Endosulfan: Centre in Denial

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It has been more than a dozen years since health professionals in north Kerala started noticing unusual health disorders in the tracts where there had been aerial spraying of the pesticide endosulfan on cashew plantations. Surveys, studies and countless media reports have brought out the burden of endosulfan. The Government of Kerala has even banned the sale of the pesticide. But the use of endosulfan continues elsewhere in the country, and India which has become a major exporter of this pesticide, remains adamant in its opposition to a global ban.

A tribute to my father, who inspired me to think against pesticides. Thanks to my friends Jayakumar, Vinod and Megha.

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For reasons that only the Government of India knows, it continues to oppose a ban on endosulfan, the pesticide that is known to have caused immense suffering in north Kerala.

At the sixth meeting of the Persistent Organic Pollutants (POP) Review Committee to the Stockholm Convention held in Geneva in October, India rejected the proposal to ban endosulfan globally. This should be a cause for concern, especially with new cases of health disorders, allegedly due to endosulfan exposure, having been reported not just from Kasargod, but also from other areas like Idukki and Palakkad in Kerala and Dakshina Kannada in Karnataka.

The Stockholm Convention deals with chemicals which have a long-lasting impact on the human body and soils. It already covers 12 chemicals, which can remain intact for long periods, bioaccumulate through food and cause damage to health and environment. Such pesticides are to be eliminated or are to be subject to restricted use. The Review Committee of POP evaluated the possible risk of endosulfan and at its Geneva meeting recommended that the Conference of Parties consider listing endosulfan in their new list of pesticides to be phased out. It is already banned in more than 70 countries. Since India is one of the largest manufacturers and exporters of endosulfan, it has naturally opposed the proposal. More recently, it has opposed the proposal on procedural grounds.[1]

A nationwide ban in the country also seems essential for statewide bans do not seem to help. In Kerala, the sale and use of endosulfan has been banned since 2004, and yet, the Pollution Control Board (PCB) of Kerala during its monitoring (2008-10) revealed endosulfan residues in the water resources, including in the Shiriya river in Kasargod district. On the basis of this investigation, in November 2010 the PCB banned endosulfan throughout the state. Earlier, a victim, Leela Kumari Amma approached a lower court (Munsif Court, Hosdurg) in 2001 and the court temporarily stayed aerial spraying of endosulfan in cashew plantations. In 2003, the Kerala High Court upheld the order of the lower court and it ordered a permanent end to endosulfan spraying. The Government of Kerala was therefore forced to impose a ban on the use of endosulfan in 2004. This was welcome relief for the people of Kasargod. Consequently, the Government of India banned the sale and use of endosulfan in Kerala from 2005 onwards.[2] But fresh reports of endosulfan victims in the state point to the ineffective implementation of the ban.

NHRC Recommendations

With the Government of India hesitant about banning endosulfan, human rights organisations have been compelled to take up the issue. The National Human Rights Commission's (NHRC) core group on health, in its meeting on 24 December 2010, reiterated that, "the present stand of the Government of India has led and will continue to lead to grave violations of human rights. Since endosulfan is a persistent organic pollutant, the dangers it poses will linger and multiply through the generations, causing harm on a scale that cannot presently be fully quantified".

The NHRC's concern dates back to 2001. That year, after seeing reports on unusual health symptoms in Kasargod district that were seen as the effect of suspected long-term exposure to endosulfan (David 2001; Joshi 2001; and *The Hindu* (2001)), the commission had intervened in the matter and filed a writ petition as a public interest litigation in the Kerala High Court against the use of endosulfan. Subsequently, the National Institute for Occupational Health (NIOH) Ahmedabad, carried out a comprehensive study on endosulfan use.

More recently, new cases of suspected additional victims of endosulfan have been reported from Muthalamada panchayat of Palakkad district. A district health survey in Muthalamada and Kollengode panchayats in Palakkad district showed more cases of hydrocephalus (Misra 2010). There have been reports of new victims of suspected endosulfan use from Idduki too.

This suggests that despite the ban endosulfan continues to be available. In some districts of Kerala, endosulfan is being transported to Idukki from Tamil Nadu, where it is not as of now banned.

In Karnataka, Kokkada, Patrame and Nidle villages in Belthangady taluk of Dakshina Kannada are reportedly the worst hit. Here endosulfan was in use till 2001 in the plantations owned by the Karnataka Cashew Development Corporation spread over 850 ha in Belthangady. A recent survey done by the government reportedly identified 231 people from Belthangady and neighbouring Puttur taluk as possible endosulfan victims (Misra 2011).

Based on such fresh reports on endosulfan, NHRC conducted an investigation again in November 2010 in Kasargod, which confirmed the continued high incidence of the medical disorders recorded by the NIOH in 2002. And it also found that the relief measures taken by the state government were meagre and not reaching the intended beneficiaries. Based on its findings, the NHRC recommended that the union government take administrative and legislative action to ban endosulfan. It has demanded a nationwide survey of populations which have been affected by the use of endosulfan, particularly sprayed from the air, to determine the scope of relief and rehabilitation that may be needed.

Tragedy Seeded by Cashew

Around 1963-64, the Kerala government brought cashew to Padre village in Kasargod district and planted cashew trees all over the wasteland in the area. In 1978, the Plantation Corporation of Kerala (PCK) took over the control of these cashew plantations, covering around 4,600 hectares, spread over Periye, Muliyarand Adhur in the Kasargod estate, Painikara, Kanady and Punathur in the Rajapuram estate and Cheemani estate.

To prevent tea mosquitoes, which affect trees during flushing, flowering and fruit set, PCK started aerially spraying endosulfan thrice a year for almost two decades. With this continuous rain of poison, everything changed in Padre. Initially, the villagers noticed dead fish and that frogs, honeybees and butterflies all disappeared. Then their domestic animals died, calves were born with deformities and stunted growth. Children were born with deformities and miscarriages became more common.

Y S Mohana Kumar, who was a doctor practising in the area since 1982, noticed a sudden increase in the number of patients having neurological developmental and reproductive diseases in the village. He informed the authorities and sent a letter to the *Kerala Medical Journal* in December 1996 for the special attention of researchers. People in the village started to suspect aerial spraying of endosulfan as this was the only discernible change they had experienced. They discussed the matter with the village authorities and requested an end to the spraying of endosulfan. A coalition of public interest groups conducted initial investigations and confirmed that a large number of diseases were occurring in the villages, especially in the vicinity of cashew plantations, where endosulfan was being aerially sprayed.

Thanal, a non-governmental organisation, conducted a house-to-house health survey in Periya cashew plantation area from October to December 1999 and observed numerous cases of infertility among men, miscarriages and menstrual disorders among women as well as swellings and discolouration of the skin of the limbs apart from frequent attacks of fever. The Kerala Sastra Sahitya Parishad (KSSP) had undertaken an extensive survey of houses within 500 metres of the plantation and also covered 4,000 houses away from the plantation and found health disorders in 750 houses. Despite people's protests, PCK continued aerial spraying. On 26 December 2000 people tried to stop a helicopter from spraying but with the help of the police, PCK carried out its operation. On that day people formed the Endosulfan Spray Protest Action Committee at Perla.

In February 2001, in an interview with *Down to Earth,* Mohana Kumar revealed the strange health disorders appearing in Padre over the previous 10 years:

> Disorders of the central nervous system are very common among the children of the area – cerebral palsy, retardation of mental and/or physical growth, epilepsy and congenital anomalies like stag horn limbs. There are too many cases of cancer of the liver and blood; infertility and undescended testis among men; miscarriages and hormonal irregularities among women; skin disorders; and asthma, to name a few. Psychiatric problems and suicidal tendencies have also been rising. Surprisingly, almost all the ailments are restricted to people under 25 years of age (Joshi 2001).

An Eye-Opening Study

The Centre for Science and Environment (CSE), New Delhi released the results of its laboratory analysis of the samples collected from Padre, including water, soil, human milk, bovine milk, vegetables, fish, etc. This analysis of 2001 disclosed an alarming presence of endosulfan residues in the selected samples and proved its link to the health hazards in Kasargod. In its chapter on "Impacts of Endosulfan on Health – Scientific Evidence" it warned,

> Short-term toxicity is high, and influenced by the solvents and emulsifiers used to dissolve it. Endosulfan is easily absorbed by the stomach, by the lungs and through the skin, meaning that all routes of exposure can pose a hazard. Exposure to endosulfan may result from, for example, breathing air near where it has been sprayed; drinking water contaminated with it; eating contaminated food; touching contaminated soil; smoking cigarettes made from tobacco with endosulfan residues; or working in an industry where endosulfan is used. Proper protective clothing (safety goggles, gloves, long sleeves, long pants, respirator) is needed to prevent poisoning when handling endosulfan (*Down to Earth* 2001).[3]

Many studies have since been conducted on health and toxicology in Padre and nearby panchayats. Most of the studies found unusual health problems in those villages where cashew plantations had conducted aerial spraying of endosulfan. One of the most important studies was conducted by the NIOH. The main objectives of the study were (1) to confirm the reported disease patterns in the exposed populations; (2) to search for etiological factors if the exposed populations show abnormal disease patterns; (3) to confirm the presence of endosulfan residues in the environmental and biological samples and estimate their levels. The final report of NIOH, "The Investigation of Unusual Illnesses Allegedly Produced by Endosulfan Exposure in Padre Village of Kasargod District (N Kerala)" which was completed in 2002, exposed a significant number of neurobehavioural disorders, congenital malformations in women and abnormalities related to the male reproductive system in the study village, Padre. The study concluded that the etiological factors responsible for these health problems were due to continuous exposures to endosulfan through food, soil and air.

However, the central government was not satisfied with NIOH study. Therefore, an expert committee was appointed by the Registration Committee of Central Insecticides Board in April 2002. It rubbished the NIOH study and observed, "the findings of the NIOH study are not in conformity with the known and accepted properties, chemistry and toxicology of endosulfan" (cited in Yadav 2004). And in April 2003 it said that "there is no link established between use of endosulfan in PCK plantations and health problems reported in Padre village" (GOI 2003). Meanwhile, a part of the NIOH study that had been published in *Environmental Health Perspectives* (Saiyed et al 2003) was criticised for its alleged omissions and flawed data by CropLife India Mumbai and Endosulfan Manufacturers and Formulations Welfare Association, Mumbai (EPH 2004).

In 2002, a Government of Kerala committee with experts from the public health department and PCB carried out an in-depth study in Vaninagar and submitted their report "Health Hazards of Aerial Spraying of Endosulfan in Kasargod District" in August 2003. It showed a high level of endosulfan residue in the examined blood samples of school children. This is an area surrounded by plantation hills. From the hills, rain water gets drained to the water sources in Vaninagar, where people depended entirely on these water sources. The study reached the conclusion that the clustering of cases in Vaninagar could be the result of long-term exposure to the pesticide in soil, water and vegetations.

But the PCK denied any role of endosulfan in these health hazards. The PCK on its part had commissioned an investigation which was carried out by the Frederick Institute of Plant Protection and Toxicology (FIPPAT is now known as International Institute of Biotechnology and Toxicology (IIBAT)), Tamil Nadu. It was conducted one month after the CSE study. But, blood samples of FIPPAT did not show any residue of endosulfan. Later, an article published in *Down to Earth* revealed how its observations were fraudulent:

> … The report, submitted to the PCK, shows that FIPPAT had actually detected endosulfan residues in human blood samples. It, however, chose not to disclose the finding.… The institute underreported the levels of residues found in the environment, too (Yadav 2004).

In February 2001, the Kerala Agriculture University had conducted a study and submitted a report in favour of PCK and had recommended only need-based spraying. At the same time, the Kerala State Council for Science, Technology and Environment submitted its report saying

> ….prima facie, aerial spraying of endosulfan seems to be the cause factor of unusual diseases among the people of the area….. Considering the potential danger and probable impact of aerial spraying of endosulfan in the human inhabited area, as in the present case, the committee recommended the government to ban aerial spraying of endosulfan, immediately. The role of endosulfan as the exact cause factor is presently neither denied nor proved beyond doubt in this area. Though spraying cf endosulfan is practised in the area for more than 25 years, no environmental impact study is seen conducted. Therefore, government may order a detailed environmental impact assessment study.[4]

Man-made Calamity

Most of the studies conducted in Kasargod emphasise that PCK had not followed any precautionary measures which had to be taken at the time of aerial spraying of an insecticide. Spraying was done from a height to avoid power lines and tall trees which aided wind drift and the settling of the endosulfan residues in the soil. Water sources were not covered properly at the time of spraying. Local people were ignorant about the consequences.

Who had given permission for aerial spraying of endosulfan in Padre and nearby villages, where geographically aerial spraying was not suitable? Who gave permission to continue aerial spraying thrice a year without considering the implications for health, even after the complaints of local people for 20 years? Who instructed them to use the same pesticide for 20 years? No answers to these questions are forthcoming. Sometimes the PCB is blamed, the Kerala Agriculture University and Central Plantation Crops Research Institute are the culprits. However, at least some authorities were against the use of endosulfan. In March 2001, the director of the National Research Centre for Cashew (NRCC), E V V Bhaskara Rao, wrote to all the regional research stations[5] asking them to stop recommending the use of endosulfan and to suggest other pesticides.

Conclusions

Chemical pesticides have become a part of farming in India since the green revolution. With the growth of agrichemical industries in India, farmers have come to depend upon pesticides like endosulfan, which is cheap and easily available. Endosulfan is used mainly for cotton, cardamom, coffee, soy, mango, etc.

A ban on endosulfan must deal with the fact that Indian manufacturers have built up a large domestic and export turnover. For instance, three producers, Excel Crop Care, Coramandal Fertilisers and Hindustan Insecticides (members of the Crop Care Federation of India) have a combined annual production of Rs 9,000 crore. Seventy per cent of the global market is believed to be held by India and estimates are that the country produces 12 million litres of endosulfan and the country earns Rs 4,500 crore annually (*Business Line,* 25 January 2010).

The Crop Care Federation claims it has a strong manufacturing base along with research and development and scientific capabilities, but so far it has not taken the initiative to conduct a health assessment of the impact of an indiscriminate use of endosulfan. It has, however, criticised the studies carried out by CSE in Padre and even filed defamation cases twice against the organisation, both of which it has lost.[6]

With mounting pressure from different levels of governmental departments as well as from the political groups and industrial lobbies, the Union Agriculture Ministry constituted a new committee in December 2010 to conduct a study on endosulfan in Kasargod. The chairman of this committee, D C Mayi, head of the Agricultural Scientists Recruitment Board, had earlier submitted a report favourable to the endosulfan lobby in his study on Kasargod. This has naturally evoked protests in Kerala. However, more recently the Indian Council for Medical Research has decided to ask the Calicut Medical College to investigate the problems in endosulfan-affected areas. Two committees will be appointed for the purpose: one will evaluate the earlier studies and the second will

evaluate the NIOH study. The ICMR is to prepare a report on the basis of the reports of these committees (*Mathrubhoomi,* 25 January 2011).

Even as attention has been focused on Kerala, in-depth health assessment studies have not been done in Maharashtra, Orissa, Madhya Pradesh and Andhra Pradesh, where endosulfan has been in use for a long time.

Santhosh Menzes (as reported in Misra 2011b) was paralysed when he was a year old; he is now 20 years old. When his mother was pregnant with him, their village, Kokkade in Dakshin Kannada, was being subject to aerial spraying of endosulfan.

Pregnant mothers of endosulfan-affected villages have only one prayer: let their children be born without any stag horn limbs or any disabilities whatsoever. They only want that their children live in an endosulfan-free environment.

NOTES

1 "India, which is opposed to such a ban, has alleged that the committee that is to take a decision on declaring endosulfan a POP has committed irregularities and procedural lapses" (*Business Line* 2011).

2 As mentioned in the website of Endosulfan Victims Relief and Remedial Cell, Kasargod, http://endosulphanvictims.org/initiative.htm

3 As posted on the site of Endosulfan Victims Relief and Rehabilitation Cell website http://endosulphanvictims.org/resources/CSE_report.pdf. Originally published in DTE 2001.

4 STED Committee Report on the Suspected Spreading of Unusal Diseases in Enmakaje Grama Panchayat of Kasargod district), http://kerenvis.nic.in/files/pubs/endosulfan/sted.html

5 "NRCC Withdraws Recommendation of Endosulfan for Cashew", letters from National Research Centre for Cashew received by Aravinda Yedamale, chairman of our Padre Endosulfan Spray Protest Action Committee: available at http://www.poptel.org.uk/panap/kerala/surat.htm

6 (http://www.cseindia.org/content/endosulfan-poisoning-padre-village-industrys-dirty-tactics-0)

REFERENCES

Business Line (2011): "India Says Trade Compulsions Forcing Ban on Endosulfan", *Business Line*, 25 January.

David, Stephan (2001): "Spray of Misery", *India Today*, 23 July.

Down to Earth (2001): "Omnipresent Poison", a special report published in *Down to Earth,* 28 February.

GoI (2003): "Minutes of the 233rd Meeting of the Registration Committee", held on 1 April 2003, Ministry of Agriculture, Krishi Bhavan, New Delhi (http://www.cibrc.nic.in/rc.htm).

Joshi, Sopan (2001): "Children of Endosulfan", *Down to Earth*, 28 February.

Misra, Savvy Saumya (2010): "State of Endosulfan", *Down to Earth,* 31 December.

– (2011): "Another Kasargod", *Down to Earth,* 31 January.

Saiyed, Habibullah, Aruna Dewan, Vijay Bhatnagar, Udyavar Shenoy, Rathika Shenoy, Hirehall Rajmohan, Kumud Patel, Rekha Kashyap, Pradip Kulkarni, Bagalur Rajan and Bhadabhai Lakkad (2003): "Effect of Endosulfan on Male Reproductive Development", *Environmental Health Perspectives*, December; 111(16).

The Hindu (2001): "Cashews for Human Life?", 22 July.

Yadav, Kushal Pal Singh (2003): "International Journal Vindicates Endosulfan Study", *Down to Earth*, 31 December.

– (2004); "Lies, Damn Lies and Endosulfan", *Down to Earth,* 15 April.