# Background of the thesis

THE HINDU
Monday, Jan 31, 2011

Business Line
Tuesday, Feb 09, 2010

THE HINDU
Monday, Oct 22, 2007

CHINADAILY
July 11, 2011

Natural News
Natural Health, Natural Living, Natural News
February 24, 2011, Mexico

## BACKGROUND OF THE THESIS

Our biosphere is under constant threat from continuing environmental pollution. Impact on its atmosphere, hydrosphere and lithosphere by anthropogenic activities by the humankind can not be ignored. Man made activities on water by domestic, industrial, agriculture, shipping, radio-active and aquaculture wastes have negative influence over biotic and abiotic components on different natural ecosystems. Some of the recent environmental issues include green house effect, loss in bio-diversity, rising of sea level, abnormal climatic change etc. Recently different approaches have been discussed to overcome man made environmental hazards.

Indian textile industry is one of the leading textile industries in the world. Textile industry in India is the second largest employment generator after agriculture, involves around 35 million workers directly and its accounts for 21 % of the total employment generated in the economy. Indian economy largely depends on textile manufacturing and exports. Further, India textile Industry contributes around 4 % of GDP (gross domestic product), 9 % of excise collections and has 16 % share in the country's export. Indian textile industry is second largest after China. The country has the highest loom capacity and has a share of 61 % in world loomage in 2010. (www.indialawoffices.com).

The textile industry is one of the largest polluters in the world. The World Bank estimates that almost 10-30 % of global industrial water pollution comes from the treatment and dyeing of textiles (Saratale *et al.,* 2009; Palmieri *et al.*, 2005; Levin *et al.*, 2004; Wesenberg *et al.,* 2003). Some 72 toxic chemicals reach our water supply from

textile dyeing. Many of these chemicals cannot be filtered or removed. The textile industry is second only to agriculture as the biggest polluter of clean water globally. More than 100,000 commercially available dyes are known and the world annual production of the dyestuffs amounts to more than $7x10^5$ tonnes (Pandey *et al.*, 2007; Pearce *et al.*, 2003; McMullan *et al.*, 2001; Pierce, 1994). Cotton production accounts for 2.6 % of annual global water usage. A single T-shirt made from conventional cotton requires 2700 l of water, and a third of a pound of chemicals to produce. Millions of gallons of wastewater discharged by mills each year contain chemicals such as formaldehyde, chlorine and heavy metals such as lead and mercury. These chemicals cause environmental damage, human disease and affect aquatic animal's life (Ghodake *et al.*, 2009; WHO, 2002; Khan *et al.*, 1995). Effluents released from mills are often at high temperatures and pH, which exacerbate the problem.

The apprehension shown by several researches, review articles and number of magazines towards the contamination of water bodies, agricultural lands and health concern had encouraged us to undertake research in the field of environmental bioremediation through enzymes. The potential to use enzymes in industrial applications has been compromised by several obstacles as these processes involve substrate, organic solvents, metallic ions, stability and other reactions conditions that are not normally encountered in their natural conditions. Therefore, extensive research has been conducted to try and optimize the application of natural enzymes in *in-vitro* conditions towards the biodegradation of synthetic azo dye polluting effluents.