"SERVING DEATH?"

A CASE FOR SAFE FOOD FOR CHILDREN IN INDIA (BY LEARNING CORRECT LESSONS RELATED TO PESTICIDE POISONINGS FROM THE BIHAR MID-DAY MEAL TRAGEDY)

India for Safe Food

Safe Food - Our Right! No Chemicals, No GM!

July, 2014

For Private Circulation Only

INDIA SAFE FOOD
A-124/6, First Floor, Katwaria Sarai, New Delhi 110 016

Preface

It was on July 16th 2013 that India and the world were shocked by an incident in an obscure village called Dharmashati Gandaman in Saran district of Bihar, close to Chhapra. On that day, despite misgivings by many primary school children in eating what they have been served as Mid Day Meal in their school since the food tasted odd, they ended up eating food laced with a deadly chemical – monocrotophos, an organophosphate pesticide. It is reported that the children were forced to eat the meals by the Head Mistress in whose house the food material was stored (as the school did not have sufficient infrastructure) – apparently, the Head Mistress chose to ignore the school cook's warnings that the new cooking oil was discolored and smelt odd. Soon after eating this food, children started falling sick and according to official figures, 23 children, aged between 4 and 12 years, died in this incident (with 16 dying on the spot). On 20th July 2013, the forensic report is reported to have confirmed that the cooking oil contained 'very toxic' levels of monocrotophos.

The incident shook the country and indeed, the world. It is, after all, food that has been planned and delivered to keep children alive and healthy – however, it appears that 'death was served', as one media report headline chose to put it.

One year on, INDIA FOR SAFE FOOD (IFSF), an informal platform for awareness and citizen action for safe food (with scores of associated individuals and organisations that work on food and environmental safety) has decided to issue this small report, asking a central question around whether the nation has learnt the right lessons from this tragedy or not, so that other such incidents can be prevented. Have the true culprits in the incident – pesticides that are not inevitable in farming – been nailed squarely?

This report is a compilation of existing evidence and information, to argue a case that children are indeed more vulnerable to toxins like pesticides, and that the government should ensure that schemes meant to provide food and meals to children should be toxin-free. We show that pesticide poisonings have been rampant, unacknowledged and not-acted-upon, including in the case of adults and including as acute poisoning instances (where the cause and effect relationship is more easier to establish); that the Bihar incident involving children and pesticides is not the first such incident; that the regulation of pesticides in India is a story that reeks of unscientific and unsafe regulation; that alternatives are indeed possible in farming as well as how we feed our children in schools.

While putting out this report, we realise fully well that proponents of transgenic technology in our food, farming and environment would like to use this report to further their fallacious arguments to promote GMOs as a solution to pesticides. However, there is by now enough scientific evidence to show that solutions don't lie in genetic modification technology, which presents irreversible and uncontrollable hazards on health and environment, including by genetically placing the pesticide within every cell of the plant (as in Bt crops) and/or modifying the genetic makeup to make the plant withstand the spraying of more toxic herbicides (as in HT or Herbicide Tolerant plants), apart from other adverse impacts. This report argues that safe food is indeed possible, without the use of synthetic pesticides or GMOs and that is where the nation's investments should be going.

We hope to draw the nation's attention to the need to draw the right lessons and implement the same, from the terrible tragedy that claimed innocent lives one year ago in Bihar. As a nation, we need to ensure that such incidents do not recur; we also need to ensure that children grow and develop in a toxin-free environment.

We would like to acknowledge the contributions of Kavitha Kuruganti, Madhu Lachin, Savvy Sowmya Mishra and Swati Maliwal to this report.

July 15th 2014
India For Safe Food
www.indiaforsafefood.in

CONTENTS OF THIS REPORT

Chapter 1: WARNING BELLS TOLLING LONG AND HARD 1

1.1. Pesticide Poisonings In India 1
1.2. Occupational Poisonings: Government's Data & Response 2
1.3. Occupational Poisonings: Civil Society Documentation 4
1.4. Accidental Poisoning, Including Of Children 5
1.5. Re-Use Of Pesticide Containers & Hazards Therein 6

Chapter 2: CHILDREN AND PESTICIDES DON'T MIX 7

Chapter 3: UNSCIENTIFIC & UNSAFE REGULATION OF PESTICIDES IN INDIA 12

Chapter 4: SAFE FOOD FOR OUR CHILDREN AN URGENT IMPERATIVE 16

4.1. Government's Response To The Bihar Food Poisoning Incident 17
4.2. Safe Food – A Basic Human Right 17
4.3. Organic Kitchen Gardens For Schools 18
4.4. Organic Produce Procured From The Community/Village 19

Chapter 5: RECOMMENDATIONS TO THE GOVERNMENT 21

Chapter 1
WARNING BELLS TOLLING LONG AND HARD

In common parlance, pesticide poisoning is mostly understood in the context of acute poisoning, since the effect is immediate and the cause triggering it can be traced back to a given pesticide. However, it needs to be reiterated that the toxic effects of pesticides are also long term, not apparent immediately and manifesting themselves in a more complex fashion. The reason for focusing on acute toxicity incidents is only illustrative.

This section deals with acute toxicity of pesticides, including of adults, to largely point out that despite the cause and effect phenomenon apparent, the issue has not been dealt with by the Indian government in any seriousness it deserves (including the regulators and the various review committees set up from time to time).

We bring to you the serious deficiencies in lack of surveillance over pesticide poisoning, the numerous instances which have highlighted the dangers in continuing with deadly pesticides in India both in terms of occupational poisoning of agricultural workers and farmers, as well as accidental poisoning due to negligent handling of pesticides and their containers. While this whole issue is eminently "actionable" in terms of the government protecting the very right to life of tens of thousands of citizens, the continued apathy and inaction are unconscionable. This section seeks to break the myth around 'safe use of pesticides', so that the nation can work towards real and safe alternatives.

Information related to poisoning cases from across India, mostly from the last decade, is presented here to highlight how widely prevalent these poisoning instances are, and to point out that the Chhapra incident had its warning bells tolling quite early on, but ignored consistently. It is important to note that several of these instances involved children being poisoned, and what's more, mid-day meals being contaminated, leading to poisoning!

1.1. PESTICIDE POISONINGS IN INDIA

It is ironical that the very need for regulation emerged out of a major accident in 1958 in Kerala that took 53 lives – in this instance, wheat flour meant for human consumption was contaminated with parathion. It was after this tragedy that India brought in an Insecticides Act for regulating pesticides. However, years later, India continues to witness major incidents of pesticide poisonings and it appears that no lessons are being learnt and no fundamental regulatory changes being made.

The Insecticides Act 1968 expressly says that it is an Act to regulate the import, manufacture, sale, transport, distribution and use of insecticides "with a view to prevent risk to human beings or animals, and for matters connected therewith" (our emphasis).

However, in its design as well as implementation, this objective of preventing risk to human beings or animals seems to have been neglected, going by the number of pesticide poisoning cases that have come to light just in the recent past (we are not even talking of chronic poisoning here). Perhaps the main reason for this neglect is the fact that the Agriculture Ministry, which is a promotional body, seeks to regulate pesticides in India, while the Health Ministry has never caught up with its food safety mandate, even though the Insecticides Act mandated the health ministry with its enforcement initially (in 1970, the enforcement of Act was transferred to the Ministry of Agriculture in the year 1970 by the Ministry of Health and Family Planning for reasons not clear; this could be because regulatory focus shifted to efficacy and quality testing rather than safety testing of pesticides, due to the advent of Green Revolution around that time).

Government of India has occasionally presented information on the floor of the Parliament, in response to questions on pesticide poisoning, based on what the state governments would have provided as information during "pre-season (agricultural seasons of Kharif and Rabi) conferences".

STATEMENT SHOWING THE NUMBER OF PESTICIDE POISONING CASES

2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	Apr09-Sept09
6506	**8315**	**9391**	**4776**	**7090**	**13137**	**11506**	**5962**	**9806**	**4302**

Source: Compiled from Parliament responses to LS QNo. 2014 dated 9/3/2010, QNo. 454, dated 7/7/2009 and LS QNo. 1245, dated 1/8/2005

Out of the above cases, deaths at the all-India level were reported to be (as part of the same responses to the above-referred questions): 1155 (2003-04); 2135 (2004-05); 2341 (2005-06), 2989 (2006-07), 693 (2007-08) and 1470 (2008-09). The usual qualifier to such information is that the "poisoning may be suicidal / homicidal / accidental / occupational".

The data presented by the Agriculture Ministry throws up two issues glaringly:
There is gross under-reporting of the extent of poisonings. How do we know this? The Government of India has another source of recording deaths due to pesticide poisoning – that is through the National Crime Records Bureau (NCRB) of the Ministry of Home Affairs. The annual reports of the Bureau titled "Accidental Deaths and Suicides in India" have a clear table (Table 2.9) on 'Incidence of suicides categorized according to means adopted'. Category 6 (i) here is suicides by consuming insecticides. As per data put out by these reports, the following is the number of suicides by means of consuming insecticides: 23311 (2004); 22316 (2005); 22947 (2006); 24125 (2007); 23805 (2008).

While these are clearly cases of pesticide poisoning deaths, the number of deaths reported by the Agriculture Ministry due to pesticide poisoning cases not just of suicides, but homicides, accidents and occupational deaths are at least ten fold lesser than what the NCRB is reporting just for suicides! The NCRB also presents deaths from accidental poisoning but none under the clear heading of "insecticide or pesticide poisoning" – therefore, we are not drawing from that data here. For information, we present data from Table 1.7. Category 13 (Poisoning) and (i) Food Poisoning/accidental intake of insecticides: 8049 (2004); 7390 (2005); 8043 (2006); 8425 (2007) and 7829 (2008). In 2013, the figure was 7550 deaths in this category.

There is also a clear indication that *no data is being collected systematically and separately* from various hospitals and other locations on occupational and accidental poisonings and deaths due to pesticides, as opposed to intentional poisonings (as seen in a Parliamentary response cited in the subsequent section). This means that the extent of prevalence of such occupational and accidental poisoning and particular pesticides responsible for the same (at least in terms of their acute toxicity) have not been sought to be identified and acted upon.

While this is the case with official data (or lack of it), there have been several instances over the years when media or civil society groups have reported occupational/accidental pesticide poisonings. Each such report was a warning bell ignored by the government and in particular, the regulators.

1.2. OCCUPATIONAL POISONING: GOVERNMENT DATA & RESPONSE

A Lok Sabha Unstarred Question (Question No. 987), on 20/08/2007 to a specific question on "whether the government maintains data relating to farmers and agricultural workers whose health was affected on account of use of pesticides due to inhaling/exposure and poisoning etc.", saw the then Minister of State, Ministry of Agriculture, Government of India (Mr Kantilal Bhuria) reply, "as per Section 26 of the Insecticides Act 1968, State Governments maintain

data regarding effects of pesticides on the health of farmers and agricultural workers". The said Section 26 states the following: "26. Notification of Poisoning: The State Government may, by notification in the Official Gazette, require any person or class of persons specified therein to report all occurrences of poisoning (through the use of handling of any insecticide) coming within his or their cognizance to such officer as may be specified in the said notification".In response to this specific question, the Minister gave the following information, as the number of occupational poisoning cases due to pesticides, on account of inhalation/exposure/poisoning while using pesticides in agricultural operations (during period 2001-02 to 2005-06). "Haryana: 65; Kerala: 2; Punjab: 21; Rajasthan: 8; Uttar Pradesh: 56. Other States have not reported any occupational poisoning". This is one of those rare instances when occupational poisoning cases have been reported thus officially. Extrapolating from other information available including the inconsistencies with the response of another agriculture minister in 2002, this appears to be gross under-reporting.

***

For a Lok Sabha question on "Agricultural Labourers Affected Due to Chemical Pesticides" posed on 13/05/2002 (Unstarred Question No. 6848), the then Minister of State for Agriculture in Government of India (Mr Hukumdeo Narayan Yadav) gave the following reply:"As per the report from the Government of Andhra Pradesh, 51 cases of pesticide poisoning involving 13 deaths due to exposure to pesticides have been reported during September and October, 2001. Some deaths due to pesticides poisoning have been reported from a few other States also.

The Registration Committee constituted under the Insecticides Act, 1968 registers the pesticides only after satisfying itself regarding their efficacy and safety to human being, animals and the environment. If the pesticides are used as per the prescribed directions, they do not pose any harm to human beings, animals and the environment. Further Government is promoting Integrated Pest Management (IPM) to reduce consumption of chemical pesticides. Farmers are provided training on safe and judicious use of pesticides by organizing farmers field schools. Training is also imparted to medical doctors on diagnosis and effective management of pesticide poisoning cases. ***No in-depth health monitoring study is contemplated in this regard by the Ministry of Agriculture".*** (emphasis ours)

In 2002, a fact-finding report in January 2002, led by Toxics Link and Community Health Cell, entitled 'Killing Fields of Warangal: Farmer Deaths Due to Exposure to Pesticides in Warangal District', estimated that there could have been more than 1,000 people exposed in Warangal alone in the period between August and December 2001. The Andhra Pradesh Rythu Sangam, a farmers union in the state of Andhra Pradesh, also documented the widespread poisoning that year.

***

A similar question on the Warangal incidence of pesticide poisoning and death was posed in the Rajya Sabha too (Starred Question No. 745, dated 17/05/2002, titled "Deaths due to pesticide exposure"). In this case, the then Minister for Agriculture replied by saying that a "few incidents of hospitalization" were reported. The blame was put on 'repeated use of high doses and improper methods of spraying of pesticides under high temperature'. As part of this reply, the Minister also gave details of deaths from other states during 2000-01, totaling 1638 from 9 states.

***

The Warangal incidents led to another Rajya Sabha question asked on the same day (Unstarred Question 5410) in which the Minister revealed that number of deaths due to pesticides poisoning in 1998-99 from 9 states were 1658, in 1999-2000 were 1818 and in 2000-01 were 1638. Moreover, the note under the reply, saying "other states have either not reported the figures or there were no deaths" is a matter of concern, showcasing again the fact that there is no mechanism for even estimating the prevalence of pesticides-related poisonings in the country, that too occupational or accidental.

1.3. OCCUPATIONAL POISONING: CIVIL SOCIETY DOCUMENTATION

In 2004, the Centre for Sustainable Agriculture (CSA), Secunderabad, and Modern Architects for Rural India (MARI), Warangal, documented a number of acute unintentional poisoning cases that were admitted at a few hospitals in Warangal[1]. The study obtained information on the number of hospitalizations due to pesticide inhalation (unintentional), as opposed to pesticide ingestion (intentional). Data from one district hospital and six area hospitals revealed that 202 people had suffered unintentional poisoning in just a few months during that year (2004). This could well be a case of under-reporting, as many people do not even get admitted to a hospital, or get into private hospitals, given the medico-legal complications involved. Eight deaths due to pesticide inhalation were also reported in this effort. The two organizations, which documented these cases, also admit that this report does not capture the full picture of the entire district nor the whole year. This report called "Killing and Poisoning Pests or Human Beings?" emphasized that "safe use of pesticides" is a myth in the Indian conditions. The report captures that due to various reasons like poverty, illiteracy and lack of awareness, feudal relationships, tropical and hot use conditions, safe use of pesticides in the Indian conditions is just not possible. For instance, the advice to not spray against the wind – for an agricultural worker who is assigned a task of finishing the spraying of pesticide on a given patch of land within a given wage, the luxury of walking back to the initial line so that he/she can align her/himself to the wind direction does not exist. Similarly, there is an instance when a farmer did not reveal the deadly nature of a given pesticide to the sprayer and actually poured into another container, for fear of finding no hired labour to spray the pesticide. The hot, sweaty conditions of work do not allow for protective gear to be worn comfortably – in fact, in some instances, masks have aggravated the situation of poisoning.

Another study published in 2004, with findings from Karnataka, Andhra Pradesh, Maharashtra and Punjab found that a majority of respondents reported acute poisoning symptoms while handling and spraying pesticides. The commonly implicated pesticides are: phorate, phosphamidon, monocrotophos, dichlorovos, oxydemeton methyl, edifenphos, chlorpyriphos, quinalphos, imidacloprid, triazophos, cypermethrin, fenvalerate, alphamethrin, dimethoate, endosulfan, acephate and malathion[2].

In 2009, a Punjab based civil society group called Kheti Virasat Mission collected some information on inhalation poisonings from the civil hospital of Bathinda under Right To Information Act through one of their volunteers (this is unpublished data, but obtained through RTI). The data revealed that in 2004, 10 deaths due to pesticides inhalation; in 2005, 17 deaths; in 2006, 15 deaths; in 2007, 11 deaths and in 2008, 12 deaths were recorded in the government Civil Hospitals of just this district. Information on the victims who died due to poisoning was provided in sixteen cases from district Sangrur to the RTI application. It is apparent that the poisoning cases would be much higher. Further investigations and reconstruction of some of these poisonings by meeting villagers and family members implicated pesticides like Glyphosate, Monocrotophos, Endosulfan etc.

In 2011, from just one revenue division (Adoni) of Kurnool district in Andhra Pradesh, 20 deaths were reported from pesticide spraying, over a 4-month period (July to October). 149 cases were admitted to hospitals with pesticide poisoning[3]. An exploratory health study on shopkeepers selling pesticides in Uttar Pradesh in India found that retail traders exposed to pesticides had significantly higher relative risk for sickness related to cardio-vascular, genitourinary, respiratory, nervous and dermal systems as compared to controls, because of multiple exposures to pesticides and poor safety culture at work place[4].

1. Kuruganti Kavitha (2005): Killing and poisoning pests or human beings?-Acute poisoning of pesticide users through pesticide exposure/inhalation, MARI (Warangal), CSA (Secunderabad) and CWS (Secunderabad)
2. Shetty PK (2004): Socio-ecological implications of pesticide use in India. Economic & Political Weekly, Dec 4, pp 5261-67
3. "PramathhathePramaadam", Eenaadu (telugu) news report from Kurnool, 2011
4. Kesavachandran C, Pathak MK, Fareed M, Bihari V, Mathur N, Srivastava AK (2013): Health risks of employees working in pesticide retail shops – an exploratory study. Indian J Occup Environ Med. 2009 December; 13(3): 121-6

1.4. ACCIDENTAL POISONING, INCLUDING OF CHILDREN

While occupational hazard could be due to inhalation, there are also accidental poisonings (acute toxicity) of people who come to be poisoned, without even working in the field of agriculture[5]. We present a few such cases here from the past decade or so.

In July 2002, 32 school children less than 12 years of age, developed symptoms of severe acute poisoning in the village of Karinjakunnu in Kottathara Panchayat of Wayanad district in Kerala and had to be rushed to a nearby hospital for immediate treatment, where some of them were discharged after only 3 days[6]. These children were affected by Phorate used on a banana plantation, close to their school. The farmer who used the pesticide was found to have used 12 times more than the recommended dosage in this case. Unfortunately, not going by the dosage recommendations is not uncommon.

In July 2006, a group of school students and other villagers in a village in Phillaur, Jalandhar district of Punjab were affected. In village Salkiana, students in a school had to be rushed to a hospital when they started complaining of breathlessness and started falling unconscious. The reason was discovered to be phorate, used in a nearby sugarcane field[7].

In September 2010, a wire service news report carried in various media channels reported that over 100 students had fallen ill in Borboruah tea garden in Dibrugarh district in Assam, due to food poisoning[8] – these were primary school students who complained of giddiness and started vomiting after they ate their mid-day meal. It was reported that the food prepared in the school was contaminated with some pesticides that were being sprayed by the tea garden workers close to the school kitchen. The uncanny similarity of a mid-day meal being possibly accidentally poisoned in this instance with the Chhapra incident, is noteworthy.

Before this, in response to a Rajya Sabha Starred Question (No. 345, dated 18/4/2005), the then Minister for Human Resource Development informed the House that over the years, there have indeed been reports during 2002-2005 of children falling ill after eating mid-day meals. While providing details on information received till then, the Minister informed that in West Bengal, 30 children fell ill due to pesticides spread in the agricultural field adjacent to the school, which had caused food poisoning.

Responding to one of the related questions on standards laid down for mid-day meals by the government, the Minister could only clarify the calories and protein requirements in each meal, in addition to a vague principle that "it should be hygienic and wholesome". This is however not the same as safe food, as the instances narrated here show very clearly.

While these are some examples of mass poisonings that too of school children, regular reports of accidental poisonings keep appearing in the media. For instance, on May 22nd 2011, a 3-year old child of Kauni village in Muktsar district is reported to have been admitted in a hospital after he consumed some pesticide-laced eatable in the house. A Times of India report points out that almost all farmers use empty pesticide containers in the kitchen of their houses for storage of various eatables. In October 2011, a boy of Safdipur village is reported to have died after drinking pesticides-mixed water from the water tank of his farmhouse.

5. For the sake of this report, we are making a distinction between Occupational Poisoning and Accidental Poisoning, though inhalation by way of one's occupation gets classified as accidental poisoning too
6. Usha Jayakumar's report in Pesticides News No. 57, September 2002, page 19, available at http://www.pan-uk.org/pestnews/Issue/pn57/pn57p19b.htm
7. http://www.downtoearth.org.in/node/8353?quicktabs_1=0
8. http://www.deccanherald.com/content/100071/over-100-students-taken-ill.html

Some academic studies have also focused on childhood accidental poisoning, using hospital records. One such study from the Sunderbans region of West Bengal reports that out of 1056 admissions of children in a hospital with accidental poisoning during 1999-2001, organophosphorus poisoning was the commonest[9].

Another study, from a tertiary care centre in North India during July 2004 and July 2006, once again based on hospital records of pediatric emergency room and poisonings, found that insecticides were amongst the top three agents most frequently implicated[10] (even in a situation where the majority of the patients resided in urban areas).

1.5. RE-USE OF PESTICIDE CONTAINERS & HAZARDS THEREIN

The unsafe use of pesticides is not limited just to the use in the fields, but to the pesticide containers. There is widespread prevalence of re-use of pesticide containers for storage of food, oils and water.

An Economist article in 2007 stated that a report put out by the Punjab Government had findings of a survey suggesting that three quarters of the respondents put pesticide containers to domestic use[11].

A study in Maharashtra's Kolhapur district in 2010 found that 33% of the respondents washed the used pesticide containers and re-used them for various purposes. Even when it comes to storage of pesticides, an overwhelming majority did not keep the pesticides in safe locations[12]. This study documented a large number of accidental poisoning cases from the study villages (chlorpyrifos, endosulfan, zinc phosphate etc., are implicated). There are a wide number of civil society and media reports, many anecdotal, which indicate that reuse of pesticide containers is a widespread practice in different parts of India.

Meanwhile, the International Code of Conduct on the Distribution and Use of Pesticides obliges the pesticides industry to use containers that are not attractive for subsequent reuse and promoting programmes to discourage their reuse, where effective container collection systems are not in place (5.2.3.5)[13]. However, the implementation of this voluntary code presents a different picture.

We showcase all the above to point out that 'safe use of pesticides' is a myth; that pesticide poisonings of different kinds are rampant in the country; that there is no systematic surveillance of even acute poisoning cases in the country, including occupational and accidental, specifically classified as such (chronic poisoning of course goes unacknowledged); that there is no mechanism by which the government is able to regulate even basic matters like pesticides containers and their re-use, and the hazards contained therein, or the end-use conditions of pesticides as seen in the numerous poisoning incidents of school children, mentioned here, also due to pesticide drift. All of this creates strong grounds for FAO's recommendation and reiteration that hazardous pesticides should be phased out in a country like India. The government should heed this.

9. Chowdhury AN, Banerjee S, Brahma A, Biswas MK (2008): A study on mortality and morbidity pattern of acute childhood poisoning cases admitted in block primary health centres of Sunderban, West Bengal. Indian J Public Health. 52(1): 40-2
10. Kohli U, Kuttiat VS, Lodha R, Kabra SK (2008): Profile of childhood poisoning at a tertiary care centre in North India. Indian J Pediatr. Aug; 75(8): 791-4
11. Chemical Generation: Punjabis are poisoning themselves. Sept. 24th 2007, The Economist.
12. Dhere Amar M, JavadekarPrachee P, Jagtap Mahesh P (2010): Modern agricultural practices: a dilemma of farmer & farm worker's health in cash crop zone in Maharashtra state. Bhatter College Journal of Multidisciplinary Studies, 1 (1).
13. FAO (2005). International code of conduct on the distribution and use of pesticides. Revised Version. Adopted by the 123rd Session of FAO Council in November 2002. Food And Agriculture Organisation, Rome

Chapter 2
CHILDREN AND PESTICIDES DON'T MIX[14]

"Children are especially sensitive to environmental toxins. Pound for pound of body weight, children have greater exposure to pesticides because they drink more water, eat more food and breathe more air than adults. Two additional characteristics of children further magnify their exposures: 1) they live and play close to the floor; and 2) they constantly put their fingers into their mouths. Children's metabolic pathways, especially in the first months after birth are immature. Generally they are less well able to metabolize, detoxify, and excrete toxicants than adults and thus are more vulnerable to them. Children are undergoing rapid growth and development, and their developmental processes are easily disrupted. Since children have more future years of life than most adults, they have more time to develop chronic diseases that may be triggered by early exposures".

– Dr Philip J. Landrigan[15], testimony before Committee on Environment and Public Works, US Senate ? Oct 1, 2002

Children are different from adults in composition and metabolism as well as in physiological and biochemical processes. In a period of 26 weeks, the foetus grows from microscopic size to recognizable human form, weighing about 500 gm. Physical growth and the maturing of function continues from birth to adolescence, with development rates varying from system to system, organ to organ, and tissue to tissue. Thus, not only do infants and children differ from adults, but also at any point during development, each child differs in structure from herself or himself at any other age[16].

Data from the United States of America shows that, generally, children in the first six months of life consume seven times more water per kilo of body weight than does the average adult. This is attributed largely to the westernized diet where children consume relatively more processed food such as fruits juices and baby foods which may concentrate residues; infants in particular also have a much higher intake of vegetables, which often have relatively higher levels of residues than do meats. Pesticides found in baby food in the US included eight that are toxic to the nervous system, five that affect the endocrine system, and eight that are potential carcinogens[17].

Children also inhale more air — the breathing rate over the first 12 years of life is about double that of adult breathing rates[18], so they can take in double the amount of inhaled pesticide as an adult under the same situation of exposure. When the breathing rate is taken into account relative to lung surface area, the amount of airborne contaminants reaching the lung surface is likely to be about 3-4 times higher in 3-month old children than in adults[19]. This makes children more vulnerable to the effects of spray drift and household insecticides.

Because children have different metabolism than adults, they may have different capacities for breaking down or metabolizing, excreting, activating or deactivating pesticides. Such processes change dramatically from birth until adulthood. These factors can cause pesticides to have more pronounced toxic effects in children, or possibly lead to somewhat different poisoning symptoms than those seen in adults[20].

14. This chapter draws heavily from the Pesticide Action Network Asia and Pacific (PAN-AP) report-'Poisoning our future: Children and Pesticides' by Meriel Watts PhD (2013)
15. Dr Philip J Landrigan (MD): pediatrician, Chairman of the Department of Community and Preventive Medicine, Director of the Center for Children's Health and the Environment of the Mount Sinai School of Medicine in New York City.
16. National Research Council (1993). Pesticides in the Diet of Infants and Children, National Acad Press, Washington D.C.
17. Landrigan PJ, Claudio L, Markowitz SB, Berkowitz GS, Brenner BL, Romero H, Wetmur JG, Matte TD, Gore AC, Godbold JH, Wolff MS (1999). Pesticides and inner-city children: exposures, risks and prevention. Environ Health Perspect 107 (Suppl 3): 431-7
18. Miller MD, Marty MA, Arcus A, Brown J, Morry D, Sandy M. (2002). Differences between children and adults: Implications for risk assessment at California EPA. Int J Toxicol 21(5):403-18
19. WHO(2006). Principles for Evaluating Health Risks in Children Associated with Exposure to Chemicals. Environmental Health Criteria 237.World Health Organization, Geneva.
20. UNEP (2004). Childhood pesticide poisoning: Information for advocacy and action. Prepared for FAO, UNEP and WHO by Dr Lynn Goldman, Professor, Environmental Health Sciences, John Hopkins School of Hygiene and Public Health, USA with contributions from Mr Bill Murray, FAO and Dr Jenny Pronczuk, WHO.

It has to be noted that children are exposed to pesticides even before they begin to eat and drink on their own or fed by their mothers or breathe in the open air. They are born polluted—it begins from the very first moments in the womb when the embryo is being formed from the father's sperm and the mother's egg. In fact, it could begin pre-conception, with father's exposure to pesticides[21]. Semen samples from farmers in the US had been found to contain alachlor, atrazine, 2,4-D, diazinon, metolachlor and a metabolite of chlorpyrifos; and the semen from urban men were found to contain chlordane, DDE, heptachlor and HCB[22].

Some pesticides cross the placental barrier thus potentially affecting children. These are classified as mutagens, reproductive toxins, feto-toxins, embryo toxins and teratogens. Embryo Toxin is one that crosses the placental barrier and could cause death or abnormal development of an embryo in humans or in laboratory animals as observed. Fetotoxins cross the placental barrier and could compromise maternal health and cause fetal malformations, altered growth and in-utero death. Teratogenic pesticides have the ability to cause malfunctions in fetus; they might cause abnormal development of a limb to malfunction of an organ. A reproductive toxin is one which affects the reproductive capabilities.

Both paternal and maternal exposure to pesticides, including occupational and home use, has been linked to stillbirths[23][24][25][26][27][28] , with one study linking it particularly to exposure during the second trimester[29], and one to paternal exposure to DDT[30]. A study in India found increased stillbirths and neonatal deaths amongst the families of workers exposed to endosulfan and other pesticides in India's cotton fields[31].

Apart from exposure to food with with pesticides residue, the foetus and subsequently the child is also affected by the spraying of pesticide around them and this especially affects the children of agricultural labourers. The latter may be exposed in utero when their mothers are in contact with pesticides. Intrauterine growth, birth weight, and birth size can have a profound effect on health in later life-for example, lower birth weight has been associated with increased risk of adult onset cardiovascular disease, type 2 diabetes, osteoporosis, depressive disorders and some cancers[32]. Birth weight is a good indicator of maternal nutritional health as well as a biomarker of chemical exposure-not just pesticides but other chemicals as well.

In a study in France associations were found between maternal exposure to insecticides from household use or nearby agricultural activity and decreased birth weight and head circumference[33].

In India, higher levels of lindane and other isomers of HCH[34] and DDT[35] were associated with reduced intrauterine growth, whilst elevated levels of HCH, DDT and DDE in cord blood and/or placenta were correlated with reduced birth weight, length at birth, head circumference, ponderal index (measure of leanness) and chest circumference in newborns[36].

21.Perera F, Herbstman J (2011). Prenatal environmental exposures, epigenetics & disease. Reprod Toxicol 31(3):363-73
22. Colborn T. (2006). A case for revisiting the safety of pesticides: a closer look at neurodevelopment. Environ Health Perspect. 114(1): 10-17
23. Goulet L, Thériault G. (1991). Stillbirth and chemical exposure of pregnant workers. Scand J Work Environ Health 17(1):25-31
24. Rupa DS, Reddy PP, Reddi OS. (1991). Reproductive performance in population exposed to pesticides in cotton fields in India. Environ Res 55(2): 123-8
25. Taha TE, Gray RH. (1993). Agricultural pesticide exposure and perinatal mortality in central Sudan. Bull World Health Organ 71(3-4): 317-21
26. Nurminen T, Rantala K, Kurppa K, Holmberg PC. (1995). Agricultural work during pregnancy and selected structural malformations in Finland. Epidemiology 6(1): 23-30
27. Pastore LM, Hertz-Picciotto I, Beaumont JJ. (1997). Risk of stillbirth from occupational and residential exposures. Occup Environ Med 54(7): 511-8
28. Medina-Carrilo L, Rivas-Solis F, Fernández-Argüelles R. (2002). Risk for congenital malformations in pregnant women exposed to pesticides in the state of Nayarit, Mexico. Ginecol Obstet Mex 70: 538-44
29. White FM, Cohen FG, Sherman G, McCurdy R. (1988). Chemicals, birth defects and stillbirths on New Brunswick: associations with agricultural activity. Can Med Ass J 138(2): 117-24.
30. Cocco P, Fadda D, Ibba A, Melis M, Tocco MG, Atzeri S, Avataneo G, Meloni M, Monni F, Flore C. (2005).Reproductive outcomes in DDT applicators. Environ Res 98(1): 120-6
31. Rupa DS, Reddy PP, Reddi OS. (1991). Reproductive performance in population exposed to pesticides in cotton fields in India. Environ Res 55(2): 123-8
32. Perera F, Herbstman J(2011)Prenatal environmental exposures, epigenetics and disease. Reprod Toxicol 31(3):363-73.
33. Petit C, Blangiardo M, Richardson S, Coquet F, Chevrier C, Cordier S. (2012). Association of environmental insecticide exposure and fetal growth with a Bayesian model including multiple exposure sources. The PELAGIE Mother-Child Cohort.Am J Epidemiol 175(11): 1182-90
34. Pathak R, Mustafa MD, Ahmed T, Ahmed RS, Tripathi AK, Guleria K, Banerjee BD. (2011). Intra uterine growth retardation: Association with organochlorine pesticide residue levels and oxidative stress markers. Reprod Toxicol 31(4): 534-9
35. Sharma E, Mustafa MD, Pathak R, Guleria K, Ahmed RS, Vaid NB, Banerjee DB. (2012). A case control study of gene environmental interaction in fetal growth restriction with special reference to organochlorine pesticides (India). Eur J Obstet Gynecol Reprod Biol 161(2): 163-9
36. Dewan P, Jain V, Gupta P, Banerjee BD. (2013).Organochlorine pesticide residues in maternal blood, cord blood, placenta, and breast milk and their relation to birth size. Chemosphere 90(5): 1704-10

However, there are also other studies that show no significant increase in low birth weights due to pesticides exposure[37].

Once born, children are further exposed to more contaminants through mother's milk, especially organochlorine pesticide like DDT and its metabolite DDE[38]. The girl child appears to accumulate higher levels than boys[39]. Though the study shows that bottled milk had lower levels of residues[40], there is a cautionary note attached to it.

In a joint statement in 2004 by the World Alliance for Breastfeeding Action (WABA) and the International POPs Elimination Network (IPEN), emphasis was laid on the importance of breast milk. The statement said "breastfeeding, even in a contaminated environment, has a positive impact on the development of children as compared to those who are artificially fed. Breastfeeding supports infant growth and health as well as maternal health in ways that breast milk substitutes cannot. Indeed, breast milk contains substances that help the child develop a stronger immune system and other protections against environmental pollutants and pathogens[41]". Because breast milk is the best source of nutrition for infants and recommended by the World Health Organization, protecting mothers from exposure to toxic contaminants is crucial[42].

Foetal exposures to endocrine-disrupting pesticides have been linked to a number of problems with the reproductive system, ranging from birth defects such as hypospadias and cryptorchidism, through early onset puberty and other effects on sexual maturity, to a whole raft of hormone-related problems in adulthood, including menstrual irregularities, uterine fibroids, endometriosis, and infertility[43]. Although these latter problems are largely adult conditions rather than those of childhood, their genesis also lies in exposures to endocrine disrupting substances during foetal development and early childhood.

Some of the pesticides that are known endocrine disruptors-Acephate, 2,4-D, Aldicarb, Atrazine, Bifenthrin, Carbaryl, Carbofuran, Chlorpyriphos, Cypermethrin, Dicofol, Diazinon, Dimethoate, Endosulfan, Fenvalerate, Malathion, Methyl Parathion[44], Carbendazim and DDT[45].

In animal experiments, certain pesticides have been shown to compromise the immune system. A weakened immune system, particularly in growing children, exacerbates the risk of infectious diseases and cancer, thus increasing mortality rates[46].

Child cancer rates have been steadily increasing around the world. In Britain, they increased by 35% between the years 1962 and 1998, with an annual increase of 0.8%. Across 15 countries in Europe, the annual increase was 1.1% between 1978-1997[47]. In the USA, whilst the overall childhood cancer incidence rates increased 13% from 1973 to 1997, the rates of increase for some specific childhood cancers were much higher: 30% for non-Hodgkin's lymphoma, 21% for brain cancer and 21% for acute lymphocytic leukemia[48]. Some cancers in

37. Liang Wang, Tiejian Wu, Xuefeng Liu, James L Anderson, ArshamAlamian, Maosun Fu, Jun Li (2012). Pesticide exposure during pregnancy and low birth weight. WHO South-East Asia Journal of Public Health. 1(3): 232-238

38. Karmaus W, deKoning EP, Kruse H, Witten J, Osius N. (2001). Early childhood determinants of organochlorine concentrations in school-aged children. Pediatr Res 50(3): 331-6

39. Grimalt JO, Carrizo D, Gari M, Font-Ribera L, Ribas-Fito N, Torrent M, Sunyer J. (2010). An evaluation of the sexual differences in accumulation of organochlorine compounds in children at birth and at the age of 4 yrs. Environ Res 110(3): 244-50

40. Carrizo D, Grimalt JO, Ribas-Fito N, Sunyer J, Torrent M. (2006).Physical-chemical and maternal determinants of the accumulation of organochlorine compounds in four-year-old children. Environ Sci Technol. 40(5): 1420-6

41. WABA & IPEN (2004). Joint Statement: http://www.waba.org.my/whatwedo/environment/pdf/Joint.pdf

42. UNEP (2004). Childhood pesticide poisoning: Information for advocacy and action. Prepared for FAO, UNEP and WHO by Dr Lynn Goldman, Professor, Environmental Health Sciences, John Hopkins School of Hygiene and Public Health, USA with contributions from Mr Bill Murray, FAO and Dr Jenny Pronczuk, WHO. http://www.who.int/ceh/publications/pestipoison/en/

43.Crain DA, Janssen SJ, Edwards TM, Heindel J, Ho S, Hunt P, Iguchi T, Juul A, McLachlan JA, Schwartz J, Skakkebaek N, Soto AM, Swan S, Walker C, Woodruff TK, Woodruff TJ, Giudice LC, Guillette LJ Jr. (2008). Female reproductive disorders: the roles of endocrine-disrupting compounds and developmental timing. Fertil Steril 90(4): 911-40

4 4. http://www.beyondpesticides.org/health/endocrine.pdf

45. Pesticide Action Network Asia and Pacific report- 'Poisoning our future: Children and Pesticides' by Meriel Watts PhD (2013)-List of Endocrine disruptors

46. UNEP (2004). Childhood pesticide poisoning: Information for advocacy and action. Prepared for FAO, UNEP and WHO by Dr Lynn Goldman, Professor, Environmental Health Sciences, John Hopkins School of Hygiene and Public Health, USA with contributions from Mr Bill Murray, FAO and Dr Jenny Pronczuk, WHO. http://www.who.int/ceh/publications/pestipoison/en/

47. Lyons G, Watterson A. (2010). A Review of the Role Pesticides Play in some Cancers: Children, Farmers and Pesticide users at Risk? CHEMTrust, UK. http://www.chemtrust.org.uk/Pesticidesandcancer.php

48. CEC. (2006). Toxic Chemicals and Children's Health in North America: A Call for Efforts to Determine the Sources, Levels of Exposure, and Risks that Industrial Chemicals Pose to Children's Health. Commission for Environmental Cooperation, Montreal. http://www.cec.org/Storage/59/5221_CHE_Toxics_en.pdf

adults may well result from contributing factors that occurred during prenatal development and childhood, given that cancer generally has a long latency period. Since children have a longer life ahead of them than do adults, they have more time in which to develop chronic diseases initiated by early exposures[49]. A large international study across seven countries identified an association between childhood brain tumors and maternal farm exposure to pesticides during the five years preceding the diagnosis[50]. Leukemia[51] and child cancer in general, are most consistently associated with maternal exposures. Exposure[5253] of the father, pre-conception, can also result in childhood cancer, particularly leukemia[54] and brain cancer[55]. A high rate of brain cancer was found in children playing in orchards in Kashmir, India[56].

There is also concern that early exposures to neurotoxic pesticides may increase risk in later life of chronic neurologic diseases such as dementia, Parkinson's disease, and amyotrophic lateral sclerosis (also called Lou Gehrig's disease, this is a form of motor neuron disease with rapid progressive and fatal weakness, muscle atrophy and other conditions)[5758]; and to metabolism, appetite and endocrine function disorders leading to obesity and diabetes[59].

Exposure to pesticides has been linked to adverse effects on the developmental abilities of children[60]. In a study across six states of India, it was seen that children exposed to pesticides performed significantly worse than the less-exposed children on various developmental tasks tested for[61].

In the case of endosulfan poisoning tragedy in Kerala's Kasaragod district, children were found to be the worst affected with congenital anomalies, mental retardation, physical deformities, cerebral palsy, epilepsy, hydrocephalus etc[62].

Its not only the indirect exposure that poses a risk to the children, with growing number of children working in the fields, pesticides also pose an occupational hazard to agricultural child labour in India. According to the International Labour Organization around 215 million children are engaged as 'child labour' worldwide. This is over 7% of all children. Nearly 70% of child labourers work in agriculture— around 150 million children. In some countries, children under the age of 10 make up 20% of the rural child labour force[6364].

Another noteworthy issue: environmental contaminants may pose a greater risk to children than adults in one more way: children have a longer life expectancy in which to develop diseases with long latency periods. For example, if a 70-year-old adult and a 5-year-old child are exposed to a carcinogen with a 40-year latency period, the child has a much higher lifetime risk of developing adverse health consequences[65].

49.Landrigan, P.J., L Claudio, SB Markowitz, et al. (1999). "Pesticides and inner city children: exposures, risks, and prevention." Environmental Health Perspectives 107 (Suppl 3): 431-437
50. Efird JT, Holly EA, Preston-Martin S, Mueller BA, Lubin F, Filippini G, Peris-Bonet R, McCredie M, Cordier S, Arslan A, Bracci PM. (2003). Farm-related exposures and childhood brain tumours in seven countries: results from the SEARCH International Brain Tumour Study. Paediatr Perinat Epidemiol. 17(2): 201-11
51. Van Maele-Fabry G, Lantin A-C, Hoet P, Lison D. (2010). Childhood leukaemia and parental occupational exposure to pesticides: a systemic review and meta-analysis. Cancer Causes Control 21(6): 787-809
52. Infante-Rivard C, Weichenthal S. (2007). Pesticides and childhood cancer: an update on Zahm and Ward's 1998 review. J Toxicol Environ Health Part B 10(1): 81-99
53. Lyons G, Watterson A. (2010). A Review of the Role Pesticides Play in some Cancers: Children, Farmers and Pesticide users at Risk? CHEMTrust, UK. http://www.chemtrust.org.uk/Pesticidesandcancer.php
54. Infante-Rivard C, Weichenthal S. (2007). Pesticides and childhood cancer: an update on Zahm and Ward's 1998 review. J Toxicol Environ Health Part B 10(1): 81-99
55. Vinson F, Merhi M, Baldi I, Raynal H, Gamet-Payrastre L. (2011). Exposure to pesticides and risk of childhood cancer: a meta-analysis of recent epidemiological studies. Occup Environ Med 68(9): 694-702
56. Bhat AR, Wani MA, Kirmani AR, Raina TH. (2010). Pesticides and brain cancer linked in orchard farmers of Kashmir. Indian J Med Paediatr Oncol 31(4): 110-20
57. Landrigan PJ, Claudio L, Markowitz SB, Berkowitz GS, Brenner BL, Romero H, Wetmur JG, Matte TD, Gore AC, Godbold JH, Wolff MS. (1999). Pesticides and inner-city children: exposures, risks, and prevention. Environ Health Perspect. 107 (Suppl 3): 431-7
58. Suk WA, Ruchirawat KM, Balakrishnan K, Berger M, Carpenter D, Damstra T, Pronczuk de Garbino J, Koh D, Landrigan PJ, Makalinao I, Sly PD, Xu Y, Zheng BS. (2003). Environmental threats to children's health in Southeast Asia and the Western Pacific. Environ Health Perspect 111(10): 1340-7
59. Lassiter TL, Brimijoin S. (2008). Rats gain excess weight after developmental exposure to the organophosphorothionate pesticide, chlorpyrifos. Neurotoxicol Teratol 30(2): 125-130
60. Guillette, Elizabeth A., Maria Mercedes Meza, Maria Guadalupe Aquilar, Alma Delia Soto and Idalia Enedina Garcia (1998). "An Anthropological Approach to the Evaluation of Preschool Children Exposed to Pesticides in Mexico." Environmental Health Perspectives 106(6): 347-353
61. Kuruganti, Kavitha. (2005). "Effects of Pesticide Exposure on Developmental Task Performance in Indian Children." Children, Youth and Environments 15(1): 83-114
62. "Endosulfan: The Kerala Story" – Report on health effects of endosulfan and progress of rehabilitation activities in Kerala. Department of Health and Family Welfare, Government of Kerala, 20th April 2011.
63. ILO. (2006). Tackling Hazardous Child Labour in Agriculture: Guidance on Policy and Practice. User Guide. International Labour Organization, Geneva. http://www.ilo.org/ipecinfo/product/viewProduct. do?productId=2799
64. ILO. (2011). Children in Hazardous Work: What We Know, What We Need to Do. International Labour Organization, Geneva. http://www.ilo.org/ipecinfo/product/viewProduct.do?productId=17035
65. Systematic Review of Pesticide Health Effects (2012), Ontario College of Family Physicians. http://ocfp.on.ca/docs/pesticides-paper/2012-systematic-review-of-pesticide.pdf

In summary, this section highlights the fact that children, especially in countries like India, are vulnerable to pesticides in numerous ways, given the peculiarities that children carry, in addition to the fact that multiple exposure routes pose a threat to them. While the first chapter took the illustration of widely-prevalent acute pesticide poisonings of adult and children for the lack of action from governments, this section further seeks to highlight that children's vulnerability to both acute and chronic poisoning is indeed very high.

Chapter 3
UNSCIENTIFIC AND UNSAFE REGULATION OF PESTICIDES IN INDIA

After the Gandaman incident in Bihar on July 16th 2013, a lot of attention was focused on the Mid Day Meal scheme in India. Not enough, however, has been said about how this accident could have been averted with better regulation around pesticides in the country, however.

We present here some analysis on the sorry state of regulatory affairs when it comes to pesticides in India, and predict that avoidable tragedies like Gandaman will continue to happen unless regulation is re-cast in fundamental ways[66].

(a) Conflict of Interest all-pervasive: When the Indian regulatory system was first created (1968), it was under the Ministry of Health and Family Planning. However, in 1970, the administration of the law was left to the Ministry of Agriculture. This presents an inherent conflict of interest, since this is the Ministry that promotes the use of agri-chemicals. Further, various NARS (National Agricultural Research System consisting of Indian Council for Agricultural Research and its associated bodies, in addition to State Agriculture Universities etc.) institutes actually earn revenues by taking up commissioned research for the pesticides industry, as part of the regulatory process.

Another element of objectionable conflict of interest is from the fact that all decision-making on safety of a given product is based on data supplied by the product developer, who has a vested interest in claiming that something is safe. There is no independent testing of safety, nor is there even an independent analysis of the safety data provided, done transparently and with all data put out in the public domain.

(b) Objective of regulation neglected: The 1968 law which is meant to govern regulation of pesticides in India, called the Insecticides Act, has protection of bio-safety as its main objective – "an act to regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, and for matters connected therewith".

However, a closer look at the law and its implementation shows that a large chunk of regulatory effort goes into regulating the quality of pesticides marketed (the entire inspection and lab testing apparatus set up under this law is geared towards this).

Three missing elements in Indian regulation that exemplify this argument that safety has been given a short shrift include: (1) fixing of Maximum Residue Levels is not done prior to registration of a pesticides (another Ministry (Health), under another Act, with its regulatory setup, is supposed to fix and monitor implementation with regard to MRLs, with very little coordination between the two regulatory agencies); (2) registration is not done in a time-bound conditional manner where every product registered comes up for an automatic review within 3-5 years. Reviews of registered pesticides are few and far between with no post-marketing surveillance systems in place; (3) no chronic or long term testing is done, even though much scientific evidence exists to show that pesticides can cause a variety of chronic impacts.

(c) No need assessment or assessment of alternatives, as part of the regulatory regime: The Indian regulatory regime, when looking at an application for a pesticide to be registered, does not first verify whether a particular product is needed, and whether safer alternatives exist or not. Compare this with the Norwegian system, for instance, which says: *"must be judged to be just as suitable as or to have advantages over….other methods for the purpose"*.

66. Kuruganti, Kavitha (2013): Regulation of Pesticides in India. Presentation in a Conference on Food Safety & Environmental Toxins, organized by Centre for Science and Environment.

(d) Regulation opaque, and proven to be corrupt: The regulatory system in India is quite opaque, compared to other regulatory regimes for risky technologies even within India (the regulatory system for transgenics, for instance, has engaged with civil society concerns). No biosafety data is put out for public scrutiny when it comes to pesticides, though in the recent past, toxicological data is being vetted by a panel of experts set up for the purpose. However, no independent testing is taken up even here. Furthermore, the regulatory system is proven to be corrupt. The registration of 4 pesticides of De-Nocil (Dow's subsidiary in India), after payment of bribes, is a prime example of this[67].

(e) Inadequacy of Review Committees: It has been seen time and again that there is no scientific rationale or basis to the reviews that take place of pesticides (and their continued approvals) in India. For looking into pesticides that clearly had the review initiated because of adverse health effects emerging from the ground, the regulators had set up Committees headed not by health experts but agricultural experts, in the past – this is just to cite a small example.

In 2005, the 'CD Mayee-led Expert Group' was mandated to look into pesticides which are banned in other countries but are being used in India (37 such pesticides), and this Expert Group was to review toxicity, persistence, safety in use and substitute available and make recommendations for their continued use or restricted use or phasing out in the country. CIBRC sought the observations, considered views and experiences of all state governments, especially in the case of ten pesticides - Monocrotophos, Mancozeb, Quinalphos, Butachlor, Diclorvos, Acephate, Fenitrothion, Carbendazim, Atrazine and Pendimethalin.

On Monocrotophos (the pesticide implicated in the Bihar mid day meal tragedy), this Committee in its 2006 (third) meeting had the following to say[68]:

"Monocrotophos: The group considered the information that it is highly hazardous pesticide class (1B) as per WHO recommended Classification of Pesticides by Hazard 2004 and it is included in the Rotterdam Convention on Prior Informed Consent Procedure on hazardous chemicals and pesticides. The group was concerned with the recent reports of endocrine disruption and the International information of poisoning cases .The group noted that the government has issued the notification regarding the ban on the use of (monocrotophos on) vegetables which is difficult to implement considering the use of this pesticide on other crops in the past. Further in view of certain reports/ observations there was an apprehension among the members that there are chances of misuse of the pesticide in terms of application technology. It was also noted that better alternatives are available (our emphasis). In view of above it was decided that the basic manufacturers/ Pesticide Associations may be asked to present their views on the above concerns."

In February 2007, the CIBRC sent a letter to various product registrants, subsequent to the review and recommendations of the Expert Group. It cited that the "Committee also decided that in case of pesticides for which certain studies have been recommended by the Registration Committee/ Expert Group, the Registration Committee should write to the industry associations and registrants of the product[69] for getting such field studies conducted by ICAR Institutions within a period of 5 years failing which action will be initiated by the Registration Committee of deleting the label claim of the product". An Annexure (Annexure I) gives details of what exactly was asked to be taken up in the case of each pesticide reviewed. "You are requested to initiate suitable action and the progress thereon may please be intimated to the Secretariat of CIB&RC from time to time", says the letter at its end. Based

67. http://www.downtoearth.org.in/node/5636 (India's corrupt pesticide registration system]; www.cibrc.nic.in/ppcancase.doc *(Gazette of India notification on cancellation of registration certification)*

68. http://www.searo.who.int/entity/occupational_health/health_implications_from_monocrotophos.pdf

69. Letter sent by S Kulshrestha, Secretary CIB&RC, dated 01/02/2007, to "Industry Association" subject titled "Review of various pesticides which are banned in other countries but are being used in India – regarding" (F.No.14-4-2006-CIR.I)

on this, the CIBRC wrote to the pesticide companies, asking for studies to be done on endocrine effects, as per protocol approved by the regulators. The irony of this review process is that evidence of safety was asked to be produced by the industry itself, which has a conflict of interest. Further, as is illustrated in the case of Monocrotophos, even after noting that better alternatives are available, the continuance of a given pesticide is perplexing.

The inherent problem with an approach like this is apparent from the following passage, from the Minutes of the 342nd meeting of the RC on 27/9/2013, held in ASRB campus[70]:

"3.5. Follow up action of Dr C D Mayee Committee recommendations on pesticides reviewed for its continued use or otherwise in the country: (i) The Committee expressed its displeasure on the delay in taking necessary follow up action including show cause notice to the pesticide companies who have not complied with their commitment to provide scientific data to substantiate their views on the concerns raised in the recommendations made by Dr. C. D. Mayee Committee. The Committee decided that scientific data may be sought from these companies within one year failing which appropriate action shall be taken to withdraw the product (s)".

(f) Indiscriminate and Illegal Recommendations: It has been found through analysis done by organizations like Centre for Science & Environment (New Delhi) and Centre for Sustainable Agriculture (Hyderabad) that while farmers and agriculture workers are often blamed for their indiscriminate and injudicious use of pesticides (contrary to recommendations made by agriculture scientists, or using unsafe practices), the fault lies equally with the pesticides industry and the agriculture research establishment that they recommend pesticides indiscriminately as well as illegally. Even though pesticides registration in India is for a specific pest, on a specific crop, it has been found that industry and public sector research bodies (and consequently, extension departments) recommend pesticides beyond the registered uses. This is a matter of great alarm since it is not clear if such recommendations are based on scientific norms, including safety considerations. More fundamentally, the regulatory apparatus which approves pesticides without taking into consideration the ground realities when it comes to dangerous products and their use, is to be blamed for not sticking to, and fulfilling the stated regulatory objective.

India's consumption of Pesticides (Technical Grade material in '000 tons)

2002-03: 48.30
2003-04: 41.00
2004-05: 40.67
2005-06: 39.77
2006-07: 41.51
2007-08: 43.63
2008-09: 43.86
2009-10: 41.82
2010-11: 55.54
2011-12: 52.98
2012-13: 56.09

Agricultural Statistics at a Glance, Govt of India, 2013

(g) Safe use of pesticides a myth: When pesticides are registered in India, the safety assessment does not take into consideration the end-use conditions in the country. Given the poverty conditions of the users in the country (including lack of awareness about the ill effects of pesticides and lack of education that would allow users to read and understand the appropriate way of using a given chemical), the tropical use conditions prevent many safe use precautions that are recommended, the aggressive marketing of deadly pesticides without any regulation of the same, lack of surveillance to monitor post-approval use and any negative fallouts and so on, there can only be one sensible way forward: to recognize and appreciate the fact that safe use of pesticides is not possible in conditions like ours. Repeated mishaps over the years are stark evidence that bear this fact out. In such a situation, prohibiting/phasing out these chemicals is the only way forward.

(h) India continues with 67 pesticides that have been banned/restricted elsewhere: While around 37 pesticides that had been banned/restricted elsewhere continued to exist for use in India in early 2000s, by 2011, the number increased to 67[71]. It is apparent that other countries are moving faster than India to prohibit and restrict these deadly pesticides,

70. http://www.cibrc.nic.in/342RC2013.pdf

71. http://www.downtoearth.org.in/content/pesticide-trap

and replace them with safer alternatives. What is noteworthy is that the last Committee which looked into the matter of such pesticides (CD Mayee Expert Group, to whom 37 pesticides were referred for review) had put only five pesticides (Dezomet, Diazinon, Fenitrothion, Fenthion, Monocrotophos, with the last being already under 'restricted') under restricted use, and two pesticides (Chlorfenapyr and Sulfosulfuron) 'under review'. The basis for this is unfounded given the existence of scientific evidence of adverse impacts and/or adverse use conditions in India and/or alternatives existing.

(i) End-Use regulation absent – "Restricted Use" has no regulatory meaning: In the Indian regulatory parlance, there is a curious phrase called "restricted use". As of 31st December 2012, 14 such pesticides are listed on the regulators' website. In this list, Monocrotophos is not to be used in vegetables, Dazomet is not permitted to be used on Tea, Captafol cannot be used as a foliar spray but can be used as a seed dresser, certain formulations of methyl parathion are banned for use on fruits and vegetables and so on. However, this category of restricted pesticides has been created without any enforcement mechanisms on the ground. There is simply no institutional mechanism by which this end use of pesticides can be regulated or even overseen.

Moreover in India, while some state governments have used the licensing authority that they hold under the Insecticides Act to stop sale of certain pesticides during certain months or in certain areas, once a chemical leaves the retailer's shop, there is absolutely no control over how it will be used. Pesticides like Monocrotophos and Methyl Parathion, unfortunately, fall under that category, despite the regulators claiming that it is 'restricted'.

(j) Experience from elsewhere on banning pesticides not picked up: The Indonesian example from the mid-1980s, of banning numerous pesticides presents ample evidence to show that profitability as well as production can improve without the use of pesticides. In the case of Indonesia, the ban also translated into savings on public financing of chemicals[72]. Sweden, which had an ambitious goal of 50% reduction in pesticide use in 5 years' time, starting 1985, did prove that it is indeed possible to achieve such a goal without any reduction in production or yields. On the health front, there have been studies, which captured the significant positive effects of bans on certain pesticides/insecticides[73]. On the environmental front too, it has been found that water contamination had come down significantly in a Canadian province that opted for banning particular pesticides.

(k) Alternatives to pesticides exist and are highly successful: While the regulatory system functions as though alternatives to pesticides do not exist, the ground level reality in locations where governments have sought to scale up agro-ecological approaches to pest management is highly encouraging. A classic illustration of the institutional approaches that will allow for such alternatives to pesticides to be promoted with farmers and scaled up is with the NPM (Non-Pesticide Management of crops) programme in Andhra Pradesh, called the Community Managed Sustainable Agriculture (CMSA) programme supported by the Department of Rural Development, where three million farmers are adopting a variety of practices and natural products for pest management without the use of synthetic pesticides[74].

There is indeed a possibility for India to recast its regulatory frameworks at least now, by addressing all the above issues squarely in the Pesticides Management Bill pending in the Parliament.

72. Dinham, Barbara (1996): Getting off the pesticide treadmill. Our Planet 8.4, quoted in "Indonesia and FAO: Achievements and Success Stories, June 2011. FAO, Rome
73. Systematic Review of Pesticide Health Effects (2012), Ontario College of Family Physicians. http://ocfp.on.ca/docs/pesticides-paper/2012-systematic-review-of-pesticide.pdf
74. http://65.19.149.141/cmsa/ui/cmsamodules/HomePage.html

Chapter 4

SAFE FOOD FOR OUR CHILDREN AN URGENT IMPERATIVE

India has the largest number of malnourished children in the world and performs dismally on child nutrition indicators. In January 2012, the then Prime Minister described the status of malnutrition amongst children in India as a 'national shame'[75]. According to the National Family Health Survey (NFHS III (2005-06)), every second child in India is malnourished[76]. Nutrition is linked to development and productivity; malnutrition, on the other hand, is both the cause and effect of poverty and ill health, following a cyclical and inter-generational pattern. It is linked with female illiteracy, sanitation, and lack of safe drinking water, ignorance and ill health. Currently around 200 million children are suffering from malnutrition[77].

A supplementary nutrition scheme — the Integrated Child Development Scheme (ICDS) — is a centrally sponsored national flagship scheme of the Government of India (specifically the Ministry of Women and Child Development), that aims at addressing health, nutrition and development needs of young children (0-6 years), pregnant women and nursing mothers. It has been in operation since 1975 and provides nutrition to infants and pregnant and lactating mothers through its anganwadi centres. According to NFHS-III, only 21% pregnant women and 17% lactating mothers received supplementary food through the scheme. The scheme is also faraught with delay in provision of supplies and food rations and weak monitoring and supervision.

Malnutrition affects the Universalization of Elementary Education (UEE) adversely. Without proper nutrition, the child finds it difficult to concentrate and participate in school activities, and eventually drops out. In a bid to boost the UEE by increasing enrollment, attendance coupled with reduction of absenteeism and simultaneously to improve the nutritional status of children in primary classes, National Programme of Nutritional support to Primary Education (NP NSPE), popularly known as the Mid Day Meal Scheme was launched on 15th August 1995.

Under the expanded scheme, the Centre and States share the expenses in the ratio of 3:1 while the Centre provides the foodgrains through the Food Corporation of India (FCI). The scheme assigns per-child nutritional requirements both for the primary and upper primary students. For instance, according to the scheme, the food should contain foodgrains (100 gms (primary) & 150 gms (upper primary)); pulses (20 gms (primary) & 30 gms (upper primary)); vegetables (50 gms & 75 gms for primary and upper primary respectively), cooking oil (5 gms & 7.5 gms for primary and upper primary respectively) and condiments (salt and spices). Some states provide eggs on a regular basis. For instance, Tamil Nadu provides an egg for each child daily. There are several reports that indicate that the nutritious items are not being supplied in adequate quantities regularly in the scheme in several states.

As is evident in the earlier sections, children face a higher risk from pesticides because they may be more susceptible than adults or more greatly exposed than adults. Children's behavior, playing and ignorance of risks result in greater potential for exposure. Malnutrition and dehydration increase their sensitivity to pesticides[78].

75. http://www.cry.org/resources/pdf/Status-Report-on-Child-Rights-2013.pdf
76. CRY-Status-Report-on-Child-Rights-2013
77. http://www.who.int/mediacentre/news/notes/2004/np19/en/
78. UNEP (2004). Childhood pesticide poisoning: Information for advocacy and action. Prepared for FAO, UNEP and WHO by Dr Lynn Goldman, Professor, Environmental Health Sciences, John Hopkins School of Hygiene and Public Health, USA with contributions from Mr Bill Murray, FAO and Dr Jenny Pronczuk, WHO. http://www.who.int/ceh/publications/pestipoison/en/

4.1. GOVERNMENT RESPONSE TO THE BIHAR FOOD POISONING INCIDENT

After the Gandaman food poisoning incident on July 16th – 17th 2013, which is now confirmed to be due to monocrotophos poisoning of the food supplied in the MDM, the Government of India's Ministry of Human Resource Development re-issued guidelines to ensure quality, safety and hygiene under the MDM scheme[79]. Here, guidelines about tasting of food before it is distributed to the children, procurement of storage bins and proper labeling for safe storage to avoid contamination, expeditious construction of kitchen-cum-stores, mechanisms for procuring Agmark ingredients, need for having an emergency medical plan etc., are all emphasized. Similarly, new guidelines have been issued in the case of ICDS too, to prevent 'contamination', covering aspects like nail polish of workers and helpers, jewellery etc.

However, the guidelines don't make any mention of pesticide residues; neither is there any mention of supplying safe, organic produce to the children.

Clearly, reviews and evaluations of the guidelines and implementation of the mid day meal scheme and the ICDS scheme have not taken into account the widespread indiscriminate recommendations as well as use of deadly pesticides (this includes handling of pesticide containers) nor have these evaluations considered food safety in terms of removal of chemical contaminants from the food, since food safety is of paramount importance when we talk about children's development, in addition to the fact that we are mostly talking about poor, malnourished children here. It is well accepted that malnourishment as a pre-condition exacerbates the negative impacts of toxins.

While this was the reaction of Government in India, which was choosing to ignore an important lesson yet again from this incident, the United Nation's Food and Agriculture Organisation (UN-FAO) put out a Press Release on July 30th 2013, referring to the tragedy of poisoned school children in India. It said that this tragic incident 'is an important reminder to speed up the withdrawal of highly hazardous pesticides from markets in developing countries'.

Meanwhile, research shows that switching children to an organic diet drastically reduces their exposure to organophosphates, a class of pesticides that includes monocrotophos and chloropyriphos. It has been seen in a study that within days of switching to organic fruits & vegetables, many pesticides clear from children's bodies - pesticide metabolites become undetectable in urine[80]. The study was conducted among young urban and suburban children in Seattle, USA, to study exposure to OP pesticides. The findings from this study demonstrated that dietary intake of OP pesticides represents the major source of exposure in young children[81].

In the case of India, while we did not come across any studies that assessed the risks posed by different exposure routes (inhalation of pesticide fumes from agricultural fields where they have been sprayed, consumption as residues in food and water, accidental exposure and ingestion as in the case of the Bihar mid day meal tragedy), it is estimated that most Indian children are exposed to the dangers of pesticides by multiple pathways.

4.2. SAFE FOOD - A BASIC HUMAN RIGHT

Nutrition and Health are pre-requisites for human resource development. Article 47 of the Constitution states that "the State shall regard raising the level of nutrition and standard of living of its people and improvement in public health among its primary duties".

Right to Food is a basic human right and this Right should logically include safe food. It is the duty of the government to provide safe food for our children and make sure that not only are

79. F.No. 1-4/2013-Desk (MDM), dated 22nd July 2013
80. Lu C, Barr DB, Pearson MA, Waller LA. Dietary intake and its contribution to longitudinal organophosphorus pesticide exposure in urban/suburban children.; Department of Environmental and Occupational Health, Rollins School of Public Health, Emory University, Atlanta
81. Environ Health Perspect. 2008 Apr; 116(4): 537-42. doi: 10.1289/ehp.10912.

they well-fed but also fed safe, chemical-free food. Government schemes like ICDS and MDM have the capacity to ensure that children in their most crucial age get chemical free food – however, the required political will is missing.

The Ministry of Human Resources Development website states that some of the best practices by states in MDMS includes a functional kitchen garden (West Bengal), role of mahila samakhyas (Bihar), community participation (Gujarat) and uninterrupted supply of food grain through provision stores (Kerala)[82].

4.3. ORGANIC KITCHEN GARDENS FOR SCHOOLS

Organic kitchen gardens is one such initiative that is sure to ensure that children get their much needed nutritional requirements through vegetables that are grown in the school premises or neighborhood and importantly, free of pesticides. Examples of such organic kitchen gardens exist from both government schemes and civil society initiatives.

A group of youngsters, under the banner of Farm2Food Foundation which is a social enterprise for promoting organic farming in Assam and other North Eastern States, for instance, is systematically expanding its school kitchen gardens programme in the region. It is reported that it is not only able to supply some vegetables to the local school, but is also enabling students' groups to get into marketing of their produce in an enterprise-developmetn spirit[83]. Similarly, organizations like Pravah in Jharkhand and DRCSC in West Bengal are working with the local administration to create chemical-free kitchen gardens in several government schools in their states.

According to the Central Government website of the Mid Day Meal Scheme, in Nadia district of West Bengal, the schools have their own kitchen garden where vegetables are grown in the school premises. An Assistant teacher of the school has voluntarily taken up responsibility of the entire farming process. Students are engaged everyday in the watering the vegetable plots. The school has also dug out a pond where fish farming is undertaken. Students are thus provided with varied fresh vegetables and fish in MDM. Support of the Village Education Committee (VEC) members is obtained in nurturing and maintenance of the vegetables plots and the pond. The school even provides its produced vegetables to other nearby schools. This innovation helped the school management committee to become self-reliant in the supply of vegetables[84].

Three Kudumbashree[85] units in Kannur district in Kerala are providing chemical-free food for the MDMS. The chemical-free produce is supplied to nearest centers at the market rates. According to official data, three Kudumbashree units and one individual woman are providing organic inputs to anganwadi and MDMS in some places in the district.

In Mizoram, certain schools, especially in the rural areas and small towns, have started their own kitchen gardens. The schools serve fresh vegetables grown in the garden in the MDM sometimes as one of the main items, sometimes as supplement to MDM and as salad depending upon the types of vegetables available in various seasons. In states like Mizoram, where adequate supply of green vegetables throughout the year is not available, it is a good practice to have kitchen garden in a school[86].

In Tamil Nadu, especially the Nilgiris and Erode, children produce their own vegetables through their Eco Clubs or National Green Corps. They prepare the land with the help of non-profits like The Earth Trust (in Nilgiris) and Tamil Nadu Organic Farmers Federation (in Erode) and prepare their own organic fertilizer and pesticides. The waste from the school is recycled

82. http://mdm.nic.in/
83. http://farm2food.org/index.php
84. http://www.mdm.nic.in/BestPractices/WB.pdf
85. Launched by the Government of Kerala in 1998 for wiping out absolute poverty from the State through concerted community action under the leadership of Local Self Governments, Kudumbashree is today one of the largest women-empowering projects in the country. The programme has 37 lakh members and covers more than 50% of the households in Kerala.
86. http://www.mdm.nic.in/BestPractices/Mizoram.pdf

into a vermicomposting pit, which is now a regular feature in most of these schools. The school kitchen gardens have ensured that the once scanty sambhar has now a variety of home grown, chemical free vegetables.

It is seen that some Joint Review Missions of MDMS recommended kitchen gardens for schools. The Uttar Pradesh JRM states that kitchen gardens can be developed including plantation of fruit-bearing trees like banana, guava, mango and papaya[87]. The members of the Tripura and the Gujarat Joint Review Mission have laid down clear recommendations on how the kitchen garden can be made a success. It suggests making nutrition education and kitchen gardens an innovative and creative school based activity for the children and teachers to participate in. Seasonal greens and drumstick can be grown to supplement the MDM[88]. It also suggests convergence with the MGNREGS for maintenance of school kitchen gardens across the state[89].

The Odisha JRM team stated that "keeping in view the congenial weather, some trees such as banana, papaya and moringa may grown for supply of fresh/leafy vegetables to make meals nutritionally rich. Similarly, pokhars may be used to rear fish that may be used in addition to or replace eggs in the menu once a week[90]".

The Tamil Nadu JRM team recommends, "Practice of raising the kitchen garden should be encouraged wherever there are facilities for water and space[91]". Children were also found to be getting vegetables like drumstick from their homes for the MDM and experiences with school kitchen gardens exist.

In 2008, in Karnataka, 19375 schools were selected (out of 55150 schools) and were given Rs 3500 each for the creation of kitchen gardens. These schools were selected on the basis of land availability and presence of proper water source.

4.4. ORGANIC PRODUCE PROCURED FROM THE COMMUNITY/VILLAGE

Apart from kitchen gardens, the other source of chemical-free food could be the local villages/local farmers themselves.

Villages that have gone organic or have given up pesticides could keep a plot aside to provide pesticide-free food to their children. For instance, Budahada village, a 130-strong Kondh village in the Bissam Cuttack block of Rayagada district in Odisha. Most of the farmers in the village have a diverse mixed cropping pattern. They grow a whole range of millets, vegetables, pulses, paddy and oilseeds. The village has a school with 50 children, coming in from two other villages. The villagers supply vegetables sometimes to the school at half the price that they would sell it at the block haat. However, this can only be made into a trend if the farmers are paid regularly, that too the market rate.

There are many organizations in India which have pioneered the concept of Balwadis (like the Deccan Development Society in Medak district of Andhra Pradesh) where women's self help groups have even leased in land for collective organic farming, for supplying poison-free, nutritious millets-based food to little children of the village[92].

State Support for Large Scale Transition to Chemical-Free Farming

For chemical-free food to school children to become a reality, the agriculture and rural development departments in each state should promote sustainable, chemical-free agriculture with their farmers. This model will not only help in providing chemical free food to children but also to the entire village. Promoting chemical free agriculture on the lines of the

87. http://www.mdm.nic.in/Files/Review/Fifth_Review/UP/Final_Report_JRM_UP.pdf
88. http://www.mdm.nic.in/Files/Review/Fifth_Review/Gujarat/Gujart_5th_RM_Report.pdf
89. http://www.mdm.nic.in/Files/Review/Fifth_Review/Tripura/Review_Mission_Report_Tripura.pdf
90. http://www.mdm.nic.in/Files/Review/Fifth_Review/Odisha/JRM_Report_Odisha_MDM.pdf
91. http://www.mdm.nic.in/Files/Review/Fifth_Review/TN/JRM_TN_MDM_Report.pdf
92. Lakshmi Krishnamurty (2003). The Balwadis of Deccan Development Society – a reflective study. http://ddsindia.com/www/PDF/Balwadievaluation.pdf

Community Managed Sustainable Agriculture (CMSA) programme, based on NPM (Non Pesticidal Management of crops) in Andhra Pradesh will not only reduce the dependency of farmers on chemical inputs like fertilizer and pesticides but also rejuvenate the soil that is losing its productivity due to the chemicals being pumped into it.

Farmers' collectives, accredited for chemical-free cultivation, should be identified and linkages should be established for supply of chemical-free produce on a regular basis, as another instrument to work in favor of the bringing nutritious food to children. In Odisha, for instance, a farmers' Cooperative associated with Chetna Organic Farmers' Association (COFA) which also has a dal processing unit set up, has supplied organic dal to the local schools, which created a win-win situation for both the producers (their farm gate price was still higher than usual price at the market) and the schools. It is reported that in Brazil, for instance, funds supplied by the government to women's groups are then used to tie up, and procure from organic farmers' collectives. For this obviously, the payments to the farmers will have to be regular, as well as in sync with the market rates.

Enabavi village, the first completely organic village in the country, could be used as a model, for instance. The village grows paddy, maize, cotton and vegetables and it is all organic. Villages such as these could be used as the source for chemical free food.

Women's Self Help Groups are the cornerstone for MDMS - they are involved in the scheme as cooks and helpers and also often as the supplier of the vegetables and other materials. In case of Andhra Pradesh, where at least a handful of NPM farmers are in practically all the villages, vegetables for the MDMS could get sourced through these fields. Encouraging collective land leasing, with a ready contractual market for the organic produce of these SHGs in the form of the MDMS could be explored.

In Malkangiri district of Odisha, in all the social welfare hostels, millets-based snacks have been introduced (millets, especially 'coarse millets' are usually grown in organic conditions and are chemical-free as well as nutritious) and supply of this food is through identified local self help groups, who in turn procure from local farmers and supply the millets to the hostels in a ready to cook form. This innovative approach has been intitiated in November 2013 by the District Collector, with the ITDA roped in along with a local organization (RRA Network).

Decentralised Procurement of Local Organic Produce Holds the Key

For ensuring safe food for all school meals schemes/ICDS food schemes, decentralized procurement of local organic produce is critical. Such decentralized procurement, especially of organic produce from accredited groups in a segregated and traceable fashion, will allow for scaling up of all the small initiatives found here and there right now – these small initiatives especially by NGOs point to the immense potential that exists in creating a win-win situation for the community of cultivators (the organic producer collective, or the SHG which might take up collective organic cultivation in a chosen plot of land etc.) and the children of the community getting supported through food schemes in any case. If the outlays for these schemes can go to the local farmers for procuring locally, multiple objectives will be met simultaneously.

All the above possibilities require better coordination and convergence on the ground – between NREGS, rural livelihood missions, MDMS etc. Organic production of food for supply to the local school by the SHGs can be supported through NREGS, for instance, in all the agricultural operations involved in the production.

Chapter 5
RECOMMENDATIONS TO THE GOVERNMENT

The safety and health of our future generation should be of paramount importance for the government and the nation. Our notions of food and nutrition security have to necessarily encompass food safety too. Food that is supplied to the most marginalized in the society through the government should be safe as well – free of all and any chemical contamination, pesticides, antibiotics, aflatoxins etc.

The Bihar Mid Day Meal tragedy should be used for learning the right lessons when we move on. This includes a clear recognition that pesticides are a major culprit in this incident and in other similar incidents compiled into this report. It is also clear that when the post-modern science of pest management has moved on to NPM and agro-ecological methods of pest control, the unsustainable and unsafe science behind chemical pesticides has to be discarded. There needs to be an express recognition that pesticides are not inevitable in our farming, as large scale positive experiences from states like Andhra Pradesh show. It is time that we tackled the lack of safety for our children in their environment and in their food in fundamental ways. To ensure this, the following recommendations have to be adopted by the Government of India and state governments.

1. **Regulatory approaches to synthetic pesticides have to change drastically:** There has to be an acknowledgement that the Bihar mid day meal tragedy can be prevented from recurring, including by way of acknowledging the contribution of pesticides to the tragedy. And like we point out in various sections of this report, poisoning incidents are nothing new in this country and it is unconscionable that no serious action is being taken on the same. There are several regulatory issues with regard to pesticides that have to be tackled head on. The government should begin the phase out of pesticides that fall in the Highly Hazardous category (see the FAO press release in the box below). The spread of NPM shows that there are perfectly effective alternatives available to all the chemical pesticides in the market. There is no reason why the regulatory system should register a pesticide in the first instance when alternative pest management practices and products are available. The Pesticides Management Bill pending in the Parliament should be re-introduced after drastic changes in our regulatory approach to pesticides[93].

2. **Increase investments on chemical-free farming:** There is much evidence to show that sustainable, safer, affordable agro-ecological approaches are available in lieu of chemical farming. In fact, evidence from NARS (National Agricultural Research System) shows that such alternatives are indeed more viable. Meanwhile, there is also evidence from large scale programmes like CMSA in Andhra Pradesh that this shift to chemical-free farming is not expensive to bring about (in terms of public financing) and is indeed possible with some innovative institutional approaches. A road map for such scaling up has been provided to the government time and again, and it is hoped that this government, with its election manifesto promises echoing this shift in direction, would make the necessary investments to promote and incentivise ecological agriculture.

3. **Provide chemical-free safe food to children (to begin with) in all government schemes:** There is a strong case for ensuring that our children are not fed with, and even exposed to toxic food and environment. As has been shown in this report, children are particularly vulnerable to pesticides, and it is the duty of the government to ensure that they are protected from the various hazards that pesticides pose (acute as well as chronic poisoning due to pesticides in our food and farming systems). There has to be large scale shift to provision of safe food in school-based mid day meal scheme and ICDS, which rests on local organic production and procurement of the food materials needed for these schemes. Investments have to be made on school kitchen gardens as well as organic production by farmer collectives and self help groups and procurement of the same. Such investments will create a win-win situation for all stakeholders, including the government.

93. http://www.kisanswaraj.in/2013/12/13/pesticides-management-bill-2008-issues/

Highly hazardous pesticides should be phased out in developing countries
Tragedy of poisoned school children in India provides another reminder

30 July 2013, Rome: The tragic incident in Bihar, India, where 23 school children died after eating a school meal contaminated with monocrotophos, is an important reminder to speed up the withdrawal of highly hazardous pesticides from markets in developing countries, the UN Food and Agriculture Organization (FAO) said today. Monocrotophos is an organophosphorus pesticide that is considered highly hazardous by FAO and the World Health Organization. Experience in many developing countries shows that the distribution and use of such highly toxic products very often poses a serious risk to human health and the environment.

The incident in Bihar underscores that secure storage of pesticide products and safe disposal of empty pesticide containers are risk reduction measures which are just as crucial as more prominent field-oriented steps like wearing proper protective masks and clothing.

The entire distribution and disposal cycle for highly hazardous pesticides carries significant risks. Safeguards are difficult to ensure in many countries. Among international organizations, including FAO, the World Health Organization and the World Bank, there is consensus that highly hazardous products should not be available to small-scale farmers who lack knowledge and the proper sprayers, protective gear and storage facilities to manage such products appropriately.

FAO therefore recommends that governments in developing countries should speed up the withdrawal of highly hazardous pesticides from their markets *(our emphasis).*

Non-chemical and less toxic alternatives are available, and in many cases Integrated Pest Management can provide adequate pest management that is more sustainable and reduces the use of pesticides. The International Code of Conduct on Pesticide Management, adopted by FAO member countries, establishes voluntary standards of conduct for all public and private entities involved in pesticide management. This Code has been broadly accepted as the main reference for responsible pesticide management. The Code states that prohibiting the importation, distribution, sale and purchase of highly hazardous pesticides may be considered if, based on risk assessment, risk mitigation measures or good marketing practices, are insufficient to ensure that the product can be handled without unacceptable risk to humans and the environment.

(FAO Media Release)