Hazardous Chemicals

Economic growth has resulted in increased production and import of hazardous chemicals for various activities such as industry and agriculture. Statistical data from the Customs department on the import of organic and inorganic hazardous chemicals in 2003 shows that 4.6 million tons of hazardous chemicals were imported. Data on number of production amount registered with Department of Industrial Works and Industrial Estate Authority of Thailand by industries in the category 42(1)(2) chemical or hazardous substances shows that 22.3 million tons were produced in Thailand. The total amount of hazardous chemical is 26.9 million tons (Table 1 and Figure 1). These chemicals used in various activities have had an impact on the health of the public, the factory workers and the farmers. Report from the Department of Disease Control, Ministry of Public Health shows that in 2003 there were 2,623 cases of patients suffering from hazardous chemicals and 9 deaths. There were 217 cases of illness from exposure to industrial activities and 2,406 cases of illness from exposure to pesticide usage with 9 deaths. Also in 2003 there were a total of 28 chemical emergency complaints.

Table 1. Amount of hazardous chemicals imported and produced in Thailand 1994-2003 (tons)

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</thead>
<tbody>
<tr>
<td>Import amounts*</td>
<td>3.01</td>
<td>3.23</td>
<td>3.40</td>
<td>3.22</td>
<td>3.11</td>
<td>3.37</td>
<td>3.54</td>
<td>4.59</td>
<td>5.38</td>
<td>4.60</td>
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<tr>
<td>Production amount**</td>
<td>5.88</td>
<td>6.61</td>
<td>8.89</td>
<td>9.70</td>
<td>9.80</td>
<td>9.87</td>
<td>14.23</td>
<td>24.74</td>
<td>28.00</td>
<td>22.30</td>
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<tr>
<td>Total</td>
<td>8.89</td>
<td>9.84</td>
<td>12.29</td>
<td>12.92</td>
<td>12.91</td>
<td>13.24</td>
<td>17.77</td>
<td>29.33</td>
<td>33.38</td>
<td>26.90</td>
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</table>

Note:
* Import data from Customs Department
** Production amount refers to the highest production rate registered with the Department of Industrial Works and Industrial Estate Authority of Thailand

Figure 1. Import and production trends of hazardous chemicals in Thailand.
Health Impacts from Exposure to Industrial Hazardous Chemicals

From the statistical data from the Ministry of Public Health in 2003, there were 217 patients suffering from hazardous chemical exposure to industrial activities (Table 2 and Figure 2). There is a 14% increased from 2002, due to increased severity in hazardous chemical accidents during transportation and production. Workers in the factories and neighboring communities are the groups exposed to these chemicals. The hazardous chemicals with health impacts are solvents, 98 cases, toxic gases and vapors, 41 cases, and heavy metals such as Mn, Hg and Ar, 38 cases and Pb 40 cases.

Table 2. Number of patients and deaths due to hazardous chemical exposure (person)

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</thead>
<tbody>
<tr>
<td>Agricultural illness</td>
<td></td>
<td>3,165</td>
<td>3,398</td>
<td>3,175</td>
<td>2,844</td>
<td>4,305</td>
<td>4,171</td>
<td>3,054</td>
<td>2,388</td>
<td>2,511</td>
<td>2,406</td>
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<td>Hazardous chemicals</td>
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<tr>
<td>death</td>
<td></td>
<td>39</td>
<td>21</td>
<td>32</td>
<td>29</td>
<td>18</td>
<td>33</td>
<td>20</td>
<td>15</td>
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<td>9</td>
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<tr>
<td>Industrial illness</td>
<td></td>
<td>104</td>
<td>162</td>
<td>201</td>
<td>211</td>
<td>287</td>
<td>365</td>
<td>1,170</td>
<td>266</td>
<td>191</td>
<td>217</td>
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</tr>
<tr>
<td>death</td>
<td></td>
<td>1</td>
<td>2</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Total</td>
<td></td>
<td>3,269</td>
<td>3,560</td>
<td>3,376</td>
<td>3,055</td>
<td>4,592</td>
<td>4,536</td>
<td>4,224</td>
<td>2,654</td>
<td>2,702</td>
<td>2,623</td>
</tr>
</tbody>
</table>

Source: Department of Disease Control, Ministry of Public Health

Figure 2. Trend of patients and deaths due to hazardous chemical exposure 1994-2003
Northeastern region has the highest number of patients, 83 cases. Northern region has 64 cases, central region 46 cases and southern region 24 cases (Figure 3).

Health Impacts from Exposure to Agricultural Hazardous Chemicals

From the statistical data from the Ministry of Public Health in 2003, there were 2,415 patients and 9 deaths from hazardous chemical exposure from agricultural activities (Table 2). There is a 4% decrease from 2002, due to actions taken concerned agencies following the policy and national plan on Pesticide use 2002-2006. These activities include the production of pesticide free fruits and vegetables, safe use of pesticide training for farmers, promotion of organic farming and use of biological alternatives to pesticides.

Most of the patients were from the northern region, 1,358 cases. Northeastern region has 657 cases, central region 347 cases and southern region 44 cases (figure 4). The top ten provinces with the highest number of patients are Petchaboon (234 cases), Nakorn sawan (219 cases), Nakom ratchasima (202 cases), Kampaengpetch, (156 cases), Uthai Thani (149 cases), Pichit (146 cases), Pitsanulok (134 cases), Sukothai (118 cases), Udon Thani (106 cases) and Srisaket (93 cases).
Actions taken to resolve problems from hazardous chemicals in 2003


   The Department of Disaster Prevention and Mitigation, Interior Ministry is the main agency to integrate the action plan and budget plan of the national plan on chemical substance safety development, as well as prevention and mitigation of chemical disasters and chemical risk area management according to the preliminary consideration committee to the Cabinet on the 31st of July 2003. In the integration of the plan, meetings were held between concerned agencies and the Budget Bureau to consider the projects and plans and adjust the proposed budget to correspond appropriately to the mission.

   The action plan and budget plan for 2004-2006, under the national plan on chemical substance safety development 2nd edition 2002-2006 comprises of 5 strategies as follows:
   
   1. Development of national chemical data network, which controls, directs and oversees the chemical to comply with the law. Set up and develop the chemical data network for the benefit of relevant agencies, with the Department of Industrial Works as the responsible agency.
   
   2. Development of the chemical accident prevention management system. National Disaster Prevention Board is the main agency to set the policy and guidelines in as prevention and mitigation of chemical disasters with Department of Disaster Prevention and Mitigation as the main coordinating agency to implement the policy. Their role is to coordinate among relevant agencies to implement the plan in the same direction. The provincial and local authorities are the main agencies at the implementation level with Pollution Control Department providing technical support and expertise.
   
   3. Promoting the management of chemical waste. Department of Industrial Works and Pollution Control Department are the main agencies responsible for the reduction of chemical waste and increase the effectiveness of chemical waste disposal. This includes controlling and management of the chemical waste to prevent causing public harm.
   
   4. Development of the National Toxicology Network Center. The Department of Medical Services is the main agency responsible for treating and rehabilitating patients exposed to chemicals.
   
   5. Research and development. The Thailand research fund is the main agency responsible for coordinating among relevant agencies.

   Department of Disaster Prevention and Mitigation has proposed the action plan and budget plan for 2004-2006, under the national plan on chemical substance safety development 2nd edition 2002-2006 to the National Disaster Prevention Board on the 4th meeting of 2003 on the 26 November 2003 and to the cabinet on the 10th February 2004. Both meetings have agreed on the principals of the strategies and measures of the national plan on chemical substance safety development 2nd edition 2002-2006. The concerned agencies are responsible for requesting for their budget from the Budget Bureau.

Fifty countries have ratified the convention in December 2003, which will enter into force on 24th February 2004. The first Conference of the Parties (COP1) will be held in September 2004 in Switzerland. The Intergovernmental Negotiating Committee at its 10th Session (INC10) on the 17-21 November 2003, considered in detail the procedures in implementing the convention, preparations for the first COP, adding chemicals to the prior informed procedure. The meeting also discussed the inclusion of the chemicals Amosite, Actinolite, Anthophyllite, Tremolite and Chrysotile Asbestos, the chemical DNOC and its salts (such as ammonium salt, potassium salt and sodium salts), severely hazardous pesticide formulation: dustable powder formulations containing Benomyl at or above 7%, Carbofuran at or above 10% and Thiram at or above 15% and the adoption of the draft decision guidance documents. The inclusion was proposed from the Interim Chemical Review Committee at its Fourth Session (ICRC4), Rome, 3-7 March 2003. Thailand’s representative to the meeting was appointed to be the expert for the Asian region in the Interim Chemical Review Committee to review additional chemicals and consider the procedures in implementing the convention. Thailand has also joined with GTZ and UNEP chemicals to organize a workshop on PCB management and the Rotterdam Convention for 14 countries in the Southeast Asian region in April 2003.
3. Stockholm Convention on Persistent Organic Pollutants (POPs)

Fifty countries will have ratified the convention in February 2004, and the convention will enter into force on 17th May 2004. The secretariat of the Stockholm convention organized the seventh session of the Intergovernmental Negotiating Committee (INC) during 14-18 July 2003 in Switzerland. This meeting is continuous from the previous meeting and will be the last meeting before the first Conference of the Parties (COP) in Uruguay in 2005. The meeting discussed the international measures in promoting human and ecological health before the convention enters into force. The meeting also discussed the preparations for the first COP and measures in reducing or eliminating the release of POPs from intentional and unintentional production and stockpiles and wastes, listing of chemical in appendix A, B and C, technical support, resources and financial mechanisms and location of the secretariat. Thailand is in the process of drafting a national implementation plan within 2 years, with funding from GEF and UNEP Chemicals as the project manager. Also PCD has joined with BMA and GTZ in conducting an assessment study on improving the existing crematoriums in the nation during July - December 2003.
Chemical Emergency

According to the statistical data gathered from public complaints and concerned agencies notification to Pollution Control Department in 2003 there were 28 chemical emergencies. PCD has provided technical support as well as sending personnel to assist the local authorities on scene. There were 4 incidents at factories, 2 incidents at chemical warehouses, 6 incidents during transportation, 15 counts of illegal dumping and 1 incident of other category. These chemical accidents that impacted human health and the environment can be divided into 16 incidents of leakage and 3 incidents of fires. The total number of casualties was 35 persons with monetary loss of 150 million baht. The most accident prone areas are Bangkok and Samutprakan, respectively.

Significant chemical emergencies were the agricultural chemical warehouse fire of the Agricultural Office of Pattalung on 28 June 2002 and the fire at Thai Urethane Plastic Company on the 7th May 2003. However when compared to previous years, the severity of the accidents and number of casualties and deaths have decreased. This is due to the chemical emergency response training in 2002 for the local authorities. The network enabled a quick response, which reduced the impacts to human and ecological health. Most of the chemical accidents result from human mistake, intentional non-compliance, lack of safety assessment system on site or at the warehouse, irresponsible driving and illegal waste dumping.

These problems could be prevented from the combined effort of concerned agencies. Responsible agencies should strengthen law enforcement and proceed to punish the wrongdoer. Entrepreneurs should comply with the law. The priority measure is to increase capacity building for local authorities to manage possible accidents. Pollution Control Department as a technical supporting agency in the prevention of chemical disasters according to the national disaster prevention plan, has joined with relevant agencies, especially Department of Disaster Prevention and Mitigation, to organize training for local authorities in high risk areas. The objective is to increase the capabilities and effectiveness of local authorities in chemical emergency management in order to rapidly eliminate human and ecological health risks.