7.0. VIEWS OF SELECTED PAINT INDUSTRIES

7.1. Large Scale Paint Manufacturing Industry: The major paint companies viz. Berger, ICI and Asian paints has switched over to lead free paints to meet the demand from industrial sector. Many certification bodies came forward to certify these lead free paint products so that these products can be marketed internationally. Also paint manufacturers view is that the organic pigments based colours should match the quality of shades as that of inorganic lead chromate based pigments but for colour yellow/orange and red there is no good hiding effect but not for other colours. Yellow/orange and red lead chrome based compounds are in greater demand because of good hiding effect and bright shade. Some of the paint manufacturers are using iron oxide and/or alloxides but it gives a buffy colour. Also one can use cobalt and manganese in place of lead for good hiding effect. For quick drying purposes lead can be replaced by zirconium and calcium based compounds. Most of our decorative paints do not have lead contents except few enamel paints with selective shades yellow and orange and lead content is minimal.

About 90% of the entrepreneurs in the paint industry are not technically qualified about the paint manufacturing process and lack of awareness about the environmental issues pertaining to using lead based compounds in paints and its effects at large in the society. Therefore lack of awareness, minimal demand of lead free paints from consumers, cost of organic pigments and absence of any strict environmental regulation lead is continue to use in paints even though

Indian Small and Medium sized Paint Manufacturers

There are about 1,541 numbers **Indian Small and Medium sized Paint** manufacturing companies in India, who are members of Indian Small Scale Paint Association (ISSPA). Apart from these innumerable number of unregistered paint companies in every corner of country. Few paint companies are listed are the members of ISSPA.

S.NO	NAME	STATE
1	20 Microns Ltd	Tamilnadu
2	20 Microns Limited	Gujrat
3	20 Microns Limited	Maharashtra
4	20 Microns Ltd	Delhi
5	20 Microns Ltd	Andhra Pradesh
6	A H Chemical Pvt. Ltd.	Maharashtra
7	A-1 Paint Industries	Maharashtra
8	A.A Chemicals	Maharashtra
9	A.Nagindas & Co.	Andhra Pradesh
10	A.G Chemicals	Gujrat
11	A.K Industries	West Bengal
12	A.K Industries	Maharashtra
13	A.N. Madhukar & Co.	Karnataka
14	Aaditya Chemicals	Maharashtra
15	Aakar Enterprises	Maharashtra
16	Aakar Paints	Gujrat
17	Aarushi Speciality Chemicals Pvt. Ltd.	Maharashtra
18	Aavo Chem Industries Ltd	Madhya Pradesh
19	Aay Key Enterprises	Punjab
20	Abigail Enterprises	Maharashtra
21	Able Plastics Pvt.Ltd	Andhra Pradesh
22	ABM Paints	Gujrat
23	Acepol Chemical	Andhra Pradesh
24	Acro Paints Ltd.	Delhi
25	Acrolite Paint Industries	Delhi
26	Adarsh Chemical Industries	Andhra Pradesh
27	Adinath Chemicals	Maharashtra
28	Adishank Chemicals Pvt. Ltd.	Maharashtra
29	Advanced Paints Limited	Maharashtra
30	Afcona Additives P. Ltd.	Maharashtra
31	Agarwal Paints	Rajasthan
32	Aggarwal Enterprises	Delhi
33	Aggarwal Metal Containers	Delhi
34	Agsars Paints Pvt. Ltd.	Tamilnadu
35	Aishwarya Paints Pvt. Ltd	Kerala
36	Ajanta Chemicals Industries	Rajasthan

37	Ajanta Solvents	Rajasthan
38	Ajantha Solvents	Kerala
39	Akross Synthetics Pvt. Ltd.	Utter Pradesh
40	Akshar Paint Industries	Gujrat
41	Akshay Chemicals	Maharashtra
42	Al- Cid and Polymer	Gujrat
43	Ala Polymer	Delhi
44	Alekya Paints	Andhra Pradesh
45	Alfa Chem	Delhi
46	Alfa Coats Pvt. Ltd.	Karnataka
47	Algitech Chemicals	Karnataka
48	All Chem Colours	Delhi
49	Alliance Packaging Pvt. Ltd	Kerala
50	Alliance Paints	Rajasthan
51	Allied Agencies	Andhra Pradesh
52	Alpha International	Maharashtra
53	Alpha Paints	Gujrat
54	Alpha Paints Pvt. Ltd	Gujrat
55	Altra Paints	Tamilnadu
56	Alwar Organics P. Ltd	Rajasthan
57	Aman Chemicals	Madhya Pradesh
58	Amar Industries	Maharashtra
59	Amar Paints	Maharashtra
60	Amardeep Paint Industries	Maharashtra
61	Ambajee Rang Udyog	Delhi
62	Ambekar Industries	Maharashtra
63	Amber Paint Industries	Kerala
64	Amber Paints	Andhra Pradesh
65	Ambuja Paints	Andhra Pradesh
66	American Paints	Uttar Pradesh
67	Amgeen Minerals	Gujarat
68	Amiet Sales Corporation	Delhi
69	Amizara Agencies	Maharashtra
70	Amkay Chem	Rajasthan
71	Amol Dye Chem	Gujarat
72	Amrit Chem	Maharashtra
73	Amritlal Chemaux P. Ltd.	Maharashtra
74	Anand Chloride	Madhya Pradesh
75	Anand Tin	Delhi
76	Ananda Industries	Tamil Nadu
77	Anandha Paints Co.	Tamil Nadu
78	Anjana Paints and Allied Products	Karnataka
79	Anmol Colours (India) Pvt. Ltd.	Rajasthan
80	Anujay Systems	Gujarat
81	Anupam Colours & Chemicals	Maharashtra

	Industries	
82	Anupam Enterprises	West Bangal
83	Anupam Talc (P) Ltd	Rajasthan
84	Anuradha Enterprises Pvt. Ltd.	Delhi
85	Anuvi Chemicals Pvt. Ltd.	Maharashtra
86	Apaari	Tamil Nadu
87	Apar Chemicals	Maharashtra
88	Aparna Chem & Chemicals	Rajasthan
89	Apco Paints & Chemical Industries	Andhra Pradesh
90	Apcotex Industries Limited	Maharashtra
91	Apex Insulation and Surface Coating	Andhra Pradesh
92	Apex Metchem (Pvt.) Ltd.	Rajasthan
93	Apex Paints	Andhra Pradesh
94	Apollo Paints Pvt. Ltd.	Karnataka
95	Apra Enterprises	Maharashtra
96	Arvind Polymers	Tamil Nadu
97	Arc Chemicals Pvt. Ltd.	Maharashtra
98	Arch-Chem	Gurjarat
99	Archana Colour Coatings	Tamil Nadu
100	Arco Chem	Delhi
101	Arco Products	Maharashtra
102	Arcoy Indudtries (India) P. Ltd.	Gurjarat
103	Arihant Chemicals and Resins (I) Pvt. Ltd.	Maharashtra
104	Arihant Paint Industries	Maharashtra
105	Arihant Paint Industries	Rajasthan
106	Arihant Paints. Mfg. Co.	Gujarat
107	Aroma Chemicals Agencies (I) P. Ltd.	Maharashtra
108	Aroma Chemicals Agencies (I) P. Ltd.	Delhi
109	Aroma Paints Ltd.	Haryana
110	Aron Universal Ltd.	Karnataka
111	Arrow Paints Pvt. Ltd.	Tamil Nadu
112	Arun Enterprises	Tamil Nadu
113	Arun Enterprises	Tamil Nadu
114	Arvind Industries	West Bengal
115	Aryan Paint Industries	Maharashtra
116	Aryavart Chemicals Pvt. Ltd.	Maharashtra
117	Ascar Paints	Tamil Nadu
118	Asha Paints	Andhra Pradesh
119	Ashish Enterprises	Maharashtra
120	Ashok Cottage Industries	Tamil Nadu
121	Ashok Mineral Enterprises	Tamil Nadu
122	Ashoka Colour Company	Andhra Pradesh
123	Ashoka Paints	Rajasthan
124	Ashwin Enterprises	Maharashtra

125	Asia Industrial & Mfg. Co.	West Bengal
126	Asia Paints	Delhi
127	Asiad Paints	Madhya Pradesh
128	Asian Colours & Coatings	Delhi
129	Ask Enterprises	Maharashtra
130	Asmita Enterprises	Maharashtra
131	Associated Chemicals Industries	Kerala
132	Associated Industries	Maharashtra
133	Associated Metal Containers	West Bengal
134	Associated Paints & Polymer Industries	Gujarat
135	Associated Rubber Chemicals(Kochi) Pvt. Ltd.	Kerala
136	B and L Coating Products	AndhraPradesh
137	B. Sen & Company	Delhi
138	Baba Group of Companies	Andhra Pradesh
139	Bahati Chemicals	Gujarat
140	Bajaj Chemical Industries	West Bengal
141	C.B. Paints Factory	Maharashtra
142	C.J. Shah & Co.	Maharashtra
143	C.M. Trading Co.	Punjab
144	Camplex Marketing Corporation	Gujarat
145	Capri Paints	Madhya Pradesh
146	D.S. Associates	Andhra Pradesh
147	D.P. Kerosene Oil and Chemicals	Rajasthan
148	D.R. Coats Ink & Resins P. Ltd.	Maharashtra
149	D.S.V. Chemicals Pvt. Ltd.	Maharashtra
150	D.S.V. Marketing	Andhra Pradesh
151	E.I. Dupont India Ltd.	Maharashtra
152	Eagle Coat Products Pvt. Ltd.	Gujarat
153	Eastcorp International	West Bengal
154	Eastern Chemical Corporation	Maharashtra
155	Elca Laboratories	Maharashtra
156	Elite Paints Pvt. Ltd.	Maharashtra
157	Faaber Paints Pvt. Ltd.	Tamilnadu
158	Fabrican	Karnataka
159	Famous Minerals & Chemical Pvt. Ltd.	Maharashtra
160	Fenasia Ltd	West Bengal
161	Festion Fiscal Services P. Ltd	Delhi
162	G.H Chemicals	Maharashtra
163	G.K Technochem Pvt. Ltd	Delhi
164	G.P Industries	Andhra Pradesh
165	Galaxy Coating Industry	Maharashtra
166	Gama Paints	Kerala
167	H.P Chemicals	Gujrat
168	H.R Organo Chem Pvt. Ltd	Maharashtra

169	Hallmark	Karnataka
170	Hammer Paints Indusrties	Gujrat
171	Hands Industrial Coatings	Kerala
172	I.J Paint Industries	Haryana
173	IAC Minerals Pvt. Ltd	Andhra Pradesh
174	IAC Minerals Pvt. Ltd	Tamilnadu
175	Ideal Coating Industries	Rajasthan
176	Ideal Paints Pvt. Ltd	Maharashtra
177	Imagico India P. Ltd	Maharashtra
178	J & J Paints And Chemicals	Kerala
179	J.J Enterprises	Maharashtra
180	J Kriti & Brothers	Maharashtra
181	J.D.I Paints Industries	Delhi
182	J.K Industries	Tamilnadu
183	J.K Shah & Co.	Tamilnadu
184	K.K Sengupta	West Bengal
185	K.Nisha Trading Co.	Gujrat
186	K.B. Enterprises	Maharashtra
187	K.C.S Metal Industries	Tamilnadu
188	K.J Polymers	Andhra Pradesh
189	Lakki Paint O Chem	Karnataka
190	Lakra Oil Trading Company	Delhi
191	Lakshmi Paints	Tamilnadu
192	Lakshmi Sales Corporation	Delhi
193	Lalit Kumar Nijhawan	Haryana
194	M.B. Paints & Chemicals	Andhra Pradesh
195	M. Amin & Company	Maharashtra
196	M.M Paints Industries	Delhi
197	M.M Sales Corporation	Delhi
198	M.S Paints Industries	Andhra Pradesh
199	N.V. Paints	Andhra Pradesh
200	N.K.S. Industries	Tamilnadu
201	N.R. Chemicals Pvt. Ltd	Maharashtra
202	N.S. Oil Mills	Tamilnadu
203	Nagrecha Paints Industries	Maharashtra
204	Narchem Industries	Maharashtra
205	O.T.C Paints And Chemicals Pvt. Ltd	Andhra Pradesh
206	Ojas Paints Private Limited	Maharashtra
207	OK Paints And Chemicals Industries	Maharashtra
208	OM Muruga Paints	Tamilnadu
209	OM Sai Andhra Paints	Andhra Pradesh
210	Omm International	Orissa
211	P.G. Resin Coating Pvt. Ltd	Maharashtra
212	P.K Enterprises	Gujrat
213	P.K. Industries	Punjab

214	P.S.B. Udyog	Rajasthan
215	Pacific Paints Industries	Gujrat
216	Packme Industries	Gujrat
217	Quality Tiles	Maharashtra
218	R.V. International	Haryana
219	R.K. Industries	Kerala
220	R. Nagardas& Co	Maharashtra
221	R.B. Enterprises	Maharashtra
222	R.K Mangturam	Andhra Pradesh
223	R.M. Mehta & Company	Maharashtra
224	S.B. Sales & Service	Kerala
225	S.K.R VarnishWorks	Andhra Pradesh
226	S.Y. Gangadhar & Co	Andhra Pradesh
227	S.B. Shah & Co.Pvt. Ltd	Delhi
228	S.D Paints	Himachal Pradesh
229	S.D Paints & Varnish P.Ltd.	West Bengal
230	T.R Sharma Engg. Works	Delhi
231	Tara Paints & Chemicals	Gujarat
232	Tarak Chemicals Pvt. Ltd	Gujarat
233	Taraka Chemical Products	Andhra Pradesh
234	Tarapur Coatings & Adhesives Pvt. Ltd	Maharashtra
235	Tarun Brush Industries	Utter Pradesh

substitutes are available. A massive awareness programme to paint and pigment manufacturing industries coupled with government intervention specially to set up research and developmental work in association with American and European commissions to see options for lead free paints over lead based paints. Indian paint manufactures view is that they can manufacturer lead free paints if there is a greater demand from the consumers and also if cost of organic pigments can be reduced. As of now paint manufacturers are asking for a time line for five years to go for lead free paints over lead based paints.

7.2.Medium Scale Paint Manufacturing Industry

7.2.1. VARNA PAINTS & ALLIED PRODUCTS:

Managing Director – Mr. Sathya Narayana says

a) Industrial painting is completely requirement based and there are various types of industrial paints available in the market

b) Lead based chromes are used in two types directly and/or indirectly by pigments

c) Golden yellow are the most running paints in the market

d) The paints can be manufactured by organic pigments or lead based pigments

e) The chrome based pigment i.e. Middle chrome & Scarlet chrome etc which carries lead content.

f) Lemon chrome & Middle chrome are banned in European countries, and it is still in use in South Korea Malaysian & Asian countries

g) Cost of organic pigment compare to lead based pigments is very high and the available in the market is low since is demand. for consumption from paint industries .

h) The organic pigment cost factor is very important.

i) Paints for exterior applications (outer walls, facades of homes buildings etc.) include the conventional cement paint, texture finishes and acrylic emulsion paints with varying durability and cost.

j) Color is the customer choice not the manufacturer choice.

k) Lead based raw materials are banned in European countries.

l) Chrome gives an outstanding clarity and basically for coloring purpose.

m) Different types of chrome pigments are there.

n) Buff colored paints are basically done with oxidize.

7.3. SMALL SCALE PAINT MANUFACTURING INDUSTRY

7.3.1. SEEMA PAINTS AND ALLIED PRODUCTS:

Managing Director – Mr. Govindraju says

a) As per the high growing demand in the market the paint requirements are growing day-to-day life and customers have a wide desires, likes and we companies manufacturing as per the customer requirements and their desire and demand.

b) Lead is one of the basic raw materials in the production of paint and has been essential part of the Paint Industries.

c) We have been in the field since 20years and running successfully as per the market demand.

d) There are mainly 120 plus paint companies in Bangalore.

e) Many companies working in low level have been forced shut down in recent years to current factor of cost in the market field and also by unable to tackle the field.

f) We have also been aware of Lead poisoning and its ill effects on health but presently

we do not have any choice and we also have paint companies working on alternate method.

g) Lead is used in paint for giving gloss, hardness, vibrant to color and acts mainly for drying .hence it's basically known as Driers.

h) To switch over the main problem is the cost factor and also the lack of equipment since we have been adjusted with the traditional method.

i) We running with 8 employees and compared the health factor of the workers there is nothing wrong currently as per observed and known.

j) Our products have been ranging from 120 to 150 rupees in the market..

k) Basically we are employing 0.67% of Lead octate in paints and it varies with the product.

l) The Lead based chemical suppliers are all mainly from Gujarat, Maharashtra and we don't have any one in Karnataka and been getting via dealers.

m) We are indeed to change or switch over to the safer alternative method if we are provided with a successful demonstration including the consideration of the cost factor.

7.3.2. GANESH PAINTS:

Managing Director- Mr. Shivalingaya says

a) We are mainly in production of oil paints and emulsion.

b) We are in the paint industry since 7 years and running locally as per the consumers demand in the market.

c) We have been working with 4 to 5 employees.

d) As per my knowledge I have no information about the alternate method.

e) We are aware of Lead Poisoning and been held with no choice.

f) We are getting the raw materials from outside the Karnataka state through dealers network.

g) If everyone are intend to change and supported by the government we would definitely work towards it.

7.3.3. SREE PAINTS AND CHEMICALS:

Managing Director – Mr. Ravi says

a) Basically we are in production of Decorative & Epoxy paint.

b) As per my knowledge we know lead is a poison from past 6 years

c) We have deliberately reducing lead and replacing with Calcium available..

d) There also been drastic regulations coming in few days the usage of Lead since it's already been effecting in other abroad countries due to the severe health and mental effects.

e) I also like to know more regarding the changes in this field.

7.3.4. Classic Paints:

Classic Paints is a company specializing in eco-friendly water based paints. The company has a state of the art manufacturing plant near Cochin in Kerala State. It is an ISO 9001 & 14001 certified company. Classic Paints manufactures a wide range of paints for decorative and industrial use. The company boasts of well-equipped quality control and development laboratories. Sophisticated manufacturing and testing equipments employed by the company has enabled it to offer world class products for architectural as well as industrial use. The company also offers custom-made products to meet specific requirements of the customers.

8.0. CONCLUSIONS AND RECOMMENDATIONS FROM GLOBAL STUDIES (ABHAY 2009 AND NRCLPI SURVEY)

INDIA

The size of the paints market in India is estimated at **Rs 110 billion**, with the contribution of the organized and unorganized sectors in the ratio of **65:35**. India produces both decorative and industrial paints.

Decorative paints can further be classified into premium, medium and distemper segments. Premium decorative paints are acrylic emulsions used mostly in the metros. The medium range consists of enamels, popular in smaller cities and towns. Distempers are economy products demanded in the suburban and rural markets. Nearly 20 percent of all decorative paints sold in India are distempers and it is here that the unorganized sector has dominance. Industrial paints include powder coatings, high performance coating and automotive and marine paints.

But two- thirds of the industrial paints produced in the country are automotive paints. Decorative and industrial paints are the segments within the sector, in a 70:30 proportion. Other sub- segments are marine paints, powder coatings for white goods like refrigerators and washing machines, and industrial coatings.

Market shares of various products in decorative sector15

Enamels 50%

Distemper 19%

Emulsions 17%

Exterior Coatings 12%

Wood Finishes 2%

Market shares of various products in Industrial Sector Composition

Automotive Paints 50%

High Performance Coating 30%

Powder Coating 10%

Coil Coating 5%

Marine Paints 5%

Goodlass and Asian Paints are the leading OEM players. Berger and 15 Goodlass lead in solid powder coating segment used for decoration and protection of white goods, electronic equipment and auto components. ICI and Asian Paints lead the segment of solvent based paints for sheets. Shalimar and Bombay Paints are the major players in these anti- corrosive, underwater marine paints used for ships and containers. Asian Paints dominates the decorative segment with a 38 percent market share. GNPL is number 2 in the decorative segment with a 14 percent market share. Berger and ICI have 9 percent and 8 percent shares respectively in this segment followed by J&N and Shalimar with 1 and 6 percent shares. GNPL dominates the industrial paints segment with 41 percent market share. India does not have any mandatory regulation for lead limits in paints. As per the Eco Mark Scheme, which is voluntary, lead should not be more than 0.1 % in certain types of paints.

A previous study by Toxics Link found 84 % of enamel samples having lead concentrations more than 600 ppm16 (Kumar and Gottesfeld, 2008) The study also found that except one brand (ICI Dulux) all other brands had their enamel paint samples having lead concentrations more than 600 ppm. After the study report was out, Toxics Link launched a multi- pronged campaign for phasing out lead from paint engaging with

various stake holders. It succeeded in getting various stake holders together on board. In one of such meeting held on 17 October 2008, where in representatives of major players such as Asian Paints and Kansai Nerolac declared that their enamel products would also be lead free by the end of the year.

Results (Table in Annexures)

As part of this study a total of 26 paint samples, which included 4 varnish samples were analyzed for total lead concentrations. The major findings of the study are given below.

1. 26 enamel paint samples, which were analyzed for total lead concentration, belonged to 4 brands, viz., Kansai Nerolac, ICI Dulux, Berger, Asian Paints and 1 sample of Shalimar Paints.

2. While all enamel samples of Kansai Nerolac and ICI Dulux had lead concentrations lower than 90 ppm, some enamel samples of Asian Paints however had lead concentrations higher than 90/600 ppm.

3. All enamel samples of Berger Paints showed lead concentrations higher than 90/600 ppm.

4. None of the varnish sample showed lead concentrations higher than 90 ppm.

5. Out of 22 enamel samples, 8 sample s (36%) showed lead concentrations higher than 90/600 ppm. Overall 31 % of samples showed lead concentrations higher than 92/600 ppm.

6. The arithmetic mean of lead concentrations of all samples is 7966.3 ppm with the range varying from 0.6 ppm to 49592.8 ppm.

The arithmetic mean of enamel samples is found to be 9410.6 ppm with lead concentrations varying from 8.1 ppm to 49592.8 ppm (4.6%)

7. The median lead concentration for enamel samples is 24.7 ppm.

8. The highest concentration of lead (4.6%) was found in a bus green colour enamel samples belonging to Berger paints.

Conclusions

The major conclusions of the study with respect to Indian paint results are following.

1. 36 % of enamel samples and 31 % of total samples were found to have lead concentrations more than 90/600 ppm.

2. None of the varnish sample was found to have lead contents exceeding 90 ppm.

3. ICI Dulux continues to have low lead concentrations in their enamel paints.

4. In the previous study done by Toxics Link (Kumar and Gottesfeld, 2008) all enamel paint samples of Kansai Nerolac were found to have high lead concentrations exceeding 600 ppm. In the present 76 study all enamel samples of Kansai Nerolac have low lead concentrations, not exceeding 90 ppm.

5. Asian paints continue to have some enamel samples having lead concentrations more than 90 ppm.

6. Enamel samples of Shalimar Paints and Berger Paints continue to have high lead concentrations in their enamel paint.

***SRI LANKA*(Table in Annexures)**

Some major conclusions that can be drawn from the present study with respect to paint samples from Sri Lanka are following:

1. In general emulsions or water - based plastic samples have low lead concentrations (less than 90 ppm).

2. Oil- based enamel paint sample s have high lead concentrations (more than 600 ppm; lead Concentrations ranging up to 13.7 %).
3. Only one brand, viz., ICI has its enamel products too containing lead in lower concentrations.

***PHILIPPINES*(Table in Annexures)**

Some of the major conclusions of the present study with respect to samples from Philippines are

1. In general water - based latex paint samples have low concentration of lead. Lead concentration is generally well below 90 ppm.
2. It is the oil- based enamel paint samples that contain high concentration of lead. The average lead concentration in enamel Samples is 28353.6 ppm with the range varying up to 18.9 %.

***THAILAND*(Table in Annexures)**

Some of the major conclusions of the present study with respect to

Samples from Thailand are

1. All plastic samples had lead in low concentrations (less than 90 ppm
2. 47.1 % of enamel samples had lead higher than 90/600 ppm. 29.6 % of the total samples exceeded 90/600 ppm.
3. Some of the enamel samples showed very high concentrations of lead, ranging up to 50.6 %. The highest concentration of lead (50.6%) was found in a yellow colour sample (THL 21).

***TANZANIA*(Table in Annexures)**

Some of the broad conclusions of the present study with respect to lead

Contents in paint samples from Tanzania are following.

1. All oil- based paint samples were found to have lead Concentrations higher than 90 ppm. 95 % of oil- based samples had lead concentrations higher than 600 ppm or 450 ppm (Tanzanian voluntary standard)

2. All water - based samples were found to have lead concentrations less than 90 ppm.

***SOUTH AFRICA*(Table in Annexures)**

The following conclusions can be drawn about the lead in paints in South Africa.

1. 65.5% of total samples (only enamel) had lead levels higher than 90ppm.

2. 62% had lead concentrations more than 600 ppm (0.06%).

3. Only some brands follow the code of practices of South African Paint Manufacturers Association (SAPMA) according to which SAPMA members must affix warning labels on paint cans that Contain more than 0.15% lead.

4. Spray paints displayed their lead free claims completely wrong.

5. The highest concentration of lead in paint 195289 ppm (19.5%) was found in the brand sunshine yellow in the spray paints

***NIGERIA*(Table in Annexures)**

The major conclusions of the study may be the following.

1. All paint samples including enamel and plastic paint samples showed high lead concentrations exceeding 90 ppm and 600 ppm limits.

***SENEGAL*(Table in Annexures)**

The major conclusions of the present study with respect to lead contents in paints collected from Senegal are following.

1. Majority of enamel paint samples showed high lead concentrations. 86 % of enamel paint samples had lead. Concentrations more than 90 ppm while 76 % of enamel paint samples had lead concentrations more than 600 ppm. None of the plastic paint samples had lead concentrations exceeding 90 ppm.
2. Over all 60 % of paint samples exceeded the lead concentrations of 90 ppm while 53 % exceeded 600 ppm of lead concentrations.
3. The highest concentration of lead was found in a green colour enamel paint sample.

***BELARUS*(Table in Annexures)**

The major conclusions of the study are stated below.

1. Majority of enamel paint samples showed high concentrations of lead. 82 % of enamel paint samples exceeded lead concentration of 90 ppm while 68 % exceeded 600 ppm of lead concentrations. Overall 60 percent of paint samples exceeded 90 ppm of lead concentrations while 50 % exceeded 600 ppm of lead concentrations.
2. None of the plastic paint sample had lead concentration exceeding 90 ppm.
3. The highest concentration of lead was found in yellow colour enamel paint sample.

***MEXICO*(Table in Annexures)**

The major conclusions of the study are stated below.

1. Lead is found in high concentration in all enamel paint samples. All enamel samples were found to have lead exceeding 90/600 ppm of lead.
2. All plastic paint samples were found to have lead in lower concentrations. All plastic samples had lead concentration lower than 90 ppm.
3. 67% of all samples were found to have lead concentrations more than 90/600 ppm.
4. The median for enamel samples was found to be 4.6 %, which was quite high. In case of plastic samples the median value was found at 4.4 ppm of lead.

***BRAZIL*(Table in Annexures)**

1. Plastic paint samples have low lead concentrations; lower than 90 ppm
2. 42 % of enamel samples had lead lower than 90 ppm while 37 % of enamel samples had lead contents lower than 600 ppm.
3. All enamel paint samples of brands such as Sherwin Williams Novacor and Coral-Coralit had lead concentrations lower than 90 ppm.
4. Not all samples of other brands showed lead concentrations lower than 90 ppm

Summarized Table of All countries Data are enclosed in the Annexures

Blood lead level of selected paint workers in selected paint companies

Preliminary study on BLL screening programme is to estimate the blood lead level of the employees working in paint industry to know the status of blood lead level and follow up in next phase for further screening and training programme. The blood lead level is ranging from 9.4 to 26.7µg/dl

Table: 7 Blood lead level (BLL) in µg/dl of workers of selected paint companies

Sl. No	NAME	AGE/ SEX	YEARS OF EXPOSURE	WORKING HOURS	TEST	RESULT in µg/dl
1.	Seema paints	30/M	6	8	BLL	14.7
2.	Seema paints	41/F	8	8	BLL	26.7
3.	Seema paints	20/M	Regular visitor	----	BLL	19.8
4.	Ganesha paints	30/M	5	8	BLL	24.4
5.	Ganesha paints	45/M	16	8	BLL	20.8
6.	Ganesha paints	40/M	15	8	BLL	9.4
7.	Shree paints	38/M	8	10	BLL	13.0
8.	Shree paints	36/M	3	10	BLL	14.8
9.	RNS paints	34/M	8	10	BLL	18.9
10.	RNS paints	29/M	2	10	BLL	19.7
11.	RNS paints	21/M	6months	10	BLL	16.5
12.	RNS paints	38/M	8	8	BLL	17.9

The average Blood Lead level is 18.05 µg/dl. This is much above the accepted level of <9µg/dl. Though right now BLL is not at an alarming level but lead accumulates in the body over a period of time and can affect the workers of paint industry.

9.0. OTHER OPTIONS:

Phasing out of lead and other toxic heavy metals over a period of time agreed upon by the industry is to be accepted and not exceeding the time limit beyond March 31st 2011. This phasing out of lead and other toxic heavy metals in paints and coatings to be made voluntary to begin with immediate effect through public notification. Prominent signage to appear on all paint containers indicating the acceptable and graded unacceptable levels of lead used for various purposes covering architectural, industrial, automotive and specialty paints with immediate effect. Paint industry to upgrade and adopt the technology appropriate during the transition period.

10.0 IMPLICATIONS:

10.1. FINANCIAL IMPLICATIONS –

The organic pigments are very expensive and at present unorganized sector cannot afford to purchase except a few. At the same time, small units are looking forward for government intervention in reducing the cost of organic pigments and helping out to increase in pigment production.

10.2.LEGAL IMPLICATIONS -

Strict legal measures to be implemented to defaulters through appropriate legislation and this can be achieved only with the active participation of the Government.

11. RECOMMENDATIONS FOR IMMEDIATE ACTION:

I. Task force broad based multi-stakeholders committee for the implementation of the contents of the white paper at both National and state level to be constituted by CII.

II. Phasing out of lead and other toxic heavy metals over a period of time agreed upon by the industry is to be accepted and not exceeding the time limit beyond March 31st 2011.

III. This phasing out of lead and other toxic heavy metals in paints and coatings to be made voluntary to begin with immediate effect through public notification.

IV. Willingness from the organized sector of paint manufacturers to shift from lead based to lead free paint to be encouraged in phase wise manner and to be supported by the Government.

V. Possible incentives such as eliminating octroi and tax benefit for the lead free paint manufacturers (which is already in existence through refund of tax to lead free paint component) to be considered.

VI. Prominent signage to appear on all paint containers indicating the acceptable and graded unacceptable levels of lead used for various purposes covering architectural, industrial, automotive and specialty paints with immediate effect.

VII. All lead based paints with unacceptable levels of lead to appear on every paint container with the precautionary measures to be taken by the end user.

VIII. CII to take prominent initiative to communicate and monitor that the IPA complies with the contents of the white paper

IX. Indian Paint manufacturer Association (IPA) and other paint related association such as SSPMA to own the total responsibility to communicate the intent.

X. Pigment, dye and other raw material manufacturers and suppliers to be informed about the hazards of the lead based pigments and the availability of the alternate non-lead pigment.

XI. Voluntary standard for the best manufacturing practices for the paint industry to be prepared by QCI involving multi-stake holders by the end of 2009 for the purpose of accreditation to the paint industry.

XII. The lead phase out plan to have at a minimum:

a) ***To limit the lead content in all paint manufactured in India, to a upper limit of 1% by weight by 31st December 2009 as agreed up on by IPA.***

b) ***To limit the lead content in all paint manufactured in India, to a maximum of 0.1% by weight by 31st December 2011 as recommended by BIS 5411, 5410, 428, 164 for certain paints.***

XIII. During the transition period to insist on a prominent warning labelling on the cans/containers with internationally accepted signage.

XIV. After the proposed cut off date, declare it illegal to manufacture, stock, and sell paints with lead content higher than the specified levels.

XV. Alternate non-lead pigments to be made available to the paint industry during the transition period.

XVI. Paint industry to upgrade and adopt the technology appropriate during the transition period.

XVII. Government to provide necessary encouragement and support to the paint industry to accomplish the phasing out of lead based paint to lead free paint.

XVIII. Strict legal measures to be implemented to defaulters through appropriate legislations.

XIX. Centralized and accredited laboratory testing facilities to certify the quality of the paint and its lead content.

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1) What do you know about lead?

☐ Yes ☐ No ☐ Some idea

2) Are you aware of the fact that the usage?

☐a. Yes ☐ No

3) What do you think can be the impact of Lead Poisoning on the biological system?

---

4) Is there any other metal you know, that can exactly replace lead in paint?

☐ No ☐ If Yes, please suggest

---

5) If yes, why aren't you using it? (please specify)

---

6) Do you have any objection against lead free paint? What problems are you facing?

---

7) Is your company in a position to make the transition, if an alternate method is suggested?

☐ Yes ☐ No

8) Why is lead used in paints?

---

9) Which paint color has lead?

☐ Grey ☐ Blue ☐ All ☐ Others (specify)

---

10) What is the concentration of upper limit and lower limits of these lead based pigments used?

---

11) Are the concentrations within the permissible limit of Bureau of Indian Standards (BIS)?

☐ Yes ☐ No

12) What is the BIS Standard followed for the lead content in paints?

---

13) Compare to India, what is the internationally accepted standards?

---

14) What quantity of paint is manufactured in your company on an average? (In volume and in terms of production)

---

15) What is the technology used in manufacturing the paints and how often it is updated? (Please list them)

---

16) What types of paints are manufactured in your company?

☐ Oil Paints ☐ Distemper ☐ Solvents ☐ Others (Specify)

---

17) What type of pigments are used in the paints? (Organic/Inorganic)

---

18) Where and all are your products being marketed?

☐ All Over India ☐ Certain regions (Specify few) ☐ Karnataka

---

19) What is the cost of paint?

_____(In Rupees)

20) What the price of lead octate (any measurement)?

_____(In Rupees)

21) What percent of paint manufactured by your company is lead free?

_____%

22) List the amount of lead based pigments and other lead based compounds in stock and how long will the stocks last?

---

23) Are lead free paints being used?

☐ Yes ☐ No

24) Can we have the addresses of the company, from you purchased the lead octate, and from where these lead based products are sourced (Suppliers and manufacturers)?

---

25) Since when is your industry located in this place?

_____ days/months/years.

26) Since how many years you have been running this industry?

_____ years

27) What measures are you taking to make eco friendly paints?

☐ Yes ☐ No

28) What is the protocol used in manufacture of paint?

---

29) What are the other ingredients used along with the lead?

---

30) How often do you visit the production unit?

☐ Everyday ☐ Once in _____ days/weeks/months.

31) Please list out few varying Lead content in Paint used for special purposes:

Amount of Lead	Application

32) What is your corporate social responsibility towards the society?

---

33) How long will it take according to you to bring a transition from lead based paints to lead-free paints?

_____ years.

34) What could be the cost-benefit ratio for the replacement of lead?

---

35) What are your observations in the last 5 years?

---

36) What is your projection for the coming years?

---------- THANK YOU ----------

COMPANY/INDUSTRIAL SCRUTINIZATION

Name of the Company:

Address:

Tel No:

Fax No:

E-mail:

Website:

Certified under:

Date of Commencement:

The Industry/company is registered under:

Small/Medium/Large Scale Industry (Tick one)

Total turnover of the company

Employee Status:

In Production Department-------

In Technical field department ---

In Sales counter----------

In Store room----------

Others----------

Total No. of Employees =

Figured ratio of total no. dependable on the company (No of lives):

No. of employees working from past 15 years:

Salary Criteria:

Place:

Date: Seal & Signature

Intergovernmental Forum on Chemical Safety
Global Partnerships for Chemical Safety

03.TS
Agenda item 8

Contributing to the 2020 Goal

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25 March 2008

FORUM VI

SIXTH SESSION
OF THE
INTERGOVERNMENTAL FORUM ON CHEMICAL SAFETY

Dakar, Senegal
15 – 19 September 2008

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THOUGHT STARTER

International Transport of Lead and Cadmium via trade: an International concern?

Prepared by:
The Center for International Environmental Law (CIEL) in consultation with the FSC Working Group
and on behalf of the Government of Germany, lead sponsor

This IFCS Thought Starter was prepared by Erika Rosenthal and Glenn Wiser, Center for International Environmental Law (CIEL), Washington, D.C., on behalf of the Government of Germany/Lead Sponsor.

Table of Contents

1. Introduction

1.1. Background and Purpose of Thought Starter

Whether the mobility of lead and cadmium through international trade may warrant coordinated international action to protect human health and the environment

1. At the fifth session of the Intergovernmental Forum on Chemical Safety (IFCS) held in Budapest 25-29 September 2006, Forum V adopted a statement on mercury, lead, and cadmium urging IFCS participants and the International Conference on Chemicals Management (ICCM) to "consider actions at the local, national, regional and global levels for mercury, lead and cadmium, as appropriate, with particular emphasis on the needs of developing countries and countries with economies in transition."[1] The statement followed the commitment by States at the World Summit on Sustainable Development to "Promote reduction of the risks posed by heavy metals that are harmful to human health and the environment, including through a review of relevant studies, such as the United Nations Environment Programme global assessment of mercury and its compounds";[2] and the UNEP Governing Council's decision urging "Governments, intergovernmental organizations and non-governmental organizations to work with the private sector to identify effective ways of reducing exposures to lead and to strengthen monitoring and surveillance efforts and the treatment of lead poisoning."[3]

2. This Thought Starter and the Forum VI session on lead and cadmium respond to these requests by examining whether the dispersal of lead and cadmium through international trade of these metals as commodities and in products and wastes may warrant coordinated international action to protect human health and the environment. The Thought Starter analyzes whether such trade may lead to problems that cannot be addressed by countries acting alone, whether those problems may rise to the level of an international concern, and thus whether they call for a coordinated international approach to addressing them. The Thought Starter and Forum VI session are intended to complement other ongoing United Nations work on lead and cadmium by providing input to discussions on the subject that may take place in 2009 at the second International Conference on Chemicals Management (ICCM-2) and the Twenty-Fifth Session of the UNEP Governing Council.

3. This important issue is not new. The IFCS and Organisation for Economic Co-operation and Development (OECD) addressed it during the 1990s, each exploring criteria for when a chemical might warrant international action. During that time, the UNEP Governing Council requested IFCS to develop recommendations on international action for an initial list of twelve persistent organic pollutants (POPs).[4] In recommending to the Governing Council that negotiation of a legally binding instrument should commence, IFCS suggested that the "process should incorporate criteria pertaining to persistence, bioaccumulation, toxicity and exposure in different

[1] IFCS Forum V, *The Budapest Statement on Mercury, Lead and Cadmium*, para. 10, IFCS/FORUM-V/05w, Executive Summary (2006), http://www.who.int/ifcs/documents/forums/forum5/report/en/index.html.
[2] WSSD Plan of Implementation, para. 23(g) (2002), http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf.
[3] UNEP Governing Council Decision 22/4 III, *Lead* (2003), http://www.chem.unep.ch/Pb_and_Cd/GC-22-4-III-lead.htm.
[4] UNEP Governing Council, Decision 18/32, *Persistent Organic Pollutants* (1995).

regions."[5] These criteria eventually evolved into the POPs criteria adopted in the Stockholm Convention, including the criterion of long-range environmental transport. However, IFCS never developed criteria for determining whether other, non-POPs chemicals may be chemicals of international concern.[6]

4. Beginning in 1990, OECD began the pilot phase of a "Co-operative Investigation and Risk Reduction of Existing Chemicals," which included lead, cadmium, mercury, methylene chloride, and brominated flame retardants. Various principles and criteria were developed for "concerted OECD-wide action." Most of them related to the nature of measures that OECD members might take, not on criteria for deciding whether the chemical warranted concerted action in the first place. In respect to characteristics of the chemicals themselves, the chemicals should "pose significant risk" and should result in "problems of a shared, transboundary or global nature." In the specific case of lead, OECD extensively addressed, but was unable to reach consensus on, whether trade in lead throughout the world necessitated international action.[7] The OECD 1996 Ministerial Declaration on Risk Reduction for Lead among other things actively promotes the progressive phase out of lead in gasoline, the elimination of exposure to lead from products intended for use such as toys and from food packaging, the phase out of use in lead in paint, in drinking water and in occupational settings. The OECD Ministerial Declaration, did not, however, mention the transport or mobility of lead via international trade.[8]

5. Subsequent considerations of the problems caused by metals have led to a general consensus that they may give rise to a global concern if they are toxic or eco-toxic, bioaccumulate, and travel long distances after being released into the environment. For example, the UNEP Governing Council found that the "deleterious impacts on human health and the environment attributed to mercury and its capacity for global transport/cycling" provided sufficient evidence to "warrant further international action to reduce the risks to human health and the environment from the release of mercury and its compounds to the environment."[9]

6. In respect to lead and cadmium, experts have not agreed yet on their potential for long-range environmental transport, although there is agreement that these metals are toxic, bioaccumulative, and (by definition) persistent. This is why UNEP is currently conducting scientific reviews on lead and cadmium and compiling an inventory of existing risk management measures for further consideration at the twenty-fifth session of the Governing Council in 2009. The question of long-range transboundary environmental transport of lead and cadmium has also been extensively considered under the UNECE Convention on Long-Range Transboundary Air Pollution (LRTAP).

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[5] IFCS, Ad Hoc Working Group on Persistent Organic Pollutants Meeting, *Final Report*, IFCS/WG.POPs/Report.1, at 14, para. 56 (1996), http://www.who.int/entity/ifcs/documents/general/adhoc_en.doc.

[6] A workshop at which interested countries would discuss the issue was proposed for 1998, postponed to 2000, but ultimately never held. *See* IFCS, Third Meeting of the Intersessional Group, *Final Report*, IFCS/ISG3/98.50w, at 19, para. 70 (1998), http://www.who.int/entity/ifcs/documents/general/isg3_report_en.pdf.

[7] *See* IFCS, Forum II, *Thematic Session on Partnership: Lead Risk Reduction* (sponsored by OECD), IFCS/FORUM-II/97.05B, at 2-3 (1996).

[8] *See* OECD, C(96)42/Final (1996), http://webdomino1.oecd.org/horizontal/oecdacts.nsf/Display/9BE26CBED53C82EFC12570880057EB60?OpenDocument.

[9] UNEP Governing Council, Decision 22/4 V, *Mercury Programme*, para. 1 (2003), http://www.unep.org/gc/gc22/REPORTS/K0360710English.pdf.

LRTAP, however, has not focused on the mobility of lead and cadmium due to international trade.

1.2. Scope and Structure of Thought Starter

7. *Because these ongoing international efforts are intended to address the* long-range environmental transport *issue, this Thought Starter does not do that. Instead, the document focuses on the health and environmental problems that may be related to the international transport of lead and cadmium via trade*. If countries are unable to address those problems effectively through unilateral or bilateral action, then there may be a need for coordinated international action and support. This is particularly true for developing countries and countries with economies in transition that may have limited capacity and capability for the sound management of chemicals.

8. This Thought Starter uses the term "international concern" to describe the potential multilateral dimension of the risks to human health and the environment that may result from trade of lead and cadmium. The Thought Starter uses the concept of international transport via trade to distinguish its focus from the assessment of "long-range environmental transport" potential that is the subject of the LRTAP Convention, the Stockholm POPs Convention, and UNEP's scientific review of lead and cadmium, among other international efforts.

9. The Thought Starter focuses specifically on whether international trade in lead and cadmium may lead to problems that call for a coordinated international approach to address them. Thus, it concentrates on considerations that may be relevant to whether a global or international approach may be warranted, and not on the specific response measures that could be used to address the problems. IFCS Forum VI may wish to consider options for international activities to address the increased health and environmental risks resulting from the international trade in lead and cadmium, based on countries' experiences.

10. As the UNEP interim reviews of scientific information on lead and cadmium have acknowledged, "The substance flows as a consequence of trade and waste disposal, mainly in developing and transition countries are major causes of human exposure to cadmium. There are gaps on lead [and cadmium] flows so research in this area is necessary in order to set priorities to global action to reduce risks."[10]

11. The information put forth in this Thought Starter concurs with these assessments. Additional data and case studies in this area will be invaluable, especially in respect to trade flows in lead and cadmium throughout their life cycles to, from, and between developing countries and countries with economies in transition; the extent to which adverse effects on human health and the environment may be related to international

[10] UNEP Chemicals, *Interim Review of Scientific Information on Lead,* 164 (October 2006) [hereinafter "UNEP Interim review on lead"], http://www.unepchemicals.ch/pb_and_cd/SR/Files/Interim_reviews/UNEP_Lead_review_Interim-Oct2006.pdf; UNEP Chemicals, *Interim Review of Scientific Information on Cadmium,* 149 (October 2006) [hereinafter "UNEP Interim review on cadmium"], http://www.unepchemicals.ch/pb_and_cd/SR/Files/Interim_reviews/UNEP_Cadmium_review_Interim_Oct2006.pdf. UNEP anticipates that these Interim Reviews will be finished during the second half of 2008 and presented to the Governing Council at its 25th regular session in 2009. The Interim Reviews could be subject to further amendments in the future as new information becomes available. Information received in response to the call to fill data gaps is accessible at http://www.chem.unep.ch/Pb_and_Cd/Call_for_information.htm.

trade in lead and cadmium commodities, products, and wastes in producing and consuming countries; and the socioeconomic impacts of such trade, especially in developing countries and countries with economies in transition. The authors and the lead sponsor urge Forum participants to share such information where it is available, and to endeavor to conduct further investigation where it is not. Individual members of the Forum Working Group on Lead and Cadmium, as well as other Forum participants, are invited to prepare additional information papers for Forum VI that may supplement the information and points of view in this Thought Starter.

12. The Thought Starter is presented in five Parts:

Part 1 (the present part) is the Introduction.

Part 2 frames the issue by briefly summarizing relevant information on lead and cadmium, including toxicity and eco-toxicity, international trade flows, environmental health problems that may be related to international trade, and multilateral agreements relevant to such trade.

Part 3 responds to questions raised at Forum V by suggesting considerations that may guide discussion of whether or not the health and environmental impacts of trade of hazardous substances throughout their lifecycles may rise to the level of an international concern that warrants a coordinated international approach.

Part 4 discusses lead and cadmium in the context of the considerations presented in Part 3.

Part 5 briefly identifies potential outcomes of the Forum VI session on lead and cadmium.

13. Note that a Reference List on Lead and Cadmium is being distributed as a separate, complementary document to this Thought Starter. The Reference List includes the authorities and sources cited in the Thought Starter, as well as additional documents that may be of interest to stakeholders, including their internet addresses, where available.

2. Framing the Issue

14. This Part frames the issue by briefly summarizing information on lead and cadmium with respect to: toxicity and eco-toxicity, international trade flows, environmental health problems that may be related to international trade, and international agreements relevant to such trade.

2.1. Toxicity and Eco-toxicity

15. Lead and cadmium can be toxic at very low exposure levels and have both acute and chronic effects on human health and the environment.

2.1.1. Lead

16. Lead is highly toxic to humans and can have a number of toxic effects at very low exposure levels. Acute and chronic effects on human health may include neurological,

cardiovascular, renal, gastrointestinal, hematological, and reproductive effects.[11] Lead is one of the most dangerous chemicals for children and developing fetuses.[12] Recent studies, along with past research, indicate there is no level of lead exposure that is "safe" for the fetal brain.[13] One study estimated that mild mental retardation and cardiovascular disease resulting from lead exposure amounted to almost one percent of the global burden from all disease, with the highest burden of disease found in developing country regions of the world.[14] Other vulnerable population groups include socially and economically disadvantaged populations and the malnourished, whose diets are deficient in proteins and calcium.[15] Lead exposures occur in most, or all, countries of the world.[16]

17. Lead has well-documented toxic effects on plants, animals, and micro-organisms. In all animal species studied lead has been shown to cause adverse effects in several organs and systems, including blood, central nervous system, kidneys, reproductive system, and immune system.[17] Lead bioaccumulates in mammals, aquatic algae, and invertebrates.[18] It can enter surface waters both as a result of erosion of lead-containing soil particles and dumping of waste containing lead products.[19]

2.1.2. Cadmium

18. Cadmium exposure can produce a wide variety of acute and chronic effects in humans, leading to a build-up of cadmium in the kidneys that can cause kidney disease.[20] For nonsmokers, food is generally the largest source of exposure.[21] The population at highest risk consists of women with nutritional deficiencies or low iron stores, people with kidney disorders, and fetuses and children with low body iron stores. Maternal exposure to cadmium is associated with low birth weight and an

[11] *See* Nordic Council of Ministers, *Lead Review*, 16 (2003), http://www.who.int/ifcs/documents/forums/forum5/nmr_lead.pdf.
[12] For example, the World Health Organization has reported that in the year 2000, about 800,000 children were affected by lead exposure, leading to lower IQ and potential mild mental retardation. A. Prüss-Üstün and C. Corvalán, WHO, *Preventing Disease Through Healthy Environments: Towards an Estimate of the Environmental Burden of Disease*, 47 (2006), http://www.who.int/quantifying_ehimpacts/publications/preventingdisease.pdf.
[13] *See* Schnaas, Lourdes, et al., *Reduced Intellectual Development in Children with Prenatal Lead Exposure*, ENVIRONMENTAL HEALTH PERSPECTIVES, 114: 791 (2006), http://www.ehponline.org/members/2005/8552/8552.pdf; *see also* Khwaja, M.A., *Effect of Lead Exposure in Children*, SCIENCE, TECHNOLOGY & DEVELOPMENT, 24: 2 (2005).
[14] Fewtrell, L.J., et. al., *Estimating the Global Burden of Disease of Mild Mental Retardation and Cardiovascular Diseases from Environmental Lead Exposure,* ENVIRONMENTAL RESEARCH, 94: 120-33 (2004), http://www.elsevier.com/locate/envres.
[15] UNEP Interim review on lead, *supra* note 10, at 12.
[16] *Id.* at 9.
[17] *Id.* at 10.
[18] Nordic Council of Ministers, *supra* note 11, at 3.
[19] UNEP, Lead and Cadmium Working Group, *Report of the first meeting of the Lead and Cadmium Working Group*, Annex 1, at 6, UNEP(DTIE)/Pb&Cd/WG.1/6 (2006).
[20] UNEP Interim review on lead, *supra* note 10, at 10; Nordic Council of Ministers, *supra* note 11, at 5-8.
[21] U.S. Environmental Protection Agency (USEPA), Technology Transfer Network Air Toxics Web Site, *Cadmium Compounds: Hazard Summary* (1992, rev. Jan. 2000), http://www.epa.gov/ttn/atw/hlthef/cadmium.html.

increase of spontaneous abortion.[22] An increased risk of lung cancer has been reported following inhalation exposure in occupational settings.[23]

19. Like lead, cadmium is toxic to plants, animals, and micro-organisms. Cadmium, like all metals, is persistent. It bioaccumulates mainly in the kidneys and liver of vertebrates. It also bioaccumulates in aquatic invertebrates and algae, which are the organisms most sensitive to it. The accumulation of cadmium by plants results in this contaminant entering the human food chain.[24]

2.2. International Trade Flows

20. The UNEP interim reviews of scientific information on lead and cadmium both note that there are significant data gaps on international flows in these metals, which necessitate additional research for decision-making and to set priorities for global action to reduce risks.[25] In particular, there is a serious lack of data in respect to international trade flows to, from, and between developing countries and countries with economies in transition.

2.2.1. Lead

21. The production and consumption of lead ore, metals, compounds, and lead-containing products is a global enterprise, in which each of the many steps along the lifecycle of a product often is conducted in a different country.[26] Lead is mined in more than forty countries, including developed and developing countries and countries with economies in transition.[27] There is extensive global trade of lead raw materials. Lead is also used and traded globally as a metal in various products. The major use of lead in recent years has been in lead batteries, accounting for 78 per cent of reported global consumption in 2003.[28] Other major application areas are lead compounds, lead sheets, ammunition, alloys, cable sheathing, petrol additives, and paint.[29]

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[22] UNEP Interim review on cadmium, *supra* note 10, at 46 (citing Piasek, M. and Laskey, J.W., *Effects of in vitro cadmium exposure on ovarian steroidogenesis in rats*, JOURNAL OF APPLIED TOXICOLOGY, 19: 211-17 (1999); Johnson, M.D. et al., *Cadmium mimics the in vivo effects of estrogen in the uterus and mammary gland*. NATURE MEDICINE, 9: 1081-84 (2003); Frery, N., Nessmann, et al., *Environmental exposure to cadmium and human birthweight*, Toxicology, 79: 109-18 (1993); Schoeters, G., et al., *Cadmium and children: Exposure and health effects*, Acta Paediatrica, 95 (Suppl.): 50-54 (2006)).

[23] *Id.* at 41 (citing Nordberg, G.F., *Cadmium and health in the 21st century: Historical remarks and trends for the future*, Biometals, 17(5): 485-89 (2004)); *see also* USEPA, Cadmium compounds, *supra* note 20. The International Agency for Research on Cancer (IARC) classifies cadmium as a human carcinogen group I; the U.S. Environmental Protection Agency has classified cadmium as a probable human carcinogen, Group B1.

[24] UNEP Interim review on cadmium, *supra* note 10, at 8.

[25] UNEP Interim review on lead, *supra* note 10, at 164; UNEP Interim review on cadmium, *supra* note 10, at 149.

[26] UNEP Interim review on lead, *supra* note 10, at 81.

[27] *Id.* at 80.

[28] *Id.* at 7.

[29] *Id.* at 79 (citing Ayres, R.U., Ayres, L.W. and Råde, I., *The life cycle of copper, its co-products and by-products*, International Institute for Environment and Development (IIED) and World Business Council for Sustainable Development (WBCSD) (2002)); s*ee also* Kumar, A., Toxics Link, *A Brush with Toxics: An Investigation on Lead in Household Paints in India* (2007), http://www.toxicslink.org/ovrvw-prog.php?prognum=4&area=2.

22. The global consumption of lead increased from 4.5 to 6.8 million tons during the period of 1970 to 2003.[30] China, for instance, is the world's major producer and user of lead. Consumption there more than doubled from 510,000 to 1,180,000 tons between 1998 and 2005.[31] As of 2004, the major exporters of lead concentrates and ores to China were Australia, Peru, and the United States. Based on available data, the major importers of refined lead from China were the Republic of Korea, Taiwan, and Thailand.[32]

23. Recycling of electronic waste (e-waste) has added another link to the global lead enterprise.[33] Vast quantities of e-waste are sent to developing countries such as China, India, Nigeria, and Kenya.[34] Coming full circle, lead has been found in high levels in cheap jewelry imported into the United States from China. Some of the lead alloy used by the Chinese toy manufacturers is derived from electronic waste exported from the United States and other western countries.[35]

2.2.2. Cadmium

24. Cadmium is also used and traded globally as a metal and as a component in various products and wastes. Production and consumption of cadmium, cadmium compounds, and cadmium-containing products are carried out on a global scale. Cadmium-containing concentrates are extracted all over the world, mainly as a by-product of zinc production.[36] The locus of cadmium primary production shifted between 1995 and 2005, with production in Asia increasing sharply and production in Europe decreasing correspondingly.[37] Overall, global primary production of cadmium appears to be decreasing, while global secondary production (mainly related to zinc production) is increasing.[38]

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[30] UNEP Interim review on lead, *supra* note 10, at 83; *see also* Rand Merchant Bank, RMB Fixed Income, Currency & Commodities Base Metals: Base Metals Weekly Report, 25 July 2007, (stating global refined lead consumption totaled 3.431m tons in the first five months of 2007, up from 3.315m a year earlier, and refined lead production rose to 3.432m tonnes from 3.389m over the same five month period), http://www.randmerchantbank.com/web/rmb-online.nsf/Online/comms2007July/$FILE/RMB%20Base%20Metals%20Weekly%2020070725.pdf.

[31] UNEP Interim review on lead, *supra* note 10, at 85 (citing ILZSG, *Principal uses of lead and zinc*, International Lead and Zinc Study Group, Lisbon, Portugal (2005)).

[32] *Id.* at 82 (citing ILZSG, *Lead and zinc statistics*, Monthly Bulletin of the International Lead and Zinc Study Group, Lisbon, Portugal (2006)).

[33] *See* San Diego E-Waste LLC, *Problems Caused By Electronic Waste*, http://www.sdewaste.com/ewaste.html. A typical computer monitor may contain more than six percent lead by weight.

[34] Associated Press, *American Consumers Unwittingly Fuel Toxic Trade in Electronic Waste*, International Herald Tribune, 17 Nov. 2007, http://www.iht.com/bin/printfriendly.php?id=8373931.

[35] Fairclough, G., *China: Lead Toxins Take a Global Round Trip*, The Wall Street Journal, 12 July 2007. Note that electronic waste represents two percent of trash in U.S. landfills, but it equals seventy percent of overall toxic waste. Lead can be found in circuit boards and monitor cathode ray tubes (CRTs). Puckett J. et al., *The Digital Dump: Exporting Re-use and Abuse to Africa*, Basel Action Network (2005), http://www.ban.org/BANreports/10-24-05/documents/TheDigitalDump.pdf.

[36] UNEP Interim review on cadmium, *supra* note 10, at 79.

[37] *Id.* at 78 (citing U.S.G.S, *Mineral commodity summaries 2006*).

[38] *See* U.S. Geological Survey, *Mineral Commodity Summaries*, 42-43 (2008), http://minerals.usgs.gov/minerals/pubs/mcs/2008/mcs2008.pdf; Cooper, Moungar E. and Peter H. Kuck, "Cadmium," *USGS 2005 Minerals Yearbook*, http://minerals.usgs.gov/minerals/pubs/commodity/cadmium/cadmimyb05.pdf.

25. The trend in global cadmium consumption over the last two decades has been a steep increase in the use of cadmium for batteries and a decrease in use for nearly all other applications. Nickel-cadmium (NiCd) batteries represented 82 percent of world consumption in 2005.[39] NiCd batteries are manufactured in a global chain: raw materials originate in one country, batteries are produced in another, the batteries are incorporated into products in yet another, and consumers purchase and use the products in still another country.[40]

26. A report prepared for the International Cadmium Association in 2005 notes both the continued growing domestic Chinese market and export market, as well as the potential for growth in other emerging and transitional markets such as India, Russia, and Brazil.[41] Cadmium, like lead, is a component of electronic waste, found in chip resistors, infrared detectors, and semiconductors.[42]

2.3. Exposures to Lead and Cadmium Resulting from International Trade

27. This section identifies some of the risks to human health and the environment that may be directly traced to international trade and export-related demand in lead and cadmium commodities, compounds, products, and wastes. The dramatic expansion of global trade has led to the globalization of many public health and environmental problems.[43] According to the UNEP Executive Director, "Accelerating trade in goods and materials across borders and across continents is one of the defining features of the early 21st century."[44] While acknowledging that there are data gaps on lead and cadmium flows that require additional research, each of the UNEP interim reviews of scientific information on lead and cadmium states that the "substance flows as a consequence of trade and waste disposal, mainly in developing and transition countries, are major causes of human exposure."[45]

2.3.1. Primary production and exports

28. International demand for products containing lead and cadmium stimulates continued mining, refining, and production of lead and cadmium metals, compounds, and products, especially in developing countries and countries with economies in transition that have little capacity to prevent, reduce, or mitigate the severe environmental health risks that such activities often entail. Because environmental health costs are rarely reflected in the prices consumers in other countries pay for such goods, they represent damage to human and ecological health for which the producing countries and their citizens are usually not compensated.

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[39] UNEP Interim review on cadmium, *supra* note 10, at 81 (citing International Cadmium Association, *Cadmium consumption by end uses*, (2006)).
[40] *Id.* at 79.
[41] Morrow H., International Cadmium Association, *Cadmium Markets and Trends* (Sept. 2005), http://www.chem.unep.ch/pb_and_cd/SR/Files/Submission%20NGO/ICdA/MARKET%20Review%20Sept2005-1.pdf.
[42] Puckett, *supra* note 35.
[43] Bettcher D., Yach D., and Guindon G.E, *Global trade and health: key linkages and future challenges*, Bulletin of the World Health Organization (2000), www.who.int/docstore/bulletin/pdf/2000/issued4/bu0215.pdf.
[44] BBC News, *UN warning on e-waste "mountain,"* 27 Nov. 2006, http://news.bbc.co.uk/2/hi/technology/6187358.stm.
[45] UNEP Interim review on lead, *supra* note 10, at 165; UNEP Interim review on cadmium, *supra* note 10, at 149.

29. In the case of lead, one documented example is the Doe Run multi-metal smelting facility in La Oroya, Peru, which has caused widespread lead poisoning and was considered to be one of the world's ten most contaminated sites of 2006. According to a 1999 study by Peru's Ministry of Health, 99.1 per cent of the children in La Oroya suffered from lead poisoning. Studies conducted since the late 1990s have found that "virtually all" of the children younger than 6 years old, and many older children and adults, have blood-lead levels exceeding the WHO limit of 10 µg/dL.[46] A 2007 study reports that air levels of lead remain four to seven times higher than allowed under Peruvian standards.[47] Driven by export-related demand, Peru is a significant source of the world's lead.[48]

30. Primary production of cadmium has shifted to Asia, where it is now five times the production level in Europe.[49] China, Korea, and Mexico rank among the major producers of primary cadmium metal, and China is a main producer of portable NiCd batteries.[50] Soils contaminated with cadmium are a serious problem in many Asian countries, where cadmium enters the food supply, especially rice; more than ten percent of China's arable land is contaminated with cadmium.[51]

2.3.2. Imported products

31. While many industrialized countries have adopted complex regulatory approaches to address the health and environmental risks of lead and cadmium, they have not been able effectively to control releases and exposures that result from traded goods. For example, both the United States and Denmark have NiCd battery collection and recycling programs. Nevertheless, "a significant part of the batteries will be disposed of with municipal solid waste."[52]

32. In 2007 the U.S. toy maker Mattel recalled millions of Chinese-made toys across the globe that were discovered with paint containing lead levels exceeding safety standards. The recall took place in both developed and developing countries.[53] Public

[46] Fraser, B., *Peruvian Mining Town Must Balance Health and Economics,* THE LANCET 367: 889-90 (2006), http://www.thelancet.com/journals/lancet/article/PIIS0140673606683633/abstract.
[47] Carlos Abanto Kcomt, Asociación Civil Labor*, Segundo Informe sobre Evolución de la calidad de Aire en La Oroya* (May 2007) (reporting data from Censo Hemático del Centro de Salud La Oroya-DIRESA-2007), http://www.aida-americas.org/templates/aida/uploads/docs/Cond_CalidadLaOroya_varios_07-05.pdf; *see also* Salazar, M., *PERU: Pollution Emergency Plan Instead of Real Action Plan for La Oroya*, INTER PRESS SERVICE, 10 Aug. 2007 (reporting main chimney at Doe Run complex emits average of 1.5 tons of lead every twenty-four hours), http://ipsnews.net/news.asp?idnews=38854
[48] U.S. Department of State, Bureau of Western Hemisphere Affairs, *Background Note: Peru,* July 2007, http://www.state.gov/r/pa/ei/bgn/35762.htm.
[49] UNEP Interim review on cadmium, *supra* note 10, at 78.
[50] *Id.* at 79.
[51] Greenwire, *TOXICS: Cadmium batteries sickening workers, environment in China*, 15 Jan. 2008.
[52] UNEP Interim review on cadmium, *supra* note 10, at 125 (citing Maag, J. and Hansen, C.L., *Collection potential for nickel-cadmium batteries in Denmark,* Environmental Project no. 1004, Danish Environmental Protection Agency, (2005); *see also* INFORM, *Community Waste Prevention Toolkit: Battery Fact Sheet* (noting that industry's Rechargeable Battery Recycling Corp. collected and recycled only ten percent of the 28 million pounds of recyclable Ni-Cds that the RBRC expected to enter the waste stream during 2000), http://www.informinc.org/fact_CWPbattery.php#rbrctopic.
[53] BBC News, *Third recall for China-made toys*, 5 Sept. 2007, http://news.bbc.co.uk/2/hi/business/6979151.stm; Reuters, *China targets toy and drug manufacturers*, 9 Aug. 2007, http://www.reuters.com/article/email/idUSPEK9266020070809; Mattel Consumer

health officials in the United States have not been able to screen imported children's toys effectively for lead content. Tests conducted by a coalition of U.S. environmental health groups found that 35 percent of 1,200 tested children's products contained lead, many with levels far above the federal recall standard for lead paint.[54] High levels of lead have recently been found in inexpensive jewelry exported to the United States from China. Some of the lead in the jewelry was traced to lead salvaged from computers and other electronic goods discarded in western countries and exported to China. A child was reported to have died in 2006 in the United States from acute lead poisoning after swallowing a piece of Chinese-made jewelry.[55]

33. Imported products containing lead and cadmium that can cause exposure through normal use are also a growing problem in developing countries and countries with economies in transition.[56] For example, India imports an estimated 70 per cent of plastic toys on its market. Eighty-eight of 111 PVC toys and other soft toys sampled from Delhi, Chennai, and Mumbai contained lead and cadmium in varying concentrations. India does not have any enforceable standard for the total content of lead, cadmium, or other toxic metals in toys.[57]

2.3.3. Wastes

34. E-waste is the fastest growing component of municipal waste worldwide, with 20-50 million tons generated annually.[58] Electronic equipment traded as "used" is often obsolete or non-operational, i.e., it is really e-waste. Much of this waste is exported to developing countries such as China, India, Nigeria, and Kenya, where uncontrolled burning of wastes and improper processing of toxic components—often extracted using hammers, gas burners, or bare hands—causes serious occupational health and safety and environmental problems.[59] Exports of obsolete electronic equipment effectively shift the costs of environmentally sound recycling and disposal from industrialized to poor countries, which often do not have the capacity to manage the lead and cadmium waste in an environmentally sound manner.[60] Accordingly, some of the lead and cadmium in this equipment "will be released to the environment, the extent of which depends on disposal methods, control technologies applied and other factors."[61]

35. Improper disposal of e-waste can lead to the release of significant amounts of lead and cadmium into the air, water, and soil, including from open dumps and poorly maintained landfills, which are the rule in most developing countries and countries with economies in transition. Products containing lead and cadmium are "not typically

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Relations, Lead Paint Hazard Recall, http://service.mattel.com/uk/recall/recall_info_paint.asp (visited 25 March 2008).

[54] Associated Press, *Lead found in toys in stores*, Los Angeles Times, 5 Dec. 2005, http://www.latimes.com/business/la-fi-toys5dec05,1,2369615.story?coll=la-headlines-business.

[55] Fairclough G., *supra* note 35.

[56] UNEP Interim review on cadmium, *supra* note 10, at 6.

[57] Kumar, A., Pastore, P., Toxics Link, *Toying with Toxics: An investigation of lead and cadmium in soft plastic toys in three cities in India* (2006), http://www.toxicslink.org/docs/06161_Toying_with_Toxics_full_report.pdf.

[58] Nakagawa L., EarthTrends, *Toxic Trade: The Real Cost of Electronics Waste Exports from the United States* (2006), http://earthtrends.wri.org/features/view_feature.php?theme=3&fid=66.

[59] Associated Press, *American Consumers Unwittingly Fuel Toxic Trade in Electronic Waste*, International Herald Tribune, 17 Nov. 2007, http://www.iht.com/bin/printfriendly.php?id=8373931.

[60] Renckens, S., *A Network and Flows Perspective on E-waste Trade and Its Governance*, IIEB Draft Working Paper (Feb. 2007).

[61] UNEP Interim review on cadmium, *supra* note 10, at 5.

collected separately from the general waste stream in developing countries."[62] Uncontrolled burning and indiscriminate dumping of such waste may be an important source of local and regional cadmium emissions to the atmosphere and to land and aquatic systems.[63] Lead that is stockpiled in landfills and other waste deposits represents a significant potential source for future releases to the environment.[64] The Indian National Center for Lead Poisoning reports that dumping and unsupervised recycling of e-waste has led to high blood levels in half the children in cities like Bangalore, possibly resulting in lowered IQs.[65] In both India and Zambia, wastewater contaminated with lead and cadmium has been documented as a source of elevated levels of these metals in locally grown food crops.[66]

2.4. International Agreements that Apply to Trade in Lead and Cadmium

36. Few international agreements directly apply to, or take into account, international trade in lead and cadmium or materials containing them. Those that do include the Rotterdam and Basel Conventions. The Basel Convention broadly covers all types of wastes that contain lead and cadmium, while the Rotterdam Convention's present coverage of lead products is very narrow, and it does not cover cadmium at all.

2.4.1. Rotterdam Convention

37. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998) has two objectives: (1) to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and (2) to contribute to the environmentally sound use of those chemicals by facilitating information exchange about their characteristics, providing for a national decision-making process on their import and export, and disseminating these decisions to Parties.[67] The Convention currently has 119 Parties.[68]

38. The heart of the Convention is its PIC procedure. Certain banned or severely restricted chemicals and severely hazardous pesticide formulations appear in Annex III, the "PIC list." Parties may export listed substances to other Parties only if the prospective importing Party first provides its informed consent. Exporting Parties must provide importing Parties with an export notification that includes specified information when they (or an entity in their territory) wish to export a chemical that is banned or severely restricted in their own territories, but not yet included in Annex III.

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[62] *Id.* at 5.
[63] *Id.* at 4-5; UNEP Interim review on lead, *supra* note 10, at 6-7.
[64] Nordic Council of Ministers, *supra* note 11, at 3.
[65] Simmons, D., *India's poor tackle toxic e-waste*, BBC News, 14 Oct. 2005, http://news.bbc.co.uk/1/hi/programmes/click_online/4341494.stm.
[66] University of Sussex, Science and Technology Policy Research Bulletin, *Contaminated irrigation water and food safety for the urban and periurban poor: Appropriate measures for monitoring and control from field research in India and Zambia* (Dec. 2005), http://www.sussex.ac.uk/spru/documents/bulletin_dfid.pdf.
[67] *See* ROTTERDAM CONVENTION ON THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE (1998), http://www.pic.int/en/ConventionText/ONU-GB.pdf.
[68] Rotterdam Convention, "Ratifications," http://www.pic.int/home.php?type=t&id=63&sid=17 (visited 20 Feb. 2008).

Importing Parties may require additional information about the chemical related to occupational safety or environmental or human health.

39. Tetraethyl lead and tetramethyl lead, two anti-knocking agents for gasoline (petrol), are on the PIC list. Of the many lead compounds and products containing lead in international trade, only trade in these compounds (which is declining as leaded gasoline is phased out worldwide) is subject to the PIC procedure. Cadmium is not listed, and thus not covered.[69]

2.4.2. Basel Convention

40. The fundamental aims of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal are to control and reduce transboundary movements of hazardous and other wastes, prevent and minimize their generation, support the environmentally sound management of such wastes, and actively promote the transfer and use of cleaner technologies. The Basel Convention covers toxic and eco-toxic wastes, including lead and cadmium. It sets up a framework for controlling the transboundary movement of hazardous wastes, allowing such movements only upon prior written notification by the State of export to the competent authorities of the States of import and transit. The Basel Convention currently has 170 Parties.[70]

41. The Convention defines "environmentally sound management" of hazardous or other wastes as "taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes."[71] The Convention requires Parties to cooperate in developing technical guidelines to improve and achieve environmentally sound management of wastes. Over the years, a number of voluntary technical guidelines related to various kinds of wastes and waste streams have been developed to assist Parties, especially developing country Parties, in their efforts to achieve environmentally sound management of wastes. Among these is "Draft technical guidelines on the environmentally sound recycling/reclamation of metals and metal compounds (R4)," which focuses mainly on the recycling and reclamation of twelve metals and metal compounds (including lead and cadmium) that are listed in Annex I to the Basel Convention.[72] The Convention in 2003 adopted "Technical guidelines for the environmentally sound management of waste lead-acid batteries."[73]

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[69] The Rotterdam Secretariat has received notifications of final regulatory actions taken by Latvia on industrial cadmium compounds and Thailand on cadmium arsenate as a pesticide. Unless and until at least one country from a different PIC region reports taking similar action on each of these uses, they cannot be considered for listing in the Rotterdam Convention. *See* PIC Circular XXVI, app. V, at 333 (Dec. 2007), http://www.pic.int/en/Circular/CIRC-26-EN.pdf.

[70] Basel Convention, "Parties to the Basel Convention," http://www.basel.int/ratif/convention.htm (visited 20 Feb. 2008).

[71] BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTE AND THEIR DISPOSAL, art. 2.8 (1989).

[72] Conference of the Parties to the Basel Convention, Seventh Meeting, *Draft Technical Guidelines on the Environmentally Sound Recycling/Reclamation of Metals and Metal Compounds (R4)*, UNEP/CHW.7/8/Add.3 (2004).

[73] *See* Basel Convention Secretariat, *Technical guidelines for the environmentally sound management of waste lead-acid batteries,* series/SBC No. 2003/9 (2003), http://www.basel.int/pub/techguid/tech-wasteacid.pdf.

The Secretariat has also released a training manual for the preparation of national management plans for lead batteries in the context of Basel implementation.[74]

42. The Convention is also promoting development of partnerships and programmes of activities on the environmentally sound management of e-waste, including from mobile phones, computers, and other sources.[75] One of the challenges of the process is how to distinguish between waste and non-waste in international trade, and how to characterize these trade flows under international law, because a great amount of e-waste may be moved across borders under the guise of used, non-waste products.

2.4.3. Other agreements

43. The Aarhus Protocol on Heavy Metals is one of the eight protocols to the UNECE Convention on Long Range Transboundary Air Pollution (LRTAP).[76] Any State may ratify LRTAP and the Aarhus Protocol; however, only States in the UNECE region have done so.[77] The Protocol requires parties to reduce their releases of cadmium, lead, and mercury with the objective of cutting emissions from large, stationary sources, including industrial sources (iron and steel and non-ferrous metal production), combustion processes (power generation and road transport), and waste incineration. The Aarhus Protocol also promotes technology exchange and other forms of cooperation between the parties. With respect to waste incineration, the Protocol provides guidance on "product management measures" such as substitution and labeling to reduce the amount of metals in the waste stream.[78] These provisions are non-binding and do not regulate imported products. Nevertheless, their effectiveness may be undercut by imported products that contain lead and cadmium.

44. Other regional agreements such as the OSPAR and Helsinki Conventions also address lead and cadmium emissions that harm the marine environment in the north-east Atlantic and the Baltic Sea, respectively. Like the Aarhus Protocol, they do not cover international trade in lead or cadmium, or in products containing these metals.

3. Considerations for Whether Trade in a Hazardous Substance May Present an International Concern

45. This Part suggests considerations that may guide discussion of whether the trade in hazardous substances such as lead and cadmium throughout their lifecycles may increase risks to human health and the environment to the level of an "international concern" warranting a coordinated international approach. International law does not provide a definition of "international concern." However, relevant criteria for determining whether a chemical may constitute an international concern, such that an

[74] Basel Convention Secretariat, *Training Manual for the Preparation of National Used Lead Acid Batteries Environmentally Sound Management Plans in the Context of the Implementation of the Basel Convention*, series SBC No 2004/5 (2004), http://www.basel.int/meetings/sbc/workdoc/tm-ulab/techdocs.html.

[75] Open-ended Working Group, *Report on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, Part XII D: Workplan for 2009–2010, UNEP/CHW/OEWG/6/29 (2007), http://www.basel.int/meetings/oewg/oewg6/docs/29e.pdf.

[76] THE 1979 CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION (1998), http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf

[77] The members of UNECE include the countries in Europe, the United States of America, Canada, Israel and the Central Asian republics, including the Russian Federation.

[78] THE 1998 AARHUS PROTOCOL ON HEAVY METALS, Annex VII (1998).

international coordinated approach is warranted, may be derived from international chemicals law and other areas of international law and agreement.

46. Three common considerations underlie the development of most multilateral chemicals and environmental agreements that have trade-related provisions. They relate, respectively, to questions of risk, responsibility, and remedy:

(i) The international community perceives that certain substances or activities present an unacceptable risk to human health or the environment.

(ii) An action (or failure to act) by one or more countries may increase the risk of harm to other countries from the substances or activities.

(iii) These third countries find it difficult or impossible to protect themselves unilaterally from the increased risk.

3.1. Certain Substances or Activities Present an Unacceptable Risk to Human Health or the Environment

47. This is an obvious consideration for all of the chemicals and trade-related environmental conventions. The international community has undertaken numerous assessments to ascertain the hazards and risks associated with substances of possible international concern. IFCS substantially undertook the international assessment that ultimately led to adoption of the Stockholm Convention; UNEP's global assessment of mercury and its compounds has provided the basis for the Governing Council's ongoing consideration of whether there should be an international framework or instrument for addressing the risks of mercury. In the case of lead and cadmium, UNEP has developed interim reviews of scientific information on these metals, focusing especially on long-range environmental transport with the objective of filling scientific gaps to inform Governing Council discussions on the need for global action. While these assessments are essential to inform policy makers about the nature of the risk, the question of whether the risks are acceptable or not—and thus whether they may or may not warrant international action—must ultimately be answered by States through the political process. Moreover, the scope of the assessment (e.g., to examine risks associated with long-range environmental transport or international transport via trade) may make a substantial difference in the nature and degree of the risks that may be identified as issues for further political decision-making.

48. In determining that particular substances or activities present an unacceptable risk, stakeholders may be influenced by several lines of inquiry. These may include:

- Is harm from the substance or activity occurring now? Is there a high level of confidence that it will occur in the future if no action is taken?
- Are many countries, people, or species placed at risk by the substance or activity?
- What is the state of scientific understanding of the causes and effects of the harm? How fully can the hazard and risk be characterized, quantified, or otherwise substantiated and demonstrated?
- Are the human health or environmental impacts temporary or permanent? In particular, might they impact future generations? Are certain vulnerable groups at greater risk?

- May the harm lead to secondary or related effects, such as impairing economic development, causing social unrest, or exacerbating poverty?
- Are there beneficial or economically important uses of the substance or activity that should be considered? Are substitutes or safer alternatives available?

3.2. An Act or Omission by One or More Countries May Increase the Risk of Harm to Others

49. As the Rio Declaration on Environment and Development acknowledges, "States have, in accordance with the Charter of the United Nations and the principles of international law . . . the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."[79] Additionally, "States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health."[80] Thus, States should ensure that their acts or omissions, including those related to international trade and investment, do not increase the risk of environmental harm to other countries, or to common resources upon which other countries depend (such as the atmosphere).

50. Moreover, the "developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."[81] This principle of common but differentiated responsibilities suggests that the *demand* of developed countries for commodities and products that may involve hazardous substances or harmful activities in developing countries should be a factor in determining whether the activity rises to an international concern.

51. The consideration of whether a country's acts or omissions may increase the risk of harm to others provides an essential rationale for the presence of trade-related measures in multilateral chemicals and environmental agreements. In some, such as the Stockholm POPs Convention and the Montreal Protocol on Ozone Depleting Substances, it reflects an understanding that trade in a given hazardous substance could undercut the effectiveness of other measures taken in those agreements to address the problem. In others, such as the Basel and Rotterdam Conventions and the Convention on International Trade in Endangered Species (CITES), it reflects an understanding that international trade, itself, may be among the primary factors giving rise to the risk that needs to be addressed. For example, international trade in certain hazardous substances may result in the substances being used or disposed of in an importing country that does not have the capacity to do so in an environmentally sound manner. Conversely, international trade may be a driver of market forces that result in unsustainable exploitation of natural resources in a country where harmful acts cannot be regulated effectively, such as taking endangered species of wildlife or plants. In the cases of lead and cadmium, demand for commodities and goods containing these metals can be a driver of market forces that result in unsustainable or unmanageable production practices in the exporting countries.

[79] UN GENERAL ASSEMBLY, RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT, Principle 2 (1992).
[80] *Id.,* Principle 14.
[81] *Id.*, Principle 7.

52. In exploring whether an act or omission (such as the failure to regulate international trade of a hazardous substance sufficiently) by one or more countries may lead to an unacceptable risk to human health or the environment in other countries, stakeholders may examine:

- Whether a significant risk may be traced to the trade?
- Whether it is reasonably foreseeable that the trade will contribute to the risk?
- The extent to which an exporting or importing country avoids internalizing the environmental and health risks or costs related to its consumption, and instead externalizes those costs to its trading partners and consumers?
- Whether there are mitigating factors to consider related to the trade, such as increased incomes in poor countries?

3.3. Countries Find It Difficult or Impossible to Protect Themselves Unilaterally from Increased Risk

53. When individual States can effectively prevent or address an environmental or health risk on their own or bilaterally, they do not need to pursue multilateral remedies.[82] Instead, States have taken action under multilateral chemicals, wastes, and other environmental agreements when significant numbers of them have found it difficult or impossible to protect themselves unilaterally from a transboundary risk, including risks that may be related to international trade. A widespread recognition of vulnerability to such risks is thus a key consideration as to whether a risk to human health and the environment may rise to the level of an "international concern" warranting an international, coordinated approach.

54. A State's difficulty in taking effective, unilateral action may derive from at least two different factors. The first factor relates to the State's *capacity* to deal with the risk. Capacity is usually, and appropriately, associated with the identified needs of developing countries and countries with economies in transition, especially capacity development for foundational chemicals management. As governments agreed in the Rio Declaration, "The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. . . ."[83] All of the major multilateral chemicals and wastes agreements cite the limited capacities of developing countries to manage hazardous wastes and substances soundly as an important reason why the agreement is needed.[84] They also recognize the critical relationship of financial and technology assistance to these capacity needs.

55. An additional, important aspect of capacity relates to the ability of *all* States, both developed and developing, to protect themselves from hazardous substances that are

[82] Zambia reported a relevant success story, in which the Zambia Bureau of Standards was actively involved with other stakeholders to phase out leaded fuel by withdrawing the standard for leaded fuel (ZS 370:2000) and replacing it with a lead replacement fuel standard (ZS 716: 2007). Lead had previously been imported into Zambia to produce leaded fuel. Interview with Mr. Michael Musenga, Senior Environment Health Officer, Zambia Public Heath Department, 29 February 2008, 78th Forum Standing Committee meeting, Bangkok, Thailand.

[83] Rio Declaration, Principle 6.

[84] *See* Basel Convention, preamble; STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPs), preamble (2001); Rotterdam Convention, preamble; International Conference on Chemicals Management, *Dubai Declaration on International Chemicals Management* (2006); International Conference on Chemicals Management, *Overarching Policy Strategy* (2006).

widely distributed through environmental media or international commerce. For example, both developed and developing countries have great difficulty protecting themselves from persistent organic pollutants, once these substances are released into the environment. Similarly, both developed and developing countries often face difficulty screening their imports for the presence of contaminants such as lead, and they are challenged in their efforts to achieve environmentally sound recycling and disposal of imported products that contain cadmium.[85]

56. The second factor relates to whether international trade law may have a "chilling effect" on the ability or willingness of individual countries to take unilateral measures to address an environmental health risk that can be traced to international trade. In respect to trade policies, "Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus."[86] World Trade Organization rulings also suggest that trade-related environmental and health measures taken by States pursuant to multilateral efforts would not run afoul of WTO principles.[87] Thus, the potential for conflicts between international trade law and unilateral efforts by States to protect themselves from environmental health risks that may result from international trade may be a factor in determining whether unilateral action or an international, coordinated approach would be most effective in avoiding, reducing or mitigating health and environmental harms caused by the international trade of these metals throughout their lifecycles.

57. In deciding whether the difficulty or impossibility of States to protect themselves unilaterally from risks related to international trade in hazardous substances throughout their lifecycles should contribute to the substances being considered of international concern, stakeholders may consider:

- Whether measures regarding the presence and risks of hazardous substances in products that are subject to international trade can be taken most effectively and efficiently by producing or importing States?
- Whether developing countries and countries with economies in transition that are experiencing the harm have the technical, financial, legal, and other resources to address it by themselves? If they do not, are there obstacles to their receiving sufficient bilateral assistance? If so, could these difficulties be overcome through multilateral action?
- Whether a country with significant chemicals management capacity is able to address the harm by itself?
- Whether measures addressing international trade in the hazardous substance (including, possibly, process and production methods) would be the most efficient and effective way to prevent the harm from occurring? If so, would the measures best be implemented through a multilateral chemicals arrangement or by the individual States that are being harmed?
- Whether a multilateral framework would be necessary or desirable to avoid challenges under international trade law to national efforts?

[85] *See* UNEP Interim review on cadmium, *supra* note 10.
[86] Rio Declaration, Principle 12.
[87] *Report of the Appellate Body, United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/AB/RW, adopted on 21 Nov. 2001, paras. 111-34; BERNASCONI-OSTERWALDER, NATHALIE ET AL, ENVIRONMENT AND TRADE: A GUIDE TO WTO JURISPRUDENCE 128-35 (Earthscan: London, 2006).

- The extent to which existing multilateral chemicals frameworks or agreements may be able to respond to the challenges posed by the hazardous substances in question?

4. Discussion of Whether Trade in Lead and Cadmium May Present an International Concern

58. This Part discusses international trade in lead and cadmium within the context of the considerations presented in Part 3. *Unless otherwise noted, the assertions of fact in this Part are based on the facts presented and cited above, in Part 2.*

4.1. Do Lead and Cadmium Present an Unacceptable Risk to Human Health or the Environment?

59. Health and environmental harms caused by exposure to lead and cadmium throughout their lifecycles occur every day around the world. Global use of ores, compounds, products, and wastes continues apace for cadmium, and is increasing for lead. Electronic wastes, the fastest growing component of municipal waste worldwide, are exported to countries that are unable to manage them in an environmentally sound manner. Global trade in products and materials is expanding dramatically. In the globalized economy, the likelihood is high that the harms caused by primary production and exports, imported products and waste will continue to occur, and likely increase, in the future, if no action is taken.

60. Exposure to lead and cadmium ores, compounds, and products and wastes containing lead and cadmium that place people and wild flora and fauna at risk are well documented and occur in most, if not all, countries of the world. The UNEP Executive Director states that the "key findings developed by the [Lead and Cadmium] Working Group show that there is a significant international dimension of the risks to human health and the environment arising from the release of lead and cadmium into the environment. . . ."[88]

61. The toxicity and eco-toxicity of lead and cadmium and their routes of exposure have been extensively studied and described by national governments and international bodies. Lead and cadmium can cause severe acute and chronic health and environmental effects, including reproductive effects. Pregnant women, fetuses, and children are among the most vulnerable populations. Chronic lead neurotoxicity is particularly severe for children, and can result in damage to the brain and nervous system and lifelong behavioral, developmental, and learning problems. Maternal exposure to cadmium is associated with low birth weight and an increase of spontaneous abortion.

62. The health harms resulting from exposure to lead, particularly long-term neurological and developmental impacts on children, may cause significant economic losses for society, especially in developing countries and transition economies where exposure is often the highest. Health harms resulting from exposure to lead and cadmium diminish labor potential and productivity, exacerbating poverty and impairing economic development. Examples abound: Chinese workers producing cadmium batteries are routinely sickened. Over 99% of the children who live next to the metal smelting facility in the Peruvian city of La Oroya suffered from lead poisoning, causing

[88] UNEP Governing Council, *Interim reviews of scientific information on lead and cadmium: Note by the Executive Director*, UNEP/GC/24/INF/16 (2006).

lifelong developmental and neurological problems. The improper recycling of e-waste has led to high blood levels of lead in half the children of Bangalore, resulting in lowered IQs and diminished abilities.

63. Mining and refining of lead and cadmium and the industrial and manufacturing processes that use lead and cadmium generate employment and revenues. For example, approximately 80,000 people are employed in lead mining worldwide. Nevertheless, the enormous social and environmental costs of exposure, which are borne largely by the poorest and most vulnerable sectors of society—laborers, waste recyclers, children, pregnant women, and the malnourished—are incalculable. Moreover, many of the jobs that result in the highest exposures pay the least. Electronic waste recyclers in India and elsewhere, for example, earn less than one dollar per day.

64. Substitutes or safer alternatives are available that can reduce the flow of lead and cadmium throughout international commerce and the environment. Alternatives to lead are available for a wide range of applications, from gasoline additives and lead shot to cable sheathing and pigments.[89] Similarly, alternatives to cadmium have been introduced for cadmium applications including NiCd batteries, plating alloys for solders and other alloys, PVC stabilizers, and pigments.[90]

4.2. Do Trade-Related Actions Increase the Risk of Harm from Lead and Cadmium?

65. The trade flows of lead and cadmium and products and wastes containing them are complex due to rapid globalization. For example, Peru is a major exporter of lead concentrates and ores to China, while China is a major exporter of refined lead to other east-Asian countries. Generally speaking, the production and use of these metals is decreasing in OECD countries and increasing in Asia and some other parts of the developing world. Especially in rapidly industrializing countries with export-driven economies, a large amount of the environmental health risk from production and use of lead and cadmium may be traced to overseas demand for processed materials and manufactured products. That demand is driven significantly by consumer preference for inexpensive products. One of the factors explaining why such products are comparatively inexpensive is the fact that some or many of the stages of their manufacture are undertaken with few, if any, environmental health safeguards. Thus, in the cases of lead and cadmium, competition within and between supply chains, and consumer preference for inexpensive imports may often result in much of the environmental health risks associated with the imported products being externalized to the exporting country. Demand for commodities and goods containing lead and cadmium can be a driver of market forces that result in unsustainable practices in exporting countries where harmful acts cannot be regulated effectively.

66. Not all of the environmental health risks, however, are externalized away from consumers. The same lax safeguards that result in low prices for consumers may bring increased risks of contamination, especially lead contamination, in the finished products, which contribute to higher releases of these metals throughout the products' lifecycles, including when they are disposed of. Consumers of these products are in developed countries, countries with economies in transition, and developing countries, where environmentally sound management of wastes may be ineffective or nonexistent. These imported products may thus have a significant, negative impact on environmental health in developing countries and countries in transition.

[89] UNEP Interim review on lead, *supra* note 10, at 24.
[90] UNEP Interim review on cadmium, *supra* note 10, at 22.

67. In contrast to consumer products that use or contain lead and cadmium, international trade of e-waste (including "used" electronics that effectively are e-waste) overwhelmingly flows from developed to developing countries and economies in transition. The devastating environmental health impacts to trash pickers, recyclers, their families and communities are increasingly well-documented and foreseeable. The export of these materials from North to South occurs because it is cheaper for people and companies in rich countries to export, rather than bear the costs of environmentally sound disposal at home.

68. Large numbers of people in developing countries and countries with economies in transition, depend on all of these activities for their livelihoods. For many of the most polluting and dangerous activities, such as e-waste recycling, the most dependent people are generally the poorest and least-able to cope with the health impacts of lead, cadmium, and other toxics. While a cost-benefit analysis that fully accounted for the environmental health impacts might demonstrate that the international trade that makes their livelihoods possible can leave them worse off, they may have no other readily apparent survival options, or they may have little information and awareness of the risks to which they and their families are exposed.

69. On a broader economic scale, the key strategy for poverty alleviation in many developing countries and countries with economies in transition is to rapidly expand their manufacturing sector for low-cost goods for export. Heavy environmental pollution is often accepted as an unavoidable cost of economic growth. However, as the pollution from lead, cadmium, and other toxics intensifies and public awareness of the high environmental health costs increases, citizens may become less willing to accept those costs.

4.3. Do Countries Have Difficulty Protecting Themselves Unilaterally?

70. Existing multilateral agreements that include trade-related measures such as the Basel and Rotterdam Conventions and the Convention on International Trade in Endangered Species (CITES) reflect the understanding that where international trade is among the primary factors giving rise to a health or environmental risk, unilateral action is unlikely to be either an effective or sufficient approach for dealing with that risk. For lead and cadmium, international trade is a driver of mining, refining and manufacture that give rise to increased occupational, public health, and environmental risks, particularly in developing countries and countries in transition. International trade is also a major factor in increased risks of exposure to commodities, products and wastes containing these metals.

71. Experience shows that industrialized countries with significant chemicals management capacity have been unable to protect themselves effectively from the increased risks presented by the international trade in products containing lead and cadmium. Public health officials, e.g. in the United States, have not been able to screen imported children's products effectively for lead content. Similarly, because NiCd battery collection and recycling programs in the United States and Denmark, for example, have proven in practice only partly effective, a significant portion of these batteries is still disposed of as municipal solid waste, which greatly increases the risk of lead and cadmium leaching into water and soils.

72. The limited capacity and capability for sound chemicals management commonly found in developing countries and countries with economies in transition, including gaps in national legislation and environmental standards, make it even more difficult, if

not impossible, for these countries to protect themselves from the increased risk of harm resulting from international trade in lead and cadmium throughout their lifecycles. Addressing the "widening gap" in capacity is a recognized and important function of all the agreements addressing chemicals and waste. The recent dumping of enormous quantities of hazardous waste in Côte d'Ivoire is a tragic reminder that developing countries seldom possess the capacity to control the transport of hazardous substances across their borders.

73. This lack of capacity is also reflected in the fact that many developing countries reported to the UNEP interim scientific reviews that they have few or no regulatory programs for lead and cadmium. India, for example, does not have any enforceable standard for the total content of lead, cadmium, and other toxic metals in toys. In Peru, air levels of lead in areas near a large metal smelter remain four to seven times higher than permitted under applicable standards.

74. The hurdles can be high for developing countries to obtain bilateral development assistance to address their capacity needs for sound chemicals management, including capacity needs related to lead and cadmium. Officials from some donor States frequently (and accurately) observe that such official development assistance (ODA) might be available if developing countries would only include it as a priority in their national development strategies and requests. However, poverty alleviation is the most pressing need in most developing countries, and environmental health issues are often not viewed as being among the highest priorities. Thus, chemicals managers in these countries rarely have the political clout to place sound chemicals management on their national government's development assistance agendas. In contrast, the receipt of multilateral assistance through, for example, the financial mechanisms of environmental conventions, is not contingent on such prioritized requests. Chemicals managers in developing countries therefore may have far greater success through multilateral, as opposed to bilateral, channels in obtaining financial assistance to support sound chemicals management capacity, including capacity to address risks from exposure to lead and cadmium.

75. The production and consumption of lead and cadmium ore, metals, compounds, and products containing lead and cadmium are a global enterprise, in which trade flows crisscross the planet and each of the many steps in the lifecycle of a product is often conducted in a different country. The UNEP interim scientific reviews of lead and cadmium recognize that "substance flows as a consequence of trade and waste disposal, mainly in developing and transition countries, are major causes of human exposure."[91] This suggests that preventive measures to control trade flows of lead and cadmium could not only be effective, but could also be among the most efficient, because measures that prevent environmental health harms from happening are usually far less expensive than the costs of dealing with the harm after it has occurred.

76. Numerous multilateral environmental agreements, including the Basel and Rotterdam Conventions, CITES, the Montreal Protocol, and the Cartagena Protocol to the Convention on Biological Diversity, are based on the understanding that controlling trade flows of hazardous substances or activities can be among the most effective approaches to preventing, reducing, or mitigating threats to environmental health. These agreements recognize that it is the international trade itself (in hazardous chemicals and waste, endangered wildlife, or living modified organisms) that results in

[91] UNEP Interim review on lead, *supra* note 10, at 149; UNEP Interim review on cadmium, *supra* note 10, at 164.

or is a primary cause of the health or environmental harms, and that these harms can only be effectively addressed via a coordinated international approach.

77. Moreover, in the absence of a multilateral approach controlling trade in lead and cadmium metals, products, and wastes, States may be concerned that they could be vulnerable to challenges under international trade law if they take unilateral trade-related action. Conversely, World Trade Organization rulings suggest that trade-related environmental and health measures taken by States pursuant to multilateral efforts would not run afoul of WTO requirements. This is an important consideration, especially for developing countries and countries with economies in transition that may not have the resources to defend themselves against trade challenges and thus may be reluctant to take unilateral, trade-related regulatory measures, such as restrictions or bans on the import of products or wastes containing lead and cadmium.

78. The Basel Convention currently covers all types of wastes that contain lead and cadmium. Thus, Parties may not export such wastes to countries that have exercised their right to prohibit them, and they may not allow the export if they have reason to believe that the wastes will not be managed in an environmentally sound manner. The Convention also requires Parties to cooperate in developing technical guidelines to improve and achieve environmentally sound management of wastes. In addition to the publication of guidance documents relevant to lead and cadmium waste, the Convention is developing programs to address the environmentally sound management of e-waste including, for example, an extended producer liability initiative in partnership with major cell phone manufacturers aimed at keeping discarded cell phone waste out of municipal waste streams. Parties have not been able to agree on an approach to address the growing problem of trade in e-wastes that are traded under the guise of used products, which represents a significant portion of total international trade flows.

79. The Rotterdam Convention could address certain aspects of the challenges presented by lead and cadmium compounds, including their use in products, although Convention Parties have not yet decided to list the use of any chemical in products. A broad listing of lead and cadmium in the Convention could result in the prior informed consent (PIC) procedure applying to exports of most industrial uses of lead and cadmium in international trade, and exchange of information on the environmentally sound management of those uses. However, it should be noted that COP decisions to add chemical listings to the Convention may only be taken by consensus and do not automatically follow a recommendation from the Convention's Chemical Review Committee. Accordingly, it could be very difficult to achieve a broad listing of lead or cadmium. Additionally, developing countries with limited institutional capacity to monitor and enforce PIC export notifications may not be able to address lead and cadmium risks adequately through this approach.

80. The Rotterdam Convention applies to international trade in listed chemicals among Parties, for the use category specified in the listing. It does not directly restrict or prevent such trade, other than to the extent that exporting countries may allow trade in listed chemicals only if an importing country has provided its prior informed consent. Moreover, receipt of the PIC notification and the information that must precede or accompany international shipments of listed chemicals may facilitate improved management of the chemical in the importing country.

81. While the Basel Convention provides a legal framework to deal with the full range of issues related to lead and cadmium wastes, no existing agreement offers a comprehensive framework to prevent, reduce, or minimize the risk of harm from

exposure to lead and cadmium throughout their lifecycles. Moreover, neither the Basel nor the Rotterdam Conventions includes a mandatory financial mechanism for assisting developing countries and countries with economies in transition to secure needed financial resources for implementation of their treaty commitments.

5. Potential Outcomes of the Forum VI Session on Lead and Cadmium

82. During the Forum VI session on lead and cadmium, the Forum may wish to discuss and consider whether the dispersal of lead and cadmium through international trade of these metals as commodities and in products and wastes may warrant coordinated international action to protect human health and the environment. The Forum may wish to examine this question from the point of view of both producing and consuming countries, and especially developing countries and countries in transition. The Forum may wish to consider whether such trade may lead to problems that cannot be sufficiently addressed by countries acting alone, whether those problems may rise to the level of an international concern, and thus whether they call for a coordinated international approach to addressing them irrespective of the legal nature of the measures.

83. If the Forum concludes that adverse effects related to mobility of these metals through international trade may warrant coordinated international action, then the Forum may wish to consider what additional steps or actions may be desirable, including the means for their implementation. The Forum may wish to prepare and submit a statement containing its findings and recommendations for consideration by the UNEP Governing Council at its twenty-fifth session and by the International Conference on Chemicals Management at its second session.