purging HIPPOCRATES' BACKYARD

The story
of Bio-medical waste
management in India

Toxics Link
for a toxics-free world

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"The unrecorded past is none other than our old friend, the tree in the primeval forest which fell where there was no one to hear the sound of the crash. If there was no ear, was there a sound."

– Barbara Tuchman

Written by: Aaruni Kant Sinha
April 2015

Preface

There is enough documentary evidence to surmise that the Bio-Medical Waste (BMW) movement has been the most successful movement of its kind in India. Less than 20 years back, there was no laid down policy, rule or regulation of any kind, pertaining to handling and disposal of BMW. Today, the management of BMW – right from policy, regulation, to implementation procedures - is widely recognised as the best among all categories of waste management in the country.

Yet, this is hardly the story.

Like all major movements concerning environment management, the recognition of Hospital Waste as the carrier of the most infectious and hazardous of waste, and the need to manage it expertly, was first established in the western hemisphere in the early 80's. Prior to that, it was pretty much below the radar, simply because it comprised – and still comprises – a miniscule fraction of the gargantuan waste generated by the human race. And even out of this fraction barely 10% is infectious. Yet, by the 1980's the world had woken up to the havoc that BioMedical Waste was capable of wreaking. As a repercussion, when the *Basel convention on Transboundary Movement of Hazardous Waste and their Disposal* came into being in 1989, Clinical Waste was listed right on the top, as the most deadly, in its 45 categories of hazardous waste.

However, what makes the Indian story remarkable is that, by the late 90's, almost every document on the subject – right from policy to implementation – seemed either to originate from India or had a major contributor in India. Not just regional and state actors, but global organisations, right until WHO, were looking "India-wards" for expert opinion. So what had changed in so short a time?

Apparently a lot.

By the mid-nineties, India was on the cusp of a new dawn. The Indian economy, pushing rapidly towards a billion consumers, was being liberalized to the world. Developed countries, with almost stagnant economies, were looking brightly – almost condescendingly - to sell their wares to the perceived "third world natives" of the country. The BMW movement – and for that matter the entire movement

against hazardous waste - is truly an offspring of the Indian vanguard action against this “Third World dumping” of redundant technologies and ideas; a vanguard that comprised crusaders from India as well as abroad. By the turn of the millennium, there were a series of developments that established India’s intellectual capital in the eyes of the world. The Indian expertise in BMW management, though not as flamboyant as the IT movement, was as crucial to this cause. It is in this perspective that the movement for management of BMW needs to be seen.

The BMW movement brought to fore, what is today one of the most important NGO’s in the ‘Global South’. Up until then, NGO activism in India was mostly based on gut feeling, and a lot of noise. This was probably the first time that a series of battles were won on hard, clear, empirical data and analysis, that was produced by young, outraged engineers, doctors, biotechnologists, and many such expert communities. The impact of this work is yet to be fully assessed, as it continues to influence policy-making across a number of conventions like Basel and Minamata. The BMW movement spawned the next generation of “social entrepreneurs” and leaders who’ve grown to become global figures today.

There is however a flip side to the story…. and it lies very much in the Indian backyard. Undoubtedly, at a policy level - National and State – the management of BioMedical Waste is as well laid out as possible. Yet, beyond the reaches of metros and larger cities, the situation remains worrisome… non-existent. It is a typical “Two Indias” challenge, and a constant reminder that your Thought Leadership can change the world; but when it comes to India, you will need champions in every state, every district, every hospital, and sometimes in every ward, to rid her of the scourge of mismanaged Bio Medical Waste.

- Aaruni Kant Sinha

Acknowledgment

The Toxics Link's journey of Bio-medical waste management was not easy but it was still full of euphoria. The Rule and subsequent five guidelines on medical waste and mercury management changed a student's group to a full blown research and advocacy group. We came to realize the power of good research and good intentions. For each problem that we found on ground we sought solutions and they lead to policy changes.

But we were never alone in this journey. From the international community to the national (medical and nursing) community, everyone was with us. The judiciary heard us and gave us the confidence and our first leap.

We would like to acknowledge our partner hospitals, Sir Ganga Ram Hospital, Holy Family, St. Stephens, Batra, Pushpanjali, Dr. Shroff's, Orthonova…, who taught us more than we could. Dr. Vijay Agarwal, Dr. Sudhakar Vira, Father Pinto and Dr. Ann Mathews were champions who steered our learning.

We would also like to thank our long term funders SIDA and SSNC who helped sustain most of our work on medical waste. WHO SEARO office too trusted us with some very significant studies on the issue. Our colleagues in Health Care Without Harm, European Environmental Bureau, International POPs Elimination Network deserve a special heartfelt gratitude. Gary Cohen, Jack Weinberg, Elena Lymberidi, Glenn Mc Rae, Jorge Emmanuel, Alex Von Hildebranda ….. and the list is long.

The more we work in the field we realize there is still a long way to go. 'And miles and miles before I sleep……' We thank all the wonderful people who have helped us get this far and we look forward to support and guidance from all of you to make this world a better world.

– Toxics Link Team

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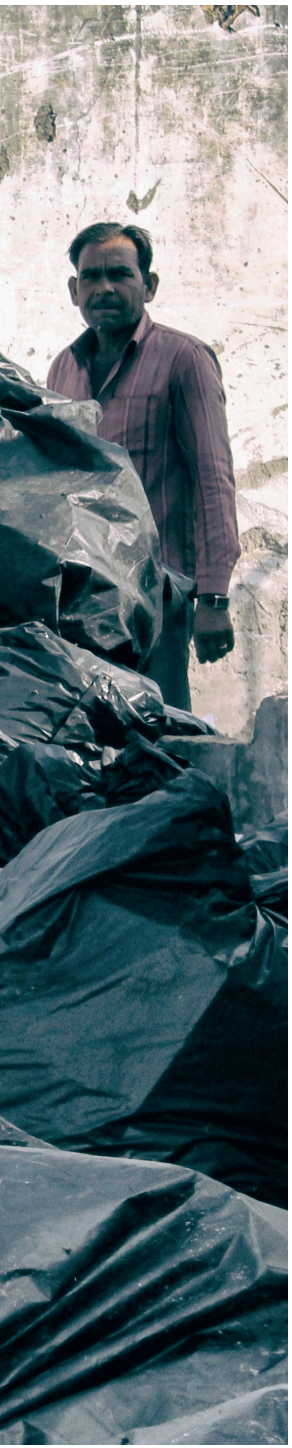


CHAPTER 1

Just Black Bags

To say that until the mid-nineties, India remained blissfully ignorant about the hazards of biomedical waste, would be rather harsh; especially in the light of the fact that till the late eighties there was nothing across the globe to indicate that clinical waste needed to be managed efficiently. The matter gained global significance, when, in the late 1980s, there were a series of syringe wash ups on beaches along the East Coast of the United States. Subsequently, the federal Medical Waste Tracking Act (MWTA 1988) was passed and the EPA attempted to set standards for managing the infectious waste component of medical waste that they renamed *regulated medical waste.*

By this time, the developed countries had been able to establish a clear pattern of increased cases of cancer and other fatal diseases, in and around areas housing medical waste incinerators. There was enough scientific evidence available to indicate that incinerators produce persistent organic chemicals like dioxins and furans. Dioxins build up primarily in fatty tissues over time (bioaccumulate); so even small exposures may eventually reach dangerous levels. In 1994, the US EPA reported that dioxins are a probable carcinogen, but noted that non-cancer effects (reproduction and sexual development, immune system) may pose a greater threat to human health. What followed was the NIMBY or *Not-In-My-BackYard* attitude in citizens who didn't want these polluting machines in their vicinity. Many installations had to be stalled, though many got through. "Third World dumping" of redundant technologies stemmed from the need to create markets for these tainted technologies.

One of the earliest researchers – and now a global expert – in this field, Glenn Mc Rae, presents this with chilling clarity, when he speaks of the official findings of the CDC (Centre for Disease Control) regarding cancer 'hotspots' in the US being created in the vicinity of incinerators.

"Despite the attempts of USEPA to suppress information, this report leaked out into the public domain, resulting in a very public backlash and shutdown of incinerators in the US. It was well near impossible to install incinerators in US now, and this had drastically impacted the incinerator market, forcing them to find new markets, through the WHO and the ADB (Asian Development Bank)."

For India, the watershed event was the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, which came into existence in the same period of time. This landmark United Nations treaty was signed on the 22nd March 1989 by 53 signatories. It came into effect on the 5th of May 1992 with 181 parties. The Basel Convention till date acts as a deterrent for "Third World dumping" of hazardous wastes, and India has been an intrinsic part of the Basel Convention.

"The trigger was set in 1989, when I was at the Basel Convention," recollects Ms. Lakshmi Raghupathy, then in MoEF and responsible for framing policy on hazardous wastes. Originally from the Bhopal Gas Commission, Lakshmi was "siphoned" into the Ministry of Environment and Forest in 1987. As a Scientific Officer, she was entrusted with the task of creating a scientific base to prevent Bhopal like gas tragedies. This included handling of "anything hazardous" - chemicals, waste, and/ or microorganisms. In the aftermath of the Bhopal Gas tragedy of 1984, the EP Act (Environment Protection Act) had also been enacted in 1986, which allowed the framing of rules and regulations for handling hazardous substances. The internal study in MoEF revealed that almost all developed countries – UK, USA, Canada, Australia, Sweden, Norway - had a law regarding hazardous wastes. Steered by an expert committee that included a representative from Sweden, the MoEF was able to come out with the Hazardous Waste Rules in 1989 itself; right on the heels of the Basel Convention*. In 1991, the MoEF also published the guidelines for implementation of Hazardous Waste Rules. However, BioMedical Waste did not form a part of these rules and regulations; something that made the MoEF very uncomfortable.

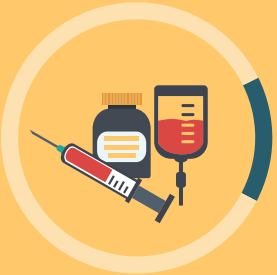
"I was aligning our Hazardous Waste policy with Basel. At that time Basel had 47 categories – 45 hazardous, plus 2 in the 'other waste' category - Household Waste being one of the two in "other waste" category. In MoEF, this list of 45 hazardous wastes was compressed into 18 categories; derived from 18 streams of waste that we determined as actually coming out of Indian industries. However, while 'Clinical Waste' was listed right on top of the Basel Convention's list of hazardous waste, it was not enlisted under hazardous waste in India."

The reason?

Health is a state subject in India, and the MoEFwas not very sure how it would be accepted in the Centre. In the early nineties, when Mr. R. Rajamani became the Secretary, the issue was broached to him. The writing was clearly on the wall; India could not be aligned completely to Basel Convention, unless Clinical Waste was addressed. "There was nothing on Clinical Waste anywhere," says Ms. Raghupathy, in summary.

Matters took an interesting turn when Dr. B.L. Wadhera filed a case in the Delhi High Court in 1992, regarding improper disposal of municipal waste. At that point in time, there was no practice of segregation of hospital waste anywhere in

The study revealed that just about



15%

of the bio-medical waste was highly infectious; but due to improper care all the waste becomes infectious

India. Hence Municipal waste had a fairly toxic amount of medical waste component. In 1993 the MoEF roped in four hospitals - Safdarjang, RML, LNJP, and AIIMS – to begin its study on how clinical waste was actually being treated/ managed. It observed doctors casually putting everything into a garbage bin; throwing it in one black polythene bag. The moment it was full, the black bag was lifted. It had swabs… it had syringes. This was the early nineties, and hospitals had just started using disposables. All the glass syringes would go for sterilization. They were very cautious while autoclaving the masks and the gloves, but not so careful about syringes etc. The study revealed that just about 15% of the waste originating from the hospitals was highly infectious; the remaining 85% was non-infectious. But, since everything was being mixed during disposal, all of it became infectious.

Sister Winnie Veeda Ram who joined Sir Gangaram Hospital way back in 1992, recalls that back then, the very concept of disinfecting did not exist. The best that was being done was mopping the floors with phenyl. Like many prominent hospitals, Sir Gangaram Hospital too had an Infection Prevention Committee since 1987, but there was no knowhow available to understand the importance of its role; leave alone putting measures in place.

Dr. Vijay Agarwal, who founded the Nursing Home Forum in 1992, recalls how the medical community was not sensitized to the issue of BioMedical Waste at all; leave alone the need for its segregation. The Nursing Home Forum is a wing of the Delhi Medical Association which had around 400 members back then.,

In 1994 and 1995, MoEF picked up a number of bright, young students to do the legwork in hospitals across the country. One of them was Megha Rathi, doing her MSc from Gwalior, but keen on working in hospitals in Delhi. Megha recalls all that existed in the name of incineration was burning highly hazardous waste out in the open. The remaining hospital waste was unceremoniously dumped outside the hospitals, and you could see cattle feeding on it.

“**I’ve seen cats getting into Operation Theatres, getting placenta out.** Rag pickers would be rummaging for waste resources, and there were some fatal cases of sharps injuries (syringe needles, scalpels etc.) amongst them. Most of this lethal BioMedical Waste was being mixed with the municipal waste and picked up by municipal garbage trucks.”

The MoEF decided to take a studied decision before belling the cat, and a team was tasked for this purpose. The team began by looking at the Public Health Law, which was not a notified law. Since Health was a State subject, this was just a framework circulated to the states. It consisted of a basic set of guidelines like keeping food covered, keeping garbage covered, not allowing flies on food, washing

hands before meals. Probably the only part in this document that was concerning the medical community was regarding sterilization of medical equipment by doctors.

While this was on in MoEF, parallel to this Justice Kuldeep Singh delivered judgment in B.L.Wadhera Vs UoI in 1994. This judgment did not address the part concerning Bio Medical Waste separately, but in conjunction with orders pertaining to disposal of municipal waste and general cleanliness of Delhi. As destiny would have it, the case became even more relevant in the backdrop of the Surat plague, which was attributed to a complete lack of management of municipal waste. The government's 'policylethargy' received a severe jolt when this epidemic broke out in 1994, leading to 52 deaths and the exodus of nearly a quarter of the city's population.

Meanwhile the MoEF notified the first draft on BMW in 1995. It had a very western outlook and was completely incineration oriented. Subsequently, in 1996, along with a series of directives to the Union of India regarding disposal of all municipal waste, the Court of Justice Kuldeep Singh, in 1996, also ordered that all 50-bedded hospitals should install an incinerator as a measure to dispose off the medical waste generated. This was in accordance with the BMW Draft Rules 1995. It was a directive that led to one of the most copiously reported legal battle in India. It brought home the truth that burning Bio-Medical Waste would only compound the problem… not solve it.

CHAPTER 2

Landfills in the sky

"Incinerators do not distinguish between hazardous and non-hazardous wastes. They simply burn everything that is pushed into them. They create what we call 'landfills in the sky'. It means that the waste that was being gathered on land, is now hovering as an invisible miasma of cancerous dioxins in the sky."

- Ravi Agarwal to Aamir Khan on 'SatyamevaJayate' on Waste Management aired on 15th March 2014.

Most of India believed that Justice Kuldeep Singh's judgment on the B.L.Wadhera case on municipal waste – including implementation of Draft BMW Rules 1995 – was a step in the right direction. However,it set the alarms ringing for a young engineer-turned-environmentalist at *Srishti*. For Ravi Agarwal, a Mechanical Engineer from Delhi College of Engineering and an MBA, this judgment spelt the death knell for the environment. After having worked in the corporate sector for 4-5 years, Ravi had recently decided he was better off on his own, turned entrepreneur, and set up his own production line. What was particularly shocking about the ruling

by Justice Kuldeep Singh was the decision to have incinerators in every 50-bedded hospital. Speaking to Annie Leonard, a Greenpeace Activist then posted in Delhi, Ravi had pointed out that this has to be seen in the context of the announcement by the Ministry of Non-Conventional Energy regarding subsidizing 'waste to energy'. It included subsidising incinerator energy. Given the post-Surat situation, everybody seemed to want to burn waste. The youngsters from *Srishti* met Dr. Wadhera, but realised that Dr. Wadhera had very little knowledge of the issues concerning the hazards of burning Bio-Medical waste. Moreover, Dr. Wadhera's objective was management of all municipal waste. The team at *Srishti* soon realised that the Delhi High Court had not been given the right empirical data to come to the correct judgment regarding incinerators in hospitals.

In their defence the Ministry of Environment and Forest (MoEF) and the Central Pollution Control Board (CPCB) had a rather interesting reason for advising the Delhi HC regarding incinerators for every 50-bedded hospital, as a method of disposal of BioMedical Waste.

"The first draft that was published, had a small part saying that every 50-bedded and above medical institution will put up an incinerator for its highly infectious waste," recollects Ms. Lakshmi Raghupathy. "That got into controversy, because Toxics Link (referring to *Srishti*) came saying that it would create too much pollution. You see, during our study of hospitals (mentioned earlier in chapter 1), some of them were having a *bhatti*, and almost all of them were burning their waste, even in the open. It was in this light that this strategy was chalked out and the doctors of AIIMS and Safdarjung acknowledged this."

Clearly, it was not just the government, but the Indian medical community as well that seemed largely ignorant of what was an evident recipe for disaster. As Emmanuel Jorge, one of the leading global scientists on technologies concerning management of BioMedical Waste, remarks about his first visit to Indian hospitals at about the same period, "These were no incinerators. There were no chambers or compartments to breakdown the components. No rapid heating or cooling to destroy any chance of creating dioxins or furans. These were just plain burners. They were only making things worse… not better."

Srishti, decided to take the route of reason, and produce empirical data and case studies from the Western Hemisphere that had led to banning of incinerators elsewhere. By 1995, *Srishti* published all it's findings and data in 2 different booklets. The first one called "No Fire without Smoke" gave out the technologies and practices in municipal waste installation. The second one, "Be Careful with that Cure", was an exhaustive data based work, revolving around recognised case studies on incineration and incinerators. As will be revealed in subsequent chapters, these seminal works simplified the USEPA (United States Environment Protection Authority) documents on technology for waste management, and laid the grounds for future surveys. In the absence of any comprehensive prior work of this nature, these documents– along with the book "*Managing Hospital Waste: A guide for health care facilities"* (known as brown book), also published by *Srishti*/Toxics Link - became the reference books for a number of NGOs across the globe.

Simultaneously, the team from *Srishti* began reaching out to the medical community in India… and just at the right time, as Dr. Vijay Agarwal reveals.

"When this judgment came, as a part of the Nursing Home Forum we were infact talking to vendors dealing in incinerators," says Dr. Vijay Agarwal recounting the circumstances in the aftermath of the judgment. "We did not have much idea about what an incinerator looked like, or what is its exact story. So, in a sense, we were ourselves absolutely ignorant. It is at this stage that Ravi Agarwal of Toxics Link (then *Srishti*) approached me. At first, I was naturally wary. There are corporate warfares going on all the time. So it could very well be a case wherein somebody is trying to sell incinerators versus somebody who is not trying to sell incinerators but is selling something else!"

Thanks to the advent of the Internet, and of course the network of medical community across the globe, the Nursing Home Forum carried out a detailed check on the facts and figures presented by *Srishti's* team. The Forum soon realised that *Srishti* was right, and filed a case in the Supreme Court. Thus, *Srishti* found an unexpected ally in what people would call the other stakeholder. Emboldened, *Srishti* filed a caveat in the High Court. Raj Panjwani was one of the few lawyers who used to do environmental cases and became the obvious choice, also because he would hardly charge a fee. Given the fact that *Srishti* barely had any funding at that time, this proved to be a crucial factor. The Court of Kuldeep Singh acknowledged the findings of Srishti as a "substantial piece of work", ordering the Central Pollution Control Board to revisit the technology and define standards.

Srishti went to Supreme Court just once, and in that one hearing itself the Supreme Court literally reversed the order that favoured incinerators for 50-bedded and above hospitals. In the face of empirical data and exhaustive proof, the Supreme Court ordered that "incineration/ non-incineration" techniques be used for disposal of Bio Medical Waste by medical institutions. The Supreme Court also directed the MoEF to come out with a rulebook on handling of BMW, directing the inclusion of "Ravi Agarwal/ *Srishti*" in the expert committee for the purpose.

On the face of it, this should've been the end of the battle. The CPCB and MoEF should've acknowledged that incineration of highly hazardous BioMedical Waste would only lead to "landfills in the sky", leading to the spread of the cancerous furans and dioxins in the atmosphere as had been seen in the US. They should've seen Bio Medical Waste as a management issue, and not something that could be "burnt or wished away". But the Supreme Court, in its wisdom, had delivered an open verdict. One might interpret this judgment as the Supreme Court's way of telling the medical community, "You are the intelligent lot. Use your brains and sort out your mess". Given the mindset of government bodies in India, since the CPCB had taken a stand in favour of incinerators, they were bound to get defensive about the issue. As events would reveal, it was rather paradoxical that an organisation created to bring out measures for pollution control becomes the defender of the wrong idea. It was therefore left to the community at large to take it upon itself to make the right choice.

For Srishti/ Toxics Link, the battle had been won… but the war just got worse.

CHAPTER 3

Battlelines & Battlegrounds

"I don't think it was a conscious decision on our part to work with Srishti/ Toxics Link on BioMedical Waste. It was just that Srishti were positioned to take a leadership role and organise things at a national level, and were able to direct things at the National government. They were able to aggregate more resources for all of us to be more active."

- Glen McRae.
(Holly Shaner McRae & Glen McRae are credited with creating the BioMedical Waste Management paradigm in the USA in the early 90's)

The court ruling was out, and in the absence of a clear-cut government policy on BMW waste management, the global incinerator manufacturers were quick to move in for the kill. It was upto the hospitals which way they wanted to go – waste segregation and management, or waste incineration. It was left to NGO's to take on the mighty corporates from across the globe, and explain to the medical community that BMW is a management issue. A number of NGO's across the country did align to the cause. The Medical Waste Working Groups in Mumbai and Kolkata did some sterling work in pushing the agenda of educating and informing the medical community in their regions. By and large, owing to the expert group of engineers, microbiologists and biotechnologists within its ranks, *Srishti*/ Toxics Link shouldered the lead in research and documentation. As a result, the onus of taking on the might of global corporates selling incinerators also fell upon them. Over the next few years, the battlegrounds were numerous, across the geography of the country, and often in full view of the media and public.

One of many such public skirmishes came early in 1996, shortly after the SC ruling. In a bid to boost commercial ties, Australia flew in a number of its companies as the Australian Trade Commission. Prominent amongst these companies was one manufacturing incinerators. In good corporate style, the bigwigs of this Australian company came down to meet people at *Srishti's* office in *Antariksh Bhavan* a day prior to the crucial media exchange.

"They showed us all their manuals on managing medical waste, and went on about the fantastic work they were doing along with NGO's like ours, all over the world," recollects Ravi Agarwal. Next day there was a meeting in the Delhi Constitution Club, and since it was the Australian trade Commission, there was quite an attendance by the Delhi Government as well. *Srishti* was also invited to this briefing and Ravi landed with a bunch of research papers, just in case they wanted him to back what he was saying. The Australian delegation went on for quite some time about the Indian standards not being correct; going to the extent of saying that you don't need standards for dioxins. At the end of the talk, Ravi Agarwal desired to ask a question.

Ravi Agarwal – You just said that you we don't need dioxins standards?

Australian Incinerator Company - You don't have so many problems.

Ravi Agarwal – What's the cost of your incinerator? What about dioxins control?

Australian Incinerator Company – It'll become unaffordable for you, since you are a developing economy.

Ravi Agarwal – Where have you set up these incinerators?

Australian Incinerator Company – We've set up one in Thailand, another in Turkey… (cites a few other countries).

Ravi Agarwal – That's it? What about European Countries?

(silence)

(Ravi continues) You can't put them up there because they won't allow you.

Australian Incinerator Company – There is no such evidence….

Ravi Agarwal – What evidence do you want? Which work should I quote – Janet Brown? USEPA?

Intervention by Australian Trade Commissioner – Now, now… you've said enough, you may please sit down.

Mr. Ramesh Chandra (then Principal Secretary, Finance and Health, Government of NCT of Delhi) – No, no, Ravi. Please ask more questions. This is helping all of us.

Understandably these standoffs were widely reported by the media. Bio-Medical Waste was a subject few understood, but was affecting everybody. By challenging and debating the matter on these prominent platforms, *Srishti* was able to achieve the larger objective of taking its knowledge to the masses.

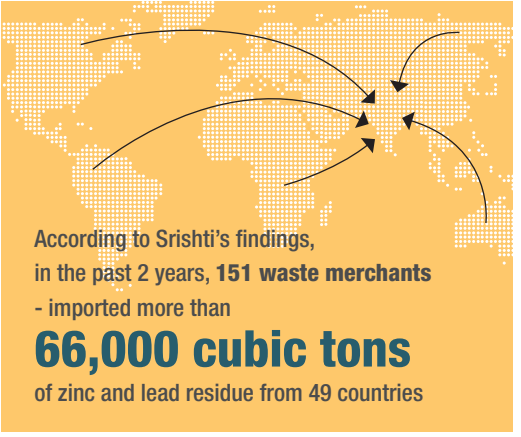
Quite unexpectedly, this also enhanced *Srishti's* reputation across the planet as the foremost "technology NGO" in the global south.

One particular event that puts things into perspective happened towards the end of 1996. Ravi Agarwal was invited to a panel discussion in Jaipur by USEPA. Mr. Saifuddin Soz, the then environment minister, was on the panel. An Indian expatriate by the name of Mr. Das, who had been with the USEPA for 20-25 years, had been specifically flown down to be on the panel. He spoke on the USEPA standards. After the panel had spoken, Ravi addressed his query to Mr. Das, asking him if what he spoke was his personal opinion or of the USEPA. On being informed by Mr. Das that he was speaking on behalf of the USEPA, Ravi said that this could not be the USEPA's position, quoting Carol Browner,

Administrator of USEPA. To everyone's surprise, and Mr. Das' utter embarrassment, most of what he had been saying was the exact opposite.

"These technologists who came in, thought they were coming in as new pioneers, because bureaucrats did not know much," says Ravi Agarwal. "But any person who cared to know, would know. They didn't think they would discover anybody who cared to know."

Srishti started focusing on specific areas; ultimately resurfacing in a new avatar as Toxics Link. The shift from *Srishti* to Toxics Link was also based on operational wisdom, since a number of signatories on the Trust had moved on, and chasing them up for signatures was becoming quite an exercise.



There was another rather significant event in 1996 that underscored the "Toxics" connection of *Srishti. Srishti* filed a petition in Delhi High Court, and produced a body of data that established a massive violation on part of the Lead Acid Battery traders. Srishti also produced its findings that in the past 2 years, 151 waste merchants – and not just 2 - imported more than 66,000 cubic tons of zinc and lead residue from 49 countries. This intervention did not go down very well with the trader community. But it was a case that brought wide international recognition to *Srishti*. From Greenpeace to WHO, all of a sudden everybody seemed to recognise *Srishti*. As circumstances would shortly reveal, this helped *Srishti* attract global experts to the cause of BMW management in India.

By 1997, *Srishti* had acquired enough inputs to take on one of the major funders of incinerators in India – the World Bank. In a strong-worded letter to Mr. James Wolfensohn, then President of World Bank, Ravi Agarwal systematically cited a number of documents released by the President, bringing out how the actions of the World Bank in India was in complete contradictions to their laid down policy. The response from WB was immediate, as they flew in their Task Manager, Tahir Ahmed, from Washington to discuss matters with Ravi Agarwal.

"He met me and said that you have written a really strong letter to the President," recalls Ravi Agarwal."I said that its completely cited, it's got all references. I'm not talking through my hat, and you can't do this."

Glen McRae brings in a very interesting third person perspective on this clear faceoff. "Even though the World Bank was going forward financing incinerators in their projects, what was admirable about the work of Toxics Link was their ability to say that 'You are wrong, but we're going to continue to work with you until we convince you otherwise.

In 1998, the World Bank reversed their policy on funding incinerators in India – the only country in the world where they have done so.

Due to all these activities, by the late 90's *Srishti* had acquired fairly prominent global footprints. A number of surveys and research work in a number of countries across the globe also contributed to this end. Besides, there was *Srishti*'s constant engagement with the Basel Convention. One of the organisations, that *Srishti* found common cause with, was Health Care Without Harm. Founded by Charlotte Brody and Gary Cohen in the mid-nineties, HCWH was a focus group of experts involved in developing environmentally responsible healthcare in the United States since late 80's.

"We were all likeminded people, and we became friends. At that time we were all talking about a global toxics movement", says Ravi.The global toxics movement was just round the corner, and Ravi Agarwal would just get "sucked" into this core-group. As we shall shortly see, it would be a relationship that would bring in global voices to India, and take Indian voices to global platforms.

CHAPTER 4

Fall of 1997

The Movement reaches Critical Mass

In 1996, the resistance to incineration technologies for BMW disposal was at it's peak in the country. While its area of operations pretty much remained Delhi-NCR, because of the core technical background of its team member, Srishti became some sort of a central contact point for the global community working on BMW. During these "knowledge collaborations" very often experts from abroad were invited to India.

It was in this vein that *Srishti*, through its friends in Greenpeace and other people working in the same space in USA, got in touch with Dr. Paul Connet - a Professor in the Chemistry Department of St. Lawrence University in New York. Prof. Paul Connet was yet to become the renowned expert he is today; having now toured more than 50 countries and delivered over 2000 lectures on the basic incorrectness behind the idea of incinerators. Dr. Connet's visit to India in 1996 went a long way in getting the message across that, "you don't have to learn things the same way as the developed nations. We have already paid the price for putting up incinerators mindlessly." His message went a long way in convincing people like Dr. Vijay Agarwal -back then the Chairman of the Nursing Home Forum- to be aligned with the cause.

By 1997, a pattern for activism against incineration and better management of BioMedical Waste in India had emerged. Individuals and organisations working in this space began exchanging notes as the movement matured. It was at this crucial juncture that Glenn McRae, who along with his wife HollieShaner-McRae has played a pivotal role in creating the hospital non-incineration waste management model in USA, decided to accept the invitation to tour India. The couple had been working on Hospital Waste management since 1989. Interestingly, their work did not begin as a spontaneous reaction to the ill effects of incinerators; but was a result of the deliberation on huge amount of waste coming out of hospitals. Hollie Shaner – who was a nurse back then – believed that, if properly inventoried and managed, waste originating from hospitals could

be a resource, ultimately reducing the cost of quality healthcare. She found a willing ally in Glenn McRae… and the rest is history.

In mid 1997, Glenn McRae was contacted by Annie Leonard with the aim of getting them to tour India as a part of a skill share programme. Annie had worked across the globe while with Greenpeace, and was at that time a part of the core team that raised *Health Care Without Harm*. Having worked in India, she was connected to Ravi.

"To me, visiting India was a continuum of our work," says Glenn McRae about the motivation behind immediately accepting the assignment. "The whole Medical Waste management field in the United States and elsewhere in the world, was quickly setting up to incinerate everything as a precaution. It just seemed crazy, and a waste of resources. The more we got into the science, the more it became clear to us that any country going in the direction of wholesale incineration, was basing its decision on faulty science, and were putting medical workers, patients, and communities at higher risk."

Glenn McRae's "national tour" – as most associated NGO's still prefer calling it – was actually restricted to Mumbai, Delhi, Jaipur and Kolkata. Yet it garnered unexpected and unprecedented media coverage. Here was one of the foremost authorities on the subject, straight from the USA, talking about the reasons why the most developed country in the world was shutting down its incinerators barely a decade after setting them up. Glenn McRae's conducted "waste audit" across major hospitals like the Hinduja Hospital, Tata Memorial Hospital, JJ Hospital etc., and, more importantly, sharing of an action plan that ensured better interaction and co-ordination between various NGO's across the country.

"I did as much as – if not more – learning, as my counterparts in India. Prior to India my technical and systems management knowledge was restricted to USA, Australia, the Caribbean Islands and Haiti. This was the first time I was working in a country as massive, incredibly diverse and socially and economically disparate, like India. The range of hospitals – from the ultra modern, to the extremely resource ridden – was mind boggling to me."

Glenn recollects that despite this, he found the energy of individuals like Dr. Rohini Kelkar (Tata Memorial Hospital, Mumbai) and the NGO's working towards putting a structure in place, quite inspiring. On returning to USA, Glenn McRae put forward a list of 11 recommendations for the developing countries - using India as a template - to ensure the proper management of BMW.

Glenn's visit was succeeded by a number of other experts in the field; names that have grown to global prominence ever since, as the world realised the colossal devastation to the habitat that ill managed Bio-Medical Waste, and its incineration, was capable of causing. Some such names were Dr. Jorge Emmanuel and Prof. Peter Oris.

Health Care Without Harm, today, is a global organisation, but up until the mid-nineties, it was just an emergent network in the USA, and hadn't done much work internationally. It was a case of intertwined destinies that made Ravi Agarwal a part of the remarkable set of people responsible for HCWH. It was during one of these early meetings of HCWH in Berkeley (US) that Ravi met

Jorge Emmanuel for the first time in 1996. Jorge had done his Chemical Engineering from the North Carolina State University, and his PhD from the University of Michigan. He had begun working on technologies for management of waste in the late 80's, and by the mid-nineties had gained reputation as a brilliant scientist. HCWH arranged for Jorge to visit India close on the heels of Glenn McRae's visit. While Glenn's visit focused on what the hospitals needed to do to manage waste, Jorge's expertise in incinerator technologies was quite an eye-opener for those who were blindly supporting incineration, without even knowing the first thing about it.

"All I saw in India were burners," says Jorge Emmanuel about his first visit. "These were open – and not chambered - and couldn't possibly achieve a temperature of more than 100 degree centigrade. Even a single-chambered incinerator is quite useless. Technically, to qualify as an incinerator, the incineration setup has to have atleast 2 chambers, and should allow for rapid cooling from extremely high temperatures, straightaway to extremely low temperatures, to disallow formation of dioxins and furans."

Till date, Emmanuel refuses to acknowledge the existence of even a single, technically acceptable "incinerator" in India; and continues calling these "burners".

A technically sound incinerator should maintain a temperature of about 800 degrees centigrade in Primary chamber. The effluent should thereafter be pushed to a second chamber, which is to be maintained at 1100 degrees centigrade, ensuring that hydrocarbons are broken down into CO_2 and water. Thereafter, an incinerator of qualified standards must 'quench' or bring the temperature rapidly from 1100 degrees to less than 100 degrees. This rapid drop in temperature is absolutely critical; since a number of highly hazardous chemicals are formed due to post combustion recombination when there is a slow, steady drop in temperature, say from 1000 to 900 to 800. The combustion temperature between 200 and 600 degrees is ideal/ optimum for the formation of fatally toxic dioxins and furans. Researchers also believe that there are thousands of molecules and compounds that have not even been listed – leave alone their impact – that are formed due to improper incineration. These Persistent Organic Pollutants or POPs do not degrade, and persist in the environment for a long time to come. These are very toxic in nature, having been identified as cause of cancers, and endocrine disrupters. These pose an unquantifiable threat to the delicate balance of life on the planet.

A technically sound incinerator should maintain a temperature of about 800 degrees centigrade in Primary chamber.

Over subsequent years, Jorge Emmanuel and Glenn McRae became an intrinsic part of the Indian BMW movement, stepping in as expert voices in unison whenever needed. 1997 was the first of their numerous visits to the country.

A similar incident happened in 1998, and this time it was the WHO that was given the wake up call. WHO was working with De Montfort - a UK-based company – to setup medical waste incinerators for the rural space. As luck would have it, *Srishti* had already documented these incinerators across Africa and found them to be nothing more than large burners. In 1998, WHO organised a couple of big conferences in Delhi

and Phnom Penh (Cambodia), with the promise of revealing "innovative technologies".

"They took us to a rural hospital outside Phnom Penh, where they were "incinerating" leaves for a demonstration. This was supposed to be an expert group meeting. At the end of it, I got up and simply asked "Have you spent all this money, flown me business class, put me up in a 5-star hotel to show me a leaves burning furnace?" They went white in the face. I asked them what were the standards on which this "incinerator" worked. They couldn't define the standards. I asked them how much it cost. They said 5000 dollars. I said you give me the contract; I'll make it in 1000 dollars in India; provided you put the first one outside WHO headquarters in Geneva. If you put one there, you can put one in every hospital in the country. You're treating us like third world natives."

The beauty of directness is that while it makes a lot of people uncomfortable, it also inspires admiration and strong bonds. No one had greater cause for embarrassment out of this entire episode than Yves Chartier, the WHO head of this programme in India and South-Asia, and yet, shortly after this incident, Yves called up Ravi Agarwal for a cup of coffee, where they ended up discussing French Literature and Philosophy. It was in this meeting that Ravi proposed "let's not focus on the technology; let's concentrate on what's happening inside the hospitals. It's not a technology issue, it's a management issue". This message became the essence of an enduring friendship between the two, which benefitted the BMW movement immensely. Another young man at the same conference in Phnom Penh, who was deeply impressed by the sound technical knowhow of Ravi, was Alex Hildebrand. Alex Hilderbrand went on to become the WHO WASH Focal point at WHO-SEARO, in Delhi, India, and played a crucial role in the Global Environment Facility (GEF) project on improving Bio-medical waste management.

10 types of hospital waste that could be segregated into 4 clearly colour-coded bins

While all this churning was going on in the medical community, the MoEF was yet to come out with the policy and rules on BioMedical Waste, even two years after the SC had asked it to do so. Advocacy in the absence of a framed policy by the government can only do as much. NGO's like *Srishti* found this a sore point in their effort to align the medical community to BMW management. After the Supreme Court ruling, a Committee was constituted under the aegis of the CPCB for the purpose of drafting a new set of policy and rules. The expert committee under Dr. Biswas, completed its job, and dispatched its recommendations to the MoEF by late 1996. Amongst others it defined 10 types of hospital waste that could be segregated into 4 clearly colour coded bins. It recommended only the *'Yellow'* category waste (body parts etc.) to be disposed through incineration. However, the draft wasn't notified through the better part of 1997.

"The bureaucrats at MoEF seemed to be wedded to the original draft they had made, which had 14 different bags for 14 different categories," recalls Ravi Agarwal, who was a part of the expert committee that had drafted the new policy. "By common logical sense, it would've never worked. It was conveyed to us that the new draft was

nonsense, and we needed to take it back." Infact, the MoEF draft was objected to by almost all stakeholders involved as too cumbersome.

It became a simmering issue between the committee and the MoEF, leading to a face off in a very unlikely location – a USAID hosted seminar at the US embassy. There was a heated debate on the issue of notification of the draft policy. This prompted Ravi Agarwal to dispatch a rather stern letter to Principal Secretary, Delhi Government, with a copy to Secretary MoEF. What followed was rather an unpleasant duel of words, but the end result was that, by the end of 1997, the draft was notified. A year later, in 1998, the government of India notified its first policy document outlining the rules governing management of BioMedical Waste. One interesting thing in the Rules was the mention that any new technology for the management of medical waste would need an approval of an 'Expert Committee for Technology approval' formed under the aegis of the MOEF. Based on its knowledge and skills with technology Toxics Link was made a member of this esteemed group.

In later years, all states across India structured their own Advisory Committee on medical waste management.(Toxics Link is on the Advisory Committee of the Delhi Government).

It was in this phase that *Srishti* also started doing something that became its *modus operandi* for the future. By 1996, volunteers at Srishti had enough evidence to deduce that activism and policymaking was not the end but the beginning of the job. Realisation had quickly dawned that the BMW movement was more a training and awareness issue than anything else. Health is a state subject in India and only awareness and training at the state, district, and infact hospital levels, would finally get things moving. Srishti began reaching out to a number of seminars to make presentations on BMW management. Adopting the"leaflet dropping from the air" philosophy, *Srishti* began acquiring cheap papers, printing out tens of thousands of single page notes, and began sending them all over the country. In the years to come, this philosophy was applied to every survey, booklet, document that came out of Toxics Link. These were addressed to almost every relevant individual in departments across states… PCBs, chief secretaries, member secretaries - everyone.

"We started by writing letters on our office computers, telling just anything about the harm of incinerators," says Ravi. "These were just single or double-sheets. Every 2-3 months we would send something out – a survey report, a booklet… anything. We knew that probably just 10% of the people would read it. But that would be great for us. You know you just flood the market with the information."

Megha Rathi, who joined *Srishti* in the first half of 1997, remembers being straightaway in the thick of actions.

"Since I had done some legwork for MoEF (referred to in Chapter 1) while doing my MSc thesis, I got to know that *Srishti* was the only NGO in the entire country which had a team specific to BMW. This was the phase of 'NGO activism'. There was Greenpeace, there was Health Care Without Harm. We would prepare banners, stand outside stations and bus stops with these big banners as a part of anti-incineration campaigns. There weren't very many of us, but all of us tried to do as much as we could."

It worked.

In 1998, the Pollution Control Board of two states - Himachal Pradesh and Andhra Pradesh – organised state level seminars. Andhra, which at that point of time was making rapid progress under NT Rama Rao, was the first state level engagement. These 9 to 5 workshops were – and still are - conducted pretty much by the BMW team at Toxics Link.

It was also in 1998, in one of those umpteen seminars that *Srishti* was making a presentation, that a lady doctor by the name of Ritika Narula walked up to Ravi Agarwal. She queried if he could help setup the BMW management and training module for the Orthonova Hospital. In just a couple of months, the BMW cell of *Srishti* went on from plain activism, regulation and policy making, to creating awareness down to the state and district level, and helping hospitals in training their staff and setting up their waste management systems.

As time would reveal, telling the doctors and nurses how to dispose waste in their very own hospitals needed far greater amount of dedication, tact, and patience. But this process also created a new set of champions, well equipped to carry out the task. It brought in a lot of young energy to *Srishti*, and a bunch of *nouveau* discipline experts. As Ravi Agarwal puts it, “Hospitals were what the team did. I didn’t do much. Anu, Sameer and Megha took the lead there. My role was just to create the space for them.”

CHAPTER 5.

Model Hospitals

Back in 1997, the 30-bedded Orthonova Hospital had been in existence for barely 6 years. As luck would have it, it was just the right place to start. Habits and drills were not as deeply ingrained within the hospital's DNA, as is usually the case in larger and aged hospitals. Further, Orthonova came on board just before Glenn McRae's visit. Having an expert of his credentials visit Orthonova, even as the BMW training programme was being thrashed out, went a great way in ensuring that volunteers from Srishti had the attention of the medical staff straightaway.

Barely a few months down the line, early in 1998, another hospital - Shroff's Eye Centre (now Shroff's Nursing Home) - also had *Srishti* come on-board to help set its BMW management culture. By this time, the strength of the BMW Cell of *Srishti* had grown to three. Anu Agarwal – a biotechnologist by education - joined Megha Rathi and Sameer Nazareth. As a research intern with Ranbaxy for 6-months, Anu had been deeply inspired by the work of *Srishti* and would often track down seminars and conferences where Ravi Agarwal was to speak. At the end of her MSc in Biotech, she chose a volunteer's post – with a 3000 Rupees stipend - at *Srishti*, over a lucrative offer from Ranbaxy.

The year 1998 was when the BMW rules had just been notified by the MoEF. With hardly any template or guidelines to go by, the entire medical community was in a state of confusion. It is in this context that the work of this small group of young scientists at Srishti needs to be seen. Since all were from a research background, over the next 3 months every work of consequence on BioMedical Waste – starting from the WHO handbook on training, to documents by HCWH experts, to USEPA regulations - was unearthed, comprehended and analyzed, and converted into slides. Anu still recalls their first training session at Dr. Shroff's.

"Understandably, a lot of doctors are apprehensive about being trained by a bunch of "greenhorns". I had expected a lot of grilling during my first session at Dr. Shroff's. But it went off remarkably well. Yes, there were quite a few

questions, but coming from a biotechnology background, made it rather easy for me to apprise them not just about the biology – which most were aware of – but the microbiology and chemistry as well. When I spoke of the endocrine system, I knew exactly what it does; and when I spoke of incineration technology, I knew precisely how it worked. At end of the session, one of the rather stern-looking doctors walked up to me and asked me if I was a medical grad. When I said I was a biotechnologist, his demeanor changed almost immediately. It was the first time I realized that my biotechnology degree makes a lot of sense."

Both Dr. Shroff and Orthonova were small hospitals. Training was quick and implementation effective. In August 1998, USIS along with *Srishti* organised the first major seminar on BMW in India. Representatives from all major hospitals in Delhi-NCR attended this seminar held at Gulmohar Hall, IHC. It was evident that despite the policy on BMW management, there was sufficient confusion at the ground level about implications and implementation. Since this seminar had panelists from Ministry of Health, MoEF, and WHO, it ended up being quite an eye-opener. It was here that the first really big hospital - the 300-bedded Holy Family Hospital – approached *Srishti* to help it efficiently manage its BMW.

"When we started working with Holy Family, we soon realised that it was like dealing with three hospitals. Taking a round of the hospital used to take a full day. Incidentally, Holy Family insisted on giving us a small honorarium."

As an aside, *Srishti* hardly had any Operational costs. The team of volunteers was small and dedicated, and was pretty much on token payment. Ravi was earning as a Consultant, and could afford to work without a salary. He did so till late 2000, until SIDA (Swedish International Development Agency) funding came into Toxics Link. In the year 1998, even a 10,000 dollars grant was good enough to sustain Operations for more than 6 months.

Dr. Sudhakar Vira, Sr. Administrative Officer, Sir Ganga Ram Hospital, recalls that not charging a fee added to *Srishti'*s credibility.

"Back in 1999, there were other NGO's who had also expressed a desire to help us manage our BMW as a resource, but *Srishti* ranked way above in terms of team strength, the energy of youth, proactiveness, and level of interest. The other NGO's also seemed to be more interested in making money. Since the top management wasn't really sure whether it was a project worth spending so much money, *Srishti* definitely had the edge in every way."

The team from *Srishti* realised on their very first day at the 300-bedded Holy Family Hospital, that the level of engagement in big hospitals had to be very different from the smaller ones. The young trainers devised an ingenious approach to training. They decided to present the problems and seek the probable solutions from the trainees. During the sessions, the BMW trainers focussed on problems and health effects of toxic waste on the staff and health workers, and the resultant fear psychosis. The strategy worked. With every hospital, the young volunteers grew better at the fear factor, and sessions became increasingly vibrant and power packed. In one particular incident, the young volunteers from *Srishti* were actually summoned by the Director of St. Stephens Hospital, Dr. Sudhir Joseph. On their arrival, he pointed to a neat stack of small

bottles on his table and asked the young ladies what they had been feeding into the brains of the nurses.

"Every time a thermometer breaks, its as if the entire ward is on military duty; till the mercury is safely collected in a bottle, sealed and deposited to my office. Very soon my office will be full of mercury bottles."

The young scientists from *Srishti* had, in their training sessions, simply apprised the nurses of the devastating effect of Mercury on humans; how Mercury affects young women in their ability to bear children, as well as results in the stunted development of foetuses. The Nursing staff was convinced that *Srishti*'s focus of BMW management was entirely around its welfare.

"The volunteers from *Srishti* helped us come to the conclusion that, first things first, we need to destroy needles at all cost" says Infection Control Nurse Winnie Veeda Ram, who was working in the blood bank in 1999, when volunteers of Srishti began their training programme in Sir Ganga Ram Hospital. "Needle sticks carry a world of infectious diseases and are the biggest culprits of accidental deaths of the hospital staff. We ourselves created the training module in *Srishti*'s classrooms and then we began training junior and new nurses, and wardboys."

Anu Agarwal has a very interesting take to this. "In my 16 years of experience, I've never walked into a training as an expert, but as a novice who wants to learn from my class. Every single time, I've handed over the reins of the class to the trainees. Once we got to the end of the class, I would simply say - Do you realise that in just one class, you've made the Hospital Waste Management rules that people in the ministry took years to make?"

Once big hospitals like Holy Family, St. Stephens, Batra, and Sir Ganga Ram began organising their BioMedical Waste, the task of convincing the smaller hospitals became a lot easier. Over the years, medical staff of almost a hundred hospitals across more than a dozen states has been subjected to this training method. Irrespective of the geography, till date the training method has pretty much remained the same. Megha Rathi, who moved to *Srishti*'s Chennai office in 1999, successfully worked with Sundaram Medical Foundation, the first Hospital to setup its BMW management module in Chennai. Of course, the State Pollution Control Board in Tamil Nadu was far more active and responsive.

In hindsight, one can observe how far an active state setup can go. Today, South in general, and Tamil Nadu in particular, has an impeccable record in BMW management. It has engendered a completely different culture towards medicine and surgery, and the entire medical community is far more conscientious about their role, which, unfortunately, cannot be said of many parts of the country.

By early 1999, the BMW team at *Srishti* had concluded training in about half a dozen hospitals of varying denominations. Simply to have this aggregated, the team decided to compile a step-by-step handbook of about 50-odd pages. Quite a bit of it were plain old hand drawings. The book, simply titled *Managing Hospital Waste* is now famously known as the "brown book". In 2013, the *Brown Book* had gone into reprint for the 7th time. The book is widely used by NGO's, governments, WHO volunteers and medical practitioners across the globe, and has

been translated into a number of languages like Russian and Portuguese. Interestingly, the last time it was revised was in 2000.

“Before reprinting in 2013, we went through it rather finely,” says Anu Agarwal, one of the original authors of the Brown Book, along with Samir Nazareth, Megha, and Ravi. “It pretty much holds water even today.

CHAPTER 6

Crossing Borders

The Global Environment Facility (GEF) was raised in October 1991 as a billion dollar pilot program in the World Bank. In 1994, the GEF was restructured and moved out of the WB to become a permanent separate financial organization. Its purpose was to serve as a financial mechanism for a number of conventions like the Convention on Biological Diversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC). In 2001, the GEF was selected to serve as the financial mechanism for The Stockholm Convention on Persistent Organic Pollutants (POPs). It is here that the GEF story meets the global BMW movement, in the form of the GEF Global Healthcare Waste Management Project.

Now the website of this particular project says that "India first became involved in this project in 2002, and the first global project planning meeting took place in 2002 in New Delhi." Infact, the outline of the GEF Global Healthcare Waste Management Project, was etched out much before that. The Safe Injection Global Network (SIGN) annual meeting in New Delhi (30-31 August 2001), was at the centre of the limelight. Bill Gates was taking centre stage, speaking about the vaccination drive of Bill and Melinda Gates Foundation. The SIGN meeting brought together a close group of 4-5 people, who would hold a quick conference of their own, during the breaks and after the day's work as well. The hot topic was The Stockholm Convention on POPs. The GEF had recently been directed to be the financial mechanism for all projects under this convention.

Of this closed group on the sidelines of the SIGN convention, 3 people have already made their entry into the story - Glenn McRae (HCWH), Ravi Agarwal (Toxics Link), and Yves Chartier (WHO). There was one, though, who actually set the ball rolling.

If you were ever to visit the FSM Café in the center of the University of California campus at Berkeley, a larger than life collage will greet you. The young man at the centre of attention in these photographs is Jack Weinberg, the legendary leader and initiator of the Free Speech Movement that started in 1964. But that is another story. It

is the same Jack Weinberg though, who, in our story, plays the critical role of initiating the idea of the Global Healthcare Waste Management Project. Jack believed that The GEF could now finance the project related to the Stockholm Convention.

"This is Jack's skill… only he can do it," says Ravi. "He knows where the institutional money is. He knows how much could be allocated to NGO's, what is the paperwork involved. As a policy expert, he was able to put across to us how we could work towards bringing what we were doing in terms of BioMedical Waste management, under the GEF funding."

Jack Weinberg explained to the concerned group at the SIGN meet, how Stockholm Convention spoke about minimizing Persistent toxic compounds. The Convention defined Dioxins - a quintessential by product of incineration and defined amongst the most lethal POPs. A project that would provide management alternatives to reducing incineration of BMW (a big source of dioxins and furan generation) could be brought under the purview of the Stockholm Convention, qualifying the project for GEF funding.

It was unanimously a "go"… and the rest is history. This constellation of the likeminded was shortly afterwards joined by Alex Hildebrand. For Alexander von Hildebrand, Delhi was his first WHO posting. He had made the shift from Madagascar, where he was working with the Swiss Agency for Development on management of hazardous waste.

"I came in contact with Ravi during an IFCS meet (Inter-governmental Forum for Chemical Safety, WHO) in 1998, where he had made a presentation of Toxics Link's work with non-burn techniques to manage hospital waste," says Alex. "I remember, it was in the shape of a book (reference to the "Brown book" – Managing Hospital Waste). I used this book in Madagascar in getting about 10 hospitals organised with regards to management of their healthcare waste."

Much because of the exertions of this expert group, the GEF Operational Focal Point endorsed the GEF Global Healthcare Waste Management Project on the 25th of August 2004, in India. As on date, the project encompasses 8 countries – Argentina, Latvia, Lebanon, Philippines, Senegal, Tanzania, Vietnam, and India. Dr. Jorge Emmanuel was, the Project Head of this enduring mission, Jack Weinberg was the Senior Policy Advisor, and, up until his tragic accidental death in 2012 while snowshoeing in the Jura Mountains outside of Geneva, Yves Chartier remained a central part of the Global Project Team.

Jack Weinberg attributes much of his understanding of the hazards of incinerators and the alternative management of BMW to chance meeting with Ravi. In the late 90's Jack Weinberg – initially with Greenpeace International and later with IPEN - and Ravi Agarwal were active participants in the Stockholm Convention on POPs; and as such would often bump into each other. The icebreaker came during an IPEN meeting in Nairobi. Ravi had been roped in by *Health Care Without Harm* to make a presentation at this meet. At the end of his presentation, Ravi, who was in Nairobi for just 2 days, was persuaded by Jack Weinberg to extend his stay. "He said you can share my hotel room, and we'll take care of your food," recalls Ravi with a smile. "It was an offer I could not refuse."

"I saw great potential in him," says Jack Weinberg. "He brought immense amount of perspective to the meeting. Ravi's company also helped me understand alternative means to incineration in disposal of BioMedical Waste."

In 2000, when *Srishti* had just revamped itself as Toxics Link, SIDA (Swedish International Development Cooperation Agency) offered TL project-based funding. It was at Jack's advice that Ravi Agarwal negotiated a 'core' funding and not a 'project' funding. From a sustainability angle, this proved crucial to Toxics Link and the BMW movement in India.

It was much because of these "inspired champions" mentioned above – and in the previous chapter – that the GEF Global Healthcare Waste Management Project triumphed. Its success lay in getting colossal hospitals like the 3000-bedded KGMC Hospital, Lucknow – go from throwing blood-soaked cotton swabs on the floor, to setting up an immaculate non-burn BMW disposal system. It was also able to create urban rural linkages in Tamil Nadu. And from the sustainability perspective, the GEF project - along with WHO - helped setup the 6-month Certificate Programme in Healthcare Waste Management.

Having been a critical part of the conceptualization of the GEF Project, Toxics Link is rather conspicuous for its absence in the implementation phase of this project. Almost everyone involved with the project - from Jorge Emmanuel, to Glenn McRae, to Alex Hildebrand, and Jack Weinberg - seem unanimous in pointing out that the concerned ministry seemed almost jealous at times of Toxics Link. In all fairness, their judgment could also be influenced by the project's fair share of challenges and frustrations intrinsic to the Indian administrative structure, and their strong belief that had Toxics Link been on-board the implementation phase would not have run into as many hurdles as it unceasingly did. Ravi Agarwal has a more circumspect view of the entire affair.

"That's a government thing. We were OK with it. People would often ask us – Why are you giving this project away to the government; what are you getting out of it? We'd say – Nothing. We can afford it. We're fine as long as things are moving ahead… as long as the project moves forward in the country. They couldn't believe it. The government kept on writing to us, trying various ways to figure out what is it that we were getting. We tried our best to explain that the fund is all coming to you; we don't have a fee built in. It actually became a cause for delay for the entire project."

The incident actually touches upon a much wider subject - that concerning the image of NGO's in the Indian public eye. For a number of reasons, Toxics Link has been fortunate enough to attract core as well as project funding to keep up its activism. For your average Indian NGO, funding soon becomes a primary exercise, outweighing activism. It is what makes NGO activism so difficult in India. Ironically, the further you go from the metros, the more difficult it becomes for NGO's to survive. It is also the reason why the beacon is only carried by a select few; mostly funded by foreign organisations and agencies.

CHAPTER 7

Building Support Systems

The regulation for management of BioMedical Waste is the only one of its kind in the country; simply because it is backed by 5 different guidelines supporting its implementation

The Ministry of Health, WHO and Toxics Link, jointly created the 1st national guideline in 1998, simplifying the rules and regulations and elaborating the various concepts listed in the Rules. The second guideline evolved from the need to save the country from incinerator pollution. A Toxics Link Survey across Delhi, and subsequent surveys by NGO partners in Mumbai, Chennai and Kerala triggered this 2nd set of guidelines. The survey conclusively proved that almost every so-called incinerator was just an open furnace, burning between 200 to 600 degrees centigrade, which is the temperature range best suited for production of dioxins and furans. The survey demonstrated that running on-site incinerators was practically very taxing - environmentally and economically. It also highlighted the fact that the standards governing incinerators in the country were very weak. The resultant installation of Air Pollution control Devices would cost double than the cost of the incinerator itself. The ministry was forced to issue comprehensive guidelines for incinerators. The incinerator guidelines were more stringent than the very basic parameters listed in the BMW rules published by the government earlier. Another strategic gain was that the guideline was against onsite incinerators. But the government had not as yet implemented this provision, and the team at TL took it up on themselves to propagate this provision.

The 70 operational incinerators in the city of Delhi was an eye sore to the activists. But the hospitals that had invested a good amount in installing these machines were against the idea of their closure. This warranted some more data collection. The Toxics Link team compiled a survey of operational cost of 5 incinerators

70 operational incinerators

in the city of Delhi was an eye sore to the activists

in Delhi. The data was presented to the Delhi's Environment Secretary who in turn invited Toxics Link to present the data to all major hospitalin Delhi (50-bedded and above).This resulted in the immediate shutdown of 60 incinerators hosted by private hospitals.

"Much of this was because of a cost benefit analysis proposed by Toxics Link, which proved beyond doubt that CTF (Common Treatment Facilities) is a much cheaper way to treating hospital waste."

This also was the basis of the third set of guidelines around the CTF's.

At around the same time, the infamous De Montfort incinerators – discussed in earlier chapters - again made an entry into India. Despite all rules and regulations, the Ministry of Health, UNICEF, Ministry of Environment &Forest and WHO, collectively seemed to agree that the country couldn't manage its immunization waste without onsite incineration; especially when mass immunization campaigns took place. This ensued in a public exchange of ideas. In one of these rather heated debates, the team from Toxics Link was exhorted to present a better alternative to the De Montfort incinerators and the ubiquitous cardboard wastebin. This was presented as a Policy paper, linking lower rung HCF (Health Care Facility) to the BMW disposal channel of District hospitals. This model was later included by the Central Pollution Control Board in its guidelines on immunization waste Management – the 4th set of guidelines on BMW Management. Over the years, the model has been implemented successfully in several states.

While working with the hospitals, the team realized that besides the infectious waste, there

Till 2004 WHO did not have any policy document on Mercury

were several other hazardous components in the hospital waste stream that need to be addressed. Globally, the use of heavy metals in the healthcare sector – particularly Mercury - was gaining prominence. The team started researching on the use of mercury and possible emissions from the hospitals. Alex Hildebrand recollects, "Till 2004 WHO did not have any policy document on Mercury. It was then that Ravi and I decided to write a Policy paper on Mercury. To our surprise and pleasure WHO HQ in Geneva accepted it without much changes."

A research document published by the team in 2004 also led to the issuance of the First State-level Phase out order on Mercury(Delhi) in 2007. Ongoing and persistent work in this area has added to the list of these state orders and a Central government Guideline. The team now endeavors to identify other difficult waste streams in the area and ensure proper management and disposal mechanisms for them. The other very important research documents and training tools developed through these many years of intervention have been used by several policy makers, academicians and students. Toxics Link has also been part of development of material of and for other agencies on this issue.

There are a number of NGO's across the country that have some sort of a programme on BioMedical Waste. Toxics Link alone has worked directly, and through partners, in building capacity across 17 states of India. Almost all of these

states today have 2 to 3 model hospitals to their credit. The story would be incomplete without the mention of these heroes, and the complete list of these NGOs has been appended in a table at the end.

In conclusion, does India now have a decent enough control over the most hazardous type of waste?

The sad truth is that we are nowhere near the solution.

"We are focusing only in Delhi and metros. What's happening all over India… nobody knows", observes Dr. Sudhakar Vira, Sr. Adminitrative Officer, Sir GangaRam Hospital. Dr. Vira now contributes a number of hours to hospitals in the rural and semi-urban space, spreading his experience of setting up a BMW disposal system at Sir Ganga Ram Hospital. "The North East is in a very bad state. In a particular state in the North East, I found hospital waste all dumped together on the top of a hillock, and set fire. They say the fire on that hillock has never died down for the last decade or so. There's hardly any awareness in UP. In my own hometown of Bijnaur, leave alone BMW management, I've seen surgeons conduct abdominal surgeries without gloves! How can infection not spread? It's terrible."

"We've been at it for quite some time now, and I've realised that BMW management is not on the priority list of people beyond Delhi and the other metros at best," says Satish Sinha, who's been with Toxics Link ever since 2003. Satish Sinha has been engaged in the effort to create a wider network by involving partners in states. "Since we've worked a fair bit in Delhi-NCR, quite a few hospitals and doctors are resources for us for training and mentoring now. We've done regional workshops across the country; pulling in medical practitioners in the less aware zones to model hospitals in the metros and larger cities… we've tried to create a sense of competition, take this work beyond Delhi. We've just been trying everything possible, and been working with anyone displaying even the slightest commitment, be it hospitals, State Pollution Control Boards, or NGO's."

"I've realised that people are not averse to the right thing, but there is a huge resistance to disturbing the status quo," says Dr. Vijay Agarwal, Executive Director, Pushpanjali-Crosslay. Dr. Agarwal helped establish the Max group of hospitals as a Mercury-free chain, and believes in continuous education and training of staff as a key to environment management.

A lot of data is being churned out of these regular workshops. Not-so-active zones like the North Eastern States, Bihar, Chattisgarh, Jharkhand, UP etc., have been identified. Stakeholders meetings are being regularly organised. And yet the wheels of change are moving too slow… as if everybody's waiting for a catastrophe. Cases of injuries and infection due to discarded sharps and needles are registered on a daily basis. What's worse, a large part of the healthcare setup, especially in the vast rural space, is not even sensitized enough to report such lapses.

"How much can you do with policy? There is no shortcut to work. Where are the foot soldiers for this?" says Ravi Agarwal. What was perceived as the *war*, turned out to be just a *battle*.So how does one create foot soldiers? What do you do next?

"It's a very difficult question… It's a question we ask ourselves everyday," concedes Ravi."What

do we do? When there is so little caring, so little sensitivity by the stakeholders. You just don't know how to change that."

There's another reality that cannot be ignored. For any NGO, the only way to survive is to make an impact; or atleast be seen as making an impact. Otherwise it gets hard to survive. Anything involving extensive legwork – especially movements or activities with a long turnaround time of measurable impact – will alienate potential funders and demoralize the volunteers. Social entrepreneurship is not very different than your regular entrepreneurship in this regard. The initial battle in the BMW movement was quick, garnered a lot of coverage, and galvanized the policymaking machinery. Now, the road ahead is a long trudge… just hardcore dogged work, and just like the BMW they deal with, Toxics Link knows that this problem of awareness and insensitivity cannot be 'incinerated' away.

The idea of capacity building and opening training schools across the country is nothing new. Way back in 1998, *Srishti* had carried out this study for the Canadian government; identifying locations across India where BMW training and capacity building centres can come up, to build an *Army of Consultants*. But here's the catch. Forget the umpteen committees that Toxics Link is a part of. Forget the budgetary outlay. Forget with whom lies the responsibility of all this. Going by record, if Toxics Link truly believed that building an *Army of Consultants* through training institutes was the solution, it would've gone after it and created one.

"You have too much regards for us," quips Ravi with a smile."The State has to do it. They have to build capacity… the training centres."

The State has not been able to get its own government hospitals to adhere to the laid down rules and regulations. Does he really think the State will ever take the lead?

"They won't do it," he concurs. "We need champions in every hospital," he says conclusively. "King George's (KGMC Hospital, Lucknow) didn't want to talk about waste before the GEF Project. Look at them now. They've found two doctors to champion the cause. They have transformed the hospital. We need champions out there. It needs citizen's action."

And will training centres help?
It is probably the place where the "champions" will emerge.

"There is very little motivation to do this," rues Ravi."There are no CNN awards, there is no recognition. So many Municipal Commissioners have done extraordinary work under the same municipal waste rules, which others claim are not good enough. It's not about the rules… you need champions."

Coming from the man who probably worked the hardest to set the rules, the admission is flustering."The job ahead needs heroes. It needs people who care. How do we make them? We can't. Wherever we get one, things change."

Partners IN TOXICS LINK'S REGIONAL WORK

S. no.	State	Name of NGO	Thematic area	Results of TL collaboration
	Kerala	Centre for Innovation in Science & Social Action	Clean Technologies, Sustainable Agriculture	Became Part of the NRHM Committee; took up trainings on mercury spill management for govt. hospitals; Created 5 model hospitals wrt BMW. State included mercury management in Accreditation document of the state, later aligned the procurement policy to non- mercury products
	Andhra Pradesh	Guide Foundation for Development	Animal Husbandry, Dairying & Fisheries, Health	1999- I state level seminar in association with APPCB 2011- Created 3 model hospitals, conducted 2 state level seminars. Department of Health agrees that doctors need recurring trainings.
	Gujarat	Paryavaraniya Vikas Kendra	organic farming	Created 6 model hospitals, trained around 200 Healthcare staff. Organized 2 state level seminars on mercury awareness. Draft Mercury policy template made
	Bihar	Social Institute for the Development of Nation	Sanitation, Health, Child Labour	Created5 model hospitals. Organized 2 state level seminar on Bio-medical waste and mercury. Bihar PCB gets interested in TOTs in the entire state
	Uttarakhand	Navjyoti Development Society	Hospital Waste Management Mobile health Unit	Creation of 4 model hospitals. Documentation of problems and talks on with the PCB and CPCB to sort out these problems. 2 state level seminars conducted.
	Uttar Pradesh	GANGA	Public Interest Litigations, Clean Ganga Campaign	Creation of 3 model hospitals and training of Healthcare workers in rural hospitals.2 state level seminars conducted.
	Odisha	Paribartan,	Health & Family Welfare, AIDS awareness, Bio Medical Waste Management	Part of the NRHM State Implementation Committee. Creation of 5 model hospitals. 2 state level seminars conducted.

S. no.	State	Name of NGO	Thematic area	Results of TL collaboration
	Manipur	Rural Health Organisation, ISRD	Rural HeaLth, Immunization	Creation of 4 model hospitals. Two state level workshops on Mercury and Bio-medical waste. Trainings in rural hospitals of 2 districts. State issues an order on Mercury phase out after the workshop.
	Assam	ENVIRON	Bio diversity, waste management, water and sanitation, education	State level seminar on medical waste and mercury
	Jharkhand	Nav Bharat Jagriti Kendra	Health, Hygiene, Sanitation, Girl Child education and empowerment	State level seminar on medical waste and mercury. Situational Analysis of BMW practices. Media pressure and Central government approached to offer solutions.
	Tamil Nadu	CAG TL Node		Creation of model hospitals. Working with the TNPCB to capacity build 200 hospitals. Several State level trainings
	Goa	Goa Desc		State level training programs and seminar
	Himachal Pradesh	DISHA		Creation of 4 model hospitals. Two state level workshops on Mercury and Bio-medical waste.
	Punjab	PPCB	-	Worked directly with the PCB. Helped getting the PPCB Mercury phase out order and help create awareness on mercury alternatives.
	Karnataka	Deshpande foundation		Worked with the Municipality Hospitals to create models in 4 Municipal hospitals. Instrumental in getting the Municipal mercury phase out order
	West Bengal	DISHA TL Node		State level training programs and seminar. Research reports on mercury in fish. State level seminar on medical waste and mercury. Situational Analysis of BMW practices.
	Meghalaya			State level training programs and seminar

LIST OF

Interviews

Interview Listing (In Chronological Order)	Designation	Date	Day	Media	location
Dr. Sudhakar Vira	Sr. Administrative Officer, Sir Gangaram Hospital	09/02/14	Sunday	In Person	New Delhi
Ms. Anu Agarwal	Sr. Programme Coordinator, Toxics Link	11/02/14	Tuesday	In Person	New Delhi
Dr. Vijay Agarwal	Executive Director, Pushpanjali Crosslay Hospital	13/02/14	Thursday	In Person	Ghaziabad
Mr. Satish Sinha	Associate Director, Toxics Link	14/02/14	Friday	In Person	New Delhi
Sister Winnie Veeda Ram	Infection Prevention Nurse, Sir Gangaram Hospital	14/02/14	Saturday	In Person	New Delhi
Sister Suma Paul	Infection Prevention Nurse, Sir Gangaram Hospital	14/02/14	Sunday	In Person	New Delhi
Glenn McRae	Co-creator of Hospital Waste Management philosophy in the US	26/02/14	Wednesday	Skype	Vermont, USA
Jorge Emmanuel	Lead Technical Consultant, UNDP GEF Project on Healthcare Waste	27/02/14	Thursday	Skype	Phillipines
Jack Weinberg	UN Policy expert, Green peace Activist, and legendary leader of Free Speech Movement	04/03/14	Tuesday	Skype	Chicago, USA
Dr. Megha Rathi	Environmental Consultant, WHO	07/03/14	Friday	Skype	Geneva, Switzerland
Ravi Agarwal	Director, Toxics Link	11/03/14	Tuesday	In Person	New Delhi
Laxmi Raghupati	Former Addl. Secretary, Ministry of	13/03/14	Thursday	In Person	New Delhi
Alexander Von Hildebrand	Technical Officer, Western Pacific Regional Office, WHO	15/03/14	Saturday	Skype	Manila, Phillipines