of-life industrial products such as machines, computers as well as mechanical and electrical assets “generously” donated by the organizations of developed countries to the organizations in developing countries;
- many obsolete equipment and instruments left behind by external support organizations after the end of their projects in developing countries;
- trash with hazardous contents left behind by expeditions in the wilderness;
- broken and worn-out vehicles used for the widely publicized rallies (e.g., the Paris-Dakar car rally, the Europe to Mongolia motor rally etc.)...

According to the estimates of **United Nations Environment Programme** (UNEP) the waste sector's processes (waste handling, decomposition, waste recovery as secondary material or energy, and waste disposal) have a relatively small impact on global greenhouse gas (GHG) emissions: in 2005, approximately 3-5% of total anthropogenic emissions were considered to be from the release of GHG in various phases of waste generation, handling and disposal. GHG emissions from waste are bound to increase with the expansion of urbanization, industrialization and global consumership. However, it is believed that the waste sector is in an unique position

to move from being a minor source of GHG emissions to becoming a major saver of emissions (ISWA, 2009). A holistic approach to waste management – right from the reduction in material demand and production design up to resource recovery and waste disposal - may also have positive collateral consequences in terms of lessening GHG emissions in many other sectors such as manufacturing, agriculture, forestry, energy, mining, transport etc..

3. Waste: local opportunities

3.1. Waste or resource?

Globally, the total value of the all waste market is estimated by international experts to be around US\$ 300,000 million a year¹⁰. The prices of prime materials and energy resources (commodities) on the world market have been quite high and tend to remain so in the foreseeable future. Policies and regulations with regard to resource recovery from the waste are well-developed in only a very few countries. The strategic alignment of policies and regulations by national governments - keeping an eye on the public interest and the commodity market - may benefit many legitimate business sectors. Trade in the valuable parts of materials (precious minerals and scrap metal)¹¹ retrieved from the waste and the energy extracted from waste have the potential to create public revenues, jobs and business opportunities.

Many governments in developing countries, and also some in the ‘developed’ world (e.g. southern and eastern Europe, many parts of the USA), do not have the administrative and technical capabilities to manage a sustainable trade of recyclables within an environmentally sound integrated waste-management system. In addition, local markets are not always capable of absorbing locally available re-extracted material. So it seems that recyclables must be traded on a larger (global) scale. But the global trade of recyclables involves many risks and uncertainties. Once on the global market, there is always competitive pressure to bring the price down, expand the scale and increase the profit margins, with adverse effects on environmental integrity and working conditions in many places where government’s regulatory and administrative capabilities are weak. The size and complexity of the global market of recyclables are difficult to tackle. The burden on international control agencies may prove to be unsustainable. Therefore, emphasis should be on local scales, manageable and enforceable, and on local governance and regulation. A minimalist multi-local approach may prove to be helpful for global sustainability. Governments can (should) provide clear guidelines, enforceable socio-environmental standards and regulatory obligations (e.g. disposal fees) to waste-generating businesses. Such provisions would generate revenues that can be used for public programs and for providing incentives for private initiatives (i.e. the remediation industries) interested in

waste management at local level. National governments are in a position to reduce the costs and increase the revenues of their local waste-market players through taxes, subsidies and incentives. With appropriate regulations and incentives, governments can reduce environmental and public health risks of waste by supporting the local waste-market players (e.g. waste-pickers¹², recyclers, traders of extracted material etc.) as well as helping other collaterally emerging (but not yet self-sustained) business sectors, such as biogas production and the composting of biodegradable waste. National governments can also create favourable social and market conditions by raising public awareness and providing adequate logistics and infrastructures.

3.2. Good practices

A proper local waste strategy can create a favourable business climate for the waste sector which, in turn, can create employment and generate revenues while fulfilling its core-duties in managing waste. With active institutional support and incentives, waste has huge business potential which extends well beyond the waste sector, and can integrate local stakeholders and market players through common social and commercial interests. This has been demonstrated by many success stories in both developed and developing countries.

The **Centro Riciclaggio Vedelago S.r.l.** (Recycling Centre Vedelago Ltd.) in the province of Treviso (Veneto region), north-eastern Italy, is an innovative company specialized in waste storage and mechanical sorting of waste¹³. It is a centre of excellence that has become a focal point of reference for the Italian and European organizations (also the industrial delegations from Asia and the Americas are frequently visit this company). **Sartori Ambiente**¹⁴ of Trento is another good business case from northern Italy. This Italian manufacturing and trading company supplies kitchen caddies and containers for separate waste-collection, compost bins and wheelie-bins which are suitable both for door-to-door collection and for public collection systems. This company's success shows of how synergies of policy, regulations and private enterprise can be achieved at local level¹⁵. **Waste Concern**¹⁶ of Dhaka (Bangladesh). **Waste Concern** has not only tackled the problem of waste in its areas of operation, it has also evolved as a social enterprise comprising several business units dealing with compost, agrochemicals, retrieving/recycling of materials¹⁷, organic farming and trading in agricultural products, energy, research and consultancy. Another remarkable case is **Ciudad Saludable**¹⁸ of Peru, which started in 2002 as an NGO dedicated to environmental hygiene and public health. It has now created 35 waste-management micro-enterprises which provide permanent employment for 230 people in 43 towns in Peru and benefit 4 million people through plant nurseries, compost (organic fertilizer) plants, paper recycling plants and sanitary landfills. **Pick-n-Pay**¹⁹, a retail

giant of South Africa, well-known for its sustainability initiatives and reporting, is given distinct for having given top priority to waste management and recycling in all its outlets, in line with (even in advance to) the evolution of policy and regulatory progress in South Africa. With the Pick-n-Pay system, waste is sorted at all its stores and sent for recycling. This has not only dramatically reduced the amount of waste sent to landfills, but has also helped to reduce costs, generate revenues and create new jobs within and around its core-business. There are many more such examples of creating synergy in public policy, regulation and entrepreneurial around waste management. Sound, integrated waste management based on recycling has demonstrated that it has many advantages: labour-intensive business projects (more jobs), better public-private relations, better community-business relations, less need for transport, less need to extract primary raw materials, less materials flow, less pollution and fewer social and economic burdens.

Last but not least, waste can have a strong impact on the tourism and leisure industry, a major sector of global growth and a beacon of hope for many non-industrialized areas. Tourism and many other sectors of local economy are negatively influenced by poor management of waste as it causes general erosion of the place-brand value of any locality and hampers the inflow of visitors and investments²⁰.

4. Waste: a development issue

4.1. Waste management problems in developing countries

Waste management problems in developing countries range from inadequate waste collection to environmental pollution and health hazards resulting from improper final disposal. In developing countries - including those considered emergent economic powers such as Brazil, China and India - collection of waste is sporadic and inefficient, and dumping (mostly landfills, often 'waste-heap-hills') is unsafe. Systematic waste collection is limited to high visibility areas where the powerful and wealthy reside or transit, and where the residents and businesses are willing to pay for the service. Overall collection in developing countries is below 50%, while in developed countries, the collection rate is between 50% and 90% (World Bank, 2012). There are direct links between waste-management problems and other critical development issues such as haphazard urbanization, technological backwardness, resource constraints etc.. There are also strong links between waste-management problems and some specifically local problems such as political stability, civic awareness, governance, economic change and socio-cultural aspects. Therefore, it is impossible to find universal solutions to waste-related problems which may work for all developing countries.

In the majority of cases, low-medium income countries do not have nation-wide organized programs of integrated waste-management. Re-use of a-biotic waste and overall low per-capita waste-generation rates are quite common in the poorest areas. But the situation is changing rapidly and a huge problem is developing because of the fast rate of urbanization and the incremental inclusion of the developing (even the poorest and remotest) countries in global trade links, supply chains and consumer life-style. In most developing countries, very few organized civic-education programs exist. The emphasis on the separation of the waste right from the source and on the three 'R's ('**R**educe-**R**euse-**R**ecycle') is rare. There are no clear and strong policies and regulation to encourage producers to act responsibly, because national governments of the developing countries tend to protect their local industries by lowering down the costs and burdens (including the mandatory norms for environmental care and public health), because the developing countries' governments pursue national development through industry-led export-oriented growth. In the developing countries, there is no pressure/stimulation to innovate production design and supply-chains in an environment-friendly and waste-preventing direction.

4.2. External support and internal difficulties

In the last 20 years, a number of solid-waste management projects have been carried out in some developing countries, in collaboration with external support agencies. Many projects were unable to support themselves and could not establish permanent waste-management systems when the external agencies withdrew their support. A number of technical, financial, institutional, economic and social factors - separately or in combination - lead to failure; and they vary from project to project, location to location. Often the recipient agencies in developing countries tend to accept whatever resources are offered to them without due consideration of the subsequent technical and management requirements.

External support agencies have severe limitations in their understanding of the situation on the ground, even more severe than their limitations as to the amount of resources they can provide, and the mandates and modalities under which they can operate the waste management projects in developing countries. Sometimes, projects are initiated with specific aims and expectations, but their strategic planning is not comprehensive enough to consider local factors, in particular the non-technical and non-financial ones, which determine the success/failure of the projects. In many cases, very little monitoring/follow-up is done. And human resource development activities, which are crucial to sustain implementation, are not adequately provided.

The difficulties vary from country to country, from region to region and from locality to locality, as there are differences in local conditions (within a single country or region). External support agencies have limited financial and cultural resources (as well as time and patience) available to solve those problems. The difficulties encountered by both parties - developing countries (recipient agencies) and external support agencies (from developed countries and/or international organizations) - hamper success and sustainability in waste management.

4.3. The ‘TV before toilet’ mentality and the financial constraints

The financial crunch in the waste sector is directly related with the lack of attention to waste by political leadership and business establishment in the developing countries. Less important an issue, less resources allocated to that issue. Waste-management is given very low priority in developing countries, except perhaps in capital cities and important towns or areas attracting tourism. It is the same mind-set that induces households in poor countries to buy a television-set for the sitting-room before having a clean water supply in the kitchen or a functioning toilet for the family. The space given to waste-related issues by leadership and establishment in political discourse, civic debate, formal education and mass media is negligible. The leadership and power establishments of many (majority) of the developing countries have not just ignored this problem. They have probably exacerbated it through consumerist social role-models, extravagant examples and subliminal messages disseminated through the mass media²¹.

Due to the low priority accorded to waste management, very limited funds are allocated for the waste sector and, as a result, the extent and quality of the services leaves much to be desired. Local taxation systems are inadequate and, therefore, the financial basis for most public services, including waste management, is weak. Theoretically, this weak financial basis of local administrations could be supplemented by the collection of user service-charges. However, users' ability (income) and willingness (compliance) to pay for waste collection and disposal services are very limited in many developing countries. People can't be blamed for hesitating to pay for services (waste collection and disposal) that are irregular and inefficient!. An effective strategy for creating a financial basis at local level needs to be found in order to ensure the sustainability of local waste management. In addition to having a weak financial basis, many local administrations in developing countries lack sound financial planning and management (e.g. cost accounting) and also, frequently, sound work ethics.

4.4. Problems with strategic vision, operational skills and institutional mechanisms

In most developing countries, a major constraint is the lack of any long-term planning perspective (strategic vision) on resource-*cum*-waste management at local/national level. Research and development activities on waste management are often regarded as low priority. As a result, a waste-management system or a component of it is often accepted, just because it is (freely or cheaply) provided by an external agency, without due consideration to the local capacity in handling it as well as to its appropriateness for the long-term needs of local habitats and communities. This leads to short-term contingency planning that may, in the long run, prove to be inappropriate in terms of the local climate, physical and economic conditions and cultural acceptability. The management model or technology selected and imported becomes unsuitable, unusable or unmanageable by the local counterparts²², thus wasting the resources spent and making the waste-management system unsustainable.

Another constraint in developing countries, at both national and local levels, is a lack of human resources with the technical and management expertise needed for waste-management. Local-level waste-management operators have little or inadequate technical or managerial training. Without adequately trained personnel, a project initiated by external consultants is never going to be established as a permanent system. Therefore, the development of human resources in the recipient country must be the central component of any collaborative project for sustainable waste- management.

A number of difficulties are related to institutional arrangements in developing countries. Several national agencies (e.g. ministries/departments of the environment, health, land-use, or housing...) and local (provincial or municipal) authorities are involved in waste management. Often there are no well-defined roles or responsibilities. No single agency is responsible for the coordination of operations and for the delivery of results; no single unit can be held accountable by the public or by the external support agency. This leads to a situation where different local units (competing offices, chaotic bureaucracies) become the local counterparts of different external support agencies for different waste-management projects. The absence of a comprehensive policy framework and any effective regulatory arrangement at national level is the root-cause of the fragmented, confusing and contradictory laws on the environment, housing, public health, urban management and local governance. All of the legal provisions governing these matters contain some regulations for waste-management at various stages. But the boundaries of operational jurisdiction remain blurred. In the end, very few of those regulations can be enforced.

4.5. The Socio-cultural status of waste workers

There is an important socio-cultural dimension to waste management in developing countries. The social status of waste-management workers is generally low in both developed and developing countries. This is so due to a negative perception of ordinary people with regard to any work that involves the handling of waste (filth, dirt, discarded and unwanted materials) and implies that the workers have a lower level of education and lower pay. In developing countries the situation is much worse.

In developing countries, the ground-level formal waste-management operators are looked down upon and considered on a par with the informal waste-pickers (scavengers). This is because both formal waste-handlers and informal waste-pickers share a common or similar background: no school education, no vocational training; they live in slums or peripheral districts of the town; they have difficulty in finding other jobs in the formal sector; they come from historically disadvantaged sections of society, at the margins of the socio-cultural mainstream (i.e. ethnic minorities, lower castes, poor migrants, orphans or abandoned children and adolescents, members of single-parent households, the homeless...).

Therefore, in many developing countries, formally (legally) employed waste-handlers also face marginalization. Ground-level waste-handlers in developing countries are neither properly trained nor well-paid, even when they are employed by a legal body, unlike their counterparts in developed countries, who are better paid and better trained. Lack of training and low pay are reasons behind the disrespect for ground-level waste-management workers in developing countries. Inevitably, this causes low self-esteem among the waste workers, with adverse effects on their morale and the work ethics; and it is one of the reasons behind the poor quality of their work.

5. International cooperation in waste management: lessons learnt

5.1. More resources and focus shift are needed

It is obvious that more resources are needed to address waste issues. It is also equally important that the resources should follow a comprehensive strategic vision (long-range planning perspective) for international cooperation. There seems to be some awareness that waste urges serious concerted action because of the scale and complexity of the global waste situation. Exponents of the **International Solid Waste Association (ISWA)** say that the international aid community doesn't seem to be adequately focused on the complexity and scale of the waste problem²³. According to David Newman²⁴ President of ISWA (for 2012-2014),

only around 0.25 % (or around US\$ 400 million) of all development aid goes to helping with waste-disposal strategies.

In order to work out a new global strategic vision there is a need for a shift in the very focus of thinking about and dealing with waste on a global level. Since the late 1980s, the waste problem has attracted institutional attention at international level; but it has focused on the issues of hazardous waste mainly. Initially, the hazardous-waste problem was seen mainly as an issue of developed countries who might export hazardous waste to, or dump it in developing countries, or dispose of the stuff in poor countries or in the ocean. In actual fact, the situation is much more complex. The problem is not just about the well-known types of hazardous waste (industrial, chemical, electrical, electronic, clinical, mining, nuclear etc.); indeed, it is about all waste. All waste, including common household and municipal waste (which is apparently innocuous) has an adverse impact on natural resources, the environment, public health and social life. Unless it can be reduced in quantity and managed and disposed properly, ultimately, all waste will become hazardous.

There is a need for a shift of focus from ‘hazardous waste’ to ‘ALL waste’, and the realization that all waste is hazardous.

In the last three decades, non-bio-degradable material items, including those containing toxic matter, have been massively produced all over the world, not just in developed and advanced industrialized contexts. The volume of all the waste generated in developing countries exceeds that of developed countries. The mind-set that considers rich countries as the main source of waste and the poor ones as the receivers (used as a dumping ground) is no more tenable. In many developing countries waste-generating heavy industry is already the economic mainstay. Even in the countries that are among the poorest (e.g. Sierra Leone) and remotest (e.g. Mongolia), the extraction of natural resources is the main economic sector. Inevitably, this sector is a very large source of waste. Besides, life-styles and consumption patterns in the urban areas of developing countries are no less waste-generating than those in developed countries. In some highly developed contexts, per capita income has been de-coupled with per capita waste-generation in recent years (e.g. Germany, the Netherlands, Switzerland, Scandinavian countries, some regions of northern Italy...). In both the developed and developing world, there are waste-intensive contexts, waste-reducing zones and waste-free pockets within a single country’s boundaries.

Therefore, another shift of focus is needed. We should discard the conventional ideological backdrop of international development cooperation which is influenced by the dichotomy of ‘North *versus* South’, ‘rich *versus* poor’, ‘developed *versus* developing/underdeveloped’,

‘industrialized’ *versus* non-industrialized’, ‘first world *versus* third world’... There should be a new planetary multi-local focus.

Such focus shifts may lead to a new strategic vision for renewed and much more vigorous international cooperation which would make all the institutions and players in both developed and developing countries equally responsible as agents and co-protagonists in tackling waste-related problems.

5.2. Vigorous international commitment is needed

The time has come for a single, simple, comprehensive, binding and unequivocally articulated international charter on ‘waste’ (a sort of **International Waste Treaty**). Specific agreements on certain topics (e.g. Basel Convention) are not sufficient although they are necessary for technical implementation at international level.

The would-be “**International Waste Treaty**” (or whatever it may be called) should aim to follow in the footsteps of the UN’s Charter on Human Rights or the mostly widely practiced (respected) international conventions; i.e. on diplomatic immunity, prisoners of war, refugees or asylum-seekers, endangered species, humanitarian assistance etc.. **International Solid Waste Association** (ISWA) may affirm its global leadership by enlarging the scope of its **Working Group on Legal Issues** to take following initiatives:

- consultative workshops with international jurist organizations and jurist academics;
- home-work on a blueprint for an eventual ‘International Waste Treaty’
- international advocacy actions to raise the profile of the global waste crisis and to ignite international debate on a blueprint/prototype for an ‘International Waste Treaty’ so that it can be placed on the agenda of the highest international public forums, at both regional (EU, EC, OAS, MERCOSUR, AU, SAARC...) and global (UN, World Bank...) level.

5.3. New ideas for public awareness campaigns and for improving communications

Attempts to introduce the waste-management systems and techniques used in developed countries to developing countries, without an understanding of their cultural traditions and social structures, has not worked effectively (and will probably never do so). As waste problems reflect many other socio-cultural problems of a community, it is appropriate to pay serious attention to the cultural dimension of the waste crisis and waste-management solutions, not only in developing countries but also in developed countries²⁵.

Developed industrialized countries, which provide external support for waste management to developing countries, directly (through bilateral cooperation) or indirectly (through multilateral/multi-bi-lateral cooperation), usually have the technical expertise and human resources, thanks to a long experimental process of trial-and-error on their home turf. A decades-long experimental process conducted over several generations helps institutions and society at large to undergo a process of cultural appropriation of the technological and administrative progress achieved. When a result - in terms of policy, management, law, technique or method - obtained in a developed country is parachuted down to a developing country, it has a high probability of not being well-implemented, because the cultural appropriation process is missing.

Cultural traditions should be regarded as one of the possible sources of scientific hypothesis for sustainable practices and local resource mobilization. Waste-focused ethnographic surveys may help disclose useful information that can be incorporated into organized public campaigns. Organized campaigns may enable cultural appropriation by local players, stakeholders and communities. Successful and sustainable waste management requires people's active participation. People will find it easier to participate if the environmental ethics and civic sense required for the successful implementation of waste-management systems can be explained in their local/native terms. A recent little experiment in this direction conducted in the steppes of Mongolia by a team of economists and social scientists has yielded some promising results²⁶. **International Solid Waste Association's** "Task Force on Globalization"²⁷ may inspire and encourage those involved to incorporate ethnographic surveys within international multi-local comparative and critical assessments of waste-management contexts.

Communication between experts and consultants from external support agencies and local personnel is crucial. There are several problems regarding the understanding of technical and management terms and jargons; not only between the different contexts of agencies, countries and international institutions but also among the agencies, institutions and experts within a single context. A rigorously univocal operational terminology is needed (as with international civil aviation). **ISWA's Working Group on Communication** may take initiatives in this direction through the following action:

- create a universal waste-management glossary in English;
- create specific operational handbooks with simplified management protocols and technological tool-kits for different types of waste in English;

- prepare a bilingual version (English + local national/regional language) of both (glossary and handbooks) in collaboration with national researchers and institutional partners;
- prepare video documentaries and video-clips on waste issues, sustainable waste-management practices possible in different contexts (good example); educational material; instructive animated cartoons etc.
- ensure that all publications are made available to all the institutions and agencies in each member country in printed form, on audio-visual channels (TV, cinema) and on line (web).

5.4. Multi-local approach and decentralized cooperation

Numerous examples have shown that local-level, small-scale collaboration among the players and stakeholders produces better results in waste-management, as in many other ground-level projects. Within a single country or region, we can find contrasting cases of success and failure in waste-management, perhaps also because of the differences in intra-local trust and cooperation, and not just due to physical or financial conditions. A multi-local comparative review of sample cases (best/worst, success/failure, total/partial success) may be helpful in singling out the key elements. The findings of such a multi-local comparative survey may enable international cooperation agencies to conceive, design and implement sustainable waste-management schemes in a cost-effective manner.

Holistic concentration on small-scale and local ground situations is needed if the external support agencies want to avoid the costly and inefficient piece-meal approach (quite frequent in waste-management projects). The tendency of external supporters to place emphasis on local ground-level schemes may oblige national governments to devolve²⁸ power to make things happen locally. It may put the onus and responsibility on local authorities as well as providing the incentive and encouraging them to design and implement cost-effective waste-management systems. Furthermore, empowered local institutions may find it easier to proceed in building a local financial basis for waste management by an appropriate mixture of taxes, user fees, incentives and other forms of fund-raising.

Therefore, a multi-local approach is needed to ensure that recipients (local institutions, organizations and citizenry) exercise ownership and develop their own waste-management capacity. High-profile agreements and protocols may be signed with the central national authorities, as forms of bi-lateral and multi-bi-lateral cooperation and commitment. Policy-level advisory support may be provided by external agencies to national authorities. But real operational projects must be implemented at local ground level involving local authorities and

local stakeholders. Ground-level local players must be encouraged to collaborate effectively on specific projects under the institutional and legal frameworks provided by the high-level agreements.

ISWA's "**Task Force on Globalization**" may establish a permanent Working Group on International Cooperation which may take the following actions:

- constantly monitor all developments in waste-related policies, laws and technology;
- maintain contacts with the relevant authorities and desk officers of all international organizations and secretariats of international conventions on waste;
- encourage and help scientific organizations to conduct international multi-local comparative surveys and critical assessments of waste-management projects in sample locations (cultural areas, ecosystems);
- explore ways to conceive and design pilot projects in sustainable waste management which involve local players in developing and developed countries: municipality-to-municipality, business guild-to-business guild, industry-to-industry, university-to-university, school-to-school, NGO-to-NGO...

5.5. Capacity building of waste-management operators

Capacity building is the key to a successful waste-management scheme, as one of most experienced external support agencies have affirmed that by prioritizing education and training in their international waste management cooperation (JICA, 2005). But with regard to waste management, very few opportunities are available in developing countries. There is a lack of educational and training opportunities in waste management. So there is a lack of human resources with sufficient experience and knowledge for sustainable waste management in developing countries. The lack of knowledge and experience in waste-management in developing countries not only causes projects to fail; it also leads to a tendency to (ab)use the technologies made available by external support agencies and donors, regardless of their applicability to the local situation in the developing country.

There is a great scope for **ISWA** to provide leadership in the waste-management capacity-building process through advocacy campaigns and civic actions designed to ensure that all institutions concerned with international development in general, and external support agencies concerned with health and environmental issues in particular, prioritize waste-management education and training (including civic education and public awareness programs) as a mandatory component in each and every development-assistance package. In other words: no waste-management training? No development assistance!.

ISWA may advance concrete policy proposals to its international partners, members and associates in the following areas:

- Systematic and consistent training on waste-related issues (historical dimension, health, environment, techniques, methods, community/neighbourhood involvement, management, policy, law, resource recovery/recycling markets and prices) must be mandatory for all waste-management operators – from the top administrators to ground-level handlers (even an appropriate simplified format) - prior to taking charge of their respective roles and functions. Periodic (annual) short sessions of human resource re-qualification programs (re-training) to update and upgrade their skills should be made mandatory. A strong and well-highlighted training program will certainly help to raise the social profile of ground-level waste-handlers (may be better to call them ‘public environmental operators’?) and will make it easier for them to claim (and obtain) better pay and benefits.
- The process of formalizing (legalizing) waste-pickers (who are key-players in resource recovery and recycling) should contain the same mandatory training-package used for the formal sector on waste-related issues. The training-package must become a prerequisite in issuing identity cards and operating licenses to each individual waste-picker and in recognizing and providing support for their enterprises, cooperatives or associations. Well-trained and well-recognized ‘private environmental operators’ will certainly enjoy better working conditions and a better social position.
- The educational institutions of developing countries should prioritize the waste-management component within their civil and environmental engineering, urban planning and management, architecture and similar courses at all levels – school certificates, Bachelor’s and Master’s degrees, as well as in executive training programs.
- The school and university education curriculum in developing countries must be encouraged and supported to expand environmental education with a strong waste-management component as part of the civic education, regardless of the area of study (liberal arts/science/technology/social science...).

6. Waste and growth: global unsustainability

From the era of geo-politics, which lasted several centuries, we have entered the era of geo-economics. In the era of geo-politics, territories and communities were subject to conquest and

control. In the era of geo-economics resources are sought everywhere; communities are seen as potential markets; and territories - particularly the remote and marginal ones (out of sight, out of mind) - serve for the extraction of natural resources and for dumping and depositing waste, especially the most hazardous kind. Global trade links and global supply chains leave no territories or communities untouched by the problem of waste. Inevitably, the continuing 'growth'-centered economic paradigm of nation-states and international organizations promotes globally homogeneous and voracious consumership and, therefore, also a waste-generating trend everywhere. This is so even among the most marginal communities, such as herders and peasants who live in the most remote territories, such as highlands, tundra, taiga, steppes, desert, savannah and marshlands. Waste has been globalized; but there is no sign of the globalization of enforceable regulation, technology and the management skills needed to handle the waste in a safe, sustainable manner. There are enormous financial and logistic constraints, as well as political and socio-cultural difficulties, in globalizing the finest techniques available for waste-management and spreading the best practices. Most nations can't really afford to acquire and/or operate the best available waste- management system. Therefore, the most sustainable solutions have to be sought by going upstream (to waste prevention²⁹) in all human habitats. To do so, we must comprehend the waste phenomenon in native terms, taking note of local circumstances in the multiple contexts (ecosystems, culture areas, economic conditions) of our planet. This implies a rigorously scientific consideration of human-material interaction in different ecosystems, economies, political orders, social systems and cultural traditions. In other terms, we need a planetary human ecology of 'waste' that guides and nudges economic policy-making towards waste prevention, waste minimization and sustainability.

The 'waste-free sustainability' imperative has the potential to unravel the entire conventional sphere of economic thinking centered on 'growth' as the *conditio sine qua non* for socio-economic development. Global waste statistics and trends affirm that the 'growth'-centered urban-industrial model of economic development is no more tenable. There is urgent need for a new economic model that strives, first and foremost, to prevent the creation and accumulation of waste, and not just the market capitalization of the waste already generated. 'Growth'-centered economic policies are responsible for the ever-increasing volume and flow of end-products where most of the a-biotic waste is derived from. 'Growth'-centered economic systems need, increasingly, a greater quantity of material and energy in order to deliver more end-products at a faster rate. That's why 'growth' is the main cause of the rising costs of energy and commodities and the increasing number of negative externalities (impact on public health, environment and landscape) deriving from extraction, processing, production, transportation

and consumption of materials. Waste is major negative externality of ‘growth’-biased economy; waste handling and safe disposal are costly burdens for communities.

‘Growth’ is based on labour productivity at the lowest possible cost. It necessarily tends to obtain the maximum quantity and quality of work from the labour force (human resources) while trying to limit expenditure on labour factors (human capital). This is part of a broader strategy to cut cost and increase profit margins in order to grow more and more. This has led to many industrial restructurings resulting in considerable lay-offs. Unemployment has become a chronic feature of many developed and developing countries. Forcing a relatively small pool of active labour to handle larger amounts of materials in order to produce higher volumes of end-products with the lowest possible labour costs – all this is the hallmark of jobless growth that we have witnessed in the past two and a half decades, in the era of so called ‘globalization’. In global industrial processes a lot of attention is paid to labour productivity (pressing hard the human operators to do more and better) while there is much less concern for material resource efficiency (recycling and re-using the existent material resources and diminishing the need of materials). Ultimately, what we have seen is that both human resources – the jobless and the hyper-productive (over-exploited) workers – in turn, become ‘human waste’. Human waste is the main source of psychopathy, social problems, health-care costs, economic burdens, civic disorder and insecurity. The ‘growth’-centered economic development model is the main cause of both material and human waste. Material waste and human waste are two sides of the same coin minted by the ‘growth’ imperative. Growth contradicts the search for global sustainability.

The ‘growth’ imperative must be discarded in order to decrease the current volume and flow of end-products (objects and artefacts) and, ultimately, to drastically reduce waste by preventing it from being created in the first place. Waste prevention presupposes a reduction in the demand of material products and energy; in other words, opulent global consumerism should be abandoned in favour of careful and critical global citizenship. Reduction in the demand will result in better quality and a longer life of the essential material supplies (end-products) needed to ensure the fulfilment of basic needs with safety and comfort. So the new strategic imperative is to enhance the quality and value of:

- the **essentials** (basic supplies)
- the **existents** (materials already in circulation)
- the **commons** (natural resources, public goods, space, infrastructures and facilities)
- the **intangibles** (non-material wealth such as healthfulness and care, arts, literary and scientific productions, brand, prestige...).

Sustainability does not demand that we should renounce prosperity and progress; it is the progressive march towards sustainability which may create widespread prosperity by triggering eco/socio-compatible innovations in policy and technology, thus opening up new business horizons.

7. Waste and global sustainability: future directions

Waste is the new urgent global issue for its worldwide ramifications in economy, environment, public health and social cohesion. Waste poses a new challenge to economic thinking: how to combine safety, prosperity and comfort for billions of human beings while drastically reducing the amount of waste and pointing to a zero waste system. Efficient waste-management is inseparable from the broader strategic framework of global sustainability.

The challenge posed by waste demands a holistic approach from the economic players, particularly from governments and inter-governmental institutions. The holistic approach will lead, as a logical consequence, to a new strategic re-positioning:

- **Outward posture:** managing safely the waste that has already been generated to reduce vulnerability/risks and to recover resources and energy from waste.
- **Forward posture:** innovative solutions in integrated resource-*cum*-waste management: less input for high value output (resource efficiency), more waste dissipation by re-use in the local/live circuits prior to final disposal.
- **Inward posture:** policies to reinforce the sustainability ethos by promoting the ‘wellness culture’ – ‘well-being’ (security, health, fitness, comfort, culture, leisure and recreation) instead of ‘well-having’ (based on the amount of material possessions).

Such strategic re-positioning promotes an alternative image of the future (‘next economy’, the scenario of reference) in each place as per the local circumstances and local specialties (*genius loci*). Current (quasi-) global economic depression and the urgency of the waste problem demands strong leadership (role-model) from governments, business and civil society in all countries with a regulatory focus on upstream prevention (reducing the material demand, controlling waste generation, care in waste collection and resource-recovery).

The progress of communities and nations should be measured by their waste-centered balance score, not only by de-coupling the **output** (value measured in currency) from **waste** (volume measured in weight and ecological footprint) but, above all, by de-coupling the **volume** of total material flow from the **value** of total customer satisfaction in fulfilment of their needs.

There are three possible waste-related parameters that we may use to measure the sustainable economic progress of communities and nations which, once scientifically established and institutionally implemented, may eventually accomplish a paradigm shift in economic thinking and enable us to move forward towards global sustainability:

- **Freedom-from-Waste Index:** verifiable measurement to determine the lesser use of waste-prone materials (non-biodegradable, non-recyclable) and quicker riddance from waste (less waste, more re-use and recycling, efficient matter/energy recovery from waste, better disposal...) as the indicators of habitat integrity, quality of public health civic life.
- **Human Vulnerability Assessment Score:** a new way of ranking societies, based on the threats to human security, public health, livelihood, rights and dignity (waste is one of the threats).
- **Place-brand Value Index:** this measures the prestige and attractiveness (to visitors, investments) of a place-system for its 'quality of context' (waste management plays a significant role).

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Notes

- ¹ This paper is a modified version of the summary of three presentations: (i) conference at IFAT-ENTSORGA, Munich (Germany) on 8th May 2012; (ii) key-note speech to the inaugural session of **World Congress on Solid Waste**, Florence (Italy) on 17th September 2012 (Austria) in October 2012; and (iii) final consultative report to **International Solid Waste Association (ISWA)**'s global taskforce, Vienna.
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- ³ The **Basel Convention** (initiated in 1989, in force since 1992), is the most comprehensive global agreement on hazardous wastes. With 175 signatories (as at 31 March 2011), it has nearly universal membership. Other multilateral agreements are: the **Rotterdam Convention** of 1998 (on the prior informed consent procedures for certain hazardous chemicals and pesticides in international trade) and the **Stockholm Convention** of 2001 (on persistent organic pollutants). All these multilateral agreements share the common objective of safeguarding human health and protecting environment from toxic wastes.
- ⁴ Between 2009 and 2012, direct field observations around the issue (waste) and unstructured interviews to concerned persons (waste management operators) as well as common individuals (random sampling) were carried out in **China** (Beijing, Inner Mongolia); **Germany** (Berlin, Munich, Frankfurt); **Italy** (Piedmont, Lombardy, Veneto, Trentino Alto Adige, Emilia Romagna, Umbria, Puglia, Campania, Rome); **Mexico** (Mérida, Vera Cruz and Jalapa); **Mongolia** (Ulan Bator, Arkhangai, Altay, Umnu-Gobi, Khuvsgul, Selenge, Bayankhongor, Mandal-Gobi); **Nepal**

- (Kathmandu valley); **Russia** (Moscow, St. Petersburg, Irkutsk and Ulan-Ude); **The Netherlands** (Amsterdam, The Hague); **Sierra Leone** (Freetown, Makeni, Bombali district rural areas); **Spain** (Madrid, Barcelona, Malaga, Granada and Vigo); **UK** (London); and, **USA** (Seattle, Washington; Baltimore, Maryland; Santa Fe, New Mexico and Winston Salem, North Carolina).
- ⁵ The majority of the LDC are to be found in Africa (Sahel and sub-Sahara regions). There are some LDCs in Asia (Afghanistan, Bangladesh, Bhutan, Cambodia, Laos, Myanmar, Nepal, Timor-Leste, Yemen); a few in Oceania (Kiribati, Samoa, the Solomon Islands, Tuvalu, Vanuatu); and one in the Latin America and Caribbean region (Haiti).
- ⁶ Global waste data should be considered with a degree of caution due to global inconsistencies and national/regional variations in definitions, data collection methodologies, and ranges of completeness.
- ⁷ The urbanites are said to suffer the NIMBY (“Not-In-My-Back-Yard”) syndrome.
- ⁸ In 2008, the environmental crime unit of the **Gendarmerie Nationale** of France organized an international seminar on waste trafficking. The participants of the seminar agreed on the need to improve the exchange of information. They stressed that it was necessary to raise the awareness of field-based law-enforcement officers with regard to environmental issues and environmental crime, and also to develop tools to facilitate and enhance the efficiency of cross-border transport checks. Subsequently, a handbook for police officers was prepared by **Interpol** offering them some simple pointers, practical advice and useful suggestions (**The Waste Transport Checks Manual AUGIAS**. Interpol, 2009).
- ⁹ In the United Kingdom alone, this business is purported to have a £2-million turnover. It is difficult to identify the criminals involved in illegal waste disposal. The findings of a study by **Interpol** concludes that many companies are somehow involved in the illegal transfer of industrial and electronic waste, whether they are aware of it or not. In 2006, **Interpol’s Pollution Crime Working Group** completed a study using information on 36 closed court cases from Sweden, Canada, Italy, the USA, Mexico, Japan, Germany and the UK. Based on the numbers, period and nature of criminal activities (i.e. much of it involved smuggling and fraud), it concluded that organized crime syndicates are actively involved in waste-related pollution crimes (**Electronic Waste and Organized Crime: Assessing the Links. Phase II Report from the Interpol Pollution Crime Working Group**, May 2009).
- ¹⁰ The Secretariat of the Basel Convention, **Vital Waste Graphics 3**, 2012, p.16.
- ¹¹ In 2008, approximately 71 million tons of ferrous waste and scrap were believed to have been traded globally, with an estimated value close to US\$ 50 000 million (The Secretariat of the Basel Convention, **Vital Waste Graphics 3**, 2012, p.18). Scrap metals, which are cheaper than the primary material, may therefore constitute the main supply source for whole countries or industrial sectors. Among scrap metals, precious metals, present in small amounts in electronic devices and used-vehicle parts, have the highest economic value.
- ¹² Waste-picking (scavenging), is a common income-generating activity for millions of people and a method to recover material resources. In China, about 20% of discarded materials is said to be recovered for recycling, largely through informal waste-picking (Hoorweg et al, 2005). Most waste-pickers live in developing countries where a large proportion of municipal waste is not collected through formal channels. In Brazil, for instance, the formal recycling industry itself relies on waste-pickers (*catadores*) who recover up to 90 per cent of recycled materials. Establishing basic social and safety standards for waste-pickers can improve both the quantity and quality of the output, as well as working conditions.
- ¹³ Established in 1999, **Centro Riciclaggio Vedelago S.r.l.** is a profitable business which helps industries, commercial organizations, municipal government agencies, and public institutions. It has recently expanded by increasing its research and development (R & D) capacity, thus becoming an important point of reference for governments, companies and scientific institutions.
- ¹⁴ **SartoriAmbiente** was established in 1996, in Trento (Italy). Focusing on the supply of compost bins, it has become one of the market leaders for this type of container. In 2000, after consolidating its market share for compost bins, the company entered the wheelie-bin market. During the same year, it became the exclusive Italian distributor for KLIKO wheelie-bins. In 2002, the company began to design and manufacture different containers for door-to-door rubbish collection, innovating and expanding its range year by year with the aim of supplying containers that meet specific needs in many different situations. The company has been able to offer different solutions by introducing and devising containers suitable for achieving specific goals, in various parts of north-eastern Italy.

- ¹⁵ The province of Trento, in the autonomous region of Trentino Alto Adige, has greater administrative and regulatory autonomy than most other provinces and regions of Italy. It has an excellent track record in socio-environmental standards and administrative efficiency.
- ¹⁶ **Waste Concern** was founded in 1995 as a non-governmental organization to launch a community-based decentralized composting initiative with the motto “Waste is a Resource”. Its business developed rapidly. Later, the **Waste Concern Group** was formed to achieve a common vision to contribute to waste recycling, environmental improvement, renewable energy, poverty reduction through job-creation and sustainable development. The **Waste Concern Group** is a social business enterprise that involves both “For Profit” and “Not-for Profit” enterprises.
- ¹⁷ The value of the retrieved material alone is estimated to be around US\$2.63 million; more than 120,000 rag-pickers (informal waste-collectors and sorters) are involved in income-generating activities related to waste-management organized by **Waste Concern** (Yedla, 2012).
- ¹⁸ **Ciudad Saludable** micro-enterprise employees earn between 1.5 and 2 times more than the minimum wage in Peru. Furthermore, they receive benefits such as health-care, pensions, vacations etc. **Ciudad Saludable** has received international recognition, and similar projects, based on this model, have been started in Venezuela, Colombia, Mexico, Bolivia and El Salvador.
- ¹⁹ In 2012, **Pick-n-Pay**, South Africa’s second-largest food retailer, was awarded the ‘Environmental Social Governance Award’ as well as the ‘Innovation Through Technology Award’ at the annual African Access National Business Awards; recently . the retailer also won second place in the **Mail & Guardian’s** annual ‘Greening the Future Award’. For the year 2012, **Pick n Pay** was one of four finalists (runners-up) in 2012 ‘World Retail Congress Responsible Retailer of the Year’ Award.
- ²⁰ According to the 2010 estimates of the Naples hoteliers’ association (**Federalberghi Napoli**), the southern Italian coastal city, the administrative and commercial centre of Campania region (a less industrialized region with agriculture and tourism as its economic mainstay), nearly 200,000 visitors were “lost” between 2003 and 2010 due to the waste crisis. According to the same source, more than 30,000 potential tourists and business visitors cancelled their plans to travel to Naples in a single year (2009), and the loss to the regional economy of Campania was estimated to be of nearly € 15 million.
- ²¹ It was quite shocking to see TV sets inside the miserable huts of *los Uros*, the Aymara-speaking native *Indios* of the Andean highlands around Lake Titikaka (Peru-Bolivia), one of the most disadvantaged communities in the American hemisphere. It was equally surprising to find the nomadic herders of Mongolia’s remote steppes spending their savings on TV sets and complaining about the malfunctioning of their Chinese-made solar panels (their only source of electricity) which led to problems in watching TV programs which mostly show urban (Ulan Bator) events, home-grown urban rock and pop music bands, and well-dressed political and business leaders talking and travelling around). The Mongolian nomadic herders and the *Uros* of the Titikaka basin share a common trait: no toilet, no running water, no waste-management system but increasing inclusion in global mass media viewership and consumership.
- ²² Some good guides and manuals on appropriate waste management are available; based on these guides/manuals a selection of techniques and methods could be made for waste management in the developing countries. However, in most cases, these guides/manuals must be modified to the local conditions prevailing in the country, and therefore local studies are normally still needed. Such studies can be relatively easily incorporated into a collaborative project and, to the extent possible, should involve local research institutions.
- ²³ “According to the OECD’s database, overall Official Development Assistance (ODA) increased by 25% between 2006 and 2010, reaching almost US\$ 164 billion in 2010. Straightforward waste-management projects count for between 0.16%-0.32% of the total ODA, ranging between US\$ 257-415 million/year for those years (ISWA, 2012). It seems that there is a stagnant trend in the relative importance of waste-management projects within the ODA financial flows. Waste management remains a very small part of the overall ODA, less than 0.5%, which is a disappointing sign for the attention to waste management in global decision making and especially in ODA. Although the overall ODA is steadily increasing, waste management’s share has increased just by 5%.” (Mavropoulos, A., **Globalization and Waste Management: Concepts and Facts**. International Solid Waste Association, July 2012).
- ²⁴ “It’s nothing, it is madness...” says Newman “... we have to raise the profile of this emergency on the international agenda. The consequences of doing nothing are disastrous.” C.f.: **D-Waste**, 26 June

- 2012 (<http://www.d-waste.com/d-waste-news/item/11-david-newman-s-outlook-on-brazil-s-waste-...>); **Think Progress**, 20 June 2012 (<http://thinkprogress.org/climate/2012/06/20/502637...>).
- ²⁵ The widely-known waste-management crisis in southern Italy in general, and in the Campania region and its centre (city of Naples) in particular, are attributed to problems of governance, management and law- enforcement. But these are just proximate factors; ultimately, we must look at the history and cultural traditions of South Italians in order to understand why these proximate factors are so persistent in southern Italy in contrast to the regions of northern Italy.
- ²⁶ In 2011-2012, an experiment of human capital development in an itinerant format (**Mobile Community Training Project**) was conducted at some nomadic herding camps in Ulziit province (*soum*) of Arkhangai region (*aimag*) in Mongolia by an academic team from Italy's **Università Carlo Cattaneo** (LIUC) and the **University of Trento**, in collaboration with the local provincial and regional administrations and a national NGO (**Rural Investment Support Center**)- as part of the **EXTREME LANDS PROGRAM** (a permanent research platform of **Interdisciplinary Unit for Sustainable Economy**, LIUC): <http://www.youtube.com/watch?v=MXD2p-ZAuHE> . The experiment consisted in brief training sessions to nomadic herding households on economic and environmental matters, including sustainable waste-management at household and local levels. The training project was designed by incorporating the findings of ethnographic surveys on local customs and traditional beliefs and world-view. During simple lessons on local-level waste management, native terms and concepts were utilized (i.e., biodegradable/non-biodegradable = “digested/refused by earth-goddess”, smoke released by burning non-biodegradables = “offence to sky-god”... and so on). A quick post-training feed-back survey revealed that the nomadic herders had fully understood the simplified lessons on sustainable waste-management (separation of biotic and a-biotic wastes, separate disposal) and were willing to put the lessons learnt into practice. A detailed report and a video documentary of this experiment are under preparation.
- ²⁷ The task-force is a temporary work unit within **International Solid Waste Association** (ISWA) Eventually, there may be a need for a permanent ‘Working Group on International Cooperation’ within the ISWA framework.
- ²⁸ As is often the case, one of the major hurdles in local development and one of the main causes of high-speed urbanization in many countries is the concentration of power, authority, resources and talent in the location of central government, the capital city. Decentralization is a strategic imperative for sustainable development.
- ²⁹ Prevention of waste is considered a priority by all international institutions and waste-management experts. The waste-management sector follows a generally accepted hierarchy with prevention at the top. The ‘waste-management hierarchy prioritizes the ‘three **Rs**’ — ‘reduce’, ‘re-use’, ‘recycle’. Now a fourth **R** has been added: ‘recovery’; because enormous amounts of secondary (scrap) material resources and, to a lesser extent, also some thermal energy and fuel gas can be recovered from waste. The generally accepted waste hierarchy responds to financial, environmental, social and management considerations. The hierarchy also encourages minimization of GHG emissions during the handling and disposal of waste.

Sommario

La comprensione del fenomeno ‘rifiuti’ su scala planetaria in generale, e nella cooperazione internazionale in particolare, richiede un’attenta analisi da più punti di vista. Il presente lavoro è un modesto contributo da una prospettiva interdisciplinare, tra l’antropologia e l’economia, che combina un approccio etnografico di ricerca sul campo sull’ecologia umana con le considerazioni ampie (globali) orientate verso soluzioni sostenibili

Abstract

Comprehension of the phenomenon of ‘waste’ in the global arena in general, and as an issue of international cooperation in particular, needs to be analyzed from many different perspectives. The current work is a modest contribution from the interdisciplinary perspective of anthropology and economics which combines an ethnographic approach (field survey) with human ecology and wider (global) strategic considerations oriented towards sustainable solutions.

Nota biografica sugli autori

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Il professor Dipak R. Pant, un antropologo con esperienze sul campo ed un economista (per caso), è il fondatore e direttore dell'Unità di Studi Interdisciplinari per l'Economia Sostenibile presso l'Università Carlo Cattaneo (LIUC), dove egli insegna 'Economia Sostenibile' e 'Sistemi Economici Comparati' agli studenti di laurea specialistica in Economia e Management. Il prof. Pant ha capeggiato numerose missioni scientifiche e ha contribuito alla pianificazione e all'implementazione di alcuni progetti di sviluppo locale in varie parti del mondo.

Biographical sketch

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Professor Dipak R. Pant, an experienced field anthropologist and an (accidental) economist, is the founder and current head of Interdisciplinary Unit for Sustainable Economy, Università Carlo Cattaneo (LIUC, Italy), where he teaches 'Sustainable Economic Policy and Management' and 'Comparative Economic Systems' to graduate students of Economics and Management. Prof. Pant has lead several scientific survey missions and has helped in planning and implementation of local development projects in different parts of the world.