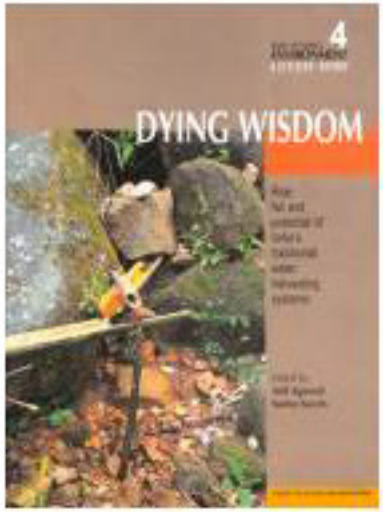
The story of pesticides in Coke-Pepsi and...

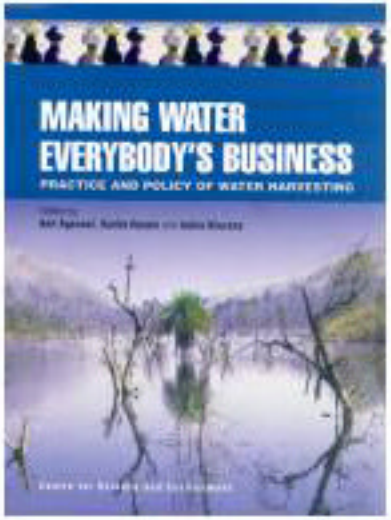
- Policy implications of pesticides in soft drinks: why it is so important to fix the problem

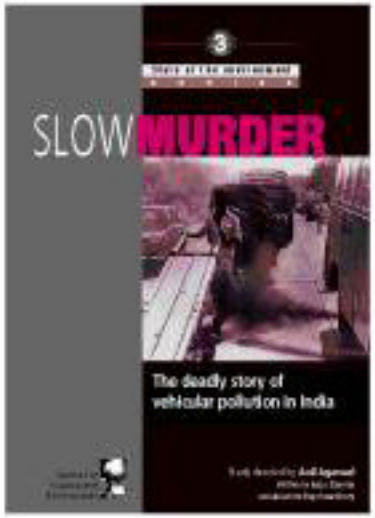
- **Centre for Science and Environment,**
- **New Delhi**

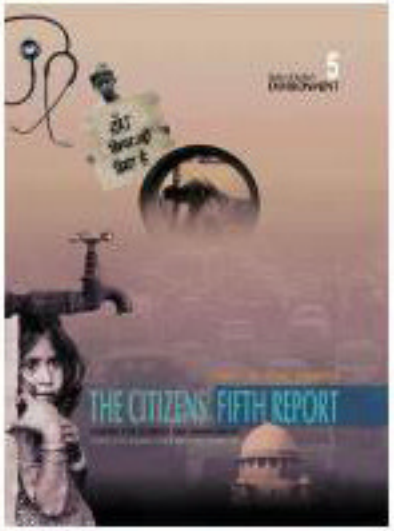
CSE: Who are we?

- **Set up in 1980.**
  A public-interest research institute.
- **Policy research and public awareness.**
  On water, forest management, air pollution, climate change, industry, health.









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Why test? Our pollution monitoring Laboratory

- **Set up in 2000, with state-of-art equipment for pesticide residue, heavy metal and air pollution monitoring.**

- **We set it up to:**
  a. respond to community requests:
  b. investigate issues of public health:

- **We set it up because there is a conspiracy of silence. We need science for ecological security.**

The story of Padre village, Kerala

- **2001: villagers from Padre, Kerala write to CSE. Mysterious diseases.**

Industry ‘uses’ science

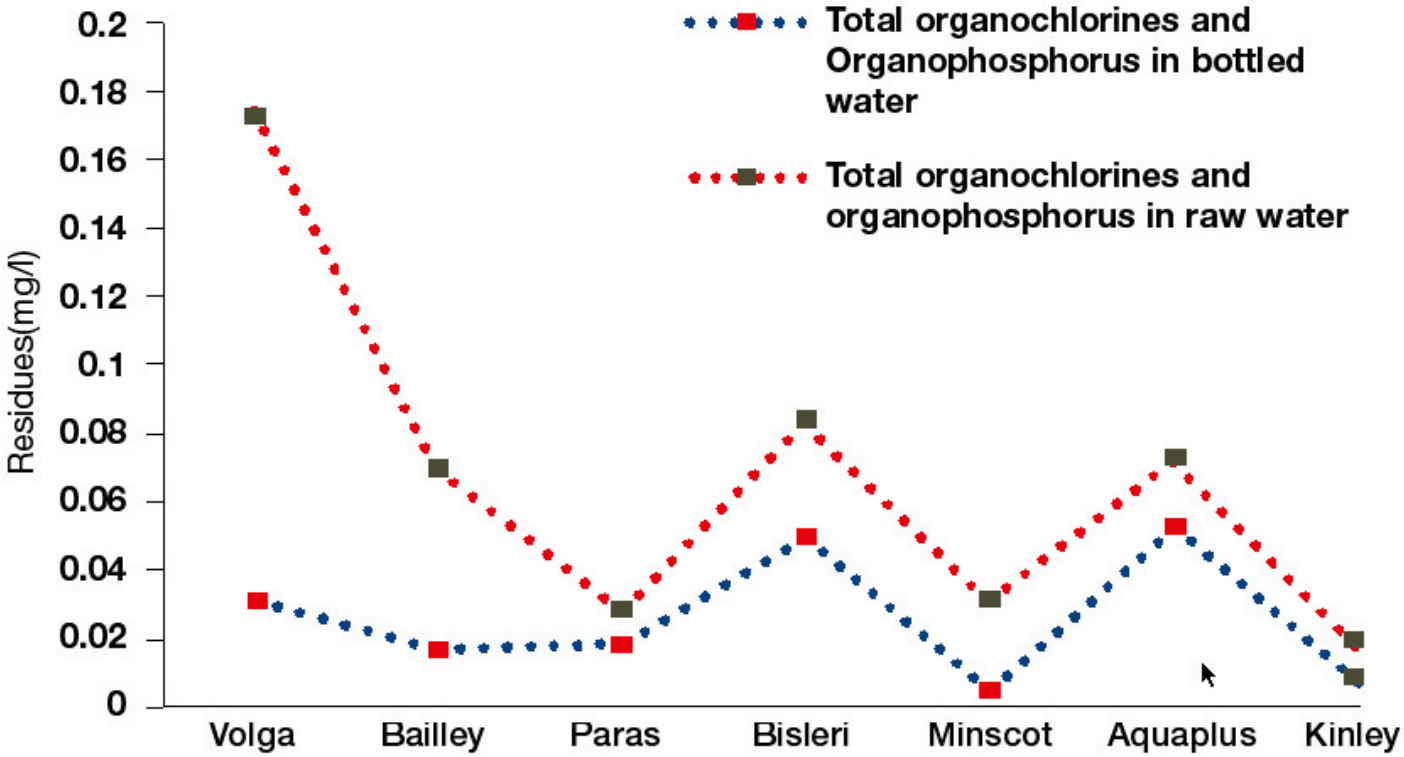
- **CSE lab finds endosulfan in human blood, tissue, food, water, fish…**
- **Industry fights back. Hires “accredited” lab. Says no endosulfan found.**
- **10 months later, NHRC asks ICMR.**
- **ICMR collects blood samples of children. Confirms endosulfan. Says that it is possible “causative factor” for high reproductive, neurological and congenital abnormalities in village.**
- **Kerala government bans pesticide spraying. Industry still fighting….**

Why study soft drinks?

- **2002: Looking at pesticides in drinking water. Collected samples from Delhi colonies. No visible trend as area very big.**
- **Decided to look at bottled water. We detected pesticides, so looked at source.**

- **Collected samples of groundwater in and around bottling plants…**

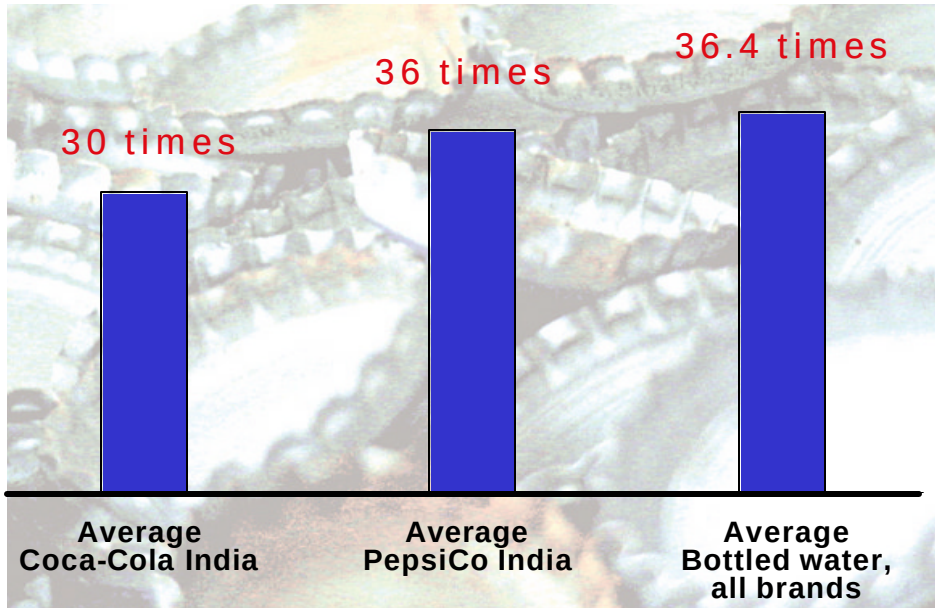
Found pesticides…



- **Letters, emails, messages asking: WHAT ABOUT SOFT DRINKS?** They use the same water.

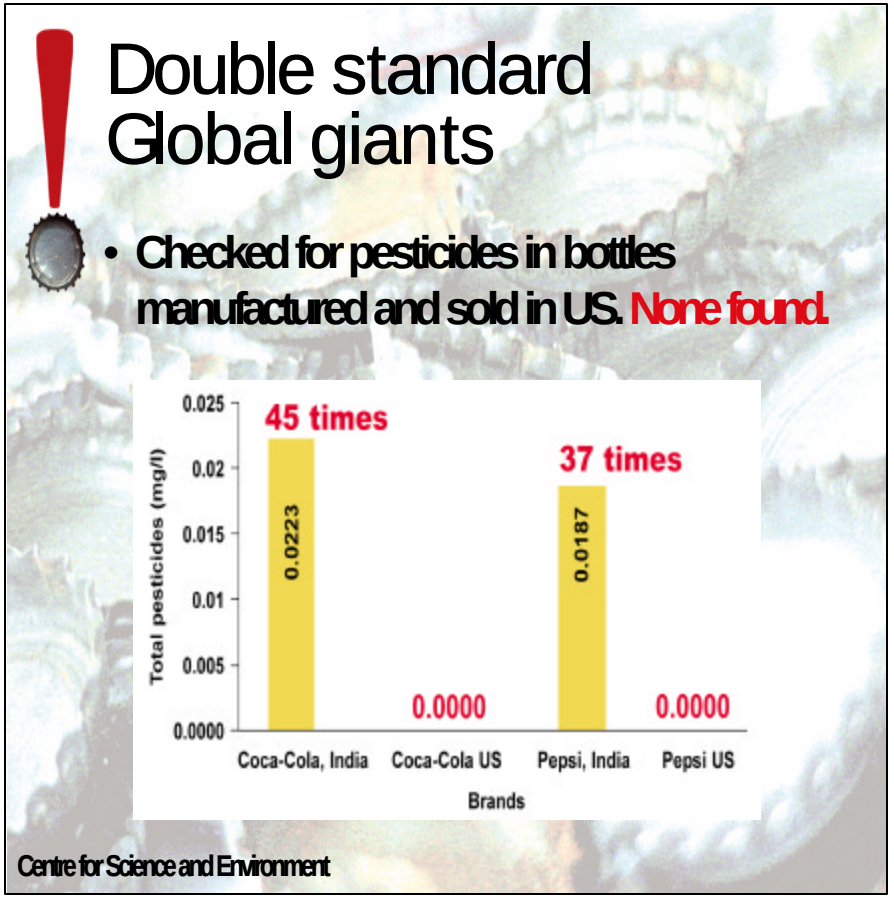
Soft drinks: what did we find?

- **Same pesticides as bottled water: DDT, lindane, chlorpyrifos, malathion.**
- **Same level as bottled water.**
- **But poorer (in fact non-existent) regulations compared to bottled water**



No pesticides in US bottles

- **Same pesticides are used in US.**
- **In a 2000 total diet study, Food and Drug Administration found five most frequently observed chemicals: DDT, malathion, chlorphyrifos, endosulfan and dieldrin.**
- **But not found in US soft drinks: Is human health more important in US regulations?**



Key issues we raised

- **Pesticide contamination is growing. Even soft drinks contain pesticides. Need a stringent policy for safe and wise use of pesticides.**

- **Pesticides found in soft drinks pose a long-term health hazard as they are above standards. A cocktail of different pesticides found.**

- **Regulations for pesticide residues in soft drinks do not exist. Is that acceptable?**

- **Water used by this industry as raw material not regulated. Not paid for. Is this right?**

Cola companies respond….

- August 5 (12 noon): **CSE releases study**
- August 5 (4 pm): **Pepsi-Coke joint press conference rejecting our study; say we are not capable of doing this research; they have tested; they know that they are safe…**
- August 8: **Pepsi file defamation suit (gag-SLAPP) case against CSE. Coke case not unaccepted by SC** (withdraws case after we file counter in November)
- August 21: **Government releases its test report. Confirms 3 pesticides, in smaller quantities. But uses phrase: drinks "safe": meet existing packaged drinking water standards** (which were already changed because they were not safe).
- August 22: **sets up Joint Parliamentary Committee (4th in India) to investigate matter. Sharad Pawar chairman.**

4th ever JPC: Its terms

- **“Whether the recent findings of CSE regarding pesticide residues in soft drinks are correct or not”**

- **“To suggest criteria for evolving suitable safety standards for soft drinks, fruit juice and other beverages where water is the main constituent.”**

JPC and what?

- **February 2004: JPC report tabled in Parliament.**
- **Says: CSE study is correct**
- **Says: Standards should be made for beverages**
- **Says: Pesticide regulations must be revamped in the country to keep in mind people's health**

- **Then what? 2006**

Bottom-line: 2006 no standard

- **Bureau of Indian Standards finalises standards in March 2006.**
- **Standards made in spite of opposition by companies**

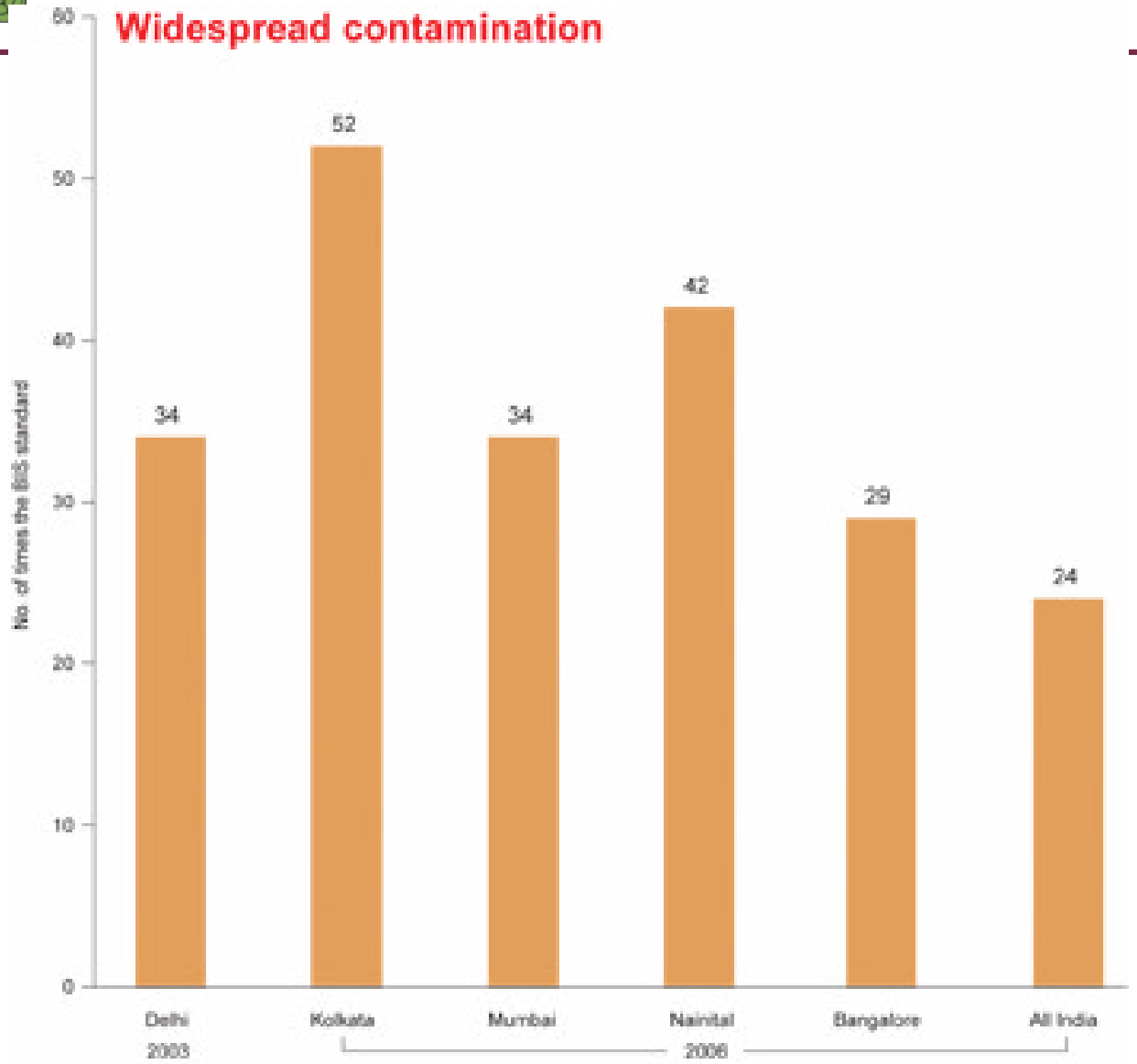
- **But standards finalised, not notified.**

- **Why?**

- **Ministry of Health says more research is needed…...**

- **"Good science" is the convenient tool to obstruct action.**
- **Companies win. We lose. Acceptable?**

2006: Even higher levels than 2003



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What we want

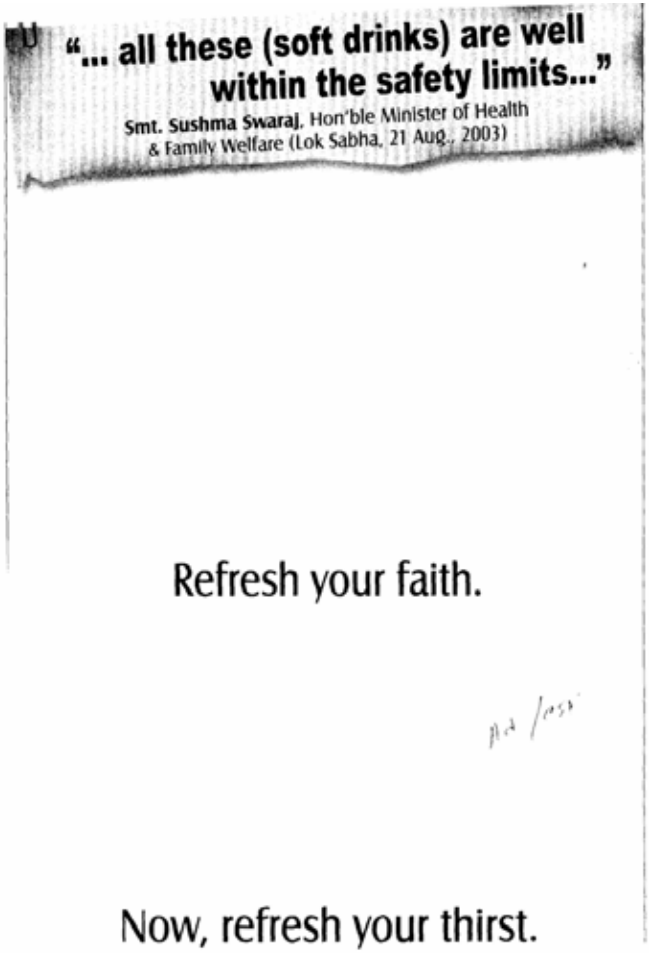
- **Urgently revise standards for all pesticide residues in food to stay below safe levels.**
- **Set most stringent standard for pesticide residue in water. Cannot afford any contamination.**
- **Set standards for finished products. Cannot follow product standards in industrialised countries. They do not have a contamination problem. We will have to regulate raw material and processed food.**

Issue: define what is ‘safe’

- Companies say: “We are safe”

- Why?
- Pesticides sub-ppb levels – too little to harm you
- Pesticides more in milk, juice etc – how does it matter

“Or we are safe: Aamir drinks it”



Safety not about large numbers

- **Pesticides are deadly. Invisible exposure – over time, in small (tiny) doses – leads to chronic health effects.**
- **Immunosuppressive effect – triggers diseases like cancer or asthma.**
- **Persistent build up in our bodies – lindane for instance is a potent carcinogen.**
- **Chlorpyrifos –pregnant women exposed to tiny amounts gave birth to babies with reduced weight and head circumference.**

- **Safety is about defining what is safe to ingest over a lifetime, setting standards of what is allowed and then enforcing standards…..**

Safety: living within ADI

- **Unsafe if consumption of pesticides is above acceptable daily intake (ADI). How much of a particular pesticide you can ingest over a lifetime without risks at different bodyweights.**

Pesticides are 'economic toxins': you take poison because you need nutrition.

Companies say: small proportion of ADI used by them: 0.2-2%.

But we exceed our ADI (quota of pesticides). No space for non-nutritive foods/ non-essential food.

Will have to decide between milk, juice or soft drinks.

Easy guide to regulate pesticide

Determine ADI (acceptable daily intake)

— Tests on rats for toxicity (NOAEL)

— Safety factor: 100 times more for humans

Set MRL (maximum residues limit)

— Based on field tests on crops

— Best-possible residue

— Compare with other countries' MRL

Multiplied by diet (exposure)

TMDI (Theoretical Maximum Daily Intake) The sum of what we eat: diet by section of population

Cross check

— Ensure exposure is lower than ADI

Regulation works…if you check..enforce..penalise

- US: 6,523 samples tested and 4% failed;
- EU: 46,000 samples only 4% failed standards;
- Canada: 44,000 samples only 2% failed standards.

- Low MRL set. Strict enforcement. Regular surveillance.

- Their governments say that pesticides are not a health hazard because the exposure is much below ADI.

- They do not regulate pesticides in finished products like soft drinks, because they have cleaned up their act.

What about us?

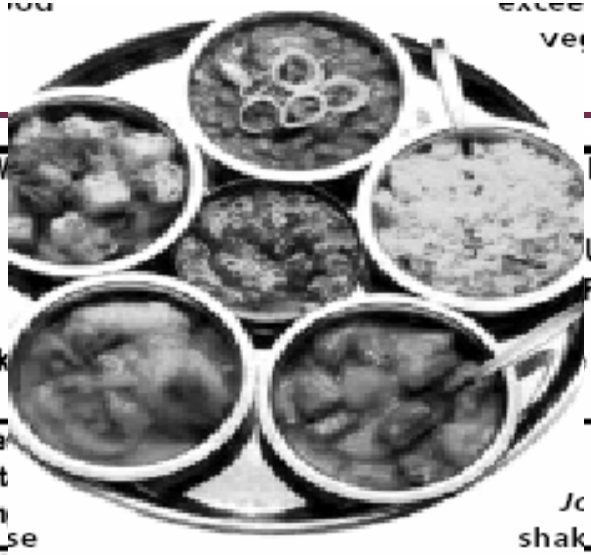
- **Remember that pesticides standards are about total exposure. That means we have to know what we eat and how much we eat. And how much pesticide is allowed in the food we eat.**

- **The food basket is also the pesticide basket.**
  It's a trade-off: between nutrition and poison.

- **Exposure=MRL x Diet (what we eat and how much)**

- **If we calculate what the law today allows: then…**

About us: Lindane in our diet



Theoretical Maximum Daily Intake (TM
LINDANE
USING PFA MRLs
FOR 60 KG ADULT

JMPR ADI for Lindane **0.3 mg/person/day (60 k**

Food Commodity	Indian MRL (mg/kg)	Diet (gm/ day)	Pe int (m	
Rice	0.05	209	0.0	
Other Cereals	0.1	236	0.02	7
Total Vegetables	1	196	0.20	55
Fruits	1	111	0.11	31
Poultry	2	3	0.01	2
Other Meat	2	22	0.004	1
Eggs	0.1	4	0.000	0
Fish	0.25	12	0.003	1
Milk	0.01	179	0.002	1
Butter & Ghee	0.2	6	0.001	0
Total pesticide intake (mg/day)			**0.36**	
ADI			**0.3**	
% of ADI			**119**	

* No sugar standard for Lindane
**Nothing allocated to beverages

Maximum Daily Intake (TMDI)
LINDANE
USING PFA MRLs
FOR 10 KG CHILD

0.05 mg/child/day (10 kg bw)

	Indian MRL (mg/kg)	Diet (gm/ day)	Pesticide intake (mg/day)	% Distribution
	0.05	184	0.0092	7
Vegetables	1	88	0.0879	65
Fruits	1	10	0.0104	8
Meat, Fish & Egg	1.1	22	0.0246	18
Milk	0.01	95	0.0009	1
Pulses	0	15	0.0000	0
Sugar & Sugar beet	0	12	0.0000	0
Oil and fats	0.2	6	0.0013	1
Condiments & spices	0	4	0.0000	0
Total pesticide intake		**437**	**0.13**	
ADI			**0.050**	
% of ADI			**268**	

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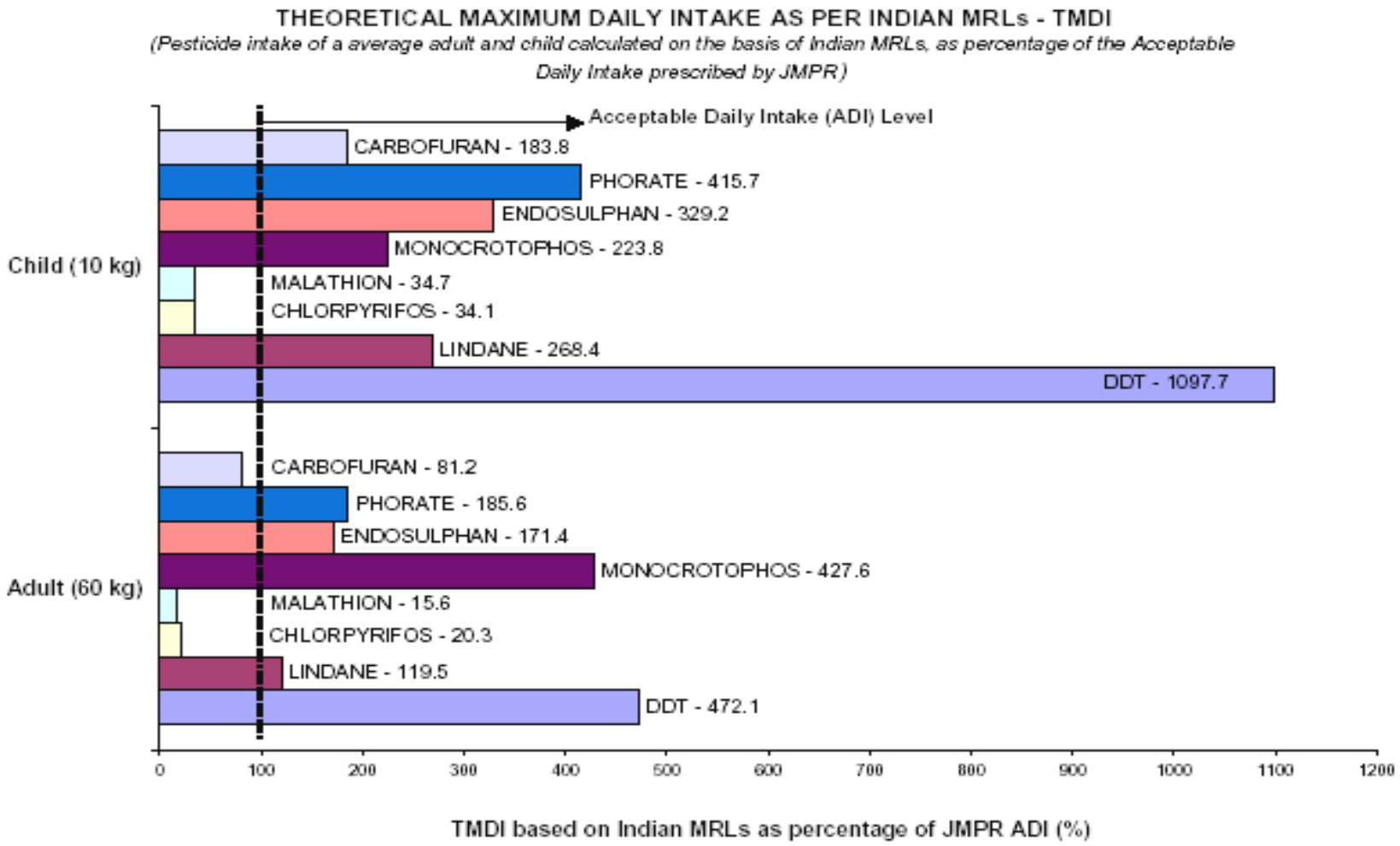
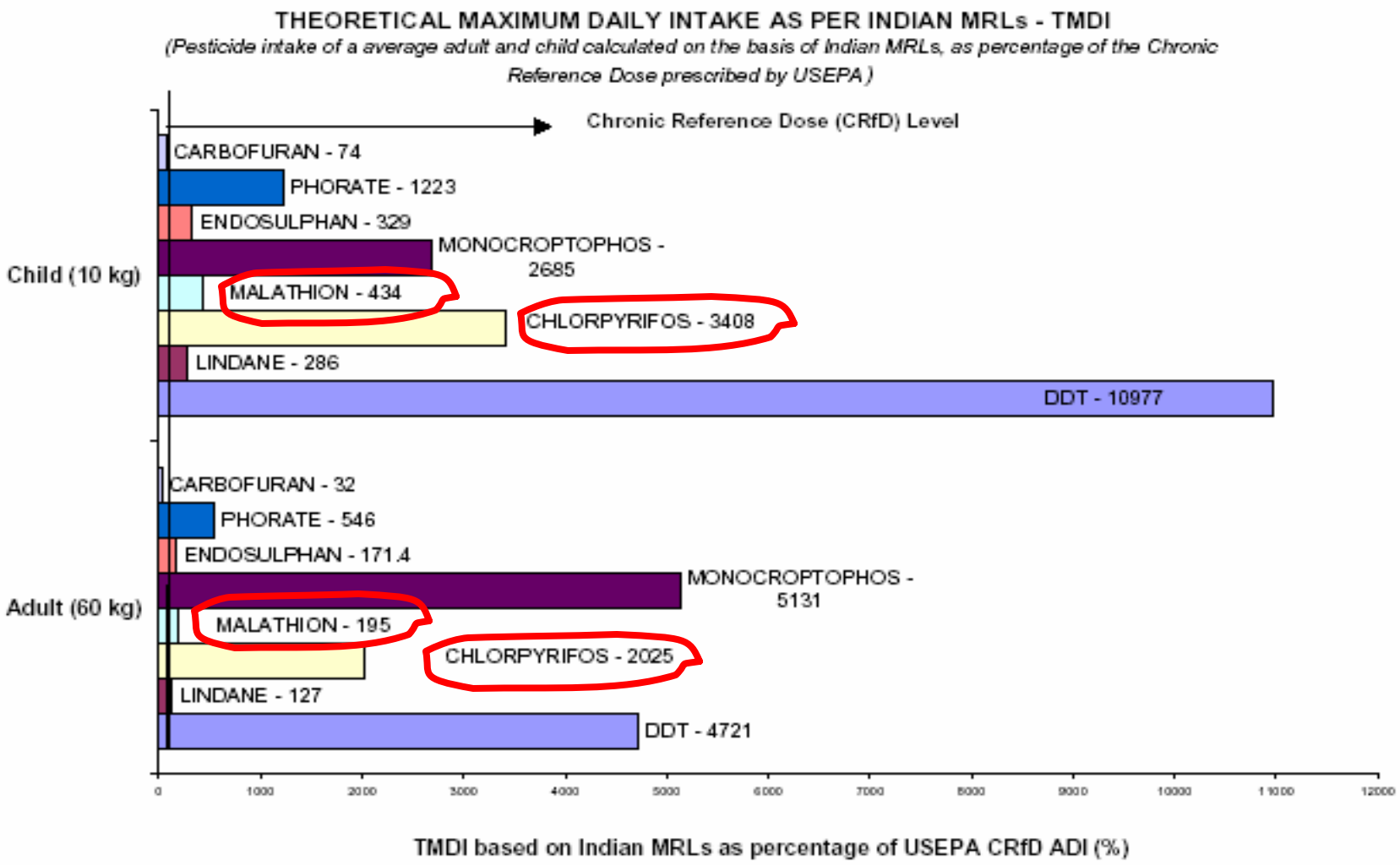
About us:Deadly legal exposures



Still about us: take USEPA



Poisoned India: Conspiracy of silence

Track record

Summary data showing contamination of different food commodities in India (1965-1998)

Food item	Samples analysed	Samples contaminated	Contamination (per cent)
Wheat	1,352	628	46.4
Rice	463	405	87.4
Sorghum	137	52	37.9
Pulses	487	211	43
Vegetables	6,803	3,642	53.5
Major vegetables*	2,930	1,659	56.62
Fruits	458	192	42
Spices	284	183	71.5
Honey	148	135	91.2
Total	13,062	7,107	54.4

*Tomato, okra, cabbage, brinjal, capsicum, potato, cauliflower

Source: G S Dhaliwal and Balwinder Singh (eds) 2000, Pesticides and Environment, Commonwealth publishers, New Delhi, p 207

No action taken so far

Pesticide residues found in baby milk powder by AICRPPR

	Himachal Pradesh		Hyderabad		Kerala	West Bengal	Bangalore
	HCH	DDT	HCH	DDT	HCH	HCH	HCH
Brand I	3.734	1.47	0.578	0.226	0.251	0.522	0.225
Brand II	1.128	0.839	1.067	0.32	0.243	0.494	0.013
Brand III	1.886	0.344	0.415	0.042	0.354	0.142	0.081
Brand IV	2.863	0.468	0.458	0.021	0.241	0.694	0.071
Brand V	3.031	–	0.389	0.054	0.168	0.279	0.026
Average	2.5284	0.78025	0.5814	0.1326	0.2514	0.4262	0.0832
Excess*	252.8	78.0	58.1	13.3	25.1	42.6	8.3

*Number of times higher than EU baby food norms (0.01 mg/kg for all pesticides)

Revamp regulations for pesticides: ensuring all food is safe

- **Since 2004 pesticides registered only after maximum residue levels are fixed;**
- **Since 2005 government regulated based on ADI.**
- **Since 2004 many efforts to improve enforcement and education of farmers -- NDDB**
- **To work on upgraded national enforcement.**

Regulation costs: Who pays?

- The more the chemicals registered, the higher the cost of regulation (surveillance, residue analysis, enforcement).
- In USA, managing pesticide risks cost 7.4 per cent of gross pesticide sale between 1971-95.
- Cannot say that we are poor to enforce health-regulations once we have allowed use of substance.

Way ahead: reinventing the treadmill

- 1939: DDT discovered. Paul Muller awarded Nobel Prize.
- 1972: DDT found to be persistent. Banned in US.
- Industry introduces alternatives: Methoxychlor and dicofol – relatively close to DDT. Endosulfan – with sulfur in structure. Now that is banned…
- Persistence still a problem. Organophosphates introduced. Discovered in 1930s – used as nerve gas. Higher acute toxicity. Reduce the ability of enzyme cholinesterase to regulate signals between neurons..can cause muscle weakness etc…..banned already in US..

No liability – profits in new

- **Commercial interests in new products and substitutes. Politics of science and data.**
- Need a global product assessment and liability convention.
- **Inventors get incentives through IPRs.**
- **Inventors of products that are found to have adverse impacts should also stand to lose.**
- **Will force companies to do careful assessment and maybe** create incentives for environment-friendly products**.**

Safety: adhering to standards

- **Safe limits are defined by standards. Standards essential. But companies do not want. Cannot be regulated.**

  Cannot be called 'unsafe'.

- **Ministry of Health has regulated input water: 0.1ppb (individual pesticide)**

  0.5ppb (total pesticides)

- All samples checked in 2006 unsafe**. But companies will say: "only input regulated" Government will say: "cannot check".**

Protected by law. Safe.

Health: business of food

- Business of food is changing. Processed food industry is now part of our daily diet. And will grow.

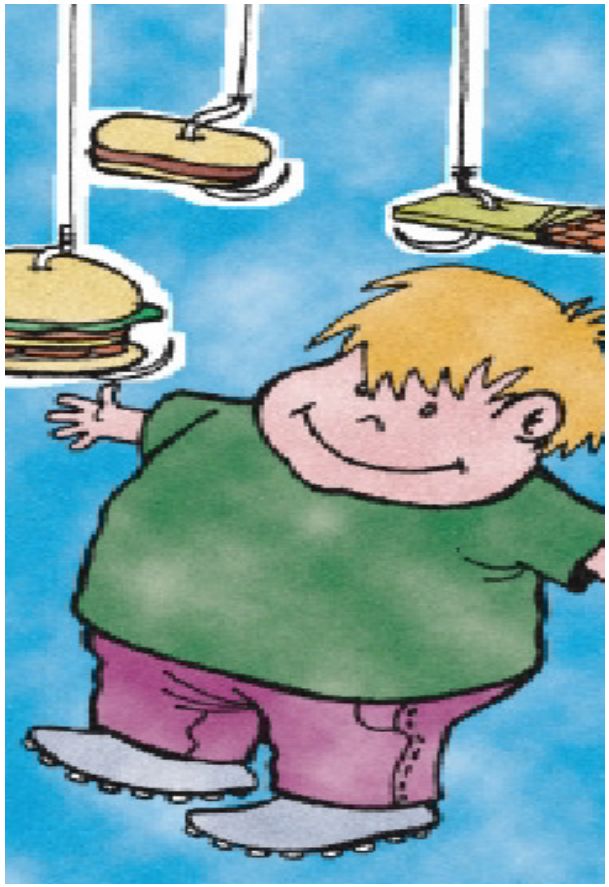
- NSS 59th round March 2005 finds that in rural areas person spends just **Rs 10 on fruits** but **Rs 25 on beverages, refreshments and processed food.**

- The total money spent each month in rural India is Rs 1,854 crore, while Rs 1,770 crore per month is spent by urban India. **Needs regulation. Because it concerns health.**

Bad food

- **All research shows that bad food-lifestyle indicted.**
- **Sugar-fat rich food is responsible for obesity related diseases..**
- **WHO says: high and increasing consumption of sugar sweetened drinks by children is serious concern. Each additional bottle each day increases risks of becoming obese by 60 per cent…**

WHO wants governments to take charge..



- **Wants sugar to be restricted to 10% of daily diet.**
- **Wants governments to stop giving incentives to unhealthy food..**
- **Wants industry to limit levels of saturated fat..sugar in products.**

Health: changing dangers

- Regulation for unsafe food must take into account:

- **Acute impact**: Visible immediate problems (bacteria, viruses and parasites etc) and adulteration by poisons etc);
- **Chronic impact:** Long term triggers of bad health (tiny doses of pesticides, heavy metals, antibiotics, industrial chemicals).

Defining safety

- Safety is about managing the poison-nutrition trade-off (we ingest poison to get some nutrition..)
- But this poison must be within safe exposures. Therefore, safety requires setting standards for the food basket.
- Safety is all about meeting and adhering to a given standard.

What regulations must do

- **Ensure that food standards are health based.**
- **Standards are set to stay below the safety threshold (the acceptable daily intake).**
- **Standards are set for the finished (food on the table) products so that consumers rights are protected.**
- **Standards differentiate between nutritious and non-nutritious**
- **There are stringent provisions for ensuring quality control and food safety by food business.**

Why is this important?

- **For our health..**

- **For ensuring that imports of food into India do not destroy our people's health (we import more than we export). We must not become dumping ground for other's junk.**
- **For ensuring that our exports are not compromised. This is a sunshine industry. Must become the kitchen-of-the-world (Thailand) by ensuring credible standards.**

Soft drinks: Cannot set standards because..

Companies say:

- **A. Cannot measure pesticides – not true found the committee.**
- **B. Cannot test complex matrix – product only water and sugar. Governments test in rest of world. Companies test. Say they are safe.**
- **C. Cannot set final product standard – governments have set pesticide residue standards for final product in other products. Consumers need final standards. Input standards cannot be regulated.**

Cannot. Need more data on sugar

- Cannot set standard because sugar has pesticides. Till sugar is tested across the country and standards revised – Data of over 150 samples checked. Companies supplied info. Pesticides negligible. Refined sugar used. Hot Carbon process. Pesticides not the issue. Only 10% of product sugar. 90% water. Water standard already mandated.
- Standard set: 0.5 ppb total pesticides

  0.1 ppb individual pesticides

Safety assured?

- **Aamir Khan and favourite bahu says they are ‘safe’. We can drink.**
- **Minister of health says they are ‘safe’. He has tested.**
- **But if they are so clean then why are they opposed to standards?**

- **No answer. Silence on standards.**
- **Are companies so powerful? Can we allow them right over our food? Our bodies?**

Our agenda…will continue

- Translating protest into policy needs (constant) public pressure.
- Challenge for Indians is to **work** democracy**.**
- It can be done. It is being done. Must be supported and enabled.