



## IPEN Chemicals in Products Initiative Project Report

**NGO:** Center for Public Health and Environmental Development (CEPHED)

**Country:** Nepal

**IPEN Region:** South Asia

**Title of project:** Strengthening Chemicals in Product Campaign towards Effective SAICM Implementation in Nepal.

**Elements of SAICM Covered:** Chemicals in Products (CiP)

### **Describe the specific product(s) and chemical(s) related to the activity:**

52 toys, which are an integral part of child development, were purchased from 4 different cities (Janakpur, Bharatpur, Kathmandu and Lalitpur) in Nepal from December 2017 to January 2018.

Samples were coded with the help of the templates provided for the project. The samples were sent to the Nepal Handicraft Association and Government of Nepal, Ministry of Industry, Commerce and Supply, Department of Nepal Bureau of Standard and Metrology's Lab for XRF (x-ray fluorescence) analyzation for heavy metals like lead, cadmium, mercury, chromium, selenium, nickel, antimony and titanium, and some other elements like barium, boron and zinc. Five of the 52 samples- those made of soft rubber - were sent to the NGO EcoWaste Coalition in the Philippines to deliver to a testing laboratory in order to further test for phthalates. The phthalates testing was done at SGS, Taiwan LTD, by a method (CPSC-CH=C1001-09.3+ (2010)). Analysis was performed by GC/MS.



Figure 1. Toys purchased and tested for heavy metals in Nepal

## Describe the toxic effects of the chemicals contained in the product(s):

The heavy metals contained in the products include cadmium, lead, arsenic, chromium (VI) and mercury. Phthalates were also found in some toys.

### Toxic chemicals and their impacts:

| Chemicals | Health Impacts   |
|-----------|--|
| Lead      | Lead is a well-known neurotoxicant with no safe level of exposure. The harms from childhood lead exposure are irreversible and persist into adolescence and adulthood. Lead has sensory, motor, cognitive and behavioral impacts, including learning disabilities; attention deficits; disorders in a child's coordination, visual, spatial and language skills, and anemia. In 2012, the US Centers for Disease lowered the defining limit for lead poisoning in children from 10 to 5 micrograms per deciliter of blood and emphasized "...preventing lead exposure rather than responding after the exposure has taken place".<br><a href="http://www.cdc.gov/ncet/lead/ACCLPP/CDC_Response_Lead_Exposure_Recs.pdf">http://www.cdc.gov/ncet/lead/ACCLPP/CDC_Response_Lead_Exposure_Recs.pdf</a>                               |
| Cadmium   | Cadmium is a known human carcinogen and associated with cancers of the breast, kidney, lung, pancreas, prostate and urinary bladder. The State of California recognizes cadmium as a reproductive toxicant. Cadmium is taken up by various crops including potatoes, root crops, leafy vegetables, and fruits. Other toxic endpoints include lung damage, renal dysfunction, hepatic injury, bone deficiencies, and hypertension.<br><a href="http://oehha.ca.gov/prop65/prop65_list/Newlist.html">http://oehha.ca.gov/prop65/prop65_list/Newlist.html</a><br><a href="http://www.oehha.ca.gov/prop65/pdf/CD-HID.pdf">http://www.oehha.ca.gov/prop65/pdf/CD-HID.pdf</a><br><a href="http://www.oehha.ca.gov/prop65/pdf/CD-HID.pdf">http://www.oehha.ca.gov/prop65/pdf/CD-HID.pdf</a>   |
| Mercury   | Can cause nerve, brain and kidney damage, lung irritation, eye irritation, skin rashes, vomiting and diarrhea, disruption of the nervous system, damage to brain functions, degradation of learning abilities, personality changes, tremors, vision changes, deafness, muscle incoordination and memory loss.  |
| Chromium  | Chromium VI is a known human carcinogen. Dermal exposure to chromium VI can cause dermatitis and ulceration of the skin and chronic inhalation or oral exposure can decrease lung function and affect the liver, kidney and immune systems. Lab studies link chromium VI to birth defects and reproductive problems.<br><a href="http://www.epa.gov/ttnatw01/hlthef/chromium.html">http://www.epa.gov/ttnatw01/hlthef/chromium.html</a><br><a href="http://www.inchem.org/documents/iarc/vol49/chromium.html">http://www.inchem.org/documents/iarc/vol49/chromium.html</a><br><a href="http://www.epa.gov/ttnatw01/hlthef/chromium.html">http://www.epa.gov/ttnatw01/hlthef/chromium.html</a><br><a href="http://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=61&amp;tid=17">http://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=61&amp;tid=17</a> |
| Bromine   | Bromine is corrosive to human tissue in a liquid state and its vapors irritate eyes and throat. Bromine vapors are very toxic with inhalation. Humans can absorb organic bromines through the skin, with food and during breathing.<br><a href="https://www.lenntech.com/periodic/elements/br.htm">https://www.lenntech.com/periodic/elements/br.htm</a>   |
| Zinc      | Zinc appears to affect the male reproductive system (sperm count). Prolonged or repeated contacts can cause dermatitis with drying and cracking of the skin<br><a href="https://nj.gov/health/eoh/rtkweb/documents/fs/2021.pdf">https://nj.gov/health/eoh/rtkweb/documents/fs/2021.pdf</a>   |
| Barium    | Effects such as numbness, muscle weakness, and paralysis may occur following exposure to high levels of barium or soluble barium compounds by inhalation or ingestion. Children do not always respond to chemicals in the same manner as adults. Different protocols for managing their care may be needed.<br><a href="https://www.atsdr.cdc.gov/MMG/MMG.asp?id=321&amp;tid=57">https://www.atsdr.cdc.gov/MMG/MMG.asp?id=321&amp;tid=57</a>   |

|                          |   |
|--------------------------|---|
| Bisphenol-A              | Bisphenol-A (BPA) is known as an endocrine-disrupting chemical (EDC) that mimics the hormone estrogen and has been linked to numerous negative health effects including breast cancer, obesity, reproductive problems, early puberty, heart disease and infertility. It also sparks multiple negative brain alterations.                    |
| Phthalates               | Can impact the neurodevelopmental stage and cause behavioral changes, aggressiveness and problems with attention. Exposures may produce developmental defects and increase the risk of diseases such as cancer later in life. Phthalates can also cause adverse impacts on the reproductive system, kidneys, liver, and respiratory system. |
| Polyvinyl Chloride (PVC) | Can cause cancer, birth defects, reproductive and developmental disorders, low sperm count, undescended testes and liver dysfunction.   |

## Describe how consumers are exposed to these toxic chemicals:

In general, people get exposed to these toxic chemicals through various means. They can enter your body when you breathe polluted air, eat contaminated food, and drink water containing toxic chemicals. Another important route of entry for chemicals and metals is through using and handling consumer products that contain them. Adverse health effects occur when toxic pollution is inhaled or ingested.

While toxic chemicals threaten everyone's health, infants and children are especially vulnerable as they are more sensitive to the effects of toxic chemicals when their organs are still developing, and their bodies are less able to detoxify<sup>1</sup>. Babies in the womb are exposed to hundreds of dangerous chemicals via the umbilical cord. As a result, modern children are born already "pre-polluted" with numerous hazardous chemicals in their bodies. Tests conducted in 2004 in US hospitals revealed a total of 287 chemicals in the umbilical cord blood of 10 children. Of these chemicals, it is known that 180 cause cancer in humans or animals, 217 are toxic to the brain and nervous system, and 208 cause birth defects or abnormal development. Among the chemicals found in cord blood were mercury, fire retardants and the Teflon constituent PFOA<sup>2</sup>.

When a child is born, exposure continues and even increases. According to Physicians for Social Responsibility, "children ingest more food and water relative to their body weight, they are constantly on the ground where contaminants collect, their defenses are not fully developed, and their high skin-to-body-mass ratio means they are more sponge like than adults"<sup>3</sup>.

In addition, children get exposed to toxic chemicals in products, including toys, through normal hand-to-mouth behaviour, skin contact or while chewing. Children's products may become a serious source of exposure when they may contain heavy metals, including antimony, arsenic, cadmium, chromium, lead, and mercury. All six metals are well-known to cause serious harm to human health, especially in children, from mild pain to permanent loss of Intelligent Quotient (IQ)<sup>4</sup>. Toys may also contain different types of phthalates, Bisphenol A, brominated flame retardants and many other toxic substances. Many toys are made of PVC that can contain lead, phthalates and volatile organic compounds.<sup>5</sup> Because children spend a lot of time playing with toys, toxic chemicals present in toys sooner or later come into contact with children, putting their health at risk.

1 <http://www.uniteforsight.org/environmental-health/module2>

2 [https://www.foodsmatter.com/infant\\_child/research/toxic\\_chemicals\\_prenatal.html](https://www.foodsmatter.com/infant_child/research/toxic_chemicals_prenatal.html)

3 <https://www.psr.org/wp-content/uploads/2018/05/prenatal-exposure-to-chemicals.pdf>

4 <http://ipen.org/site/toxics-products-overview>

5 <https://www.smallfootprintfamily.com/toxic-chemicals-in-toys>

## Describe how the product waste that contains the hazardous chemical(s) is handled:

There isn't any hazardous waste management policy in place in Nepal, despite the fact that it became a Party to the Basel Convention decades ago. At the moment, once toys are no longer used, they generally get mixed with household wastes and end up in landfills or along river banks, or are burnt along with other household waste. In any of these cases, toy waste releases toxic chemicals into the environment, and thus contributes to overall exposure.

## Describe any national legislation that regulates this type of waste:

There are a number of national laws that regulate waste management, as well as legislation that protects children's and workers' (waste workers') rights.

Nepal has promulgated a Constitution through the Constituent Assembly on 20 September 2015 that encompasses over 30 different fundamental rights including that of children, workers and/or labourers, and also includes the compensation provision in case of failure of ensuring these fundamental rights by perpetrator.

The major rights relevant to workers included into the Constitution of Nepal<sup>6</sup> are:

| Articles<br>(Sub Articles) | Description of Fundamental Right  |
|----------------------------|---|
| 16                         | <b>Right to live with dignity</b>   |
| 27                         | <b>Right to information:</b> Every citizen shall have the right to seek information on any matters of concern to her/him or the public.                                     |
| 30 (1)                     | <b>Right regarding clean environment:</b> Each person shall have the right to live in a healthy and clean environment.  |
| 30(2)                      | The victim of environmental pollution and degradation shall have the <b>right to be compensated</b> by the pollutant as provided for by law.                                |
| 34 (1)                     | <b>Right regarding labour:</b> Every labourer shall have the right to proper work practices.  |
| 34 (2)                     | Every labourer shall have the <b>right to appropriate remuneration, facilities and contribution-based social security.</b>  |
| 35 (1)                     | <b>Right to healthcare:</b> Every citizen shall have the right to seek basic health care services from the state and no citizen shall be deprived of emergency health care. |
| 35 (2)                     | Each person shall have the <b>right to be informed about his/her health condition</b> with regard to health care services.  |
| 35 (3)                     | Each person shall have <b>equal access to health care.</b>  |
| 35 (4)                     | Each citizen shall have the <b>right to access to clean water and hygiene.</b>  |
| 36(1)                      | <b>Right to food:</b> Each citizen shall have the right to food.  |
| 38(2)                      | Every woman shall have the right relating to <b>safe motherhood and reproductive health.</b>  |
| 38(5)                      | Women shall have the <b>right to special opportunity in the spheres of education, health, employment and social security</b> on the basis of positive discrimination.       |

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<sup>6</sup> The Constitution of Nepal, 2015

Other legislative frameworks for waste management and environmental conservation are as follows:

| S.No. | Legislation   | Legislative provisions  |
|-------|---|---|
| 1     | <b>Environment Protection Act (EPA-1997) and Environment Protection Regulation (EPR 1997)</b> | <p>EPA and EPR do not have exclusive provisions for the Occupational Safety and Health; however, all industries of a hazardous nature are required to carry out full-scale Initial Environmental Examination (IEE) and/or Environmental Impact Assessment (EIA), depending on their scale. For example, the asbestos industry falls under non-metallic industries, e.g. asbestos industries of all sizes (Schedule 2, Rule 3, B. Industrial Sector, 12. Production of Asbestos) and are required to fulfill an EIA clearance; however, such cancer causing industries do not require a Pollution Control Certificate as per the Schedule-7 (Relating to Sub-Rule (1) of Rule 16) of the Environment Protection Regulation.<sup>7</sup> These provisions of EPA and EPR need to be amended and make it compatible with the government asbestos banning decision.</p> <p><b>Environment Protection Act 1997, Section (7). Prevention and Control of Pollution</b></p> <p>Sub Section 7 (1): Nobody shall create pollution in such a manner as to cause significant adverse impacts on the environment or likely to be hazardous to public life and people's health, or dispose or cause to be disposed sound, heat radioactive rays and wastes from any mechanical devices, industrial enterprises, or other places contrary to the prescribed standards.</p> <p>Sub Section7 (3): If it appears that the use of any types of substance, fuel, tools or device has caused or is likely to cause significant adverse impacts on the environment, the <b>Ministry may, by a notification in the Nepal Gazette, forbid the use of such substance, fuel, tools or device.</b></p> <p><b>Chapter 3</b> of Environment Protection Regulation deals with <b>Prevention and control of pollutions (rule 15)</b>. Prohibition to emit waste in contravention of the prescribed standards: No one shall emit or cause to emit the noise, heat and waste from any mechanical means, industrial establishment or any other place in contravention of the standards prescribed by the Ministry by a Notification published in the Gazette.</p> |
| 2     | <b>Solid Waste Management Act 2011 and Solid Waste Management Regulation 2013</b>             | <p>Enacted to make management of solid waste systematic and effective by reducing at its source, re-use, processing or discharge, and for maintaining a clean and healthy environment through the reduction of adverse effects that may be caused to the public health and environment. It defines “<b>Solid Waste</b>” to mean domestic waste, industrial waste, chemical waste, health institution-related waste or harmful waste, and this word shall also mean the materials which cannot be used and are thrown away. It also defines “<b>Harmful Waste</b>”</p>   |

<sup>7</sup> Environment Protection Act 1997 and Environment Protection Regulation 1997

|   |   |   |
|---|---|---|
|   |   | <p>as any substance, matter or radioactive radiation produced in any form, capable of derogating the natural environment, causing damage or injury to human or living being's health.</p> <p>Though local bodies are held responsible for managing solid waste, the prime responsibility for the processing and management, within the set standard of harmful waste, health institution-related waste, chemical waste or industrial waste, shall be of the individual or body producing such solid waste (Section 4).</p>  |
| 3 | <b>Convention on the Rights of the Child (CRC)</b>  | <p>The Convention on the Rights of the Child is the first legally binding international instrument to incorporate the full range of human rights—civil, cultural, economic, political and social rights. .</p> <p>The Convention sets out these rights in 54 articles and two Optional Protocols. It states that children everywhere have: the right to survival; to develop to the fullest; <b>protection from harmful influences</b>, abuse and exploitation; and to participate fully in family, cultural and social life.</p> <p>Nepal ratified this Convention in September 1990 and the Ministry of Women, Children and Social Welfare was established in September 1995.</p>   |
| 4 | <b>Basel, Rotterdam and Stockholm Conventions</b><br><br><b>(Nepal is a Party to all three Conventions)</b>       | <p>The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal entered into force in 1992.</p> <p>The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade entered into force on 24 February 2004.</p> <p>The Stockholm Convention on Persistent Organic Pollutants entered into force on 17 May 2004.</p>  |
| 5 | <b>Strategic Approach to International Chemicals Management (SAICM)</b><br><br><b>Nepal adopted SAICM in 2006</b> | <p>Adopted by the First International Conference on Chemicals Management (ICCM1) on 6 February 2006 in Dubai, the Strategic Approach to International Chemicals Management (SAICM) is a policy framework to promote chemical safety around the world.</p> <p>The fourth session of the International Conference on Chemicals Management welcomed the Chemicals in Products Programme document as a voluntary framework for all Strategic Approach stakeholders. ICCM4 also took note of the guidance on chemicals in products, as a practical means of implementing the chemicals in products programme, and recognized the guidance as a living document that will evolve to address the needs of SAICM stakeholders and encouraged participants to consider the guidance in the implementation.</p> <p>The multi-stakeholder project on chemicals in product has analyzed the need to improve the exchange of information on chemicals contained in products and proposed cooperative actions to address gaps in the current levels of information access. Work is focused on the priority product categories of electronics, toys, building products and textiles.</p> |

## **Describe what information (or level of information) is available to consumers about the toxic chemicals in the product:**

### **What information is available on toy labels?**






The ideas about the right to information and information disclosure under SAICM's plan of action could be achieved through having a national mandatory provision of proper product labeling. This is especially important for children's products, including toys, to minimise toxic exposure. Governments and industry have a duty to prevent children from being exposed to toxic chemicals and pollution. One of the ways to do this is to ensure the right to information about chemicals in children's products, especially those which are known to cause significant negative health impacts.

Labeling chemicals in children's products, along with information about the country of origin, manufacture and expiry dates, and contact details of producers, etc. needs to be mandatory for every single children's product, including toys, produced, imported, marketed, used and disposed of in Nepal. As this mandatory labeling has been missed intentionally and/or un-intentionally from both the original mandatory toys standard enacted in 2017 and the proposed changed toys standard of 2018, there is an urgent need to introduce a mandatory labeling of children's products, including toys.




Out of 52 toys analyzed in 2018, only 22 (42%) of toys produced, imported, marketed and used in Nepal have labeling of safety symbols. The symbols include: EU legal requirements; unsuitable for children under 3; meets British safety standards and adheres to strict advertising and counterfeiting ethics; will not easily catch light from cigarettes or matches; warning symbol of choking hazard; keep city clean; and the "3Rs" (reduce, reuse, recycle) (see Table 1).

However, none of the toys contained labels that list the chemicals contained in them. This clearly violates the right to information enshrined by the Constitution of Nepal 2015 as well as principles of several international treaties, SAICM and CRC.

**Table 1: Safety symbols labeled on children's toys**

|   |  |
|---|--|
|  | Manufacturer's self-declaration that its product meets basic EU legal requirements   |
|  | Unsuitable for children under three years because it might, for instance, contain small parts.                               |
|  | The Lion mark shows that a toy meets British safety standards and adheres to strict advertising and counterfeiting ethics.   |
|  | The Kite mark confirms that the British Standards Institution has tested a product and found it meets a particular standard. |
|  | Will not easily catch light from cigarettes or matches. Does not mean fireproof.   |



|   |   |
|---|---|
|  | Warning symbol to raise awareness about a certain hazard. |
|  | Awareness symbol about disposal.                          |
|  | Awareness symbol about the “3Rs”.                         |

## **Describe what types of similar products are available on the market, including safer alternatives:**

Label analysis of toys purchased in the frame of this study clearly showed that information on what chemicals are in the toys is not disclosed. Consumers are denied their right to information, which leaves them unaware of potential health and environmental hazards associated with children’s products they purchase. There were small percentages of toys available with undetectable level of toxic chemicals, including those made of wood, cotton, paper, glass or stainless steel, as well as less colourful toys. Unfortunately, a majority of toys on the market are made of plastic containing hazardous substances which disrupt hormone systems, effect the brain and behaviour, and cause irreversible health damage, including cancer. However, information on product labels does not help consumers chose a toxic-free toy, leaving them unaware of the product’s toxic health effect. Thus there is an urgent need to have a mandatory labelling provision of the chemical content of children’s products including toys.

No data – no market should become a key principle for substances in children’s products. Governments should introduce fines for selling toys without labeling and health certificates. The amount of fines should be increased depending on the production volume of the manufacturing company.

## **Project Outcomes:**

### **Describe the activities conducted, including methods (number of toys purchased, methods of analysis on heavy metals and phthalates):**

**Sampling of Toys:** A total of 52 toy samples from Janakpur, Bharatpur, Kathmandu, Lalitpur and Bhaktapur were collected.

They are made out of hard plastics, metals, fabrics, soft plastics, cottons, wood, rubber, foams, etc. The purchased toys were produced in Thailand (1), India (5) and China (46).

The sample collection includes a variety of children’s toys such as balls, cars, guns, plastic and fabric animals, mobile, cubes, rattles, whistles, cameras, puzzles, building blocks, etc. While purchasing samples, color was kept in mind i.e. diversification in toy color was chosen.

Samples were purchased from supermarkets, malls, street vendors, retailers, dealers, toy shops, show rooms, cosmetic shops, and educational enterprises.

Samples were coded with the help of the templates provided for the project. The samples were sent to the Nepal Handicraft Association and Government of Nepal, Ministry of Industry, Commerce



and Supply, Department of Nepal Bureau of Standard and Metrology's Lab for XRF (x-ray fluorescence) analyzation for heavy metals like lead, cadmium, mercury, chromium, selenium, nickel, antimony and titanium, and some other elements like barium, bromine and zinc.

Five of the 52 samples- those made of soft rubber - were sent to the NGO EcoWaste Coalition in the Philippines to deliver to a testing laboratory in order to further test for several phthalates. The phthalates testing was done at SGS, Taiwan LTD, by a method (CPSC-CH=C1001-09.3+ (2010). Analysis was performed by GC/MS.

### Working principle of XRF:

X-ray fluorescence analyzers (XRF) can rapidly measure elements in consumer products, paint, soil, metals, and other materials. Modern portable XRF devices are about the size of an electronic hair dryer. The device shoots a low-energy X-ray into the material to be analyzed and then measures the fluorescent spectrum to identify and quantify approximately 20 elements simultaneously. The elements include antimony, arsenic, bromine, cadmium, chlorine, chromium, copper, iron, lead, manganese, mercury, nickel, phosphorous, silver, and zinc. The measurement takes place near the surface of the materials since the X-ray penetrates from just a few microns (metal) to 1/4 inch (plastics and other softer substrates). Measurements can be made in 30 seconds. The sensitivity of the measurement varies depending on the metal and the measurement time. The device can measure less than five parts per million (ppm) arsenic, lead, and mercury, but is slightly less sensitive for measuring antimony, cadmium, and chromium.<sup>8</sup>

### Lab testing of samples using XRF:

When this primary X-ray beam illuminates the sample, it is said to be excited. The excited sample in turn emits X-rays along a spectrum of wavelengths characteristic of the types of atoms present in the sample. The atoms in the sample absorb X-ray energy by ionizing, ejecting electrons from the lower (usually K and L) energy levels. The ejected electrons are replaced by electrons from an outer, higher energy orbital. When this happens, energy is released due to the decreased binding energy of the inner electron orbital compared with an outer one. This energy release is in the form of emission of characteristic X-rays indicating the type of atom present.

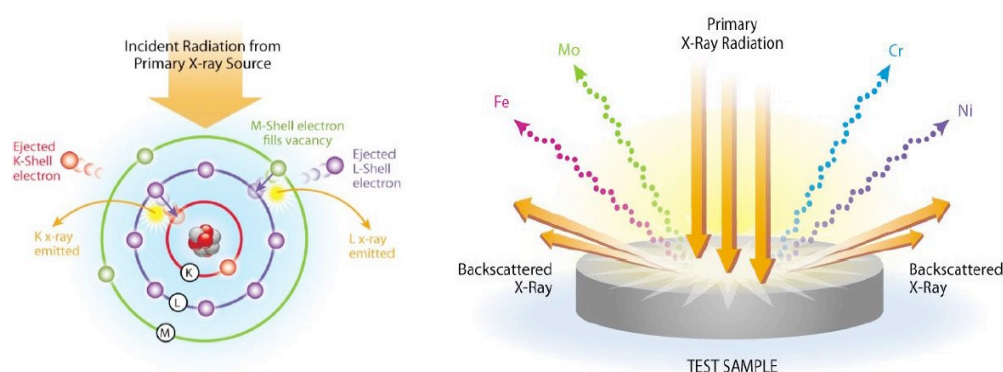


Figure 2. Working principles of XRF

### Describe the result of the activity and its impact on the target policy:

The results of the sampling and the effect of the early media reports have yet to be assessed. Since earlier testing in 2013, we have seen less contamination with respect to individual chemicals, which could indicate an increased level of compliance with the toys standard, but overall, new data that

<sup>8</sup> [http://www.olympus-ims.com/en/downloads/download/?file=285213158&fl=en\\_US](http://www.olympus-ims.com/en/downloads/download/?file=285213158&fl=en_US)

was generated has not been so encouraging. Toys were still found heavily contaminated with the heavy metals and phthalates.

These particular results from the sampling will help to accelerate the discussion to try to reinstate the mandatory toys standard that had been promulgated in 2017. It was recently proposed to make detrimental changes to this standard. Thus our campaign moving forward will focus on restricting the changes.

### Children's toy standard of Nepal 2017 and proposed regressive changes 2018

On January 16, 2017 the government of Nepal adopted a precedent-setting mandatory toy standard for 12 chemicals, including heavy metals, bisphenol A (BPA) and several phthalates, which was enforced six months later, on July 15, 2017 (see Table 2). The standard was the first in the world to limit metals and chemicals in toys based on a total concentration standard, the same way countries regulate lead in paint.<sup>9</sup> This regulatory method is rapid, easy to measure, less costly for developing countries, and clear and unambiguous for both the private sector and consumers. In contrast, the US and EU regulations are based on migration of metals in laboratory conditions.<sup>10</sup> This “extractable elements” approach is cumbersome, expensive, and relies on numerous assumptions that do not prevent exposure – particularly in children.

**Table 2. Mandatory standard of toys, Nepal**

| S.No. | Parameters         | Standard (ppm)<br>Maximum Value | Standard (mg/kg)<br>Maximum Value |
|-------|--------------------|---------------------------------|-----------------------------------|
| 1     | Cadmium (Cd)       | 75                              | 75                                |
| 2     | Chromium (Cr)      | 60                              | 60                                |
| 3     | Lead (Pb)          | 90                              | 90                                |
| 4     | Mercury(Hg)        | 60                              | 60                                |
| 5     | Zinc (Zn)          | 3.75                            | 3.75                              |
| 6     | Antimony (Sb)      | 60                              | 60                                |
| 7     | Arsenic (Ar)       | 25                              | 25                                |
| 8     | Barium (Ba)        | 1000                            | 1000                              |
| 9     | Selenium (Se)      | 500                             | 500                               |
| 10    | Bromine (Br)       | < 100                           | < 100                             |
| 11    | Bis Phenol A (BPA) | BPA Free                        | BPA Free                          |
| 12    | Phthalates         | < 100                           | < 100                             |

Enacting the standard, which encompasses about a dozen toxic chemicals that hinder physical, mental and intellectual growth of children, will not only ensured their right to play safe, but will eventually minimize the negative impacts on health and environment. The standard enacted is a progressive step taken by the government of Nepal, Ministry of Population and Environment (MOPE). The Ministry has now restructured as the Ministry of Forest and Environment (MOFE).

<sup>9</sup> Total concentration expresses mg substance per kg of product (or product part). This approach is usually used in regulating toxic metals in soil or lead in consumer products and paint.

<sup>10</sup> The extractable elements approach requires an extensive preparation procedure to extract metals from certain size particles of a children's product into an acid solution at a certain temperature to attempt to imitate the acidic environment of the stomach. The assumption of the method is that exposure only occurs if a child swallows a portion of the product. However, children can be exposed to toxic metals from dust on the surface of products or by chewing and sucking directly on them. Furthermore, the procedure itself is cumbersome and not appropriate for small- to medium-sized enterprises and developing and transition countries that need a rapid, clear approach to regulation that does not burden already-strained infrastructures.

Even though the mandatory standard has been enacted for just one year, the compliance monitoring has already shown some improvements in the ingredients contained in children's toys. However, the government of Nepal was pressured to make changes to the existing toy standard based on an industry request. A description of the industry request is provided below.

Based on the existing mandatory standard, the government is also required to introduce labeling provisions to ensure the consumer right-to-know what chemicals are in children's products, including toys. However, this request is opposed by the industry basically for the reason of "confidential business information."

The existing mandatory toy standard can be seen in Annex 1.

### **Industry Attempts to Weaken a Protective Law**

This study was published on the first anniversary of Nepal's 2017 mandatory Toy Standard, which set legal limits for 12 toxic substances in children's toys, including heavy metals, bisphenol A (BPA) and phthalate.

In response to the passage of Nepal's 2017 Toy Standard regulations last July, industry lobbyists have been petitioning the Nepalese government to remove BPA and phthalates from the law. These two classes of endocrine disrupting chemicals in plastics are associated with a host of illnesses including cardiovascular disease, obesity, and infertility, and are linked to cancer.

In addition, the industry is urging the government to change how it determines heavy metal levels in products. Chemical experts say that the regulatory method that measures total concentration limit of chemicals is rapid, easy, and less costly for developing countries. It is clear and unambiguous for both the private sector and consumers. However, the "extractable elements" approach, a change industry is advocating, is cumbersome, expensive, and relies on assumptions that do not prevent exposure, particularly in children. Children can be exposed to toxic metals from dust on the surface of products or by chewing and sucking directly on them. This industry-suggested change would be a dangerous move, say chemical experts, that will complicate monitoring and enforcement of the Toy Standard. The assumption of the method based on the "extractable elements" approach is that exposure only occurs if a child swallows a portion of the product.

The industry request is backed up by the rules of the World Trade Organization (WTO). WTO has to be notified about the development of any new national standards in advance. However, the government of Nepal had not done it before July 2017 when the Toy Standards came into force in Nepal. The government is currently revising the standard to meet the requirements of the industry and the WTO rules.

CEPHED believes that the government of Nepal should not put industry's interest over the interests of children and public health. Backtracking on the law to allow dangerous chemicals in toys would be a violation of the fundamental right of children to health that is ensured by the Constitution of Nepal and the Convention on the Rights of the Child (CRC), to which Nepal has been a Party for over 25 years.

Additionally, IPEN Senior Advisor Dr. Olga Speranskaya contends that the shockingly high levels of phthalates discovered in all samples indicate that there are toxic products sold as toys on the market that pose a serious threat to children's health, and that industry should be eliminating endocrine disruptors from toys to keep children safe rather than scheming about how to undermine important protections for children's health.

This time, however, the government has basically started the revision process and informed WTO about the changes. The revised toy standard will have two major deviations from the previous version:

1. Switch from total concentration of chemicals in toys to industry-supported migratory concentration-based standard except for lead (because in the US, the toy standard on lead is based on its total concentration). Nepal used to be the only country in the world that had regulation that limited metals in toys based on the total concentration standard. With enforced industry request, Nepal will lose its leadership in protecting children's health over corporate interests.
2. Instead of 12 chemicals included in the original toy standard, the new one includes only 8, leaving out the most important chemicals like Br, Zn, BPA, and phthalates. This change was made to ensure that nothings restricts the international trade or violates the WTO provisions.

Laboratory analysis of phthalates in toy samples revealed a high concentration of DEHP (Diethylhexyl Phthalate- CAS No. 117-81-7) and DIBP (Disobutyl Phthalates- CAS No. 84-69-5) in all toy samples tested. New data justifies the need to have toy standards for phthalates, but the proposed new standards would revoke phthalates from the previous standard which is a regressive step that puts children's health at risk. The revised toy standard can be seen from <http://www.mope.gov.np/noticedetail.php?id=61>.

**Describe what stakeholders and sectors were engaged in this activity, and whether there is a potential for follow-up to advance the relationships with these stakeholders:**

We talked to media to raise our concerns about the proposed changes to the mandatory toy standard. This was reported on in the national newspaper and reached a huge number of stakeholders, including policy makers as well as business communities and consumers (Figure below of news coverage).

An additional advocacy letter was written to the government of Nepal, Ministry of Forest and Environment (MOFE). The Ministry of Industry, Nepal Bureau of Standard and Metrology, Department of Custom and Department of Environment were also consulted and we held discussions with them.

# 'New toy standard trusts four toxic chemicals'

CHANDAN KUMAR NARDAL  
KATHMANDU, APRIL 23

Within 10 months of enacting toy standard to control children's exposure to harmful chemicals and heavy metals in toys, the government has drafted yet another standard.

The government has said that the Mandatory Toys Standard (MTS), which was enforced on July 15, 2017, had errors in terms of defining the value and testing method of harmful chemicals and it had overlooked a crucial procedure.

"Such standard affect the import and exports. Prior to introducing such standard, we have to inform the World Trade Organisation as it should be in compliance with the provisions mentioned in the Agreement on Technical Barriers to Trade (TBT), which were overlooked," said Bipin Rajbhandari, senior divisional engineer at the Ministry of Forest and Environment (MoFE).

Like the MTS, the new standard has also fixed the maximum permissible limit for concentration of heavy metals and elements in toys.



However, the standard looks comparatively weaker in comparison to its predecessor, as it has excluded four chemicals and elements that are hazardous to humans.

The MTS had restricted the

## ACCEPTABLE CONCENTRATION

| SN | ELEMENTS      | ACCEPTABLE CONCENTRATION            |
|----|---------------|-------------------------------------|
| 1. | Antimony (Sb) | 60                                  |
| 2. | Arsenic (As)  | 25                                  |
| 3. | Barium (Ba)   | 3000                                |
| 4. | Cadmium (Cd)  | 75                                  |
| 5. | Chromium (Cr) | 60                                  |
| 6. | Mercury (Hg)  | 60                                  |
| 7. | Selenium (Se) | 500                                 |
| 8. | Lead (Pb)     | 90 accessible toys/100 painted toys |

maximum value of a total of 12 elements and chemicals and fixed the maximum amount of eight harmful heavy metals and elements. The new standard has excluded four chemicals - Bromine (Br), Bis Phenol A (BPA), Phthalates and Zinc (Zn)- that were listed on the MTS.

According to Anjana Suwal, programme officer with Center for Public Health and Environmental Development (CEPHED), exclusion of harmful chemicals shows a drawback in the proposed standard that is likely to put public health in danger.

"It is sad that the government has excluded four dangerous chemicals from the new standard," said Suwal.

However, the government has said that the excluded chemicals are irrelevant for setting standard for toys.

"These chemicals are not important. After going through international standard, we found them to be irrelevant. Earlier, we had included chemicals which were not in other international standard as well," said Rajbhandari.

A CEPHEP study in 2013, conducted on 100 toy samples, collected from different parts of Kathmandu Valley, had shown that 54 percent of the items contained far higher levels of toxic heavy metals such as lead, mercury, cadmium, chromium and bromine than permissible limits as per international standard.

Continued exposure to toys containing these toxic chemicals affects physical, mental and intellectual growth of children, according to health experts.

Besides removing four toxic heavy metals, the new standard

has also changed the total concentration in toys to migratory concentration of these hazardous elements from toys to children, another downside of the standard, say experts.

The total concentration denotes the total amount of such chemicals in toys, whereas the migratory amount refers to the amount that is transmitted to users once they are exposed.

"The maximum limit of these chemicals should have been the migration amount from toys, not the total amount present in the toys. We had said their total concentration should not cross the maximum limit as mentioned in previous standard, which is not possible. They are likely to have higher concentration," said Rajbhandari.

The proposed standard has, however, fixed the total concentration of lead (Pb) in these toys.

According to the new standard, the total concentration of lead in toys and in paints, painted or coated surfaces of toys materials shall not exceed the maximum concentration limit of 100 ppm and 90 ppm respectively.

"If the maximum total concentration of lead was included, why was similar standard not fixed for other toxic chemicals that are equally hazardous?" said Suwal, adding that the standard has once again missed out the mandatory labelling provision, mentioning the exact amount of chemicals, their amount and warning.

For now, the government has put the previous standard on hold and sent the new draft to the TBT for their suggestion.

Figure 3. News coverage on new proposed standard on toys

**List the types of outputs from the activity, including reports, brochures or other information/education/communication materials:**

**The following outcomes /results occurred after completion the activities:**

- Availability and accessibility of the prepared comprehensive reports with provision of elaborated testing method development or standard operating procedure for analysis of chemicals in products, especially in children's toys. This would be most important for the mandatory labeling that has been missing from the current standard.
- Increased awareness among all stakeholders, especially all concerned government officials responsible for import regulation such as custom officers, market monitoring, issuing license, end of life management agencies, and waste management agencies, as well as consumers as a whole through mass media, etc. Other impacted stakeholders include school teachers, administration, local bodies, research institutions, toys importers and ministries.
- Media sensitization has occurred and will continue to be informed through making the new generated data on the toy samples available to them.
- This report will be released through a series of awareness-raising and capacity-building workshops. The most important stakeholders, like custom officers in one border area who directly contribute to the effective implementation of the toys standards, will be engaged.
- This reports will also be made available through IPEN and CEPHED websites and will be widely accessible in the national and international policy arenas. It will enrich the SAICM process to manage chemicals throughout a product's lifecycle.
- CEPEHD will participate and present the study findings in SAICM regional forums to share the results as well as initiatives with other participating countries and bring back the lessons that will be implemented in Nepal to improve the situation.

**Results of XRF and laboratory testing:**

**Table 3: Overall CiP Template sheet, Part I: Toys Sample Description**

| Sample ID     | City      | Place of purchase | Item Type    | Product Name  | Product label   | ID Number<br>(Batch number<br>or Lot number) | Country<br>origin |
|---------------|-----------|-------------------|--------------|---------------|---|--|-------------------|
| 1Nep14012018  | Bharatpur | Retail            | Hard Plastic | Cock          |   |  | China             |
| 2Nep14012018  | Bharatpur | Retail            | Metal        | Gun           |   | XINSIYUAN-<br>HT838                          | China             |
| 3Nep14012018  | Bharatpur | Retail            | Fabric       | Dog           |   |  | China             |
| 4Nep14012018  | Bharatpur | Retail            | Soft plastic | Big doll      |   |  | India             |
| 5Nep14012018  | Bharatpur | Retail            | Hard plastic | Tolhing phone | Choking hazard, not for children<br>under 3 years                             | 103  | China             |
| 6Nep16012018  | Janakpur  | Cosmetic shop     | Soft plastic | Deer          |   |  | China             |
| 7Nep16012018  | Janakpur  | Baby Zone         | Hard plastic | Bee           | Choking hazard-small parts, not<br>for children under 3 years                 | 3313-1                                       | China             |
| 8Nep16012018  | Janakpur  | Shop              | Hard plastic | Cube          | Choking hazard-small parts, not<br>for children under 3 years                 |  | China             |
| 9Nep16012018  | Janakpur  | Shop              | Hard plastic | Rattle        | Choking hazard-small parts, not<br>for children under 3 years                 |  | China             |
| 10Nep16012018 | Janakpur  | Shop              | Hard plastic | Rattle        |   | 2108   | China             |
| 11Nep16012018 | Janakpur  | Retail            | Hard plastic | Whistle       |   |  | China             |
| 12Nep16012018 | Janakpur  | Shop              | Hard plastic | Mobile        | Not suitable for children under 6<br>years                                    |  | China             |
| 13Nep16012018 | Janakpur  | Shop              | Hard plastic | Glass         |   |  | China             |
| 14Nep04022018 | Bhaktapur | Toy Shop          | Soft plastic | Small doll    |   |  | China             |
| 15Nep04022018 | Bhaktapur | Toy Shop          | Cotton       | Bear          |   |  | China             |
| 16Nep04022018 | Bhaktapur | Toy Shop          | Soft plastic | Ball          |   |  | China             |
| 17Nep04022018 | Bhaktapur | Toy Shop          | Hard plastic | Car           |   |  | China             |
| 18Nep04022018 | Bhaktapur | Toy Shop          | Hard plastic | Gun           |   |  | China             |
| 19Nep04022018 | Lalitpur  | Labim Mall        | Metal        | Car           | Not suitable for children under 36<br>months. Small parts may be<br>generated | DFK71-0911                                   | Thailand          |



|               |           |                       |              |                 |  |        |       |
|---------------|-----------|-----------------------|--------------|-----------------|--|--------|-------|
| 20Nep04022018 | Lalitpur  | Ekta Book Center      | Wood         | Puzzle          |  |        | China |
| 21Nep04022018 | Lalitpur  | Ekta Book Center      | Foam         | Building blocks |  | B0XO31 | China |
| 22Nep04022018 | Lalitpur  | Saleways Department   | Hard plastic | Camera baby     |  |        | China |
| 23Nep04022018 | Lalitpur  | Saleways Department   | Hard plastic | Toys water      | Choking hazard, not for children under 3 years             |        | China |
| 24Nep04022018 | Lalitpur  | Saleways Department   | Rubber       | Ox              |  |        | China |
| 25Nep03022018 | Nepalgunj | Shop                  | Hard plastic | Doremon         | Choking hazard-small parts, not for children under 3 years | 399-4  | China |
| 26Nep04022018 | Kathmandu | Expression shop       | Plastic      | Animal kit      | Choking hazard-small parts, not for children under 3 years |        | China |
| 27Nep05022018 | Kathmandu | Retail                | Hard plastic | Police van      | Choking hazard-small parts, not for children under 3 years |        | China |
| 28Nep05022018 | Kathmandu | Shopping center       | Rubber       | Alligator       | Choking hazard-small parts, not for children under 3 years |        | China |
| 29Nep05022018 | Kathmandu | Gift and toy shop     | Hard plastic | Bat and ball    | Remove polybag, Staples and card from the product          |        | India |
| 30Nep05022018 | Kathmandu | Gift and toy shop     | Rubber       | Tortoise        |  |        | India |
| 31Nep05022018 | Lalitpur  | Bhatbhateni, Pulchowk | Hard plastic | Gun             | Choking hazard-small parts, not for children under 3 years |        | China |
| 32Nep05022018 | Kathmandu | Small show room       | Rubber       | Balls           | Choking hazard-small parts, not for children under 3 years |        | China |
| 33Nep05022018 | Kathmandu | Small show room       | Rubber       | Cock            |  |        | China |
| 34Nep05022018 | Kathmandu | Small show room       | Rubber       | Duck            |  |        | China |
| 35Nep05022018 | Kathmandu | Small show room       | Hard plastic | Tiger           |  |        | China |
| 36Nep05022018 | Kathmandu | Small show room       | Rubber       | Crocodile       | Choking hazard-small parts, not for children under 3 years |        | China |
| 37Nep05022018 | Kathmandu | Small show room       | Hard plastic | Cube            | Not suitable for children under 3 years due to small parts |        | China |

|               |           |               |              |                 |  |          |       |
|---------------|-----------|---------------|--------------|-----------------|--|----------|-------|
| 38Nep05022018 | Kathmandu | Toy Shop      | Rubber       | Ball            |  |          | China |
| 39Nep05022018 | Kathmandu | Toy Shop      | Hard plastic | Helicopter      | Choking Hazard-small parts, not for children under 3 years | 218      | China |
| 40Nep05022018 | Kathmandu | Toy Shop      | Rubber       | Barbie doll     |  |          | India |
| 41Nep05022018 | Kathmandu | Toy Shop      | Hard plastic | Skipping rope   |  | 578      | China |
| 42Nep05022018 | Kathmandu | Toy Shop      | Hard plastic | Ring            | For ages 3 and up  |          | China |
| 43Nep05022018 | Kathmandu | Toy Shop      | Rubber       | Panda           |  |          | China |
| 44Nep05022018 | Kathmandu | Sashi Traders | Hard plastic | Duck            | Not suitable for children under 3 years                    |          | China |
| 45Nep05022018 | Kathmandu | Sashi Traders | Rubber       | Ball and animal |  |          | China |
| 46Nep05022018 | Kathmandu | Sashi Traders | Rubber       | Giraffe         |  |          | China |
| 47Nep05022018 | Kathmandu | Romi Traders  | Wood         | Puzzle          |  | WZP-8107 | China |
| 48Nep05022018 | Kathmandu | Romi Traders  | Wood         | Frog tower      | Choking hazard-small parts, not for children under 3 years |          | China |
| 49Nep05022018 | Kathmandu | Romi Traders  | Hard plastic | Tower           | Choking hazard-small parts, not for children under 3 years |          | China |
| 50Nep05022018 | Kathmandu | Romi Traders  | Rubber       | Sheep           | Choking hazard-small parts, not for children under 3 years |          | China |
| 51Nep05022018 | Kathmandu | Romi Traders  | Rubber       | Ball            |  |          | China |
| 52Nep07022018 | Lalitpur  | Labim Mall    | Plastic      | Teether         |  |          | China |

**Table 4: Overall CiP Template sheet, Part II: XRF Screening Results**

| Sample Description    |              |                 | Tested Metals in toys Samples (ppm) |      |    |       |        |    |    |     |      |       |
|-----------------------|--------------|-----------------|-------------------------------------|------|----|-------|--------|----|----|-----|------|-------|
| National Limits (ppm) |              |                 | 90                                  | 75   | 60 | <100  | 60     | 60 | 25 | 500 | 1000 | 3.75  |
| Sample Id             | Types        | Product Names   | Pb                                  | Cd   | Sn | Br    | Cr     | Hg | As | Se  | Ba   | Zn    |
| 1Nep14012018          | Hard plastic | Cock            | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 2Nep14012018          | Metal        | Gun             | ND                                  | ND   | 0  | 263.2 | ND     | ND | ND | ND  | ND   | ND    |
| 3Nep14012018          | Fabric       | Dog             | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 4Nep14012018          | Soft plastic | Big doll        | 900.2                               | 76.4 | 0  | ND    | 1103.9 | ND | ND | ND  | ND   | ND    |
| 5Nep14012018          | Hard plastic | Tolhing phone   | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 6Nep16012018          | Soft plastic | Deer            | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 7Nep16012018          | Hard plastic | Bee             | ND                                  | ND   | 0  | ND    | 49.8   | ND | ND | ND  | ND   | ND    |
| 8Nep16012018          | Hard plastic | Cube            | 328.9                               | ND   | 0  | 262.5 | ND     | ND | ND | ND  | 670  | ND    |
| 9Nep16012018          | Hard plastic | Rattle          | ND                                  | ND   | 0  | 54.1  | ND     | ND | ND | ND  | ND   | ND    |
| 10Nep16012018         | Hard plastic | Rattle          | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 11Nep16012018         | Hard plastic | Whistle         | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | 840  | ND    |
| 12Nep16012018         | Hard plastic | Mobile          | 86.6                                | ND   | 0  | ND    | ND     | ND | ND | ND  | 3030 | ND    |
| 13Nep16012018         | Hard plastic | Glass           | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | 730  | ND    |
| 14Nep04022018         | Soft plastic | Small doll      | ND                                  | 363  | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 15Nep04022018         | Cotton       | Bear            | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 16Nep04022018         | Soft plastic | Ball            | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 17Nep04022018         | Hard plastic | Car             | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 18Nep04022018         | Hard plastic | Gun             | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 990   |
| 19Nep04022018         | Metal        | Car             | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 78820 |
| 20Nep04022018         | Wood         | Puzzle          | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | ND    |
| 21Nep04022018         | Foam         | Building blocks | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 8730  |
| 22Nep04022018         | Hard plastic | Camera baby     | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 330   |
| 23Nep04022018         | Hard plastic | Toys water      | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 130   |
| 24Nep04022018         | Rubber       | Ox              | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 200   |
| 25Nep03022018         | Hard plastic | Doremon         | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 170   |
| 26Nep04022018         | Plastic      | Animal kit      | ND                                  | ND   | 0  | ND    | ND     | ND | ND | ND  | ND   | 490   |

|               |              |                 |      |      |   |     |      |    |    |    |     |      |
|---------------|--------------|-----------------|------|------|---|-----|------|----|----|----|-----|------|
| 27Nep05022018 | Hard plastic | Police van      | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | ND   |
| 28Nep05022018 | Rubber       | Alligator       | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 230  |
| 29Nep05022018 | Hard plastic | Bat and ball    | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 60   |
| 30Nep05022018 | Rubber       | Tortoise        | 4688 | ND   | 0 | ND  | 3348 | ND | ND | ND | ND  | ND   |
| 31Nep05022018 | Hard plastic | Gun             | ND   | ND   | 0 | 56  | ND   | ND | ND | ND | ND  | 100  |
| 32Nep05022018 | Rubber       | Balls           | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 2640 |
| 33Nep05022018 | Rubber       | Cock            | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 590  |
| 34Nep05022018 | Rubber       | Duck            | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 270  |
| 35Nep05022018 | Hard plastic | Tiger           | 151  | ND   | 0 | 63  | ND   | ND | ND | ND | ND  | 320  |
| 36Nep05022018 | Rubber       | Crocodile       | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 520  |
| 37Nep05022018 | Hard plastic | Cube            | 243  | ND   | 0 | 462 | ND   | ND | ND | ND | ND  | 70   |
| 38Nep05022018 | Rubber       | Ball            | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 1300 |
| 39Nep05022018 | Hard plastic | Helicopter      | 185  | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 180  |
| 40Nep05022018 | Rubber       | Barbie doll     | ND   | 92.6 | 0 | ND  | ND   | ND | ND | ND | ND  | ND   |
| 41Nep05022018 | Hard plastic | Skipping rope   | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 1920 |
| 42Nep05022018 | Hard plastic | Ring            | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | 240 | ND   |
| 43Nep05022018 | Rubber       | Panda           | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 300  |
| 44Nep05022018 | Hard plastic | Duck            | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | ND   |
| 45Nep05022018 | Rubber       | Ball and animal | ND   | ND   | 0 | ND  | 74.5 | ND | ND | ND | ND  | 920  |
| 46Nep05022018 | Rubber       | Giraffe         | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 580  |
| 47Nep05022018 | Wood         | Puzzle          | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | ND   |
| 48Nep05022018 | Wood         | Frog tower      | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 240  |
| 49Nep05022018 | Hard plastic | Tower           | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | ND   |
| 50Nep05022018 | Rubber       | Sheep           | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | 580  |
| 51Nep05022018 | Rubber       | Ball            | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | ND   |
| 52Nep07022018 | Plastic      | Teether         | ND   | ND   | 0 | ND  | ND   | ND | ND | ND | ND  | ND   |
| Total         |              |                 | 7    | 3    | 0 | 6   | 4    | 0  | 0  | 0  | 5   | 25   |

## Results and Discussion:

XRF (x-ray fluorescence) screening carried out in all collected 52 toys samples for heavy metals and other metals mostly included in Nepal's national toys standard at the Nepal Handicraft Association and Government of Nepal, Ministry of Industry, Commerce and Supply, Department of Nepal Bureau of Standard and Metrology (NBSM)'s Handicraft Lab.

Five of the 52 samples- those made of soft rubber - were sent to the NGO EcoWaste Coalition in the Philippines to deliver to a testing laboratory in order to further test for phthalates. The phthalates testing was done at SGS, Taiwan LTD, by a method (CPSC-CH=C1001-09.3+ (2010). Analysis was performed by GC/MS.

Results thus obtained from these two labs have been further analyzed and presented in the following section along with its best interpretation.

**Table 5. Summary of heavy metals XRF screening in the 52 children's toys samples from Nepal**

| Chemical Tested | Samples with Chemicals | Samples No Compliance (ND + < st. value) | Noncompliance Samples | Chemical Range (ppm) found | National Limit (ppm) | Times More Than Standard |
|-----------------|------------------------|--|-----------------------|----------------------------|----------------------|--------------------------|
| Lead (Pb)       | 7                      | 46                                       | 6                     | 86.6 – 4688                | 90                   | 52.09                    |
| Cadmium (Cd)    | 3                      | 49                                       | 3                     | 76.4-363                   | 75                   | 4.84                     |
| Bromine (Br)    | 6                      | 49                                       | 3                     | 54.1-462                   | <100                 | 4.62                     |
| Chromium (Cr)   | 4                      | 49                                       | 3                     | 49.8-3348                  | 60                   | 55.80                    |
| Barium (Ba)     | 5                      | 51                                       | 1                     | 240-3030                   | 1000                 | 3.03                     |
| Zinc (Zn)       | 25                     | 25                                       | 25                    | 60-78820                   | 3.75                 | 21018.67                 |
| Titanium (Ti)   | 28                     |  |                       | 510-395180                 | =                    |                          |
| Mercury (Hg)    | 0                      | 52                                       |                       |                            | 60                   |                          |
| Selenium (Se)   | 0                      | 52                                       |                       |                            | 500                  |                          |
| Antimony (Sb)   | 0                      | 52                                       |                       |                            | 60                   |                          |
| Arsenic (As)    | 0                      | 52                                       |                       |                            | 25                   |                          |
| Nickel (Ni)     | 0                      |  |                       |                            | =                    |                          |

From the above table it is clear that the toys are contaminated with multiple heavy metals such as lead, cadmium, chromium and toxic metals such as zinc, bromine and barium.

High concentrations of lead, cadmium, chromium, zinc, barium and bromine were identified in 32 out of 52 (62%) toy samples and they contained more than national standard limit.

Some samples of toys contained very high levels of toxic heavy metals such as lead (4688 ppm), cadmium (363 ppm), chromium (3348 ppm), zinc (78820 ppm), barium (3030 ppm) and bromine (462 ppm), which significantly exceed the national standard limits set by the government of Nepal in 2017.

**Table 6. Comparison between heavy metals XRF screening data in 2013 and 2018 in children's toys in Nepal**

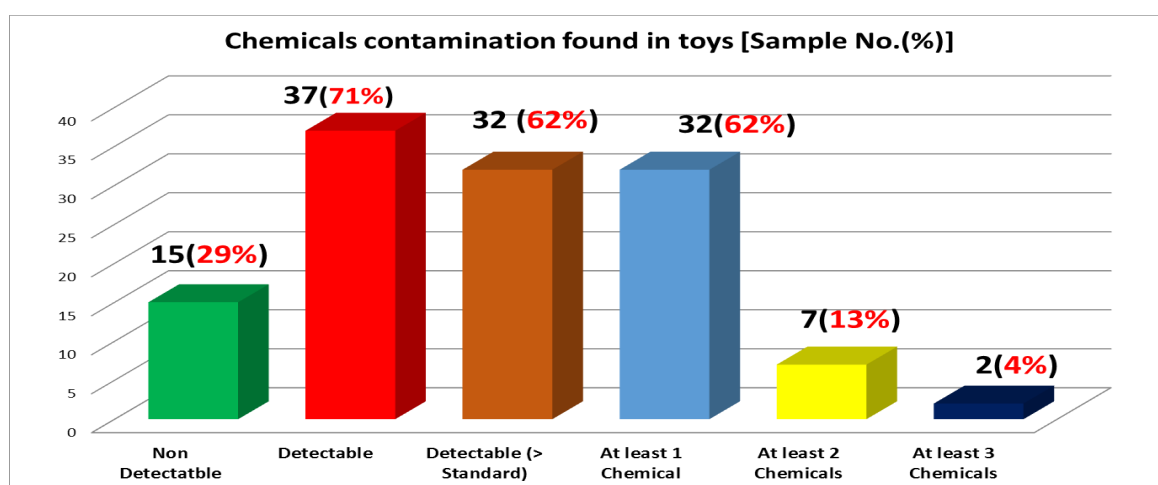
| Chemical Studied | Chemical Range (ppm) found in Toys in Nepal 2012/13 | National Limit (ppm) | Chemical Range (ppm) found in Toys in Nepal 2017/18 |
|------------------|---|----------------------|---|
| Lead (Pb)        | 15.2 ppm - 8305.8 ppm                               | 90                   | 86.6 ppm - 4688 ppm                                 |
| Cadmium (Cd)     | 16.2 ppm to 409.5 ppm                               | 75                   | 76.4ppm -363ppm                                     |
| Bromine (Br)     | 3.6 ppm to 3923.00 ppm                              | <100                 | 54.1ppm-462 ppm                                     |
| Chromium (Cr)    | 9.6 ppm to 2052.2 ppm                               | 60                   | 49.8 ppm-3348 ppm                                   |
| Barium (Ba)      |   | 1000                 | 240ppm -3030 ppm                                    |
| Zinc (Zn)        |   | 3.75                 | 60ppm -78820 ppm                                    |
| Titanium (Ti)    |   | No Nat. Limit        | 510ppm -395180 ppm                                  |
| Mercury (Hg)     | 4.3 ppm   | 60                   |   |

Comparing data of 2018 with similar data generated in 2013, we note that the levels of lead, cadmium and bromine in toys have decreased, while the level of chromium has increased.

In the new study, lead, cadmium, bromine, chromium, barium and zinc were traced in the studied toy samples.

**Table 7. Analysis of heavy metals in children's toys (Pb, Cd, Cr, Zn, Ba, Br)**

|                                    | No. of toys | Percentage |
|------------------------------------|-------------|------------|
| Non Detectable                     | 15          | 29         |
| Detectable                         | 37          | 71         |
| Detectable with more than standard | 32          | 62         |
| At Least 1 Chemical                | 32          | 62         |
| At Least 2 Chemicals               | 7           | 13         |
| At Least 3 Chemicals               | 2           | 4          |



Some toys were contaminated with one to three toxic metals in concentrations exceeding the national standards: 32 toys (62%) contained one toxic metal; 7 toys (13%) contained two toxic metals; and 2 toys (4%) contained three toxic metals.

**Table 8. Status of labeling in children's toys**

| Labels  | No. of toy samples | % Percentage |
|---|--------------------|--------------|
| Labeling  | 22                 | 42.31        |
| Non labeling  | 30                 | 57.69        |
| Total   | 52                 | 100.00       |
| Remarks : Only 42.3 % (22 out of 52) toy samples have some labeling |                    |              |

**Table 9. Category of labeling**

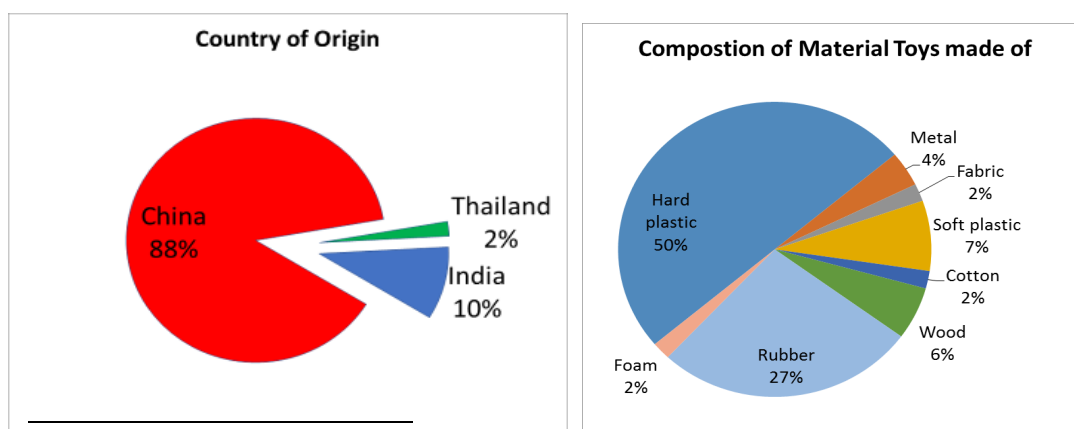
| Labeling categories  | No. of toys Samples | % of different labels (Out of 22 labeled samples) |
|--|---------------------|---|
| Choking hazard and not suitable for under 3 years  | 17                  | 77.27   |
| Not suitable for under 3 years   | 4                   | 18.18   |
| Remove polybag, staples and card   | 1                   | 4.55  |
| <b>Total</b>   | <b>22</b>           | <b>100.00</b>                                     |
| <b>Remarks:</b> Labeling about the choking hazards and age of the children are the only labels found in labeling. <b>None of the samples have labeling about the chemical make-up of the toys.</b> |                     |   |

Only 42.3 % (22 out of 52) of toy samples had labels with information on choking hazards and child's age.

None of the toy samples had labels containing information on the chemical composition. This undermines the recommendations of UN Environment's Chemicals in Products Program<sup>11</sup> adopted by more than 100 governments including the Government of Nepal in 2015.<sup>12</sup>

### Country of Origin and Composition of tested Toy Materials

Toys included in the study were manufactured in China (88%), India (10%) and Thailand (2%) and they are made of hard plastics (50%), rubber (27%), soft plastic (7%), wood (6%), metals (4%), foam (2%) cotton (2%) and fabric (2%).



<sup>11</sup> <http://www.saicm.org/Default.aspx?tabid=5473>

<sup>12</sup> <http://www.saicm.org/About/ICCM/ICCM4/tabid/5464/language/en-US/Default.aspx>



**Tables 10 A, B & C: Products that contain toxic metals that appears to be regulated by the national legislation**

**Table 10 A: Children's products containing lead (Pb)**

| Sample No and Name  | Country of origin | Product type | Place of purchase       | Heavy metal (ppm) Lead | National standard |
|---|-------------------|--------------|-------------------------|------------------------|-------------------|
| 4-Big Doll  | India             | Soft plastic | Bharatpur, Chitwan      | 900.2                  | 90 ppm            |
| 8-Cube  | China             | Hard Plastic | Janakpur , Dhanusha     | 328                    | 90 ppm            |
| 12-Mobile   | China             | Hard Plastic | Janakpur , Dhanusha     | 86.6                   | 90 ppm            |
| 30-Tortoise   | India             | Soft Plastic | Bishal Bazar, Kathmandu | 4688                   | 90 ppm            |
| 35-Tiger  | China             | Hard Rubber  | Baneshwor, Kathmandu    | 151                    | 90 ppm            |
| 37-Cube   | China             | Hard Plastic | Baneshwor, Kathmandu    | 234                    | 90 ppm            |
| 39-Helicopter   | China             | Hard Plastic | Bhote Bahal, Kathmandu  | 185                    | 90 ppm            |
| <b>Remarks:</b> Lead found in 7 toy samples. 6 samples have lead level higher than national standard limit of 90 ppm. |                   |              |                         |                        |                   |

**Table 10 B: Children's products containing cadmium (Cd)**

| Sample No and Name   | Country of origin | Product type | Place of purchase      | Heavy metal (ppm) Cadmium | National standard |
|--|-------------------|--------------|------------------------|---------------------------|-------------------|
| 4-Big Doll   | India             | Soft plastic | Bharatpur, Chitwan     | 76.4                      | 75 ppm            |
| 14-Small Doll  | China             | Soft Plastic | Bhaktpur               | 363                       | 75 ppm            |
| 40-Barbie Doll   | India             | Rubber       | Bhote Bahal, Kathmandu | 92.6                      | 75 ppm            |
| <b>Remarks:</b> Cadmium found in 3 toy samples. All 3 samples contain cadmium higher than the national standard limit of 75 ppm. |                   |              |                        |                           |                   |

**Table 10 C: Children's products containing chromium (Cr)**

| Sample No and Name  | Country of origin | Product type | Place of purchase       | Heavy metal (ppm) Chromium | National standard |
|---|-------------------|--------------|-------------------------|----------------------------|-------------------|
| 4-Big Doll  | India             | Soft plastic | Bharatpur, Chitwan      | 1103,9                     | 60 ppm            |
| 7-Bee   | China             | Hard Plastic | Janakpur                | 49.8                       | 60 ppm            |
| 30-Tortoise   | India             | Soft Plastic | Bishal Bazar, Kathmandu | 3348                       | 60 ppm            |
| 45-Ball & Animal  | China             | Rubber       | Bhote Bahal, Kathmandu  | 74.5                       | 60 ppm            |
| <b>Remarks:</b> Chromium found in 4 toy samples. 3 samples have chromium level higher than national standard limit of 60 ppm. |                   |              |                         |                            |                   |

**Table 11: Products that contain toxic phthalates that appear to be regulated by the national legislation or by US/EU/Canada legislation**

| Sample No  | Country of origin | Product type | Place of purchase     | Phthalates (%) *                                      | National standard | Standards from other countries |
|--|-------------------|--------------|-----------------------|---|-------------------|--------------------------------|
| 1. Crocodile   | China             | Soft Rubber  | Bhotebahal, Kathmandu | DEHP-12.5<br>DINP-0.570<br>DIBP-0.246                 | < 100<br>or 0.01% | CPSIA limit<br>0.1 %           |
| 2. Tortoise  | India             | Soft Rubber  | Bisal Bazar Kathmandu | DBP-0.0159<br>DEHP-37.1<br>DINP-0.0189<br>DIBP-0.0976 | < 100<br>or 0.01% | CPSIA limit<br>0.1 %           |
| 3. Teddy bear  | China             | Soft Rubber  | Janakpur , Dhanusha   | DEHP-15.5<br>DIBP-18.3                                | < 100<br>or 0.01% | CPSIA limit<br>0.1 %           |
| 4. Panda   | China             | Soft Rubber  | Bhotebahal Kathmandu  | DEHP-7.61<br>DIBP-8.97                                | < 100<br>or 0.01% | CPSIA limit<br>0.1 %           |
| 5. Giraffe   | China             | Soft Rubber  | Bhotebahal Kathmandu  | DEHP-16.0<br>DIBP-15.6                                | < 100<br>or 0.01% | CPSIA limit<br>0.1 %           |
| <b>Remarks :</b> concentration of most of the tested phthalates exceeds the US Consumer Product Safety Improvement Act (CPSIA) limits in the tested toys and all samples contain phthalates at levels that exceed Nepal national standard of phthalates in toys. |                   |              |                       |   |                   |                                |
| * DEHP= Di EthylHexyl Phthalate , DINP= Diisononyl phthalate , DIBP=Diisobutyl phthalate , DBP=Dibutyl phthalate   |                   |              |                       |   |                   |                                |



**Figure 4. Toys samples tested for phthalates**

5 toy samples made of rubber and originating from China and India contain high levels of the most dangerous phthalates banned in many countries, including the US and Europe. All toys contained phthalates in concentration of hundreds and thousands of times higher than the limit set up by Nepal National Standards on Phthalates in Toys.

## Conclusion and Recommendations:

Toxic chemicals identified in children's products threaten the health of infants and children who are especially vulnerable as they are more sensitive to the effects of toxic chemicals when their organs are still developing, and their bodies are less able to detoxify.<sup>13</sup> The presence of these substances in children's products violates the fundamental right of children to health ensured by the Constitution of Nepal and the Convention on the Rights of the Child (CRC), of which Nepal has been a Party for over 25 years.

Chemical experts encourage Nepal to require full disclosure of information on chemicals contained in toys and other children's products through labelling. The lack of labelling undermines the right of consumers to know about product chemical safety.

Disclosing information on chemicals in products will prove Nepal's commitment to protect the health of children and also the country's compliance with the recommendations of the UN Environment Chemicals in Products Program, which was adopted by more than 100 governments (including the government of Nepal) in 2015.

To protect the health of children and ensure their right to health, the following recommendations have been developed to reduce risks from exposure to toxic chemicals in toys.

- The 2017 Nepal toy standard should be reinforced and effectively implemented
- Regular compliance monitoring of toxic chemicals in toys should be conducted and the results should be made publicly available.
- Information on the chemical ingredients in toys on labels should be mandatory under Nepal's toy standard.
- Non-governmental organisations and civil society groups should cooperate with government agencies to raise public awareness on toxic chemicals in toys and their impacts on human health and environment.
- Full information disclosure on chemicals contained in toys and other children's products should be provided throughout the life cycle of the products.
- The national standard on phthalates should be enforced to ensure all toys meet the national limit of less than 0.01% for phthalates in toys.
- The government of Nepal should become an official member of the Chemicals in Products Programme developed in the frame of SAICM and adopted at ICCM4 in 2015, and ensure its implementation in Nepal.
- The implementation of SAICM and its emerging policy issues and other issues of concern in Nepal should be strengthened, with a priority focus on chemicals in products, endocrine disrupting chemicals, and hazardous substances within the lifecycle of electrical and electronic products.

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13 <http://www.uniteforsight.org/environmental-health/module2>



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## Annex 1:

### Translation of Nepal Gazettes Notice of Children Toys Standard

Government of Nepal

Notice of Ministry of Population and Environment (MOPE)

Nepal Gazette (Kand 66, Number 48, Part 5, Dated 16<sup>th</sup> January 2017)

In exercising the power conferred by the Sub Article (3) of Article 7 of Environment Protection Act 1997 shall come into effect from 181 days from the date of publication of the notice by the Government of Nepal, Ministry of Population and Environment (MOPE) has set the Mandatory Standard limiting the maximum value of following elements including heavy metals and chemical compounds. Toys that does not comply fully the standard have been strictly prohibited to Import, Produce, Store, Sale, Distribute and even used inside Nepal. This standard will take effects automatically after 181 days of date of publication of this gazette notice and limiting the maximum value of the following chemicals in the Children Toys for all type of toys in Nepal.

| S.No. | Parameters         | Standard (ppm) Maximum Value | Standard (mg/kg) Maximum Value |
|-------|--------------------|------------------------------|--------------------------------|
| 1     | Cadmium (Cd)       | 75                           | 75                             |
| 2     | Chromium (Cr)      | 60                           | 60                             |
| 3     | Lead (Pb)          | 90                           | 90                             |
| 4     | Mercury(Hg)        | 60                           | 60                             |
| 5     | Zinc (Zn)          | 3.75                         | 3.75                           |
| 6     | Antimony (Sb)      | 60                           | 60                             |
| 7     | Arsenic (As)       | 25                           | 25                             |
| 8     | Barium (Ba)        | 1000                         | 1000                           |
| 9     | Selenium (Se)      | 500                          | 500                            |
| 10    | Bromine (Br)       | < 100                        | < 100                          |
| 11    | Bis Phenol A (BPA) | BPA Free                     | BPA Free                       |
| 12    | Phthalates         | < 100                        | < 100                          |

#### **Definition of Toys (included into the Standard)**

Following items used to play by the group of people from 0 to 16 Years age can be considered as TOYS to be regulated under this standard.

1. Construction sets
2. Dolls and miniatures
3. Flying, Scrolling and walking Vehicles
4. Puzzles
5. Collectibles
6. Promotional Merchandise

7. Electric and Electronic Toys
8. Educational (writable and erasable)

**Testing Mechanism (mentioned in the published Toys Standard Gazette Notification)**

- (a) All toxic heavy metals should be tested using XRF Spectroscopy or AAS
- (b) BPA should be tested using HPLC
- (c) Phthalate should be tested using GC / MS

**Certificate and Declaration of Chemicals Constituents :**

- (a) For importation of children toys from other countries, importer need to produce the testing certificate of each batch toys from accredited laboratory from the respective government agencies from the importing countries. Toys that comply the set standard limits are only allowed to import into Nepal.
- (b) In case of domestic industry produced Toys, manufacturers are also required to produce test results for each batch produced from the government accredited laboratories and can only sell and distribute if they fully comply the standard.

With permission  
Dr. Bishwa Nath Oli  
Secretary, Government of Nepal