

BACKGROUND PAPERS

2nd INDIA ROUNDTABLE ON SUSTAINABLE
CONSUMPTION & PRODUCTION

New Delhi

19th – 20th December 2007

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Introduction to Background Papers for the

Second India Roundtable on Sustainable Consumption & Production

Key Resources and Information Tools

NEW DELHI, 19TH - 20TH December 2007

The world will not be able to sustain current consumption and production patterns without running into resource constraints or damaging the environment beyond repair. The way we produce and consume goods and services is one of the principal causes of climate change. The carbon emissions generated from our consumer lifestyles are significant, and increasing.

These unsustainable consumption and production patterns are also inextricably linked to other major threats to the planet such as biodiversity loss, pollution and the challenge of feeding a growing population. UNEP's latest Global Environment Outlook (GEO-4) also points out the problem of consumption and resource inequality. For example, there are fewer resources to share: the amount of land per capita is about a quarter of what it was a century ago, and is expected to fall to about one-fifth of the 1900 level by 2050.

Sustainable consumption and production (SCP) is one of the solutions. By producing and consuming more efficiently we can reduce the pressure on the natural environment and improve human wellbeing. Today, countless businesses are coming up with more sustainable products and services. The simple actions of changing to more energy efficient lighting at home or using non-motorised means of transport can generate huge resource savings, particularly when practiced on a mass scale. However, these industry and consumer actions alone will not be enough. Government-led, integrated national programmes on sustainable consumption and production and resource efficiency are important. In support, increased research efforts and mobilisation at the international level is necessary.

Changing unsustainable consumption and production patterns was one of the main commitments of the World Summit on Sustainable Development held in Johannesburg in 2002. The Johannesburg Plan of Implementation (JPOI) dedicated a whole chapter to SCP, and called for national, regional and international action on a range of related issues. UNEP, and its various partners, is supporting this agenda through two main initiatives, the UN Marrakech Process on SCP and the International Panel for Sustainable Resource Management (Resource Panel). The Marrakech Process is supporting national initiatives through roundtables, guidelines, demonstration projects and training (see paper contributed by UNEP). The European Commission is also currently developing an Action Plan on SCP and provides support through a range of policies and other mechanisms.

The need to develop a national programme on SCP was one of the outcomes of the India Roundtable on Sustainable Consumption and Production (SCP), Mumbai, 29

September 2006. The Roundtable, co-hosted by the Ministry of Environment and Forests, Government of India and UNEP and supported by the EC helped to raise awareness on SCP and to identify country-specific priority areas in a multi-stakeholder setting. Energy and water (resource) efficiency, agriculture, unrestrained and unsustainable consumer demand and waste management were key SCP priority areas identified and tabled. Consumer information tools such as eco-labelling and sustainable public procurement were also considered paramount to changing consumption and production patterns.

This follow up roundtable, also to be co-hosted by the Government of India and UNEP with the continued support of the EC, will draw on the lessons learned from the previous meeting and exchange ideas and experiences on developing ‘key sector’ action plans as well as integrated national programmes on SCP. This Roundtable will focus on the following key sectors/themes: **water efficiency and utilisation; integrated waste management; and creating awareness for sustainable goods and services.** The discussion of these issues may also be relevant in light of the new International Panel for Sustainable Resource Management, launched in Budapest on 9 November 2007 at the World Science Forum.

The Resource Panel will provide scientific assessments and expert advice on the use intensity, the security of supplies and the environmental impacts of selected products and services on a global level. It will identify barriers and opportunities in developed, developing and emerging economies and suggests options for capacity building, training, demonstration projects and international knowledge exchange.

The objectives of the December 2007 Roundtable in New Delhi can broadly be stated to be:

- To exchange ideas and experiences on developing ‘key sector’ action plans and on integrated national SCP programmes, including through presentation of the Marrakech Guidelines for SCP programmes and selected case studies
- To strengthen understanding and appreciation of the key stakeholders on the importance of promoting SCP at both the sectoral and the strategic/national level
- To initiate the development of a national SCP programme for India

The background papers which follow have been written by experts in their respective fields in furtherance of the broad objectives and are intended to provoke discussion and debate at the Roundtable; by no means should they be treated as definitive. The presentations to be made at the Roundtable should also be in consonance with the objectives and consequently, it is hoped that the deliberations will help in formulating/strengthening India’s position on SCP.

The authors of the papers herein will be participating at the Roundtable and delegates will have the opportunity of personal interactions with them formally during the break-out sessions or informally at any time.

Improving Water Data and Water Literacy: Key to Sustainable Water Utilisation in India

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Sustainable water management in India is hampered by the fact that comprehensive and reliable data on water utilisation is not available.

The term water utilisation may seem self evident but it is worth noting that it can be measured or assessed at different levels, right from that of an individual to that of the world as a whole. We are concerned here primarily with water utilisation as it occurs in India—at the national level as well as any of several other levels within the country, going right down to water usage in households.

Water ensures a country or region's unhindered development since it is not only essential for all life but also a major input in many production processes. Given this critical role, there is some debate about the quantum of total usable water in India and what this implies for sustaining the economy's current rates of growth.

Table: Water Resources in India¹

Water Resources	Available	Usable
Annual precipitation	4,000 BCM	?
Surface water	1,953 BCM	690 BCM
Groundwater	432 BCM	396 BCM
Total	—	1,086 BCM

BCM = billion cubic metres

The figure for total usable water resources in India, combined with a projection of total water requirements in 2050 as anywhere between 970 and 1,150 BCM, seems to indicate a looming scarcity of water. A more recent evaluation however, says that groundwater sources have been overexploited for over a decade and that the actual usable water resources of the country are 668 BCM.² Thus, in the face of even a

¹ National Commission on Integrated Water Resources Development Plan (NCIWRDP 1999), as in Ramaswamy R. Iyer (2007) *Towards Water Wisdom: Limits, Justice, Harmony*. Pp.36-37. New Delhi: Sage.

² N.K. Garg and Q. Hassan (2007) *Alarming Scarcity of Water in India*. *Current Science* 93 (7): 932-941.

conservative estimate of current water demand, India is already experiencing a scarcity of alarming proportions.

Water Stress—Individual and National

The Basic Water Requirement (BWR) of an adult human has been calculated to be 50 lcpd (litres per capita per day).³ BWR is defined as the essential, minimum water needs of an individual—meant for drinking, cooking, and bathing or washing— independent of what is needed for economic or cultural activities. A denial of this amount can lead the individual to experience some form of water-related distress, whether in physical or economic terms.

BWR is a universal standard and is therefore different from the right of access to safe water enshrined in some constitutions, including that of India. In theory, this right gives people the ability to sue their governments if they are dissatisfied with water service delivery and also opens up the offending governments to international condemnation and penalties. However, if specified, the quantity associated with this right is usually pegged at less than 50 lcpd in most countries. In the case of India, the Eighth Five-Year Plan (1992-97) specified an amount of 40 lcpd for small towns with standposts so it is likely that rural areas were accorded an even smaller quota.⁴

In comparison, water requirements for the entire economy take into account not just the BWR but requirements from all sectors. The composite amount, termed Annual Water Resources (AWR), is expressed as water availability per capita per annum. For 2001, the Ministry of Water Resources stated this to be 1,820 cubic metres.⁵ The method used to estimate this is unclear but according to international calculations, a country will experience water stress if the amount of its AWR falls below 1,500 cu.m. International estimates already rank India among countries experiencing periodic water stress, vindicating criticism of the government's estimation of usable water resources.

Inevitably, some regions of the country are more water stressed than others. But even in areas experiencing some of the highest rainfall in the world—in parts of northeastern India—there are periodic episodes of water scarcity that suggest faulty water management.⁶ Traditional systems of water extraction, conservation and utilisation are falling into disrepair and cannot seem to cope with burgeoning water demand. At the same time, there is a growing shortfall in supply whether due to demographic growth in all regions or to changing patterns of water use in all sectors.

Thus, water stress is more a function of poor water management as well as the inability to curb demand for water and not always a symptom of absolute water scarcity.

³ Peter H. Gleick (1998) The Human Right to Water. *Water Policy* 1: 487-503.

⁴ C. Ramachandraiah (2001) Drinking Water as a Fundamental Right. Commentary. *Economic and Political Weekly*. February 24, 2001.

⁵ Ministry of Water Resources, Government of India. Web page accessed on 28th November 2007. <http://wrmin.nic.in/index2.asp?sublinkid=290&langid=1&slid=412>.

⁶ Anil Agarwal, Sunita Narain and Indira Khurana, eds. (2001) *Making Water Everybody's Business: Practice and Policy of Water Harvesting*. Pp. 3, 347. New Delhi: Centre for Science and Environment.

Implications of Water Stress: A Lack of Sustainable Utilisation and Distributive Equity

While the possibility of outright wars over water may be somewhat exaggerated, it is a fact that the sharing of water is contentious in both international as well as domestic settings, primarily due to inequitable distribution, real and perceived.

In the context of national water sufficiency, the usual questions asked about patterns of water utilisation are how much water is available for use and how much of this is actually being used in a handful of sectors in the country.

However, attempts to solve the problem of current or future water scarcity rarely consider whether the draft of water is sustainable and if water use is appropriate or efficient in any particular locality. Instead they argue for enhancing its overall supply, usually through high-cost and sometimes questionable endeavours like building large dams, interlinking rivers or constructing desalination plants. Such supply-side projects create more problems than they resolve while doing nothing to question the underlying psychology that considers water to be scarce rather than its management to be problematic.

Other questions—more relevant to the twin issues of equity and sustainability in water utilisation—are being overlooked. These include, in what sector and at what level is the water in question being used, from where is it obtained, how much is used, for what purpose is it used, how efficient is this use (and by implication what actions, if any, can lead to water savings), by whom is it used, what are the costs entailed in its extraction and use (financial, temporal and physical) and who bears these costs, what benefits accrue from its use and who avails of these benefits?

These supplementary questions enable an investigation of whether or not water utilisation is equitable; without such equity there can be no sustainability.

Rigorous measurements of the productivity of water—in terms of crop yield, or income or job generation—can reveal how efficiently it is being used and where there is scope for saving water. At the same time, there is a growing concern for distributive justice in the water sector as ever larger numbers of people are being left out of the country's programmes for water delivery.

Across sectors, water pricing strategies—as part of the state's cost recovery programmes—are subject to political considerations and often end up penalising the poor and those who lack effective political connections. So even where water delivery to the poor does occur, the absolute or proportional cost of each unit of water is much higher for them than it is for households in a higher income bracket. Poor farmers, entrepreneurs, artisans or domestic consumers have less access to safe and reliable water sources than do those who are better off.

The task of analysing current data is made onerous by the fact that the existing statistics related to the water sector are far from comprehensive and those available in the public realm are not conducive to effective policy making.⁷

Agricultural Use

The three sectors for which some data—however uncertain—is available are agriculture, industry and the domestic sector. It is widely accepted that the agricultural sector, which accounts for more than 80% of water used in the country, is also a very inefficient user and that savings of 60-65% can be made if there was less wastage of irrigation water. Such inefficiency in water utilisation comes not only from poor water management practices but also because of the existence of ecologically unsuitable cropping regimes. The issue of retracting agricultural water subsidies and also persuading farmers to revert to more sustainable cropping patterns is highly contentious and will require a great deal of political will.

Undoubtedly there are regional differences in water utilisation for cultivation but without consistent data for actual levels of utilisation for any area it is difficult to recommend how water efficiency can be improved.

Industrial Use

The industrial sector accounts for about 10-15% of water usage nationally but there are no details of the precise amounts of water used in different kinds of industries, some of which are very water intensive, e.g., tanning, dyeing, metallurgical industries, thermal power generation, and so on. Besides, there is a lack of oversight of industries that pollute water and release the untreated effluent back into river systems. Some researchers believe that legal statutes should require that industry recycle and reuse up to 90% of the wastewater it generates.

A hidden aspect of industrial wastewater—often combined with raw sewage from urban areas—is that it is used to irrigate large tracts of otherwise uncultivable land in some parts of the country. There are health risks emanating from cultivation using wastewater but these are outweighed by the concerns of marginal farmers for whose livelihoods it constitutes a central component.

Domestic Use

Within the domestic sector, it is recognised that there is a great shortfall in water supplied in districts and municipalities all over the country. In many rural districts, people still fetch water from distant sources, relying on small quantities of water of dubious quality. In urban areas, on the other hand, the performance of municipal corporations in charge of water supply ranges between being dismal and excessive, often within a single jurisdiction. There is considerable disparity between some neighbourhoods where water supply is intermittent and where the supply can go down to 30 lcpd while others receive a supply of 400-500 lcpd and in yet others supply

⁷ This point was made by the NCIWRDP (1999:370) in the context of its efforts to obtain hydrological data about river basins in India, and again more recently by the “India at Risk” report released at the India Economic Summit held in New Delhi in early December 2007).

appears unrestricted. In many urban areas, the wastage of water due to leakage from municipal piped water schemes is reckoned to be to the order of 40-45%.

In some places, tensions have arisen due to fast-depleting water tables—a consequence of the large-scale extraction of groundwater in rural and peri-urban areas for transport to nearby cities where it is used by households as well as commercial establishments. Water supply in all these cases seems to be correlated to the wealth and political connectedness of the residents of certain areas.

Domestic demand, which encompasses the basic human need for drinking water, is perhaps the most critical use of water but its draw-off in comparison to other sectors is minuscule. Yet, ironically, the scope for saving water by changing awareness regarding water use is proportionally the greatest in this sector. The domestic sector is an arena where citizen's groups can be involved in managing their own water supplies and thus make their own water use more efficient.⁸

Within this sector, the use and disposal of water for household sanitation needs to be paid particular attention. In places where indoor plumbing exists, sanitation uses considerable—some claim excessive—amounts of water. Conversely, inadequate sewerage infrastructure leads to the improper removal of waste and, consequently, the pollution of ground or surface water resources and an increase in water-borne diseases.

Domestic in the sense of household water demand is given priority in not just the National Water Policy (2002) but in the water policies of states that have drafted similar documents. This is in keeping with the fundamental right to water enshrined in the Indian constitution. But the majority of these documents do not specify allowances for rural or urban areas and none of them makes it a justiciable right, i.e., a right one can sue to guarantee.

Other Uses

Within each of these sectors there are almost always some significant kinds of water utilisation that slip below the radar. For instance, it is difficult to decide how to classify the consumption of water by tourism because its uses of water are both commercial as well as domestic—recreational uses, cooking and cleaning versus water for drinking, washing or bathing. Some of these uses may be non-consumptive but a breakdown of the large amounts of water that are consumed within tourism is justified and, yet, difficult to find.

Similarly, hydel power generation and navigation should probably be categorised as industries. By most accounts, the consumption of water in both is negligible but there is no account of the degree to which either of these uses, especially navigation, is polluting. Therefore, a special assessment needs to be made of non-consumptive uses

⁸ A technical distinction is sometimes made between the municipal sector and the domestic sector. The municipal sector refers to all water supplied by a municipality for both commercial and domestic uses within its boundaries. In contrast, the domestic sector refers strictly to use by households and individuals for personal purposes. While accepting this rationale, this paper blurs this distinction because household water may sometimes be used for productive purposes—commercial or otherwise—in both urban and rural areas.

that still pollute water to the extent that it is rendered unusable without further treatment.

Another important hydrological use for which some data exists is the amount required to maintain river flow and sustain different kinds of inland aquatic ecological systems. Although not easily accessible, these calculations are presumably deducted from the amount of water available in each basin in the country to arrive at the figures for usable water nationwide.

Cultural and religious uses consume insignificant amounts of water but often constitute serious sources of water pollution. These include the practice of floating partially cremated bodies down rivers as well as immersing large numbers of terracotta idols—painted with commercial paints and dyes—in rivers or seas during certain festivities. With sufficient tact and legislative will these kinds of activities can be monitored and controlled but the first course of action on the part of policy makers and implementers is to determine the extent to which they use and pollute water. Here again, classification may seem difficult but most cultural uses seem to fall within the domestic realm of water utilisation.

Problems with Current Measurements of Water Utilisation

The primary focus of government data collection is water utilisation for only a handful of sectors—agriculture, industry and domestic—at the national level.

National statistics on water utilisation are very basic and are calculated at take-off points following a top-down approach that while having the merit of being less time-consuming and painstaking than calculating actual water use by household, group, community or industry makes available only gross data.

Data collected at the sub-national level are usually obtained from project plans, case studies and media reports where the parameters covered are specific to the inquiry at hand and, thus, not conducive to comparison across cases. Like national-level data, these are also often calculated at source. For example, water utilisation in a bulk water scheme takes account of the water supplied rather than the water that is actually received by households or other establishments using the project. This approach discounts the fact that there is tremendous wastage of water before it has even reached the end user. Similarly, irrigation water use is calculated at the dam outlet rather than at the farmer's field intake. Such calculations overlook actual utilisation rates and therefore make calculations of potential water savings very difficult.

In the past several years, there has been an increased discussion of forms of water utilisation that have been disregarded so far, including navigation, water for livestock and fisheries, recreational uses, cultural uses and uses for service-oriented sectors such as tourism. The productive use of water by urban and rural households and the use of wastewater in irrigation have also gained some prominence.⁹ Account must be

⁹ See Patrick Moriarty and John Butterworth (2003) *The Productive Use of Domestic Water Supplies: How Water Supplies Can Play a Wider Role in Livelihood Improvement and Poverty Reduction*. IRC Thematic Overview Paper, Delft, Netherlands. Available at www.irc.nl/page.php/256. Also Stephanie Buechler and Gayathri Devi (2003) *Wastewater as a Source of Multiple Livelihoods? A Study of a*

taken of these uses because of the potential or actual income accruing from them or else due to their inherent value in preserving the local or regional ecology.

The concerns of hydrologists and environmentalists are reflected in an increased cognisance of water allocated for maintaining river flows and conserving aquatic life in rivers and wetlands.

Awareness of these “new” uses does not diminish the importance of the conventional uses of water. It does, however, make the task of policy makers and researchers accounting for water utilisation much more complex.

A Revised Approach to Assessing Water Utilisation

The paucity of comprehensive and comparable data on water utilisation from all sectors and for different areas of India hinders the ability to plan properly at national, regional or local levels, especially to curtail the inefficient use of water. In the public perception, there is little if any knowledge of how much or what quality of water specific sectors should be using. Differently put, water literacy in India is abysmal and the state of water utilisation data made available by the government does nothing to remedy matters.

Part of the problem seems to stem from the constitutionality of water in India. Drafting and implementing water policy is strictly within the domain of individual states in the federal structure of the constitution. This means that the central government only has an advisory role in matters pertaining to water and sometimes acts as an arbiter when disputes over water cross state boundaries.

The National Water Policy is a brief and bland policy statement that fails to translate an individual’s right to water into a definite target to be met by every state in the union. Only a minority of the more enlightened states have drafted water policies of their own but even most of these are thin on specifics. There is no common, centrally-devised framework by which states can collect and make available more rigorous and comprehensive data on a fixed set of parameters regarding water utilisation. Under such circumstances, and without greater water literacy, it is unlikely that inhabitants of the country will have equitable access to water regardless of where they live and work.

There can be little understanding of what is sustainable when there is no proper comprehension of actual water usage. Only when a sample of such data is obtained, using a common set of parameters, can one speak of water utilisation by cottage industry X or households in neighbourhood Y as adhering to or deviating from the average. Such data would allow the iniquitous nature of water utilisation to be addressed. It would also enable the reduction of inefficient water usage and the design of better policies whose objective will be to make water utilisation more sustainable throughout the economy.

Rural Area near Hyderabad City, Andhra Pradesh, India. In Rema Devi and Naved Ahsan, eds. *Water and Wastewater: Developing Country Perspectives*. London: International Water Association.

DOWNSIDE OF THE DIGITAL REVOLUTION

The Issue of E Waste

Satish Sinha

Satish is Associate Director, Toxics Link, a leading environmental group in India and has been involved in research-based advocacy on issues related to toxics and waste. Toxics Link in the recent past has been at the forefront in researching and campaigning on issues such as Electronic waste, Mercury in Healthcare, heavy metals and POPs. He has been actively involved for over three years in various studies and researches on E waste issues.

Introduction

The Indian economy has witnessed a sustained growth rate of over 8% in the last three years and is predicted to continue at the same pace. This has largely been achieved on account of reforms initiated over the last decade. The pace of growth and development has been faster than expected and controls on production being slowly lifted. If the current trends continue, the Indian economy could surpass the US economy and be only second to China by the middle of the century. India occupies a significant position in the global market both as one of the biggest markets and an important outsourcing hub - with the economic boom triggering a major shift in consumption patterns among the Indian middle class.

The Indian IT industry has been one of the major drivers of change in the economy in the last decade and has contributed significantly to the digital revolution being experienced by the world. This digital revolution has also been responsible for changing the consumption trends and lifestyle of societies. The accelerated growth in consumption patterns has resulted in substantial rise in the quantum of waste being generated along with rapid depletion of natural resources. Sound mechanisms for disposal of waste and loss of non-renewal natural resource have very significant impacts on the environment around us and raise questions about the long term sustainability of such growth patterns.

. New electronic gadgets and appliances have infiltrated every aspect of our daily lives, providing our society with more comfort, health and security, with easy information acquisition and exchange. Rapid technological innovations, coupled with growing consumerism, accelerate the replacement frequency of consumer durables and increase the generation of such waste. This new kind of waste broadly covers waste from all electronic and electrical appliances and comprise of items such as computers, mobile phones, , digital music recorders/players, refrigerators, washing machines, televisions and many other household consumer items.

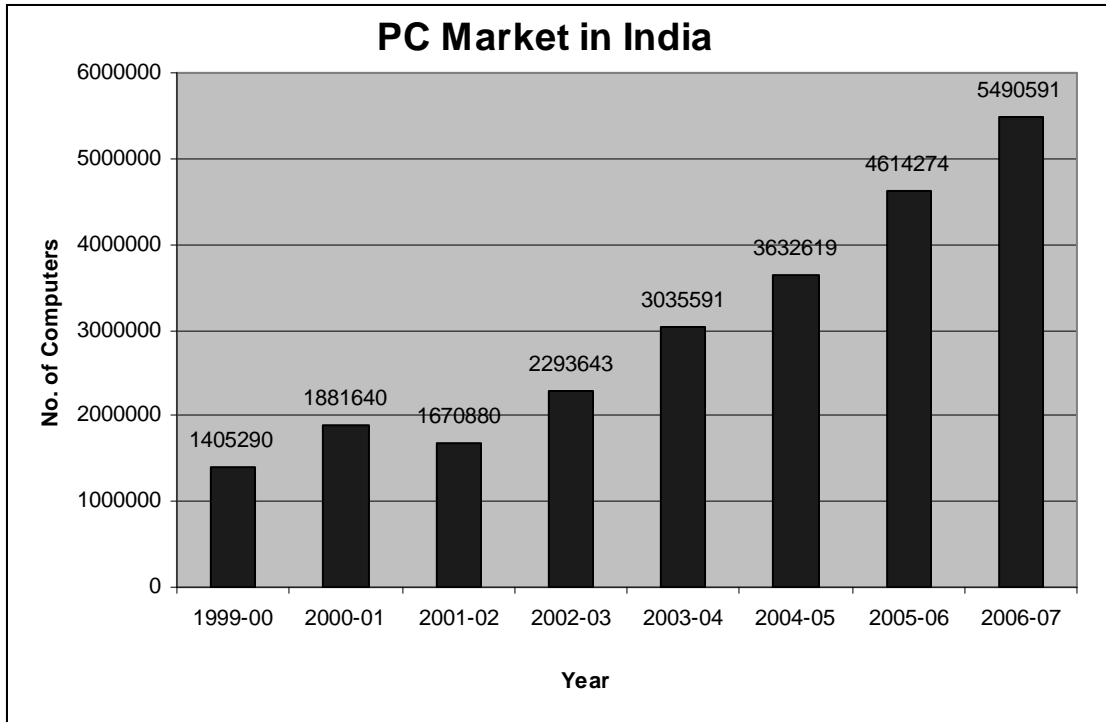
This new kind of waste is known as Electronic waste, also termed as E waste and its constituents are highly complex and toxic. Some of these products like computers and printers have a large bouquet of toxic materials, and require highly advanced set of

technological interventions for disposal and recycling. This new kind of waste is posing a serious challenge in disposal and recycling to both developed and developing countries. The challenge today is also on the production processes and efficient utilization of these goods, to reduce the burden on the environment by reducing use of toxic materials and promoting sound disposal of waste. Some of the developed countries have engaged with these issues and have more evolved policies and systems on the ground to deal with this new kind of waste.

In India, however, the issue is yet to be addressed appropriately and there is little effort to find solutions which suit local needs. The issue of E waste and its adverse impacts was brought into the public domain in 2003 and has now been debated and discussed for over four years without any significant results. The urgency to find solutions is not so compelling, as this toxic e waste is not creating visible mountains like municipal waste which attract attention. In India E waste is being handled in the informal sector without any concern for its impacts on human or environmental health. The level of awareness and understanding on the issue is almost negligible amongst the community at large, thus creating little pressure on the policy makers to devise sustainable solutions. The country is yet to adopt a policy on E waste handling which is acceptable to a larger number of stakeholders and to society.

Growth of E waste

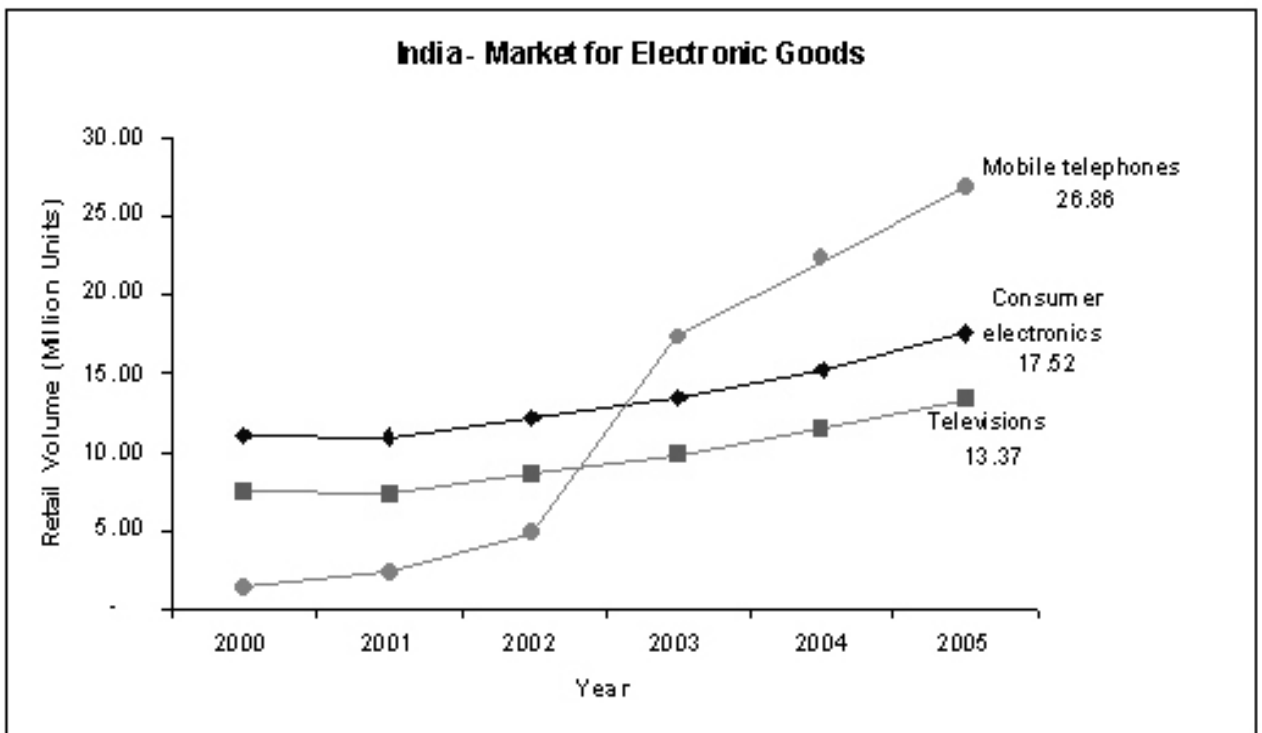
The electronic and electrical goods are largely classified under three major heads of: “White goods” comprising household appliances like air conditioners, dishwashers, refrigerators and washing machines; “Brown goods” comprising Televisions, Camcorders, Cameras etc and “Grey goods” like Computers, Printers, Fax machines, Scanners, etc. These grey goods are comparatively more complex to recycle due to their toxic composition. The last decade has also seen major growth in the grey goods market. India is expected to achieve a PC penetration rate of 65 per one thousand by the year 2008 (Source MAIT).



Source: MAIT

Personal computer sales have seen a major jump in last few years- from around 1.4 million in 1999-00 to 5.4 million units in 2006-07 and are expected to show a growth of 14% this year (Source- MAIT). The laptop sales has seen even greater growth - from 44,000 units in 2001-02 to 850,000 units in 2006-07, with the last year growth of 97%. This phenomenal growth rate is going to add large volumes of electronic wastes as we continue to grow and consume at this fast rate. As per the estimates available, there are two million PCs, which are ready for disposal. India would generate approximately 200,000 tons of e-waste in year 2007, and this is finding its way into the informal sector for recycling. This trend is likely to increase manifold in proportion to the growth in the electronics industry.

The market for consumer durables is also exhibiting highly accelerated growth rate of



approximately 10-15% over last two years. The advent of LCD, plasma and larger screens have changed the way India views television and this has meant growing sales resulting in increasing disposal rate as well.

The telephone industry has also witnessed a phenomenal growth in the recent past and the sector today has 75 million cell phone users, which is likely to grow to 200 million by the year 2007.

Another important contributing factor to increased waste generation is the high obsolescence rate of these products and the inability of technology to support up-gradation. It is also business strategy and programmed obsolescence in product design which promotes a high-waste economy. Every two years a new computer model is made available in the market rendering the previous one obsolete. The Indian mindset has so far been to prolong the usage of such products by devising innovative solutions though this is also slowly undergoing change after being bitten by the new bug of consumerism.

The urban centers have so far been large consumers and hence large contributors to this waste generation but the trend is changing and the smaller towns and rural areas are increasingly finding their place on the waste map of the country. Today, the smaller cities constitute close to 50% of the sales of personal computers. Some of the smaller towns and cities are also fast emerging as centers of recycling of E waste due to relaxed or not so efficient monitoring mechanisms in place. It is interesting to unearth that Delhi, India's capital city, is almost the biggest hub of E waste recycling in the country producing a huge **11,000 tonnes** of waste annually, second only to Mumbai which produces a staggering 19,000 tonnes. The city of Delhi has also gained the reputation of waste capital as waste from other cities traverse the States and ends up in Delhi for recycling, even though interstate movement of such waste is not freely permitted as per current rules. This migration of waste has resulted in the satellites towns like Ghaziabad, Meerut, Saharanpur and Firozabad becoming the other centers for recycling and refurbishment for such products.

E waste: Main sources

The main sources of electronic waste in India are the government, public and private (industrial) sector discards, which account for almost 70 % of the total waste generation. The growth in the government sector alone has been a staggering 126% over the last year; the Government emerges as one of the largest generators of this waste. The contribution of individual households is relatively small at about 15 % the rest being contributed by manufacturers. Though individual households are not large contributors to waste generated by computers, they certainly consume large quantities of consumer durables and are potential creators of waste thereof.

Another major source of e-waste is the import of such material being brought in illegally. This adds to the volume of waste being generated within the country. The accurate data on such imports is not available largely owing to the nature of the trade. However, estimates suggest that imports accounts for an almost equal amount to what is being generated in the country.

Globalization has added another dimension to waste trade and E waste occupies center stage of this trade. Large volumes of E waste are being traded globally though in many cases illegally, and India is viewed as one of the most preferred destinations for outsourcing for the reverse manufacturing process of E waste. Availability of cheap labour and weak environmental laws are largely responsible for the promotion of such illegal trade. Subsequent to the WEEE Directive in the EU and the State laws in five States of US, India receives large amount of electronic waste for recycling and treatment from these countries. Lack of understanding of national policies on import export and porous ports at both the points of origin and the final destination also add to the volumes being traded. As the trade opportunities grow the traders and recyclers resort to newer methods and approaches in import-export of such materials. . It is very unfortunate that the burden of such hazard processing is passed on from the most developed world to the most marginalized communities of developing countries.

On tracking some of the consignments and scrutinising trade documents it becomes amply clear that most of these consignments are from Western countries and the rationale for such imports is mainly economic. As per available data, it costs \$ 20 to recycle a single computer in the United States while the same could be recycled in India for only \$2, a saving of \$18 if the computer is exported to India. Cathode Ray Tubes (CRT) a Basel listed waste is being openly traded between US and India as CRT monitors become obsolete with the advent of flat screen monitors. Large quantities of CRTs are now finding their way into India for being recycled. This trade though flourishing, is illegal and contravenes the international Basel treaty which prohibits trans-boundary movement of hazardous goods; India is a signatory to this treaty.

Hazards from E waste

E waste is highly complex to handle due to its composition. Waste from white and brown goods is less toxic as compared to grey goods. White and brown goods are also lower in value for want of precious metals and as such most attention is focused on computer waste. A computer contains highly toxic chemicals like lead, cadmium, mercury, beryllium, Brominated Flame Retardants (BFRs), PVC and phosphorus compounds. Though some of these materials are used in small quantities in each computer the net volumes being recycled are significant and have a huge impact on both environment and human health.

Given below is a quantification of some of the toxic elements present in an average computer, weighing approximately 31.5 Kg:

Element	Quantity
Plastics	7.24 kg
Lead	1.98 kg
Mercury	0.693 g
Arsenic	0.4095 g
Cadmium	2.961 g
Chromium	1.98 g
Barium	9.92 g
Beryllium	4.94 g

Most recycling operations in E waste in India are being conducted by the informal sector and the process and technology adopted is rudimentary. There are clusters in bigger cities where such activities are concentrated, and though the process is rudimentary and operated by the informal sector, some of the skills demonstrated are very specialized. The activities of recycling include physical breaking and segregation of hazardous components, burning of PVC wires to retrieve copper, melting of lead and heating mercury-laden components.

The process of extraction of gold and copper is also complex and the components are processed through acid baths and require physical handling. Mercury is also used to make an amalgam for extraction of gold from the pins and mercury is evaporated into the environment during this process. The plastic, which contains Brominated Flame Retardants (BFRs), is broken down to small granules and then recycled, to be used for making toys and other products thus releasing BFRs and toxic fumes into the environment. The residues are released in the sewer or nearby land leading to water and soil contamination. Most of the people working in this recycling sector are the urban poor with very low literacy levels and hence very little awareness regarding the hazards of e-waste toxics. There is a sizeable number of women and children who are engaged in these activities and they are more vulnerable to the hazards of this waste. The poor working conditions and the low wages paid to these workers are also prime reasons for recycling to be cheaper in India

The other important aspect is the wide dispersal of these chemicals and elements into the environment due to the highly dispersed locations of the recycling units across the country. Availability of waste and its generation in larger volumes in smaller towns is supporting new centers of indiscriminate recycling.

The informal sector of recycling is slowly but gradually changing its face as more formal groups and entrepreneurs join the bandwagon to reap benefits from this trade. The recycling industry visualizes immense potential in this business with globalization of this trade. Earlier the trade was confined to the by-lanes of cities with a very sound and well-defined network of reverse supply chain. This chain has undergone a change with involvement of formal recyclers in the trade. E waste, both domestic and imported, is handled in the informal sector for dismantling and segregation and materials are being shipped out by formal recyclers to smelters abroad for material recovery. Some of the major recyclers are today engaged in these kind of partnerships and materials like PCBs and plastics are shipped out of India post dismantling for material recovery. The margin of profits are also relatively higher in such partnerships as these recycling majors are highly efficient in extracting high-value precious metals.

Existing Legal Framework.

The current National Rules on Hazardous Waste Substances cover the generation, storage, transportation and disposal of hazardous waste. This is more aimed at the issue of large industrial houses generating waste, traders of these hazardous waste and the facility managers of such waste. The existing Hazardous Waste rules have been found to have many shortcomings and are but in the interim, the situation remains very fluid for E waste processing.

The country can be justifiably proud of some of the recycling and reuse traditions being inherited and passed down but the larger question that emerges is of environmentally sound technology of recycling. The ineffectiveness of the current regulation can also be gauged from the fact that most of these highly hazardous recycling operations are functional in large clusters of major cities, under the full scrutiny of enforcement agencies. The regulation reflects immense deficiencies the ability to define the issue and enforce its provisions. . Lack of clarity on the issue of electronic waste and the inability of the current hazardous waste rules to govern and effectively monitor the e-waste recycling are some of the prime reasons for experts and members of civil society demanding a separate set of rules to guide and control these processes.

It has been after four long years of discussion and debate largely initiated by civil society that The Ministry of Environment and Forest (MoEF) has issued draft guidelines on e-waste management. The first draft fails to address most issues related to safer handling, health and environmental concerns. The current attempt has been largely to address the technological gap, which perhaps is not so difficult. What it fails to address is putting in place a sound collection mechanism, which will eventually assure regular and uninterrupted supply to the technologically better equipped facilities.

Most countries that have drafted regulation on E-waste have sought participation and involvement of producers, as they are best equipped to address both upstream and downstream solutions in view of complex material composition of such products. The issue of cleaner production and use of cleaner materials can also be best understood and implemented with active involvement of producers. This is largely not addressed in the current draft regulation and the issue of waste trade has also been left to market forces.

The Basel Convention on Trans-boundary Movements of Hazardous Waste, to which India is a signatory, addresses the issue of import of such waste. Lists A and B of the Convention list such waste and the imports of these are regulated. The Convention also prohibits the import/ trans- boundary movement of such waste from an OECD to a non-OECD country.

Recommendations For Action

In view of the magnitude of the problem and the situation that emerges from it, there is an urgent need to bring together all stakeholders and engage them in the debate to find sustainable solutions to this issue of electronic waste. It also emerges that one of the foremost requirement is to have suitable legislation on electronic and electric waste. The legislation should address the problems of imports as well as domestic generation of waste.

Any solution on this issue needs to be seen in the broader context of sustainable production and consumption. Some of the basic principle of environmental justice such as 'precautionary principle' and 'polluter pays' should be the overriding factors when designing solutions.

To promote sustainable production one needs to bring in legislation which will focus on reduction and subsequent phase-out of toxic materials and also encourages use of alternate and new environmentally friendly materials and most efficient methods of handling waste. In other words, the legislation must look at the complete life cycle of the product so that it causes the least burden to the environment.

Extended Producers Responsibility (EPR) is considered the most appropriate framework that attempts to amalgamate all the enlisted principles of environmental justice. This framework shifts the responsibility of safe disposal on to the producers. It not only looks at downstream solutions but also at upstream technology. It promotes sound environment management technology and also aims at better raw material, cleaner production technology and designing for longevity. The EPR models being implemented in many developed countries need to be suitably altered to suit the localized conditions prevailing in this country.

India is placed in a very interesting position and can convert this challenge into a very promising business opportunity if it uses its current strength of cheap skilled manpower, the network of informal sector and the cutting edge technology to handle this waste.

STATUS OF SOLID WASTE MANAGEMENT IN INDIA AND STRATEGIES TO IMPROVE THE SERVICES

P. U. ASNANI

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He is presently working as a INDIA Team Leader for SWM learning program in INDIA initiated by World Bank Institute and as an institutional expert under Yamuna Action Plan in the states of U.P. & Delhi funded by JBIC. He is also working as consultant to USAID and USEPA on environment improvement projects in INDIA and abroad, besides advising States of Gujarat, Rajasthan, Karnataka, Tamil Nadu, West Bengal, Kerala etc. in improving solid waste management services.

INTRODUCTION

Solid waste management is a state function under the Constitution of India and it is an obligatory duty of municipal authorities in the country to keep cities/towns clean and provide a good quality of life to citizens. However, the services provided by the municipal authorities are outdated, unscientific and inefficient. Waste is generally disposed of by citizens on the streets, drains, open spaces, water bodies, etc., creating unsanitary conditions. The problems of solid waste management are growing with rapid urbanization, population growth and change in the lifestyle of the people. The situation is becoming critical with the passage of time. The urban population in India has gone up five times in the last six decades. As per the 2001 census, 285.35 million people live in urban areas and this figure is going up in the range of 25 to 35% every decade.

WASTE GENERATION RATE

Waste generation in Indian cities/towns ranges between 0.2 kg/capita/day in small towns and 0.6 kg/capita/day in mega cities amounting to over 115000 MT of waste per day and over 42 million MT annually. The Energy & Resources Institute (TERI) has estimated that waste generation will exceed 260 million tonnes per year by 2047 - more than five times the present level.

India has 4378 cities and towns as per 2001 census, out of these 423 class-1 cities having a population of over 1 lac people, generate 72.5% of the total waste generated in the urban areas. Remaining towns produce only 27.5% of the total waste.

Government of India, Ministry of Urban Development has estimated Waste generation in class-1 cities as under:

Table - 1.

Types of cities	Tonnes/day	% of total garbage
The 7 mega cities	21100	18.35

The 28 metro cities	19643	17.08
The 388 class-1 tons	42635	37.07
Total	83378	72.50

PHYSICAL AND CHEMICAL CHARACTERISTICS OF WASTE.

Physical and chemical characteristics of solid waste is changing with the passage of time on account of increasing use of packaging material, paper and plastics, etc. Indian waste has a large proportion of organic matter as well as inert material as compared to developed countries where paper, plastic and packaging material is found to be in much larger proportion. The Indian situation is as under.

Table – 2 - Physical Composition of Municipal Solid Waste in 1 million plus cities and state capitals in India. (Average Values)

name of the city	total compostable	Recyclables				others including inert							total
		Paper, etc.	Plastics	Glasses	Metal	Inert	Rubber and leather	Rags	Wooden matter	Coconut	Bones		
Indore	48.97	6.10	5.77	0.55	0.15	31.02	2.95	2.41	1.17	0.91	0.00	100	
Bhopal	52.44	9.01	12.38	0.55	0.39	18.88	0.09	2.65	1.35	2.25	0.01	100	
Dhanbad	46.93	7.20	5.56	1.79	1.62	26.93	2.77	4.14	1.56	1.52	0.00	100	
Jabalpur	48.07	7.67	8.30	0.35	0.29	26.60	2.15	4.42	1.49	0.66	0.00	100	
Jamshedpur	43.36	10.24	5.27	0.06	0.13	30.93	2.51	2.99	4.29	0.22	0.01	100	
Patna	51.96	4.78	4.14	2.00	1.66	25.47	1.17	4.17	1.43	2.34	0.89	100	
Ranchi	51.49	3.17	3.45	1.79	1.45	25.92	1.45	4.97	2.74	3.19	0.38	100	
Bhubaneswar	49.81	5.74	5.70	0.46	0.79	27.15	2.10	3.21	2.85	2.20	0.00	100	
Ahmedabad	40.81	5.28	5.29	0.79	0.30	39.28	0.92	5.00	1.22	1.02	0.10	100	
Nashik	39.52	9.69	12.58	1.30	1.54	27.12	1.11	2.53	0.34	4.12	0.15	100	
Raipur	51.40	8.31	7.07	0.76	0.16	16.97	1.47	3.90	1.43	6.44	0.08	100	
Asansol	50.33	10.66	2.78	0.77	0.00	25.49	0.48	3.05	3.00	2.49	0.95	100	
Bangalore	51.84	11.58	9.72	0.78	0.35	17.34	1.14	2.29	2.67	2.28	0.01	100	
Agartala	58.57	8.11	4.43	0.98	0.16	20.5	0.76	2.1	0.00	2.56	1.69	100	

						7		7				0
Agra	46.38	6.12	8.72	0.85	0.11	30.07	1.97	3.92	1.68	0.19	100	100
Allahabad	35.49	7.27	10.33	1.23	0.40	31.01	1.83	7.34	2.08	2.74	0.30	100
Daman	29.60	10.54	8.92	2.15	0.410	34.80	2.60	4.90	1.60	4.48	-	100
Faridabad	42.06	8.57	13.73	0.83	0.18	26.52	2.52	4.14	1.26	0.19	-	100
Lucknow	47.41	6.87	7.45	0.92	0.29	18.01	5.38	9.48	2.10	2.09	0.00	100
Meerut	54.54	4.95	54.48	0.30	0.24	27.30	0.49	4.98	0.95	0.66	0.12	100
Nagpur	47.41	6.87	7.45	0.92	0.29	18.01	5.38	9.48	2.10	2.09	-	100
Vadodara	47.43	5.98	7.58	0.47	0.47	27.80	1.28	4.86	1.55	2.58	-	100
Gandhinagar	34.3	5.6	6.4	0.8	0.4	36.5	3.7	5.3	3.7	3.3	-	100
Visakhapatnam	45.96	14.46	9.24	0.35	0.15	20.77	0.47	2.41	0.68	5.51	-	100
Dehradun	51.37	9.56	8.58	1.40	0.03	22.89	0.23	5.60	0.32	-	-	100
Ludhiana	49.80	9.65	8.27	1.03	0.37	17.57	1.01	11.5	0.8	0.00	-	100
Guwahati	53.69	11.63	10.04	1.30	0.31	17.66	0.16	2.18	1.39	1.38	0.26	100
Kohima	57.48	12.28	6.80	2.32	1.26	15.97	0.18	1.86	1.70	0.00	0.35	100

Source: CPCB Akolkar 2005

There has been a significant change in the waste composition in last one decade as could be seen from the table below.

TABLE -3
PHYSICAL COMPOSITION OF WASTE

<u>Year</u>	<u>Compostable matter</u>	<u>Paper</u>	<u>Plastic, rubber, leather</u>	<u>Metal</u>	<u>Glass</u>	<u>Rags</u>	<u>Others</u>	<u>Inert</u>
<u>1996 (NEER's study)</u>	<u>42.21%</u>	<u>3.63%</u>	<u>0.6%</u>	<u>0.490%</u>	<u>0.6%</u>	=	=	<u>45.13%</u>
<u>2005 (CPCB's study)</u>	<u>47.43%</u>	<u>8.13%</u>	<u>9.22%</u>	<u>0.496%</u>	<u>1.01%</u>	<u>4.49%</u>	<u>4.016%</u>	<u>25.16%</u>

Observations.

In one decade paper waste has increased by 224%, plastic and rubber waste has increased by 1537%.

Current Status of Solid Waste Management in Indian Cities:

The systems of Solid Waste Management adopted in Indian Cities are unscientific and unhygienic as municipal authorities have not given due attention to the subject. The systems adopted are old and out dated. Municipal Authorities have never considered it their duty to provide services of primary collection of waste from the door step and this therefore led to a situation where citizens had no option but to throw the waste on the streets or in the municipal bins if available nearby. The current practice can be briefly described as under:

Citizens throw their waste on the streets, open spaces, drains, water bodies, etc., causing unsanitary conditions. This waste is collected by the Municipal Authority through their street sweepers and taken to the waste storage depots.

In the absence of adequate staff, street sweeping is not carried out on a day-to-day basis. Only commercial streets and few other important areas are prioritised and rests of the streets are swept irregularly. Slums and informal settlements are by and large neglected. Some streets are swept on alternate days, some are swept bi-weekly and some are swept only occasionally or not at all giving rise to unhygienic conditions in the city.

The street sweepings are carried in traditional handcarts / tricycles or in small containers to waste storage depots which are created in the cities on the road side for temporary storage of waste for its onward transportation. They are an eyesore as they are generally open sites, round cement concrete bins or masonry bins where waste is always seen overflowing. These sites are unsightly as well as unhygienic .

The waste stored at the depots, is transported manually in open tractors, and/or trucks. The fleet is generally inadequate and does not synchronise with the system of primary collection and secondary waste storage. The waste is loaded by the staff without putting on protecting gears and the trucks wade through the city uncovered causing nuisance and annoyance to the people. The waste is found spilling from the vehicles on the road very often. Hardly 50% of the waste is transported on a day to day basis leaving a backlog of about 50% waste at various open waste storage depots giving rise to filth and unhygienic conditions.

In the absence of adequate technical know how and in-house capabilities to treat the waste, generally no processing of municipal solid waste is done in the country. Only a few cities have been practicing de-centralised or centralised composting on a limited scale using vermin-composting or aerobic systems of composting. In about 35 large cities aerobic compost plant of 100 MT to 700 MT capacities are set up but they are functioning much below their installed capacity. A few cities have attempted to set up waste to energy plants where the results are not encouraging. The first incineration plant set up in Delhi in 1986 and the first large biomethanation plant constructed in Lucknow recently have failed and closed down. Two RDF plants of 6.5 MW, however, are operational in Andhra Pradesh for last four years but there is a doubt raised about their claim of generating power from municipal solid waste. It is alleged that they use more of agro waste than municipal solid waste. Few more RDF plants have also come into operation in Jaipur, Chandigarh etc. and many more are in the pipeline. Though, their success is still being doubted as the segregation of recyclable waste when becomes effective, will severely handicapped these plants as they will not get the burnable material in the proportion they get today in a mixed waste reaching the treatment plants.

Almost all municipal authorities deposit solid waste at open dump-yards situated within or outside their city unscientifically. They do not bother to spread and cover the waste with inert material. These sites become breeding grounds for flies, rodent, pests and emanate foul smell. These sites pollute underground water resources through leachate and pose a serious threat to public health. Only seven engineered landfills have been constructed so far in India at Bangalore, Surat, Pune, Ahmedabad (AUDA), Navi Mumbai, Karwar and Puttur and few more are under construction. A few among these sites are yet to be operationalised.

REASONS FOR INEFFICIENT SWM SERVICES.

Apathy of Municipal Authorities

Political leadership as well as the municipal officers responsible for SWM give low priority to this subject. They generally pass on the responsibility of managing municipal solid waste (MSW) to junior officials such as sanitary inspectors who on account of their limitations continue outdated and inefficient systems. No serious efforts are made to improve the systems and adopt latest technologies of waste management, treatment and disposal. A labour intensive system is adopted which consumes large portion of municipal budget on the wages of sanitation workers whose productivity is very low. Strong labour unions having political patronage, indiscipline among the workforce, inept handling of labour issues by lower level of municipal officers and total lack of supervision and control make the situation worse.

Lack of Community Participation

Community participation is the key to an efficient and cost effective SWM services. Yet, the municipal authorities have failed to educate the citizens not to litter and adopt a practice of storing the waste at source in their own bins at the household, shops and establishment level and handover the waste to the municipal authority for appropriate disposal. In absence of any facility of collection of waste from source, citizens have formed a habit of throwing the waste on the streets, open spaces, etc., creating insanitary conditions.

Lack of human and financial resources.

Most of the municipal authorities do not have qualified technical staff to handle solid waste management services. Except in a few large cities, no city has environmental or public health engineers to handle this service. Health officer or sanitary inspectors are put in charge of this service who are not technically competent to handle this subject.

Municipal authorities do not raise adequate financial resources through taxation or user fees. The recovery mechanism is inefficient and many properties escape tax net. The financial resources are, therefore, limited and they are not used judiciously for improving essential services. The available resources are very often utilized for non-essential services ignoring the financial requirement of SWM services.

PRINCIPAL DEFICIENCIES IN SWM SERVICE

- No storage of waste at source:
- No primary collection from the doorstep.
- Irregular street sweeping.
- Unhygienic waste storage depots.
- Irregular transportation in open trucks.
- No processing of waste.
- Crude dumping of waste.

INTERVENTION OF THE SUPREME COURT OF INDIA TO IMPROVE THE SITUATION.

A public interest litigation was filed in The Supreme Court of India in the year 1996 (Special Civil Application No. 888 of 1996) by Smt. Almitra H. Patel and another against the Government of India, all state governments and several municipal authorities in the country alleging that they have failed to manage municipal solid waste appropriately. The Supreme Court appointed an Expert Committee, to look into all aspects of solid waste management and make recommendations to improve the situation. The committee submitted its report in March, 1999 making detailed recommendations for class-1 cities, which were circulated to all states for implementation.

Soon after this report, the Ministry of Environment and Forest, Government of India, notified Municipal Solid Waste (Management and Handling) Rules 2000 in September, 2000 and made it mandatory for all cities and towns of the country to take certain measures to improve SWM services.

MUNICIPAL SOLID WASTE (MANAGEMENT AND HANDLING) RULES 2000.

Municipal Solid Waste (Management and Handling) Rules 2000 mandates principally following seven steps.

1. Prohibit littering on the streets by ensuring storage of waste at source in two bins; one for biodegradable waste and another for recyclable material.
2. Primary collection of biodegradable and non-biodegradable waste from the doorstep, (including slums and squatter areas,) at pre-informed timings on a day-to-day basis using containerised tricycle/handcarts/pick up vans.
3. Street sweeping covering all the residential and commercial areas on all the days of the year irrespective of Sundays and public holidays.
4. Abolition of open waste storage depots and provision of covered containers or closed body waste storage depots.
5. Transportation of waste in covered vehicles on a day to day basis.
6. Treatment of biodegradable waste using composting or waste to energy technologies meeting the standards laid down.
7. Minimise the waste going to the land fill and dispose of only rejects from the treatment plants and inert material at the landfills as per the standards laid down in the rules.

Time Frame for the implementation of the Rules.

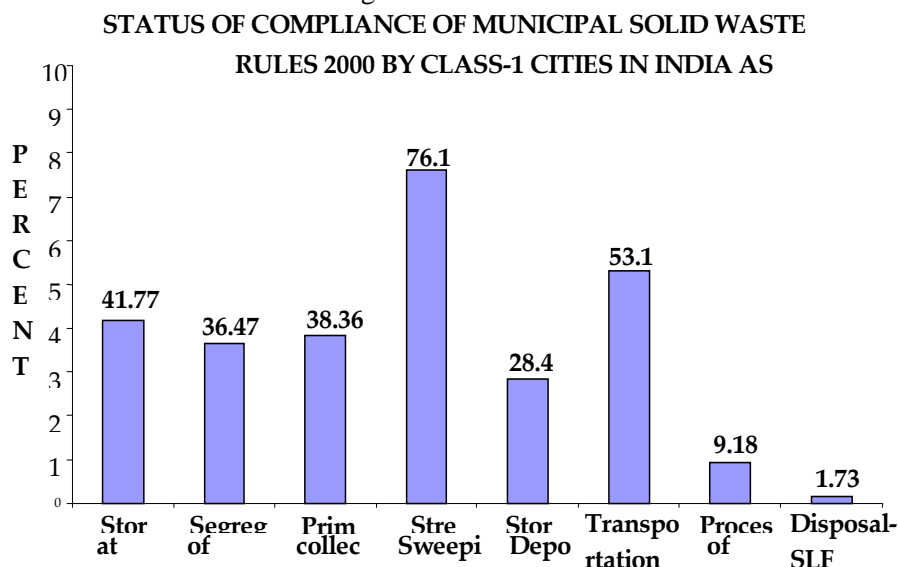
Serial no.	Compliance criteria	Schedule
A.	Setting up of waste processing and disposal facilities	By 31.12.2003 or earlier
B.	Monitoring the performance of waste processing and disposal facilities	Once in six months
C.	Improvement of existing landfill sites as per provisions of these rules	By 31.12.2001 or earlier
D.	Identification of landfill sites for future use and making site(s) ready for operation.	By 31.12.2002 or earlier

Responsibility for Implementation

The entire responsibility of implementation is put on municipal authorities. The Secretary, Urban Development Department of the respective state government is made responsible for the enforcement of the provisions in metropolitan cities. A District Magistrate or a Deputy Commissioner of the concerned district is responsible for the enforcement of these provisions within the territorial limit of his jurisdiction. The state pollution control boards are expected to monitor the compliance of standards regarding ground water, ambient air, leachate quality and the compost quality including incineration standards as specified in the rules. Each municipal authority is expected to take authorization from state pollution control board for setting up treatment and disposal facility.

STATUS OF COMPLIANCE OF MSW RULES 2000

A study was conducted by the author of this paper to ascertain the status of compliance of MSW Rules 2000 by class-1 cities of India as on 1.4.2004. 128 class-1 cities of India responded and the status of compliance shows that there is an insignificant progress in the matter of construction of processing plants and sanitary landfills, and much remains to be done in other areas of waste management as could be seen from the table below.



Source: P. U. Asnani (2004)

Reasons for Non-Compliance reported.

- lack of public awareness, motivation;
- non cooperation from households, trade and commerce;
- Lack of financial resources for procurement of tools and modern vehicles.
- lack of technical know how and skilled manpower for treatment and disposal of waste
- non-availability of appropriate land for treatment and disposal
- lack of powers to levy spot fines

After the study of 2004, during the period of subsequent 3 years several cities have taken initiatives to improve the systems of waste management. Concerted efforts are made by some cities to introduce storage of waste at source, source segregation, primary collection from the door step, covered transportation as well as for setting up treatment and disposal facilities yet a lot is required to be done to meet the national mandate given through MSW Rules 2000.]

Simple measures recommended to comply with the rules.

1. Municipal authorities take up massive awareness campaign to educate the citizen not to litter and store the waste in two separate bins one for biodegradable waste and another for recyclable waste. Domestic hazardous waste, toxic waste, etc., to be kept separate when generated.
2. Municipal authorities to introduce door to door collection of waste using containerized handcarts/tricycles with bell ringing system through resident welfare associations, CBOs, NGOs, and/or private sector by engaging part time waste collectors on a cost recovery

basis. User fees should be introduced to cover the cost and make the operation sustainable.

3. Street sweeping should cover all residential and commercial areas including informal settlements on a day to day basis.
4. Open waste storage depots, round cylindrical concrete bins, masonry bins, should be abolished and replaced by neat mobile containers or cities may be made bin-less by arranging direct transfer of waste from handcarts/tricycles into collection vehicles.
5. Transportation of waste should be carried out in covered vehicles using containerized system. Dumper placers or tractors having container lifting device may be used for transportation of waste. Transfer stations may be established when the distance of the treatment plant/disposal site is more than 15 KM.
6. Aerobic composting may be adopted in large cities and vermi composting in small towns. Waste to energy projects may be considered by large cities after careful analysis of the technology offered.
7. Regional Engineered landfills may be constructed for a group of cities to economize in the cost of construction and professional management of the disposal site in a cost effective manner.

NEED TO FIND "OUT OF BOX" SOLUTIONS TO IMPLEMENT THE RULES EXPEDITIOUSLY

Looking to the poor performance by the ULBs in India during last seven years, authorities now need to find 'out of the box' solutions. On account of the lack of in-house capability of municipal authorities and paucity of financial resources, it is desirable to outsource certain services and resort to private sector/NGO participation in providing SWM services.

Private sector participation can be easily attempted in door to door collection of waste, secondary storage of waste, transportation of waste, composting of waste or power generation from waste and final disposal of waste at the engineered landfill.

Mission mode adopted by certain states.

Of late certain State Govt. have taken initiatives to expedite the implementation of MSW Rules 2000 by creating Solid Waste Management missions or a mission approach to implement the rules. Governments of Gujarat, Andhra Pradesh, Karnataka, Rajasthan, Kerala, West Bengal, Tamil Nadu, Maharashtra etc. have taken measures to facilitate expeditious implementation by centrally preparing designs and specifications for the tools and equipments to be used, assess the needs of the cities and towns, have called for bids for the procurement of tools and equipments and for construction of treatment and disposal facilities centrally. A major initiative is taken by state of Gujarat, Tamil Nadu, Kerala, Andhra Pradesh, West Bengal etc. to identify regional landfills through satellite imagery for construction of regional landfills instead of individual landfills to make landfills cost effective and sustainable. The Solid Waste Management missions created by certain states are yielding wonderful reasons in implementing the MSW Rules and this approach need to be followed by other states as well to meet the requirements of law and rules.

SOME EXAMPLES OF PUBLIC PRIVATE PARTNERSHIP.

Bangalore

Bangalore has entered into two kinds of contracts. One for the primary waste collection from the doorstep and direct transportation to the disposal site through 61 small contractors and another for integrated treatment and disposal of waste.

For the purpose of primary collection and transportation of waste, 2/3rd of the city has been divided over 60 contracts. This work is being done at 50% cost as compared departmental cost. The compost plant and landfill has also been operationalised through private sector though it is yet to reach its full capacity.

Chennai

Chennai is the first city to go for large scale contract for waste collection and transportation from nearly 1/3rd of the city having 20 lacs population. A seven year contract was awarded to the private operator through competitive bidding process for primary collection, street sweeping, secondary storage at a transfer station and transportation of waste to the disposal site. The private agency had engaged its own manpower, tools, equipment and fleet of vehicles. The company was paid an annual increase of 5% in the rate fixed. This service was available to the city at about 50% of the departmental cost. On completion of seven years contact, a new contract is awarded and is operationalised.

Hyderabad

Hyderabad has adopted a unique method of Public Private Partnership. Nearly 75% of its street sweeping operations are privatized applying a unit area method. Each unit comprising of 8 km road length and allotted to a team of 16 female and 3 male workers for street sweeping and waste transfer to the secondary storage depot. The unit cost has been worked out on the basis of the need for manpower, the minimum wage payable, the tools and equipment required, etc. About Rs. 60000/- per month per team is paid. Contracts are given through drawl of lots. 161 such contracts are given. The system is in operation for more than seven years and working satisfactorily.

Selco International, Hyderabad has set up 400 MT/day waste to energy plant generating 6.5 MW power using RDF technology. Solid waste is provided by the municipal corporation free of charge. Besides, corporation has provided 10 acres land on 30 years lease to Selco.

Ahmedabad

Ahmedabad city has adopted several models of PPPs. PPPs in SWM in Ahmedabad started with the setting up of a 500 MT capacity compost plant by Excel Industries, Mumbai. This followed by private contracting of 50% of secondary storage sites and transportation of 350 containers. For Door-to-door collection, 3900 units of 200 households each have been formed. This work is entrusted to RWAs, associations of sanitation workers, etc.. The municipal corporation gives them monthly grants for door-to-door waste collection and supervision. It has met with reasonable success.

The municipal corporation has also awarded a contract to a private firm for setting up plant to produce refuse derived fuel (RDF) from 500 MT/day waste. A further contract to treat 800 MT / day waste has been negotiated with Selco International for setting up RDF based waste to energy power plant. This contract is also likely to be operationalized very soon with this contract, the corporation is likely to treat 100% waste on a day to day basis. The Corporation has further given a contract for setting up an engineered landfill of 1 million ton capacity. The site is under construction and will be operationalized within one year. The corporation has planned the landfill to meet its requirement for 30 years.

Surat

Surat has introduced several measures of privatisation in solid waste management.

Surat has contracted out night brushing and scraping of roads. Primary waste collection is promoted by giving grant in aid at the rate of 40 paise per sq. mtr. per month for cleaning their own area. Transportation of waste from the primary collection points to transfer stations has been contracted to two agencies and contracts for transportation of waste from transfer station to final disposal site have been awarded. 5 transfer stations have been set up and the entire quantity of 1000 MT of MSW is transported by the private agencies.

For final waste disposal Surat is the first city in India which has constructed the large size engineered landfill with a capacity of 125000 cmt at a cost of only Rs. 105 per cmt. The cell will last for six years. Provision of seven more cells is made for future.

TECHNOLOGIES FOR PROCESSING, TREATMENT AND DISPOSAL OF SOLID WASTE

The main technological options available for processing/ treatment of MSW are microbial composting, vermi-composting, Biomethanation, production of Refuse Derived Fuel (RDF), (pellatization). Sanitary landfilling is the only viable option for final disposal of residual waste. Each technology has advantages and limitations.

Sanitary landfills.

Landfill sites are meant for final disposal of waste in a scientific manner. In India disposal of organic waste at the landfill is prohibited and it is made mandatory to treat the organic fraction of municipal solid waste before disposal of waste.

Until recently there was not a single sanitary landfill site in India. Of late six sites have been constructed as mentioned earlier. As construction of sanitary landfills is quite expensive and need professional management, construction of regional facilities for a group of cities is being actively considered by a few states in India such as Gujarat, West Bengal and Rajasthan.

SOURCES OF FUNDS.

The 12th Finance Commission Grants

The 12th Finance Commission of India has allotted Rs. 5,000 crores for supplementing the resources of the ULBs in the country 50% of which are to be spent on solid waste management only. The States have been allotted their share out of Rs. 5000 crores and they are planning to spend 50% amount so allotted on SWM.

Subsidy for Compost Plants and waste to energy Projects

The Ministry of Agriculture and the Ministry of Non-conventional Energy Sources have been actively promoting waste compost and waste to energy projects

The Ministry of Agriculture has introduced a centrally sponsored scheme under which support is given to local bodies and private sector for setting up compost plants using MSW. This grant is available for building, plant, and machinery up to one-third of the project cost subject to a maximum of Rs. 50 lacs per project for a treatment capacity of 50 to 100 TPD.

Ministry of Non-Conventional Energy Sources has notified an accelerated program providing financial assistance for projects on energy recovery from urban waste during the year 2005-6. The incentives offered vary from scheme to scheme as under.

GOI Subsidy on SWM plants

Project for Power Generation from MSW involving Refused Derived Fuel (RDF)	1.5 crores per MW
Power project based on high rate bio-methanation technology	2 crores per MW
Demonstration project for power generation from MSW based on gasification/Pyrolysis and plasma arc technology	3 crores per MW
Biomethanation technology for power generation from cattle dung, vegetable market and slaughterhouse waste above 250 KW capacity	50% of project cost. Max. 3 crores per MW
Bio-gas generation for thermal application	Up to 1 crore MW eq
Project development assistance	Up to 10 lakhs per project
Training course, seminar, workshop, etc.	3 lakhs per event

Note - The financial assistance for any single project will be limited to Rs. 8 crores.

Source Government of India, Ministry of Non-Conventional Energy Source Scheme 25/07/2005.

Investment by Private Sector

The private sector is now entering in treatment and disposal of waste such as setting up compost plant, waste to energy plant, construction of landfill sites, etc. They are bringing investment if they are given an assured supply of waste free, land at a nominal lease rent, and some tipping fee to cover the gap in the cost of providing service.

Funds from Sale of Carbon Credits

Major initiatives are underway to mitigate greenhouse gas emission from MSW. Through Kyoto in 1997 wherein industrialized nations have agreed to reduce their aggregate emission to 5.2% of 1990 levels by 2008 - 12. As reduction of emission invites huge costs for developed nations, a system is evolved wherein developed national can reduce emissions in any part of the world and earn carbon credits to count towards their effort to reduce greenhouse gas emissions globally.

Cities can take up waste treatment and disposal projects under this mechanism and avail of the benefits through sale of certified emission reduction credits at the prevailing market price which is around US\$ 10 of per ton of carbon equivalent to developed countries. The MoEF has a nodal officer handling these matters. Landfills generate biogas consisting of 50% methane. A ton of methane is equivalent to 21 tones of carbon dioxide and a serious threat to the cause of GHG reduction. Appropriately management of landfills, compost plants or WTE plants can earn municipal authorities in large cities substantial carbon credits which can be sold not only to recover cost of system installation and upgradation of operations but also generate surplus funds invaluable for the cash starved ULBs. Smaller cities can pool resources together and make a combined case for availing of carbon credits.

SUSTAINABILITY OF SWM SERVICE.

Even though the state governments may construct treatment and disposal facilities at government cost or give capital grants for creating those facilities, the operation and maintenance will have to be done by the respective urban local bodies or collectively by the group of ULBs in cases where regional facilities have been created or are to be created. The ULBs will, therefore, have to create sources of fund to sustain the operation and maintenance of the services. The answer lies in having adequate taxation and imposition of user charges.

Conservancy Tax

Generally, ULBs use a percentage of the property tax to provide the solid waste management services which is inadequate and does not cover the cost of primary collection and scientific disposal of waste. This needs to be increased for the protection of health and environment and sustainability of the services.

User charges

For sustainability of operation and maintenance of solid waste management services, with the gradual introduction of door to door collection system, element of cost recovery need to be introduced by municipalities to cover the cost of this additional service by levying a monthly charge ranging between Rs. 10 and 30 per month from residential areas. and a higher charge from commercial establishments. **The user fees should be introduced with a firm determination by local bodies to sustain the services.**

CONCLUSION.

Efforts made by the Government of India, state governments, various regulatory agencies to improve the systems of waste management in the country have not yielded the desired results in spite of Honourable Supreme Court's intervention and monitoring from time to time. A very few states have taken major initiatives whereas a large number of states are substantially lagging behind. Very few cities and towns in India have taken initiatives and implemented the directions contained in Municipal Solid Waste (Management & Handling) Rules 2000 but none have so far implemented all the seven steps effectively. Many cities have not even initiated the implementation of the rules even though the time frame prescribed in the rules is over. This situation, therefore, calls for a strategy to expedite the implementation of the rules in a time bound manner. This can best be done on a mission mode using judiciously and expeditiously the allocation of Rs. 2500 crores made by Government of India to various states for improving solid waste management services on the recommendations of 12th Finance Commission and other funds that are likely to be made available under Jawaharlal Nehru Urban Renewal Mission (JNURM) and Urban Infrastructure Development Scheme for small and medium towns (UIDSSMT).

The Government of India and all state governments need to create a SWM mission at least for a period of five years to facilitate implementation of MSW Rules 2000 in the country pooling all available financial resources with various ministries and 12th Finance Commission grants, JNURM & UIDSSMT grants for implementation of MSW Rules in a time bound manner. The mission may motivate the political leadership and the bureaucracy in the municipal authorities to appreciate the need of the hour to improve the SWM services to make their cities livable by giving priority to the subject. The mission may avail of national and international expertise, identify appropriate technologies suitable under Indian conditions, identify technology providers, develop standard designs and specifications for tools, equipment, vehicles suitable in different levels of cities, standard contracting mechanism, and terms and conditions for involving private sector, NGO and community groups and take measures for training and capacity building of municipal officials for managing the contracts effectively and supervise the services provided departmentally or through contractual arrangements. The mission may also do handholding of small municipal authorities in implementing the improved systems of waste management.

The states must, however, ensure that the municipal authorities who are responsible for managing municipal solid waste in their areas remain on the driver's seat and stand committed for the operation and maintenance of the facilities that get created in their cities centrally on a mission mode and ensure sustainability of the facilities created through levy of appropriate taxes and user charges.

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SUSTAINABLE CONSUMPTION IN INDIA – CONSCIOUSNESS RAISING AND CONSCIENCE RAISING

Rajan R Gandhi

Rajan Gandhi is a former professional manager in a large chemicals MNC, a Company Director in an SME and a businessman. Having spent over 30 years in the Corporate sector, largely in the marketing and sales functions with a stint in Purchase, he switched to the voluntary sector where his NGO, Society in Action Group (SAG) works on issues at the interface between manufacturing industry and civil society. He is also a consumer activist and was one of the keynote speakers at Marrakech in 2003. He has been most active in the areas of sustainable consumption & production and Corporate Social Responsibility.

The entire issue of creating environmental awareness amongst Indian consumers is often met with scepticism. *Prima facie*, it would seem a paradox to be preaching environmental concern and consciousness when most of the population gets by on less than \$ 3 per day and is thus still at subsistence level. Votaries of this proposition feel that expressions of concern about sustainable consumption should be directed at the population of countries whose spending power and propensity to consume is high, not at India.

According to this view, proponents of sustainable consumption are generally from the developed countries of the West, preaching what they have not practiced. Having spent the past few decades exploiting the earth's resources beyond reason or sustainability, the West is now alarmed that developing countries might wish to follow suit and in the ensuing competition for dwindling resources, countries with a large, still-growing and young population will inevitably win the race.

Regrettably, this is a race to the bottom. There is an undoubted element of truth in the expressions mentioned above, but equally, it is in the interests of developing countries such as India to question whether the Western development paradigm of the past is the best way forward.

Defining Sustainable Consumption

There exists an U.N. definition of sustainable consumption, first proposed in 1995:

“The use of services and related products which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life-cycle, so as not to jeopardise the needs of future generations”.

This is, however, too broad to be of much practical help. For a start, it focuses on human *needs* and de-emphasises human *wants*. In a country like India, where for the first time in recent history a section of the population has “that extra buck” to spend, no-one can afford to ignore human aspirations. Secondly, the definition refers to minimising the use of natural resources ignoring the distinction between renewable and non-renewable resources, and further setting aside the fact that some countries

may be rich in such resources and others may not. It might make sense to use wood substitutes in the Saharan regions, but not in Brazil, Canada or Malaysia.

It is imperative that each country determines its own set of criteria for assessing whether or not a product, service or process is sustainable. Even tools such as life-cycle analysis which aid in the assessment of sustainability must be tailored to a country's individual geographical, climatic, social and cultural norms. Sometimes a country's very size would determine sustainability; for example small island States with little land mass to spare have to take a different approach to waste disposal than large countries which can afford landfills.

Income Levels and Consumption Patterns:

If indeed the majority of Indians survive on just about \$ 3 per day, then a question is raised about whether there is any reason to be alarmed about sustainable consumption.. The argument goes that such levels of income are sustenance or survival levels, leaving no room for adjustments in consumption.

But consider the 80-20 rule – that 20 per cent of the (richer) population account for 80% of the consumption - and one gets a different picture altogether. Moreover, this 20% of the population is very large in absolute terms – over 200 million, exceeding the entire population of many rich, industrialised countries.

Consider, too, the other demographics: 60% of the Indian population is between the ages of 21 and 45, the age of maximum consumption. In the next 15-20 years, half of the Indian population will be teenagers ! India's economic growth rate has been running at around 8% in the last few years and the trend appears likely to continue, if not actually increase. Put all these figures together and the cause for concern becomes obvious. The present generation has already begun to feel the absence of restraint on consumption. India's streets are full of plastic litter, it's cities are smog-bound in winter and freak weather plays havoc throughout the country.

Consumption rises with disposable income; that is indisputable. However, at the micro level, it does not rise in the same manner and for the same type or goods and services. Every country seems to differ.

Indeed, at the micro level, Multinational Companies which entered the Indian market after the Indian economy was liberalised in 1991 with “global standard” products as in their home countries, found the Indian consumer had a mind of her own. Many such companies went home licking their wounds. Others quickly adapted to Indian needs; where else in the world would an

“.....if the per capita consumption of a widget in America or Brazil was 100, and in India it was 10, then the gap of 90 represented a huge opportunity waiting to happen. I considered the possibility that maybe Indian consumers have use for only 10 units per capita, either because of environmental or cultural factors, or because they have leap-frogged to a new kind of more modern widget and have skipped this stage altogether..”

Rama Bijapurkar, 2007. “We are Like That Only – Understanding the Logic of Consumer India”. Penguin Portfolio.

American Pizza chain offer a “Jain Pizza” containing no meat, fish, poultry, or any vegetable which grew underground ?

Clearly, such examples underscore the need to have a country-specific policy on sustainable consumption.

The Buying Decision

The individual consumer’s decision to buy is based on a complex matrix where key priorities vary with income, age, educational levels, exposure, seasonality and a host of sometimes unexpected factors. Industrial buying is perhaps less complex but equally based on a multiplicity of factors:

INDIVIDUALS	ORGANISATIONS
Price	Price
Perceived quality	Measured quality
Availability	Consistency
Merchandising	Credit terms
Advertising/publicity/promotions	Lead time
Packaging	Response time
Peer pressures	Prompt service & repair
Manufacturer's reputation	Orderable quantity
Ease of service/repair	Vendor's credentials
Guarantee/warranty	Alternative source
Novelty factor	Vendor's return policy
Ease of payment (e.g. instalments)	Proximity of supplier
Salesmanship	Salesmanship
Others	Others

Concepts such as organically produced food (for individual consumers) or no-child-labour policies for industrial purchasing are entering the consciousness of the Indian buyer, but thus far, environmental considerations have hardly figured in the matrix.

This is largely because of two factors. The first has more to do with the psychology of the Indian consumer than anything else. For decades since Independence, consumer demand was suppressed: either by the absence of purchasing power or by the absence of competition or by the total ban on imports of consumer goods. What was not suppressed was the access to foreign media and advertising, so that the Indian consumer was bombarded with advertising exhorting him or her to buy the very products which he or she could not. Post the 1991 liberalisation, a backlash ensued and it is only now that there is an equilibrium of sorts.

The second is the absence of a fully-functional, fair, transparent and third-party certified method of rating for environmental soundness such as an Ecolabel. True, the Indian Ecomark scheme does exist but it is in a moribund state.

Ecolabelling in India

The major reasons for the failure of the Indian Ecomark to take off have been identified and pointed out to policy makers time and again by civil society

organisations. Some of the reasons are: a) poor choice of products, b) inadequate focus on life-cycle analysis c) insistence on Government organisations playing the dominant role rather than a facilitating role d) failure of the self-same Government organisations to “concept-sell” the Ecomark to manufacturers or consumers.

It is simply not sufficient to provide the consumer with information on the environmental qualifications of a product or service, however impartial, fair and transparent. These features of the goods and services have to be converted into *benefits* for the consumer and sold to him or her, in the same manner as any goods or services are sold.

This is in fact one of the flaws of the Ecomark; it assumed that mere access to or possession of information would lead to a change in consumer behaviour. This is being un-realistic, The need to “hard-sell” a concept such as environmental sustainability must be built into any policy aimed at sustainable consumption,

Further, institutional buying must be directed towards sustainable procurement (previously called “green” public procurement) and the Government, it’s various departments and public sector organisations could take the lead. Any rating for good Corporate Social Responsibility (CSR) must take into account the Company’s procurement policies for its raw and packing material as well as its support to the Ecomark.

There are numerous sceptics of Ecolabelling who will point out that except for a handful of European countries, nowhere in the world has an Ecolabel made any serious difference to the buying habits of consumers. In Thailand, a country similar to India in many respects, experts point out that while the scheme has been widely adopted amongst manufacturers, consumers are largely indifferent and continue to see price and quality as the main determinants.

But despite the scepticism, there are some signs of change. Consumers have begun to reject plastic carry-bags, schoolchildren have formed Eco-clubs which proudly declare their Schools to be a “plastic bag free zone”, rain-water harvesting is now widely practiced and even if people do not see immediate advantages of turning “green”, they are certainly beginning to see the disadvantages of ignoring the environment.

Motivating the Indian Consumer

Even today, advertising exhorts the consumer to spend relentlessly. Meanwhile the consumer rights movement in India has chosen a reactive approach – protecting the consumer against unsafe and poor quality goods and services, against profiteering from scarcity, against unfair or misleading advertising and against monopolies and cartels. It is time that consumer rights groups in India adopted a more proactive and environmentally conscious stance.

Sustainable consumption often comes into direct conflict with economics, and this is an issue which must be addressed. For example, lower-income consumers in India have readily adopted “unit-packs” of products such as shampoo. These are small

sachet packs, containing just enough for a single use, and are thus more easily affordable than large bottles containing enough for a month's use or more. However the use of packing material is inordinately high in sachet packs and the wastage greater.

Similarly, a major detergent manufacturer pointed out that domestic detergents contain a large amount of fillers and extenders which increase the bulk without contributing to washing power. The increased bulk was an attempt to fool the customer into thinking that she was getting more value for money..

It should not be forgotten that the most Indians in the 200 – 300 million “consuming class” have just got there. Economic considerations are and will remain foremost in their minds and the challenge of insinuating sustainability into the matrix of their buying decision becomes doubly difficult.. Yet a way has to be found.

The international experts meeting in Marrakech in 2003 led to the formation of “Marrakech Task Forces” (MTFs) of European countries with specific areas of expertise, available to nations which needed them. Of the 7 MTFs, two are of particular importance for creating consumer awareness – the Italy led MTF on Education for Sustainable Consumption and the Swedish MTF on sustainable lifestyles. While India must necessarily develop its own norms and criteria, there is much to learn from the manner in which, for example, children as young as 3 years are being gently guided to make sustainable choices.

The Manufacturers Responsibility:

The onus of making a choice for sustainable goods and services cannot rest only with the consumer. Producers must bear at least equal, if not greater responsibility and manufacture and promote genuinely sustainable products and services. If all manufacturers of Ink-jet printers – as a matter of deliberate policy – decide to make profits only from disposal of spent ink cartridges and void warranties if refilling is attempted, the consumer has no little choice but to comply.

India has more cell phones (over 250 million) than Bank Accounts, and more colour TVs than toilets. Sooner or later, these will have to be discarded. Yet the public has no guidelines about how to ensure safe disposal.

Manufacturers often claim that the Indian consumer is so price sensitive that it is futile trying to offer sustainable goods and services which may be more expensive than the alternatives. This claim is often made by producers who have never even attempted anything different. Very often, there is a sound business case for delivering sustainable goods and services which would lead to increased profitability, but it is the fear of change at the managerial level which seems to be the barrier. As often, the reluctance to offer sustainable products or to participate in schemes such as the Ecomark is a way of trying to extract tax concessions from the Government.

It is ironic that some such manufacturers prefer to expend vast sums on claiming good corporate citizenship !

Government's Role

The Government can and should play a major role in increasing consumer awareness for sustainable goods and services on the one hand, and propelling manufacturers to deliver such goods on the other hand.

The question in India is “Who will bell the cat ?”. The task involved is complex and sensitive, requiring as it does a combination of legislative measures, fiscal measures, directives and implementation/enforcement as well as gentle persuasion. Different Ministries are involved and each has differing priorities and does not always see the creation of consumer awareness for sustainability as its task.

If inter-Ministerial coordination proves to be beyond the ambit of a single Ministry, perhaps a body such as the Planning Commission could act as the lead agency. Certainly the issue is important enough to merit intervention at the highest level.

Towards Integrated National Programmes on SCP

Contributed by Matthew Bentley, United Nations Environment Programme (UNEP)

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Introduction

Many countries have instituted policies to promote sustainable consumption and sustainable production. However, these actions are often neither coherent nor driven by an integrated programme. Individual national initiatives – no matter how innovative – stand little chance of bringing about wholesale changes in consumption and production patterns. Therefore, the Global Marrakech Process on Sustainable Consumption and Production (SCP) is encouraging the development of integrated national programmes on SCP.

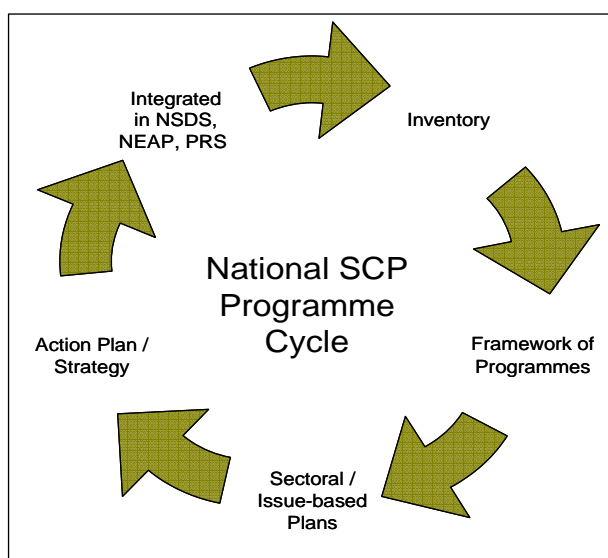
National SCP programmes should seek to achieve win-win outcomes through multi-stakeholder dialogues, involve industry and consumers (key partners for sustainable development) and help to encourage effective policy and market-based solutions.

To support the implementation of national SCP programmes, UNEP with the financial assistance of the UK Government, is following up a key recommendation of the Marrakech Process meeting in Costa Rica (2005) to develop guidelines for policy makers. The Guidelines provide step-by-step advice to governments and other stakeholders on how to develop, implement and monitor a national SCP programme. The Guidelines are informed by earlier work to develop national action plans in Asia. Experts from the project's advisory group are also providing their input. The Guidelines will be tested in several new and ongoing demonstration projects in 2007. Training on the Guidelines will be delivered in 2008.

The information presented here is just a snapshot of the international guidelines that are currently being drafted and tested.

What is a national programme on SCP?

“SCP action plans could be a cornerstone for achieving progress. Such plans should, where relevant, be integrated into the national sustainable development strategy (NSDS) or poverty reduction strategy (PRS).” (Costa Rica Meeting, 2005)



There is no one type of approach and no single formula by which national SCP programmes can or should be instituted. Every country needs to determine, for itself, how best to approach the development, implementation and monitoring of its SCP programme considering the existing political, cultural, economic and ecological conditions.

The *SCP Programme* has been used in the Guidelines as the umbrella term to describe the various strategic ways countries approach SCP. In reality the prevailing programmes are diverse in nature. They constitute national inventories, frameworks of programmes, action plans, strategies, multi-stakeholder dialogues as well as often being treated as a priority issue in another policy framework.

It may be useful to consider the SCP programme as a cycle that moves from a national Inventory or general catalogue of ongoing SCP activities through to the full integration of SCP in a major national-level policy framework such as a National Sustainable Development Strategy (NSDS), National Environmental Action Plan (NEAP) or national development plan including Poverty Reduction Strategy Papers (PRSP). A Framework of Programmes tends to include a strategic overview for SCP and highlights priority areas for further work. This often leads to the development of sectoral or issue-based action plans on such topics as sustainable government procurement, energy efficiency and education for SCP which are also sometimes linked to other national strategies or plans. An integrated Action Plan or Strategy deals with SCP more thoroughly and generally includes objectives, targets and monitoring mechanisms. However due to discrepancies associated with language translation and how certain regions apply terminology even these basic definitions can not be relied upon completely.

These Guidelines are designed to be flexible enough to provide assistance to experts regardless of their preferred approach to SCP. A country that already has a SCP programme can use the Guidelines to help test, improve and sustain the process. A defined or “blueprint” approach for national SCP programmes is neither possible nor desirable. What is important is the ongoing application of the underlying principles and elements of SCP programmes. In many cases this will indeed result in progression through the SCP programme cycle as described above.

Why develop a national programme on SCP?

National SCP programmes

SCP programmes have the power to effect positive change. For example, mitigation of global warming can come about through making consumption and productions patterns more sustainable. But integrated solutions are required. Some top reasons for developing a national SCP programme are

Top reasons for developing a national SCP programme

- ✓ **SCP is more focused and thus easier to communicate and implement than sustainable development**
- ✓ **Integrates supply (production) and demand (consumption)-side activities in coherent market strategy**
- ✓ **Seeks to achieve ‘win-win’ outcomes through a multi-stakeholder setting**
- ✓ **SCP targets business and industry – key players in achieving sustainable development**
- ✓ **SCP initiatives can create jobs and investment and encourage social and business innovation**
- ✓ **SCP is a main pillar of sustainable development and can also help to alleviate poverty**

framework; select the priority areas; define objectives and set targets; select policies and instruments; obtain official approval of the programme; implement the programme; document, monitor and evaluate; and sustain and improve the programme. There is also an important cross-cutting step to link the programme to existing national strategies such as national development plans (e.g. poverty reduction strategy papers) and national sustainable development strategies. It helps to consider where the SCP programme should be included in the national policy framework early on in the process.

The steps represent an iterative process of continuous improvement that is often embedded into existing plans or strategies. This is a flexible approach to SCP programme development and local circumstances will dictate the final process to be followed. In practice, some steps may not be required or will be combined with other steps. The Guidelines will also be useful to countries that already have a SCP programme but are keen to improve and sustain the process.

Crosscutting Step - Link to existing national strategies

There are several ways to go about developing and implementing a national SCP programme. The programme can be either wholly integrated in an existing national strategy on sustainable development or national development / poverty reduction, mainstreamed through existing national strategies or developed as a ‘standalone’ programme. It helps to consider where the SCP programme should be included in the national policy framework early on in the process. The decision on how the SCP programme is to be developed and integrated depends a lot on local conditions.

Each step of the Guidelines describe in more detail how integration and linkages can be considered and/or pursued at the different phases of the programme development and implementation process. These include for example reviewing and linking up with SCP actions included in existing strategies (**Step 2**) and evaluating priority areas in existing strategies to help set priorities for the SCP programme (**Step 4**).

Key Principles for SCP Programmes

There is no fixed way to develop and implement a national SCP programme. Nevertheless there are certain key principles that should be respected. Some of these include:

National commitment and leadership

To increase the likelihood of the programme’s success countries should assume active leadership and in most cases initiate proceedings. A long-term commitment to SCP is an essential underlying principle. Consulted national SCP experts highlight the importance of soliciting high-level political support and selecting the appropriate ministry or ministries to lead the ongoing initiative. Setting up an inter-ministerial advisory group to manage the process is a good first step. The mechanics for such groups may already exist with

“The process of developing the SCP programme enabled us to identify the importance of decoupling economic growth from environmental degradation, using lifecycle analysis to identify priority resources/products and the need to integrate SCP in all policy development and implementation.” (Dept. for Environment, Food and Rural Affairs, U.K.)

prevailing sustainable development or national development/growth committees and working groups. Linking to the international and regional ten-year frameworks on SCP is also important.

Initiate a multi-stakeholder process

It is important that the programme development and implementation process is as participatory as possible. This includes reorienting SCP away from its traditional focus on environment to consider also economic and social issues. A multi-stakeholder dialogue as instituted in the case of Finland for example, can help to engage a wider consortium of ministries and other stakeholders including civil society and business.

Based on comprehensive and reliable analysis

The local, regional and global context (i.e. threats and opportunities) should be properly articulated in the SCP programme development process. The market for goods and services is international and consumption and production impacts are global, affecting economic, social and environmental systems. This needs to be duly recognised. The programme should not be completed until a comprehensive review of problems, needs, existing activities and required actions is conducted. The information and research utilised needs to be robust.

Define objectives, targets and indicators

The setting of objectives and targets is crucial to the success of the programme. Monitoring and evaluating progress toward the programme's goals is another critical consideration. It provides for accountability of those parties involved and demonstrates achievements and worthiness of the programme itself. The U.K. and Japan are among the countries that have set targets and are monitoring progress towards these goals.

Integrate with existing national strategies

A SCP programme should be an ongoing, flexible and iterative process that does not constitute a one-off initiative to produce a document. It should also pursue a process of sensitising all existing national strategies to SCP and integrating relevant components of these strategies where possible. In some cases this could equate to full integration of the SCP programme in a sustainable development, poverty reduction or other existing strategy. For example, the U.K. and France have included SCP as a priority area in their national sustainable development strategy and Ethiopia, Jamaica and Mauritius have done the same in their national environmental action plan. However, there is also a need to integrate with mainstream activities in other policy areas that can drive SCP policy goals including skills/education and building/infrastructure.

Develop sectoral SCP action plans

In most countries there are at least some SCP-related policies and actions in operation, particularly those related to energy and water efficiency and waste recycling. Many of these activities are delivered through existing strategies and plans. Other countries, particularly those in Latin America, have sustainable production strategies that include mainly activities concentrated at the production-side of SCP. These ongoing activities and the results of a review will lead to the identification of priority areas for the country's SCP programme. A national SCP programme is usually concentrated on a few initial key priority areas, as attempting to do everything at once is neither practical nor possible. Another way to approach a SCP programme is to develop one or two sector-based action plans that link to a framework document or existing strategy. This can be a more efficient means to tackle SCP for some countries, at least in the short-term.

Current status of national SCP programmes

The 2002 UNEP *Tracking Progress* survey¹ showed that no country had implemented an integrated programme on SCP. Since then there has been steady progress. Today, more than thirty countries have developed or are developing national SCP programmes. These include France, Czech Republic, Finland, Belgium, Poland and UK in Europe; Ethiopia, Mauritius, Senegal and Tanzania in Africa; Jamaica, Costa Rica and Brazil in Latin America and the Caribbean; and Japan, Thailand and Indonesia in Asia and the Pacific. As pointed out earlier, the existing programmes are quite different. Half of the existing programmes are in fact integrated in existing national strategies. In addition, countries such as The Netherlands, Austria, Norway and Germany have dispersed SCP elements throughout their sustainable development strategies and have a range of national initiatives that deal with various aspects of SCP.

Types of Selected National SCP Programmes

Country	Inventory	Framework of Programmes	Action plan / Strategy	Integrated in existing strategy	Other integrated approach*	Under development
Argentina			+			+
Austria	+				+	
Belgium					+	+
Costa Rica					+	+
Czech Republic		+			+	
Ethiopia				+		+
Finland		+		+		
France				+		
Germany	+				+	
Jamaica					+	
Japan			+			
Mauritius			+		+	+
Norway					+	
Poland			+			
Sweden					+	+
Thailand				+		
The Netherlands					+	
UK		+		+		

* Includes actions to mainstream SCP throughout existing strategies such as the NSDS, PRS or NEAP or the inclusion of SCP as a priority issue in existing strategies but without full elaboration of the programme.

This Table has been compiled using ad-hoc information received from countries. UNEP has not undertaken a detailed survey or review to produce this Table but rather relied on voluntary inputs and advice from national governments. A more detailed and up-to-date listing can be found on the project's national SCP programmes clearinghouse at: <http://www.unep.fr/pc/sustain/initiatives/actionplans/clearinghouse.htm>

The majority of the existing programmes include a combination of new and existing SCP actions. Some SCP programmes focus on providing economic incentives and internalising external costs. This is the case with the UK and Finnish initiatives. The Finnish programme also includes a particular emphasis on technology. By contrast, the Japanese programme concentrates on resource efficiency measures. Ethiopia's programme sets several targets in areas such as recycling, waste management and

natural resource management. The targets are to be met through several initiatives including education and the use of environmentally sound technologies.

Environmental issues are the key focus of many of the programmes and plans, especially with respect to eco-efficiency and resource use. The link to economic development is normally made through a focus on resource efficiency as a competitiveness issue. Social issues are addressed in some programmes. However, there is limited focus on the linkages between social and environmental issues.

“SCP is the basis for sustainable development: the best way to make people understand sustainability is approaching and convincing them through consumption and production” (Ministry of Environment and Water, Hungary)

The Guidelines contain eight case and several other examples of good practice, which illustrate how governments are implementing SCP programmes all over the world. Updated information on the existing national and regional initiatives can be found on the UNEP clearinghouse for SCP programmes at <http://www.unep.fr/pc/sustain/initiatives/actionplans/clearinghouse.htm> (currently under development)

Example SCP programmes in Europe

Finland



Finland was one of the countries that lobbied for the inclusion of sustainable consumption and production in the Johannesburg Plan of Implementation. Finland's SCP programme – *Getting More from Less* – was approved by the Government in December 2006. The government made an in-principle decision on the National Sustainable Development Strategy (NSDS) in December 2006. It was agreed that the NSDS would include the SCP programme. The National Waste Plan that is being developed also includes linkages to the SCP programme.

The SCP programme is valid until 2025, with most of the activities to be implemented in the next ten years. A multi-stakeholder committee developed the SCP programme. The administration of the programme is the responsibility of the Ministry of the Environment and the Ministry of Trade and Industry. An informal network from different ministries follows the implementation of the SCP programme.

The programme considers the “hidden impacts” from imported and exported products. One of the objectives is to increase the levels of eco-efficiency in production throughout product chains.

The intention is that Finnish companies particularly strive to meet their social responsibilities when procuring raw materials and unfinished products from abroad. Environmental and social innovations frequently give rise to new business opportunities and jobs. Another aim is that levels of natural resource use do not exceed the capacity of the natural environment. The programme highlights the following overriding principles:

- Economic instruments must be effectively applied to promote sustainable production and consumption

- Quantitative and qualitative targets must be set for material- and energy-efficiency and specific emissions, with a view to the international discussion on medium-term international goal of doubling wellbeing while halving the rate of consumption of natural resources
- Environmental impacts throughout product life cycles must be considered during the planning and development of products and services, in order to reduce the overall burden on the environment
- International co-operation and controls must be enhanced to improve the state of the environment and working conditions, and to ensure that companies can work in international markets with a level playing field
- Improvements in energy-efficiency and energy saving must halt the rising trend in energy use within a decade, with the use of energy from renewable sources increased in line with Finland's National Climate Strategy and the programme to promote renewable energy.

The programme has seventy-three action points, which are sorted under eleven main fields of action. The eleven main fields of action areas are as follows:

- Forms of production that save materials and energy
- Fewer material goods, but a higher quality of life
- Building pleasant and functional communities
- Improving the quality of construction
- Getting transport on the right track
- Sustainable food production from the farm to the table
- Promoting well-being in workplaces and leisure activities
- Setting an example in the public sector
- Increasing sustainability through new technologies and innovations
- Values, knowledge and skills
- An active international role for Finland.

The programme identifies the use of a range of policy tools. Most of them fall in the categories of market-based instruments, information activities and voluntary agreements.

The programme has objectives and targets. Some of them are concrete and easy to follow, some of them more abstract and general. Some of the actions are linked to the national budget (setting up the centre for material efficiency, energy conservation programmes, research on specific topics). The programme does not include quantitative indicators to measure progress. However Finland does have national indicators on sustainable development and these will probably be used to measure progress on specific fields. Indicators for SCP will be discussed in a follow-up forum.

Finland leads the Marrakech Task Force (MTF) on Sustainable Buildings and Construction, which is developing local and national policies and legislation to secure the sustainability of construction, use and maintenance of the built environment. The priority is: How can public policies and legislation promote energy efficiency, energy savings and use of renewable energy in the built environment? The task force is currently looking to develop a checklist for decision-makers not familiar with challenges and opportunities for sustainable buildings and construction. Other projects include an internal exchange of best and worst practices, initiating research projects,

and publishing best policy practices. So far, the MTF has reported on energy use and GHG emissions in construction & buildings and issued recommendations for policy action points. For more information see: <http://www.unep.fr/pc/sustain/10year/taskforce.htm>

United Kingdom



The main objective of the UK's Sustainable Consumption and Production Programme is to address the increasing environmental impacts from the lifecycles of goods, services and materials whilst still achieving economic growth. The Department for Environment Food and Rural Affairs (Defra) is in the lead on developing and implementing the programme jointly with the Department for Business, Enterprise and Regulatory Reform.

The UK has had a range of activities addressing various elements of an SCP approach for a number of years. However, the formal drawing together of this activity under an SCP 'umbrella' began with the UK signing up to the commitments at the World Summit on Sustainable Development in 2002. The UK subsequently formally set out a framework outlining how it would be taking forward the WSSD commitments in *Changing Patterns* in 2003.

Building on this framework, in 2005, the UK formally adopted Sustainable Consumption and Production as one of four shared priorities for UK action in the revision of its Sustainable Development Strategy. *One Future Different Paths* – setting out the common goals for the UK and its devolved regions, was launched alongside *Securing the Future* - the UK government's Sustainable Development Strategy. The development of the UK Sustainable Development Strategy was subject to a wide consultation and stakeholder engagement exercise. Questions and issues on the approach to encouraging more sustainable patterns of consumption and production were raised as part of that process. Although SCP is a shared priority, the devolved regions in the UK are developing their own strategies. The material in this case study relates to the approach being taken in England.

The aim of the SCP programme is to decouple economic growth from environmental degradation. The recognition that reducing waste and the use of resources, such as energy and water, can help both the environment and contribute to economic growth and competitiveness is an underlying theme to all activity. Social aspects are taken into account where significant when developing policy.

The programme activity is focused around measures to achieve the following:

- Better products and services, which reduce the environmental impacts from the use of energy, resources (such as water), or hazardous substances
- Cleaner, more efficient production processes, which strengthen competitiveness
- Shifts in consumption towards goods and services with lower impacts.

There is an ongoing programme of evidence development to support the UK government's approach to SCP. Within these above areas the Government has used

the evidence base to help to identify the policy priorities. A range of policy tools are used, the selection of which depends on the problem being addressed. Policy tools include regulation, fiscal instruments, voluntary agreements, best practice advice, innovation programmes, business support programmes, procurement standards, environmental labelling, international cooperation on traded products, environmental management systems and reporting, information and awareness raising.

Working closely with stakeholders is a key part of the programme and is generally on an issue- by-issue or product-by-product basis using standard methods (workshops, meetings, seminars etc). However, some areas do need more regular liaison and the programme leaders look to bring stakeholders into the policy development process in developing evidence, agreeing priorities, potential options and the way ahead. The UK Government has a number of communications initiatives which aim to raise awareness, change attitudes and encourage behaviour change to ensure consumers and businesses make more sustainable choices. These include websites, marketing campaigns, guidance for consumers on greener living, and guidance for business on resource efficiency.

Progress on the overall decoupling goal is measured by the government's Sustainable Development indicators. A set of national Sustainable Development indicators was developed and consulted on as part of the UK's sustainable development strategy. They represent the four UK priorities, including SCP. There are presently 25 sustainable consumption and production indicators.

Defra's work on SCP is linked through to national budgets by the system of Public Service Agreements (PSA) each government department has with Her Majesty's Treasury. Work under the SCP programme feeds into the delivery of 5 cross Government PSA targets. Each department is required to prepare regular progress reports on this work. Progress is also monitored through Defra's internal programme management mechanisms which report progress to the department's ministers, and allow adjustments for longer term planning.

The United Kingdom also leads the Marrakech Task Force on Sustainable Products. The MTF aims at raising awareness of product policy as a means of achieving international development and environmental objectives; seeking common priorities and opportunities for practical cooperation in encouraging more innovation on product eco-design and establishing and participating in open and transparent processes for improving product performance. For example, the MTF is creating Global Sustainable Products Networks (GSPNs) on lighting, home entertainment, and electronic motors. For more information see:
<http://www.unep.fr/pc/sustain/10year/taskforce.htm>

NOTES

¹ UN-DESA (2002). "Guidance in Preparing a National Sustainable Development Strategy: Managing Sustainable Development in the New Millennium, Background Paper No. 13". New York: UN-DESA.

¹ The Johannesburg Summit (WSSD) Plan of Implementation (POI) called on countries to also consider the integration of SCP in sustainable development and poverty reduction strategies.

¹ UNEP-Consumers International (2005) Tracking Progress: Implementing sustainable consumption policies. Paris: UNEP

Sustainable Consumption and Production in Europe

Contributed by Helen McCarthy, European Commission, DG Environment

European SCP trends

The European model of wealth, like that of all industrialized countries, has been based on a high level of resource consumption, including energy and materials. Current total material consumption in industrialized countries is between 31 and 74 tonnes/person/year, and environmentally most significant is the consumption of materials for housing, food and mobility.

Important progress has been made in promoting cleaner production, not only in the EU, but also - often at a slower pace - in the wider European region. Progress has also been made in improving eco-efficiency and addressing the environmental impacts of consumption. However, progress towards changing consumers' behaviour has been rather limited. In most European countries, absolute de-coupling of the environmental effects from growing material use and waste generation remains an important challenge.

Over the last decade, per capita use of resources in the European region has been stable. The use of non-renewable materials dominates, with construction materials accounting for the largest share. However, efficiency of resource use varies significantly between countries, and is several times higher in the EU-15 than in the new member states.

There has been an increase in generation of municipal waste per capita in western European countries (EU15) whilst in Central and Eastern Europe (EU10), the volume of municipal waste has remained stable. There has been an 11.7% increase of total packaging waste in the EU15 between 1997 and 2004. However, the EU target to recycle 25% of packaging waste in 2001 has been significantly exceeded. In 2004 the recycling rate in EU-25 was 54 percent and was close to the 2008 target of 55%.

The EU15 has made considerable progress regarding sulphur dioxide emissions - reducing them by over 60% since 1990 - and nitrogen oxides - by 25%. Emissions of sulphur (SO_x) have been reduced by almost 70% since 1990, and levels of nitrogen oxides (NO_x), as reported by the EU-27 Member States, have been reduced by 35%.ⁱ However, greenhouse gas emissions are increasing again in Europe after having decreased during the early 1990sⁱ and ammonia emitted from agricultural activity and nitrogen oxides from combustion processes have become the predominant acidifying and eutrophying agents affecting ecosystems.ⁱ

Many fish stocks in European waters are over fished or fully exploited, due to over fishing, but also because of coastal and marine pollution, and changes in ecosystems. Forest on the other hand is an example of a relatively well managed natural resource.

The area covered by forests in Europe is around 36 %, and on average, has been increasing by half a million hectares a year in recent years.

Overview of European Union SCP tools and strategies

EU enlargement is a driving force for political and economic changes in Europe. Currently there are 27 Member States in the European Union. Through this process, the EU is extending its environmental standards and policies across the wider European region. Moreover, Europe is the world's largest trader, with the EU accounting for about a fifth of the world exports and imports. Trade policy has an important impact on global sustainable development. Europe is also a major player in the development process, with the EU providing approximately half of all public aid to the developing countries. These global interactions have a multiplier effect on approaches promoted by Europe. The EU is fully committed to the SCP goals of the Johannesburg Plan of Implementation (JPOI). EU action in this field is inscribed in the broader strategic framework of the Lisbon Strategyⁱ on Growth and Jobs, and the renewed EU Sustainable Development Strategy (SDS).

The **Lisbon Strategy** aims at making the EU, by 2010, “the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion”. This strategy sets out the ambitious goal of achieving an economic growth rate of 3% per annum, which would roughly double GDP in 25 yearsⁱ, and it also aims to boost research and innovation. Accelerating progress in achieving the goals of the Lisbon strategy is now at the top of the EU agenda. The European Social Policy Agendaⁱ for the period 2000-2005 provides concrete measures for implementing the Lisbon Strategy's economic and social renewal objectives. The Commission Communication “The social dimension of globalisation -the EU's contribution on extending the benefits to all”ⁱⁱ acknowledges its key external role linking economic and social progress, proposing concrete measures.

The **EU Sustainable Development Strategy (SDS)**ⁱ was adopted in 2001. It was reviewed in June 2006, to better respond to the current sustainability challenges and the EU's international commitments. The original six priority areas remain valid: combating climate change, public health, poverty and exclusion, ageing society, mobility and transport and management of natural resources)ⁱ. However in the revised strategy, sustainable consumption and production is added as a priority area for action. The European Commission is requested to develop an EU Action Plan on SCP to improve synergies between the existing policies and tools and to address the potential gaps. Furthermore, some of the EU Member States have already developed national SCP strategies or action plans.

Monitoring the implementation of commitments is important. The European Commission will continue reporting at regular intervals to the European Council, i.e. the meeting of the heads of state and government, on progress on implementing the SDS, using a number of headline performance indicators.

EU SCP Action Plan

In summer 2007, the Directorates General for Environment (DG ENV) and Enterprise (DG ENTR) published a joint document on Sustainable Consumption and Production (SCP) and Sustainable Industrial Policy (SIP) to consult stakeholders on the SCP and SIP Action Plans. This document described the options which could be considered at EU level in order to achieve economic growth, while respecting the environment's carrying capacity, and to find ways to minimise environmental damage and make sustainable use of the earth's resources. It focused on the key main challenges: leveraging innovation, leaner and cleaner production, better products and smarter consumption.¹ The Commission is planning to launch the SCP and SIP Action Plans in spring 2008.

The Sixth Community Environment Action Programme¹ (6EAP) identifies the EU's environmental goals to be attained between 2002 and 2012. It aims at ensuring a high level of environmental protection and de-coupling of environmental pressures and economic growth. To achieve this, it focuses on enhancing information, integration and implementation. Key areas to be tackled are climate change; nature and biodiversity; environmental and health and quality of life; and natural resources and waste. The programme aims at better resource efficiency and improved resource and waste management to bring about more sustainable consumption and production patterns.

The 6EAP is complemented by **seven thematic strategies** with concrete targets in the areas of air quality, soil protection, sustainable use of pesticides, protection and conservation of the marine environment, waste prevention and recycling, sustainable use of natural resources and urban environment. The waste and resource strategies are key ingredients in the EU's efforts to move towards sustainable consumption and production patterns.

The Thematic Strategy on the Sustainable Use of Natural Resources¹ aims to reduce the environmental impacts associated with resource use in a growing economy. The strategy focuses on improving knowledge, developing monitoring tools and fostering strategic approaches in specific economic sectors in the EU and internationally. One key initiative under the Thematic Strategy on the Sustainable Use of Natural Resources is the proposal to set up an **International Panel for Sustainable Resource Management** to examine and provide information on the global aspects of natural resource use and its environmental impacts. This kind of information is crucial for improving EU policies, but it can also give useful input to international processes such as the Marrakech process. The Panel was launched on 9 November 2007.

The Thematic Strategy on the prevention and recycling of waste seeks to turn Europe into a recycling society preventing waste and, where waste cannot be prevented, using it as a resource. It aims at reducing the environmental impacts of waste by focusing waste policy on the key environmental impacts, taking account of the life-cycle of resources and products; promoting waste prevention policies reaching out to individuals and businesses whose decisions influence the generation of waste, strengthening recycling activities by setting standards, modernizing and simplifying EU waste legislation, and improving implementation.

To achieve the environment policy objectives, the EU uses a blend of policies and instruments, including market based and economic instruments as well as information and communication tools. It also actively seeks to involve all government levels and relevant actors (business, citizens, NGOs, consumer organizations and other social partners). Integration of environmental considerations into sectoral policies remains crucial.

The EU's **Integrated Product Policy (IPP)** seeks to minimise the environmental impacts of products by looking at all phases of a products' life-cycle and taking action where it is most effective. The life-cycle of a product is often long and complicated, covering all the areas from the extraction of natural resources, through their design, manufacture, assembly, marketing, distribution, sale and use to their eventual disposal as waste.

Two pilot projects with European companies demonstrate how IPP can work in practice. The projects on mobile phones and teak furniture were finalised as part of the practical implementation of IPP. Research has been conducted on the environmental impacts of products in order to identify those products with the greatest environmental impact and room for environmental improvement.

A European Platform for Life Cycle Assessment has also been set up. The purpose is to improve credibility, acceptance and practice of Life Cycle Assessment (LCA) in business and public authorities, by providing reference data and recommended methods for LCA studies.

Information tools are crucial to enable consumers to make informed choices. The **EU eco-label scheme**, launched in 1992, is a voluntary scheme designed to encourage businesses to market products and services kinder to the environment and for European consumers - including public and private purchasers to easily identify them. The "Flower logo" is used across different product groups and Member States, making it easier to recognize products with a superior environmental performance. Criteria are established for individual product groups, such as paper products, textiles, detergents, paints and appliances such as refrigerators or dishwashers. The service sectors (such as tourism) are also included

The EU's **Environmental Technology Action Plan (ETAP, 2004)** aims to stimulate the development and uptake of environmental technologies in order to protect the environment and boost competitiveness. It focuses on getting environmental technologies from research to markets; improving market conditions; and global action. More priority and funding have been given to environmental technologies and eco-innovation in the new research and development programme. Technology platforms have been established for areas relevant such as water supply and sanitation and hydrogen and fuel cells.

A new financial programme, the Competitiveness and Innovation Programme (2007-2013), supports *inter alia* investments and projects in the field of eco-innovation. An initiative is in preparation for the verification of environmental technologies in order to facilitate their market up-take.

The EU is also actively promoting green public procurement. The volume of public procurement in the EU is c. 16 % of EU wide GDP - making it an important vehicle to create markets for sustainable products and services in order to help achieve environmental goals. In some product and service groups the impact could be still greater, as public purchasers are particularly significant (computers, energy efficient buildings, public transport...).

A **Handbook on Green Public Procurement** was published in all EU languages in 2005, to give public authorities at all levels concrete information on how they can integrate environmental considerations into their purchasing policies. The Sustainable Development Strategy sets the aim of by 2010 having the average figure for green public purchasing in the EU as high as it is now in the best performing member states.

One example of a **regulatory tool that** promotes SCP is the EU's '**Eco-design directive for energy-using products**' adopted in June 2005. It represents an important step in setting environmental design standards for appliances such as lightning, heating equipment or consumer electronics.

Some initiatives that contribute to SCP have also been taken up by the business sector and include **Corporate Social Responsibility (CSR)**, the **Environmental Management and Audit Scheme (EMAS)**, and green supply chain, among other voluntary agreements.

The European Commission focuses on promoting **CSR** practices by Europe's 25 million SMEs which are recognized as the most important drivers of economic growth and employment, and represent over 95% of European businesses. The programme aims at ensuring that SMEs have a good understanding of the drivers, success factors and pitfalls related to CSR. The programme has offered SMEs a tailored, user-friendly CSR toolkit.

The EU's Environmental Management and Auditing Scheme (EMAS) offers companies in the manufacturing sector a voluntary instrument to improve their environmental performance. EMAS covers companies and organizations from all economic sectors, including public authorities. The European Commission also aims to stimulate and co-ordinate voluntary actions by business with regard to sustainable production.

For more information please refer to the comprehensive overview provided in the *Inventory on Sustainable Consumption and production in the EU19* developed by the European Commission and EU Member States' expertsⁱ, and to the European Commission website: <http://ec.europa.eu/environment/>.