Environmental data in Annual Survey of Industries

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Manufacturing in Indian Economy

• India has emerged as one of the fastest growing economies over last two decades.

• Manufacturing contributes around 15% of GDP and provides almost 12.6% of India’s total employment.

• Manufacturing activities are not always environmentally friendly and therefore, environmental data in manufacturing sector are important parameters.
Data sources and methods

India’s manufacturing has been stratified into two mutually exclusive and collectively exhaustive strata for the purpose of collection of statistics in Ministry of Statistics & PI, Govt of India viz. (i) sector covered under Annual Survey of Industries (ASI) and (ii) the rest covered under survey of unorganized manufacturing sector through National Sample Survey (NSS).

ASI is a statutory survey under the Collection of Statistics Act 1953/2008. It is a record based survey.

Data are collected on various economic and physical parameters based on records for the reference period which include inter alia environmental data like (i) Fixed assets data on pollution control equipments, (ii) Fossil fuels, electrical energy consumed in terms of quantity and value, (iii) ISO certification (14000 series) status, (iv) raw materials consumed as input and (iv) products, by-products including waste.
Sources and method contd...

• From ASI 2010-2011, input and output materials including waste are in National Product Code for Manufacturing Sector (NPCMS) 2011, based on CPC, version 2.0. NPCMS, a 7 digit product code, is used from ASI 2010-2011.

• Industries, including recycling industries, are classified in National Industrial Classification (NIC) 2008, based on ISIC, version 4.0
Sources and method contd…

• ASI covers all factories registered under sec 2(m) of the Factories Act 1948 and Bidi & Cigar Workers (conditions of employment) Act, 1966.

• A statistical sampling design is adopted for the survey by stratifying the domain in Census and Sample sectors. From sample sector, around 20% sample is taken through circular systematic sampling upto ASI 2011-2012.

• For non-ASI manufacturing sector, NSS covers every five year using area frame in rural area and list frame urban area (from 2005-2006) using various stratified multistage sampling. The last survey was in the year 2010-2011.
ASI data- collection and quality

• There are multi-level trainings at all India and local level
• There are multi-tier scrutiny and field inspection of survey schedules
• There is a web-portal for on-line submission of return
• There are separate offices for data collection and data processing.
• Meetings with industrial associations to facilitate collection
• Publicity
• Regular seminars on industrial statistics to promote research work on industrial data including environmental aspects.
• Published data are available in website www.mospi.nic.in
• Unit level data are available on cost.
Future plan of actions: A study under an expert group is continuing for inclusion of more environmental related data in ASI schedule *viz.* on water and non-conventional energy

Recommendations for inclusion in INPUT block:

- **Quantity consumed and purchase value of** Petrol, Diesel, Other oil, lubricants consumed separately

- **Value** of non-conventional energy own generated and purchased

- **Quantity of**
  1. Water purchased & consumed
  2. Water harvested & consumed
  3. Water own extracted from surface
  4. Water own extracted from ground
Recommendations for inclusion of a separate WATER block:

Quantity of:

a. Waste water generated
b. Waste water treated
c. Treated water released
d. Treated water recycled
e. Others (if any)
f. Metered or not (yes-1, no-2)
END –Part-I

Thanks

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Part-II
Statistical analysis based on environmental data
Share of factories reporting pollution control equipments in last seven years in ASI sector

<table>
<thead>
<tr>
<th>ASI Years</th>
<th>Total Surveyed factories</th>
<th>Factories in operation</th>
<th>Number of factories reported pollution control equipments</th>
<th>Percentage Share (%) over factories in operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-11</td>
<td>61872</td>
<td>49634</td>
<td>2983</td>
<td>6.01</td>
</tr>
<tr>
<td>2010-11</td>
<td>56467</td>
<td>48620</td>
<td>3002</td>
<td>6.17</td>
</tr>
<tr>
<td>2009-10</td>
<td>61114</td>
<td>56112</td>
<td>3268</td>
<td>5.82</td>
</tr>
<tr>
<td>2008-09</td>
<td>58391</td>
<td>51230</td>
<td>3268</td>
<td>6.38</td>
</tr>
<tr>
<td>2007-08</td>
<td>60856</td>
<td>53486</td>
<td>3252</td>
<td>6.08</td>
</tr>
<tr>
<td>2006-07</td>
<td>70725</td>
<td>58311</td>
<td>3458</td>
<td>5.93</td>
</tr>
<tr>
<td>2005-06</td>
<td>60980</td>
<td>57857</td>
<td>3420</td>
<td>5.91</td>
</tr>
</tbody>
</table>

The share of Pollution control equipment is 0.49% of the total fixed capital as per ASI 2010-2011.
Recycling industries
There is an overall growth with huge growth in investment in fixed capital.
Huge growth is noticed in this industry.

Materials recovery industries

Huge growth is noticed in this industry.

Waste treatment & disposal industries

Huge growth is noticed in this industry.
Remediation activities and other waste management services

Though slight fall is noticed in size, growth is noticed in employment, investment and GVA.
Waste produced and consumed
What is waste balance?

- Waste products defined by Central Product Classification version 2.0 as generated from various industries do have economic value. Such products are also used as input raw material in other industries. In some cases, it is found that the demand is very high in the organized sector whereas there are many waste products which have no taker.

- Organised manufacturing sector is the biggest producer and consumer of waste products, a flow matrix shows various waste product as output being consumed as input in other industries in quantity terms.

- The balance so obtained is the waste disposal capacity.
Methodology

• Raw materials classified under Class 39 of NPCMS which are consumed as input by each industry division (NIC 2 digit) reveal the quantity of waste product being used in the organized manufacturing sector as input.

• Similarly, Raw materials classified under Class 39 of NPCMS which are produced as output by the entire organized manufacturing sector (NIC 2 digit) reveal the product-wise quantity of waste product produced in the organized manufacturing sector as output.

• Under the assumption that such output being consumed within the organized the manufacturing sector as input raw material, two flow matrices has been prepared for ASI 2010-2011 and ASI 2011-2012.

• In case total output is greater than total cumulative input, it is termed as excess supply in the economy from the organized sector otherwise it is termed as additional demand.
Figure: Surplus waste in organized manufacturing sector
ASI: 2011-2012

The total production in ASI sector is not used fully in the same sector leading to the possibilities of use in unorganized sector, trade and dumping in nature.
Figure: Additional demand of waste in organized manufacturing sector ASI 2011-2012

- Clinical waste, including pharmaceutical waste
- Vessels and other floating structures for breaking up
- Wastes from chemical or allied industries
- Waste and scrap of primary cells, primary batteries
- Waste organic solvents
- Other wastes n.e.c.
- Waste, parings and scrap of plastics
- Waste of leather, leather dust, powder and flour
- Raw offal, inedible (including pigs' bristles, horse hair,
- Sawdust and wood waste and scrap
- Cocoa shells, husks, skins and other cocoa waste;
- Waste, parings and scrap of rubber (except hard rubber)
- Residues of starch manufacture and similar residues
- Remelting scrap ingots of iron or steel
- Slag, dross, scalings and other waste from manufacture
- Ash and residue (except from the manufacture of iron or steel)
- Waste and scrap of paper or paperboard

Additional demand of waste in '000 tonne
Polluting industries
Size structure of large and small polluting industries by type of activity in India (number)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large</td>
<td>Small</td>
<td>Total</td>
<td>Large</td>
<td>Small</td>
</tr>
<tr>
<td>Aluminium, Copper, Zinc</td>
<td>2627</td>
<td>23418</td>
<td>26045</td>
<td>1719</td>
<td>20056</td>
</tr>
<tr>
<td>Cement</td>
<td>1510</td>
<td>11633</td>
<td>13143</td>
<td>1185</td>
<td>5526</td>
</tr>
<tr>
<td>Soap &amp; Detergent</td>
<td>3794</td>
<td>84220</td>
<td>88014</td>
<td>4632</td>
<td>268638</td>
</tr>
<tr>
<td>Distillery</td>
<td>979</td>
<td>140284</td>
<td>141263</td>
<td>339</td>
<td>128639</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>626</td>
<td>694</td>
<td>1320</td>
<td>636</td>
<td>2975</td>
</tr>
<tr>
<td>Iron &amp; Steel</td>
<td>3820</td>
<td>10181</td>
<td>14001</td>
<td>4374</td>
<td>5786</td>
</tr>
<tr>
<td>Pesticides</td>
<td>433</td>
<td>320</td>
<td>753</td>
<td>531</td>
<td>676</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>7444</td>
<td>8756</td>
<td>16200</td>
<td>4042</td>
<td>4480</td>
</tr>
<tr>
<td>Pulp &amp; Paper</td>
<td>1250</td>
<td>4466</td>
<td>5716</td>
<td>1064</td>
<td>2506</td>
</tr>
<tr>
<td>Sugar</td>
<td>17837</td>
<td>100637</td>
<td>118474</td>
<td>37915</td>
<td>50043</td>
</tr>
<tr>
<td>Total</td>
<td>40320</td>
<td>384609</td>
<td>424929</td>
<td>56437</td>
<td>489325</td>
</tr>
</tbody>
</table>
Industries considered for statistical analysis are:
- Aluminium, Copper, Zinc
- Cement
- Soap & Detergent
- Distillery
- Fertilizer
- Iron & Steel
- Pesticides
- Pharmaceuticals
- Pulp & Paper
- Sugar

It is notable that the size and growth in polluting small industries has reduced drastically in the year 2010-2011 compared to its growth in 2005-2006 over 2000-2001.
Due to strict pollution control norms, large industries in this sector mandatorily use measures to control pollution.
END