Background note endosulfan: Global and Indian evidence about toxicity and dangers to human health
July 2010

1. The recent ban on endosulfan in US

On June 9, 2010, after a detailed assessment, the US Environmental Protection Agency (EPA) announced that endosulfan would be eliminated in the United States. The decision was taken following a risk assessment and benefit evaluation over years with input from the public and the stakeholders. This decision based on EPA's 2010 revised ecological risk assessment, which reflects all exposure and ecological effects information for endosulfan, including independent external peer-reviewed recommendations made by the Endosulfan Scientific Advisory Panel. Talks are on with the pesticides manufacturer, to phase it out (Annex 1).

2. The EPA Study

EPA concluded that endosulfan poses a hazard to both wildlife and humans and also that the organochlorine chemical was linked to cancer, autism, birth defects, and delayed puberty in humans. The data with the agency shows that the risks faced by farm workers, exposed through inhalation and contact with the skin, are greater than previously known. EPA finds that there are risks above the Agency's level of concern to aquatic and terrestrial wildlife, as well as to birds and mammals that consume aquatic prey in which endosulfan has bio-accumulated. The EPA's review and its decision have also been reported by the prestigious magazine, *Science* (Annex 2).

3. Global implications of the recent US decisison

The US is present at the Stockholm Convention as an observer nation, not as a party. But the US decision is likely to have its impact on countries using endosulfan. The pesticide is already banned in more than 60 countries around the world and a global ban on endosulfan is being pursued under the UN treaty, the Stockholm Convention on Persistent Organic Pollutants.

The review committee of the Stockholm Convention on Persistent Organic Pollutants (POP) has agreed that endosulfan should be considered for addition to the list of chemicals banned globally under the treaty with a final decision by government representatives in 2011.

Endosulfan is also currently under consideration as an addition to another international treaty, the Rotterdam Convention, which requires government-to-government notification when dangerous pesticides and other chemicals cross international borders.

4. Endosulfan issues in India

The residents of Padre village in Kasaragod district, Kerala had been, for over two-decades, exposed to aerially-sprayed endosulfan and this led to horrendous

ailments. There is a high incidence of disorders of the central nervous system — cerebral palsy, retardation of mental and/or physical growth, epilepsy among children — congenital anomalies, cancer and reproductive disorders. This was first reported in 2001. The Centre for Science and Environment conducted a laboratory analysis and detected endosulfan widely present in the human bodies and environment of the village. This fact was reconfirmed by various studies subsequently.

A study done by the Ahmedabad-based National Institute of Occupational Health (NIOH) in 2003 also found presence of endosulfan residues in human blood samples that it collected from the affected area in September-October 2001. NIOH, which also conducted studies on villages, not exposed to aerial sprays, concluded that "endosulfan was a causative factor" for the health problems. The study was published in the December 2003 issue of *Environmental Health Perspectives (EHP)*, a peer reviewed scientific journal. A high power committee set up by Kerala government submitted its report in September 2004. The committee concluded that endosulfan is the cause of the health problems in Kasaragod. In December 2004, the state pollution control board banned the use of endosulfan in Kerala. In 2005 the Union agriculture ministry reaffirmed this decision through a gazette notification banning any use of endosulfan in the entire state of Kerala.

The NIOH study included the report from the Regional Remote Sensing Service Centre (RRSSC), Bangalore that confirmed, through satellite mapping, that topology of the area is such that any chemical sprayed in the cashew plantations surrounding Padre will contaminate the entire area. "The watershed characteristics are favourable for any aerially sprayed toxicant to reach the soil-water-plant continuum in a very short span, and get accumulated… The crops cultivated on these soils may act as stores through which the toxicant gets entry into the target organisms (including humans)". The importance of Padre in establishing the toxicity of endosulfan has been noted by scientists across the world. "This is the first study to measure the effects of endosulfan on the male reproductive system. Decades of spraying this, and only this, pesticide provided a unique opportunity to analyse impact" *said science editor of Environmental Health Perspectives from US*.

As the world gradually discovers the ills of indiscriminate use of endosulfan, it is time India reviews its policy of not supporting the global ban. There is ample research, which points to the toxicity of endosulfan. It is important that India must also be proactive in banning this pesticide, which has serious human health implications.