

Submission made to the Supreme Court's Expert Committee on GM

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Of the various points on which the Supreme Court desires to have the opinion of the Expert Committee and, the provision that the SC has given that the Committee may hear the Government, petitioners and any other intervener in this petition, who, in the opinion of the Committee, shall help the cause of expeditious and accurate finalization of its report.

As a person in my then capacity as the Chairman of the Kerala State Biodiversity Board, who was instrumental in the then government's decision to ask for a GM free India and declare a ban of GM crop even for trials in Kerala, would like to give my comments on the most important following two points on which the Committee's expert opinion is sought.

1. "To advice on whether a proper evaluation of the genetically engineered crop/plants is scientifically tenable in the green house conditions and whether it is possible to replicate the conditions for testing under different agro ecological regions and seasons in greenhouse?"
2. "Whether there should or should not be any ban, partial or otherwise, upon conducting of open field tests of the GMOs? In the event open field trials are permitted, what protocol should be followed and conditions, if any, that may be imposed by the Court for implementation of open field trials."

It is humanly impossible to properly evaluate the genetically engineered crop in the green house conditions. However, it may be possible, if the evaluation need not cover the ecological and environmental impacts of the said species. As what is required now in the case of the GM crop plants in the greenhouse conditions is to examine:

- 1) the various pollinators, the distance that they fly in various climatic conditions including at various wind speed; if it is mainly a wind pollinator, the speed and direction of the wind in varying environmental factors; the influence of other pollinators on a particular pollinator in varying environmental conditions;
- 2) the various insects, spiders, birds and other organisms which in natural conditions visit the particular plant species in different times of the day in various microclimatic conditions,

- 3) the time each of them spend on the plant under study;
- 4) the activities of each of them on the plant: to feed on caterpillar, insect, spider, or for nectar, fruit;
- 5) the effect of genetically modified plant's nectar on the pollinator, the effect of feeding on the caterpillar, insects, spider found on the GM plant or its fruit on the predator species;
- 6) the long-term effect of the same on the life and population of the particular species, which include reproductive success, genetic impact, if any, in the present and at least five generations;
- 7) whether the roots of the GM plant produce any exudes, if so its chemical composition, presence or absence of any GM gene, the impact of the exudes on the microbial community around the root, the distance up to which the impacts exist at varying ecological and environmental conditions;
- 8) whether such soil with genetically contaminated exudes flows into any river or water bodies during rain; if so its impacts on the aquatic ecosystem and biodiversity
- 9) the impact of feeding on GM plant's leaves and other parts on the grazing animals,
- 10) Whether the GM plants' leaves and other parts are driven to the neighbouring water bodies during rain, especially after harvesting. If so the impact of the same on the aquatic ecosystem and biodiversity.

I do not think any one of these could be done in the greenhouse condition. Therefore, the question of possibility to replicate the conditions for testing under different agro ecological regions and seasons in greenhouse does not arise.

The second question I would like to comment upon is "Whether there should or should not be any ban, partial or otherwise, upon conducting of open field tests of the GMOs? In the event open field trials are permitted, what protocol should be followed and conditions, if any, that may be imposed by the Court for implementation of open field trials."

There must be a ban on conducting open field tests, as the studies required to be conducted in the greenhouse conditions themselves could not be done by anybody. And, unless those studies are done satisfactorily, testing them in the open field would be disastrous to the biodiversity and ecology. That amounts to just taking a risk. It is to be noted that once the GM plant is introduced in the open field, the impact of it on the biodiversity, ecosystem

and environment can never be rectified or recovered. It would be irreparable and irrevocable.

The most pertinent question now to be answered is since the Government of India, the Supreme Court and the scientists working in the field are convinced beyond doubt that the GM plant would become injurious to our biodiversity, environment and health unless bio-safety regulations are strictly followed, why should India adopt such a dangerous technology in the field of agriculture?

The first often repeated explanation by the GM lobby is that Genetic Modification is the only solution for hunger. It may be noted that Genetic Modification is not done to increase productivity; it is only to control attack of a pest, that too only a particular one. When insect control is the only objective of the introduction of GM, the question is whether there are no alternatives to GM. Why not go in for organic cultivation which has been shown more profitable to the farmers and is also environment friendly.

The studies have clearly shown that GM fails to control the Bollworm in Bt cotton, the Bollworm develops resistance; pesticide usage is not reduced significantly, GM is not at all economical to the farmers, GM plants genetically contaminates the native varieties leading to loss of biodiversity, GM generates health problems, GM food experiments have not given any positive, convincing results; adopting cultivation of GM plants would lead inevitably to surrendering the right on seeds and the food sovereignty of the nation to multinational corporate bodies.

If GM ensures high production and solves hunger in the world, why is it confined only to 25 nations in the world and, that too in five countries in a substantial way? Why was it rejected even by some of the African countries where food scarcity is so acute?

It may be noted that The UN Agriculture Assessment (also known as IAASTD – International Assessment of Agricultural Science and Technology for Development) sponsored by the World Bank in partnership with the UN Food and Agriculture Organisation, the UN Environment Programme, the UN Development Programme, the World Health Organisation, governments, civil society, private sector and scientific institutions [<http://www.agassessment.org>], altogether consisting of 400 agricultural scientists from various countries, says that **“such techniques as genetic engineering are no solution for soaring food prices, hunger and poverty.”** It further says that “there is the urgent need to move away from destructive and chemical-dependent industrial agriculture and to adopt environmental modern farming methods that champion biodiversity and benefit local communities.” Learned opinion of 400 eminent scientists across the world should certainly prevail over the commercial interests of

multinational corporate bodies.

The UN Special Rapporteur, Olivier de Schutter in his reports “Agro-ecology and the Right to Food”, presented at the 16th Session of the United Nations Human Rights Council [A/HRC/16/49] and "Seed policies and the right to food: enhancing agro-biodiversity and encouraging innovation" presented to the UN General Assembly (64th session) (UN doc. A/64/170) states that *“States should implement public policies supporting the adoption of agro-ecological practices by “making reference to agro-ecology and sustainable agriculture in national strategies...”*

In the light of the above facts, and the scientific facts provided by international scientists of repute, in the absence of convincing evidences to support the positive arguments put forward by the multinational corporate bodies, the resolution of the IUCN passed at its meeting in 2004 for a ban on GM crops and foods, and the continuing dispute over the issue, it is only prudent to declare a moratorium on GM crops and foods till we could learn from the experiences of the countries which have adopted the GM crops in a large scale.

A detailed note explaining why there should be ban on GM is annexed.

Why India should be GM free

GM (Genetic Modification) is not a solution for hunger as genetic modification is not done to increase productivity. It is done only to control attack of a pest, that too only a particular one. (For other pests farmers have to use pesticides). India has traditional time-tested organic methods to control insect pests that do not affect the biodiversity, ecology, health and environment

I) GM and productivity

1. **Productivity does not increase substantially in Bt cotton:** There are no convincing evidences to show that GM increases productivity in a significant way. There, of course, is a marginal increase in *Bt* cotton, but there is no convincing evidences to show that whether it is solely due to GM.
2. According to Cotton Corporation of India, the yield was 470 kg/ha when the *Bt* cotton cultivated was only in 6% of the total (87 lakh ha) area of cotton during 2004 - 2005, while it was only 481 kg/ha when the area was extended to 95% of cotton cultivation (111.42 lakh ha) during 2011 -2012 ([Cotton Corporation of India, State-wise Area, Production, Yield. http://cotcorp.gov.in/state-operations.aspx](http://cotcorp.gov.in/state-operations.aspx)). It must be noted that during 1998 - 1999, prior to the introduction of *Bt*, the productivity of cotton was 502 kg/ha in Gujarat (<http://www.expresstextile.com/20020711/edit2.shtml>).
3. The findings of the CICR (Central Institute of Cotton Research) after an assessment of 10 years of *Bt* performance also show the same. "The main issue that worries stakeholders is the stagnation of productivity at an average of 500 kg lint per ha for the past seven years. The gains have been stagnant and unaffected by the increase in area of *Bt* cotton from 5.6% in 2004 to 85% in 2010. The yield was 463 kg per hectare when the *Bt* cotton area was 5.6% in 2004 and reached a mere 506 kg per hectare when the area under *Bt* cotton increased to 9.4 M hectares at 85% of the total 11.1 M hectares." (Kranthi. K (2011). Part-3: 10 year of *Bt* in India. <http://cotton247.com/news/ci/?storyid=2159>)

4. It may also be noted that the highest production during the *Bt* saga in India was 560 kg/ha when the *Bt* area was 60% of the total cotton area in 2006 and it started declining since then to 506 kg/ha when the *Bt* area increased to 85% in 2010 (Kranthi. K (2011). Part-3: 10 year of *Bt* in India. <http://cotton247.com/news/ci/?storyid=2159>).
5. Gujarat Government itself made it clear that ***marginal increase in the yield is not solely due to Bt:*** Increase in the production of cotton in Gujarat, from just 175 kg/ha in 2002 - 2003 to almost 460 kg/ha in 2004 - 2005, according to a letter to the Chairperson of the GEAC of the Gujarat Government, may not be solely due to *Bt* cotton, as Gujarat has recorded 450 kg/ha during 1998 - 1999 even when there was no *Bt* cotton. The Government's official monitoring of the performance of the GM cotton shows that the increased productivity was because of the increased irrigation facility by massive water harvesting programmes, good monsoon, use of drip, low pest pressure among other similar factors. Because of this very factor, inclusion of Gujarat's data to the country's total production would give a distorted picture.
6. Further, an analysis of the data of the Cotton Advisory Board makes the abundant role of irrigation in production of cotton. The 'Irrigated Area' under cotton in Gujarat during 1975-76 was 21.6 per cent, while it was 36.2 per cent in 2000-01. Accordingly there has been an increase in the production; from 16.77 lakh bales in 1975 - 76 to 33.00 lakh bales in 2001-2002 (A K Chowdhury, Cotton Advisory Board: Cotton cultivation scenario in Gujarat - I, 2002 (<http://www.expresstextile.com/20020711/edit2.shtml>)). Again, it is reported that six to seven lakh ha of groundnut area was converted for cotton which was irrigated by 1, 00,000 new check dams (Kranthi.K.2011). Part-11: 10 year of *Bt* in India. <http://cotton247.com/news/ci/?storyid=2159> ;).
7. In Gujarat, the average productivity in irrigated area was 689 lint kg/ha whereas that in un-irrigated was a mere 247 kg/ha. The state's cotton production was 84% from the 65% irrigated cotton area and 16% from the 35 % un-irrigated area (Kumar.V 2011. Navsari Agricultural University, Gujarat. *Bt Cotton : A Gujarat experience & issues*)
8. Comparison of productivity data between 2004 - 2005 and 2009 -2010 when the *Bt* was cultivated in 6% and 85% respectively of the total cotton area shows that in Punjab, Gujarat, Maharashtra and Madhya Pradesh there was a loss in yield in various degrees, but in the other cotton grown states, namely Haryana, Rajasthan, Andhra Pradesh, Karnataka, Tamil Nadu and Orissa an increase was noted (Table 1).
9. The reasons for both the yield loss and gain have to be thoroughly analysed taking into consideration of the various ecological factors and management such as increased irrigation facilities, additional land brought under cotton,

the soil types, total quantum and the pattern of rainfall, the number of rainy days, temperature, the kind of hybrid cotton used, and the type and quantity of pesticides used. Attributing increased production, although only marginal, entirely to *Bt* is unscientific and hence unacceptable. One could claim so, if the *BT* cotton was cultivated in the laboratories with all other parameters the same.

10. **Specific loss also has been reported:** An average yield loss of about 1.75 quintals per acre (for 16,632 acres) was reported in Warangal district during 2004 - 05 by a special team constituted by the Government of AP to evaluate the performance of the *Bt* cotton. The Government ordered the *Bt* company to give compensation of Rs. 3.3 crores to the affected farmers.
11. The Maharashtra Government is seriously considering switching from genetically modified (GM) cotton to more conventional cotton seeds. A plan to phase out and look for alternatives of *Bacillus thuringiensis* (*Bt*) cotton is being chalked out by leading state agricultural universities with the help of private companies. (Review *Bt* cotton, orders State Govt (TNN | Jul 21, 2012, 03.08AM IST). Further the State Government officials assert that Since 2005, *Bt* is causing "crop failure", resulting in a loss of Rs 2,000 crores annually.

Table 1: State -wise area, production and productivity of cotton

Area in Lakh ha; production in bales of 170 kg; yield in

kg/ha

Year	2004			2009-10			
State	Area	Prod	Yield	Area	Prod	Yield	Yield loss/gain
Punjab	5.09	16.50	551	5.11	14.25	474	- 77
Haryana	6.21	16.50	452	5.07	14.75	495	+ 43
Rajasthan	4.38	10.0	388	4.44	11.00	421	+ 33

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North total	15.68	43.00	466	14.62	40.00	465	- 1
Gujarat	19.06	73.00	651	26.25	98.00	635	- 14
Maharashtra	28.40	52.00	311	35.03	63.00	306	- 5
Madhya Pradesh	5.76	16.00	472	6.11	15.00	417	- 55
Central total	53.22	141.00	450	67.39	176.00	444	- 14
Andhra Pradesh	11.78	33.00	476	14.75	52.00	599	+ 123
Karnataka	5.21	8.00	261	4.55	9.00	336	+ 75
Tamil Nadu	1.29	5.00	659	1.04	5.00	817	+ 158
South Total	18.28	46.00	428	20.34	66.00	552	+ 124
Orissa	0.68	1.00	250	0.54	1.00	315	+ 65
Others				0.21	1.00		
Total	-	231.00	-	-	293.00	-	
Loose Cotton	-	12.00	-	-	12.00	-	
Grand Total	87.86	243.00	470	103.10	305.00	503	

Source: Cotton Corporation of India Ltd.: State wise distribution of area, production and productivity of Cotton

12. **Figures on yield of Bt is often blown up for obvious reasons:** A study during 2003 - 2004 in Andhra Pradesh on the performance of *Bt* cotton, undertaken separately by a market research firm, namely A. C. Nielson commissioned by Monsanto-Mahyco and, agricultural scientists of Andhra Pradesh Coalition in Defence of Diversity (APCIDD) shows this highly exaggerated claim (Table 2).

Table 2. Comparative study of *Bt* and non- *Bt*

State	Bollworm Reduction reported with Bt Cotton	Pesticide Usage reduction with Bt Cotton, compared to non-Bt	Yield Increase of Bt cotton over non-Bt Cotton		Increase in Net Profit - of Bt Cotton over non-Bt Cotton/acre	
	per cent	Rs	per cent	Quintals/Acre	per cent	Rs/Acre
AP: Monsanto Study	58	1856/-	24	1.98	92	5138/-
AP: APCIDD Study	14	321/-	2	0.09	(-) 9	(-) 750/-

(II) Use of pesticides in Bt Cotton

13. One of the justifications given for introduction of GM crop was to save the crop from pests without using chemical fertilisers which damage the health and environment. However, the data shows the other way.

Table 3. Pesticide usage in Metric Tonnes technical grade

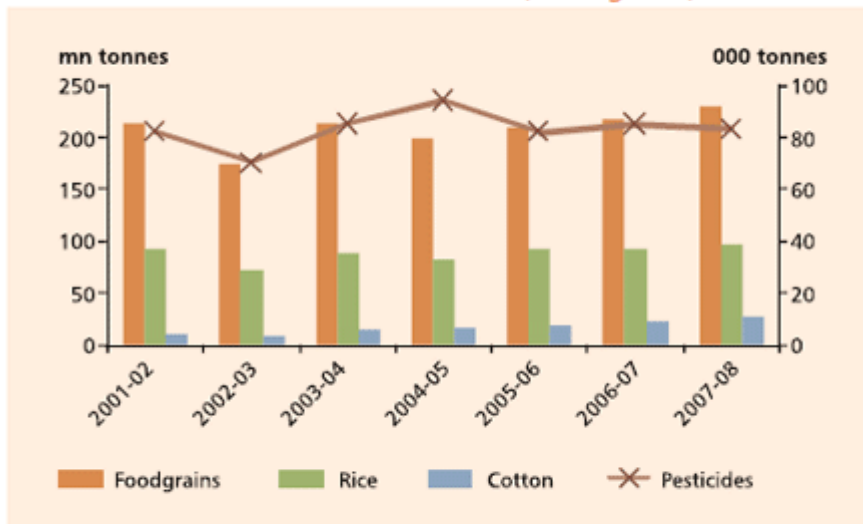
State	2005 -06	2006 -07	2007 -08	2008 -09	2009 -10
Andhra Pradesh	1997	1394	1541	1381	1015
Gujarat	2700	2670	2660	2650	2750
Karnataka	1638	1362	1588	1675	1647
Maharashtra	3198	3193	3050	2400	4639
Punjab	5610	5975	6080	5760	5810

Haryana	4560	4600	4390	4288	4070
Madhya Pradesh	787	957	696	663	645
Rajasthan	1008	3567	3804	3333	3527
Total	45,341	49,682	51824	51,481	49,419

Source: Directorate of Plant Protection, Quarantine & Storage; July 2012 (<http://ppqs.gov.in/lpmPesticides.htm>)

14. There is no substantial decrease in the use of pesticides in the States where Cotton is being cultivated. On the other hand pesticide use in the 8 States where cotton is grown has increased to an average of 5000 MT from 2005 -2006 to 2009 - 2010 (Table 3). Again, the data from Ministry of Agriculture also show that there is hardly any decline in the total use of pesticides in the country from 2001 - 2002 to 2007 - 2008 (Fig 1)

Fig.1 Production trend, pesticides, food grains, Rice and Cotton



Source: Ministry of Agriculture and Ministry of Chemicals & Petrochemicals (Annual Report Cotton production in million bales of 170 Kgs each)

15. It may be noted that these figures do not convey a clear picture of the use of pesticides for any comparative study, as the strength of the pesticide is not the same. Low-volume pesticides require a very small quantity compared to the high volume. Therefore, the quantities shown in table 3 and Figure 1 above are misleading. It would have been quite high if they were of high volume pesticides.

(III) GM is not a viable, sustainable solution for pest control

16. It is widely known in pest management that pests would develop resistance to pesticides on continual use of the same brand. Bollworm is no exception.
17. However, the evolutionary process could not be halted by the biotech giants. In a study of the Arizona University, published in 2008, reported for the first time *Bt* resistant populations of Bollworm in more than a dozen crop fields in Mississippi and Arkansas between 2003 and 2006
18. **Bollworm becomes resistant to Bt:** Monsanto in early 2010 publically admitted that the cotton pest -pink bollworm- has developed resistance to the Cry 1Ac toxin (*Bt*) in Bollgard I in Gujarat where *Bt* cotton was planted commercially for the first time (Sharma, D (2010). *Bt* cotton has failed, admits Monsanto. India Today, March 6, 2010: <http://indiatoday.intoday.in/site/Story/86939/India/Bt+cotton+has+failed+admits>).
19. Resistance monitoring studies done at CICR have demonstrated that bollworm, *Helicoverpa armigera*, the target pest of cotton, has developed tolerance for it. Other studies have also shown bollworm surviving and reproducing in *Bt* cotton both single gene and double gene *Bt* (M. T. Ranjith, A. Prabhuraj, & Y. B. Srinivasa. (2010). Survival and reproduction of natural populations of *Helicoverpa armigera* on *Bt*-cotton hybrids in Raichur, India. *Current Science*, 99, (11) 1602-1606)

(IV) Emergence of secondary pests

20. In his 2011 report Dr.Kranthi states: "*Productivity in north India is likely to decline because of the declining potential of hybrids; the emerging problem of leaf curl virus on the new susceptible Bt-hybrids; a high level of susceptibility to sucking pests (straight varieties were resistant); problems with nutrient deficiencies and physiological disorders; and mealy bugs, whiteflies and miscellaneous insect problems that are likely to increase.*" (Kranthi.K (2011). Part-3: 10 years of *Bt* in India. <http://www.cotton247.com/news/ci/?storyid=2171>)
21. According to Dr.Kranthi, a mealy bug not observed in India before, has spread in the cotton regions and farmers have been spraying "extremely hazardous" pesticides to eliminate this hard-to-kill pest. The prolific spread of *Bt* cotton hybrids has created a conducive climate for the rapid spread of this pest (Mudur.G.S (2010) Cotton lessons for *Bt* brinjal. The Telegraph, February 16, 2010) http://www.telegraphindia.com/1100216/jsp/nation/story_12110833.jsp
22. Other pests like stem borer are also found on *Bt* cotton. In addition, occurrence of new diseases hitherto unknown to cotton crop, such as Tobacco Streak Virus and Bronze Wilt was also noted.

23. Research Foundation for Science, Technology and Ecology in Delhi reports that Monsanto's *Bt* cotton not only failed to protect the plants from the bollworm, but increased the attack of non-target pests such as jassids, aphids, whitefly and thrips to 250 -300 per cent.
24. In China, Cornell University after a household survey, find that the quantum of pesticide use has not come down after seven years of commercial farming of *Bt* cotton. They use pesticide worth \$ 101/ha for both *Bt* and non-*Bt* cotton. Interestingly, the study further reveals that while *Bt* farmers saved 46 per cent on Bollworm pesticide, they had to spend 40 per cent more on pesticides designed to kill an emerging secondary pest. This offsets the savings made on account of the primary pest. China's Nanjing Institute of Environmental Sciences concludes that if the *Bt* cotton was planted continuously, its resistance to bollworm will disappear within 10 years.
25. Since the GM crops failed to control the bollworm, the Australian farmers have been advised by the Transgenic and Insect Management Strategy Committee of the Australian Cotton Growers Research Association to spray additional insecticide on Monsanto's *Bt* cotton.
26. The phenomenon is true for herbicide - tolerant crops also. The use of herbicide, namely Roundup Ready, the largest selling herbicide in the world and is owned by Monsanto, has always been on the increase. Weed resistance is reported from more than 15 million acres in the USA. In a decade of herbicide use, 30 new herbicide resistant weeds have emerged. GM soy, corn, and cotton are reported to have an increase of 122-million pound pesticide use since 1996. 'Super-weeds' are getting created along with herbicide-tolerant GM crops, resulting in an ever increasing use of herbicide on these crops.
27. Yet another disaster is that the left over seeds can germinate in subsequent years when different crops are grown in the same area. These "volunteer plant" would then contaminate the new crop. In some cases the volunteer plants develop resistance to more than one herbicide, reported up to three, and the farmer is forced to use stronger pesticides.
28. The irony is that four of the ten top seed companies in the world trying to sell GM seeds are also world's largest agro-chemical giants, namely Monsanto, Du Pont, Syngenta, and Bayer. Their commitment to solve world's hunger and poverty is now clear!

(V) *Bt* requires more fertilisers

29. Acharya N.G Ranga University, one of the few universities doing research on *Bt* and non-*Bt* cotton, found that *Bt* cotton requires 15% more fertilizers (Agricultural Almanac, ANGRAU 2009) and recommended the farmers accordingly.

30. Dr C D Mayee (ISAAA Board Member) and former Co-Chair of GEAC, reports that “If the area under advanced transgenic seeds increases to 10 per cent in a few years from the present level of 4 per cent, **the country’s fertiliser consumption will increase 107 per cent to 220 kg per hectare (ha)** from the current levels (the latest available figure 2005-06), at 106 kg per ha.” (Jha, D (2009). Transgenic seeds to push up fertiliser consumption. <http://www.business-standard.com/india/news/transgenic-seeds-to-pushfertiliser-consumption/00/12/350768/>)

31. ***Bt depletes soil fertility:*** According to the study conducted by the CICR, repeated cultivation of *Bt* cotton hybrids leads to depletion of soil fertility as they draw more nutrients and water from the soil. The crop exhibits nutrient deficiency especially in rain-fed zones where wilt and leaf-reddening problems are also getting more severe over the years (Kranthi, K. (2011). Part III- 10 year of *Bt* in India. <http://www.cotton247.com/news/ci/?storyid=2171>)

(VI) High cost of production

32. **Exorbitant Seed prices:** *Bt* cotton seeds in 2004 were priced between Rs 1650-1800 for 450 gm, as against Rs 350 for hybrid seeds and less than Rs 100 for desi cotton seeds. (Sainath.P, (2009). The largest wave of suicides in history. Counter-Punch, February 12, 2009. <http://www.counterpunch.org/2009/02/12/the-largest-wave-of-suicides-in-history/>) interestingly, when the seed prices were brought under control through the MRTP Act and Essential Commodities Act, Monsanto has taken the A.P. and Gujarat governments to Court to decontrol seed prices!

33. **Increasing expenditure on pesticides:** Dr. Kranthi reported to the MoEF, that with 90% of cotton area under *Bt*, resistance will develop sooner than later. There has been emergence of new sucking pests and pesticide expenditure has risen from Rs 597 crore in 2002 to Rs 791 crore in 2009”(ibid)

34. *Bt* cotton cultivation is more costly than organic cultivation of desi cotton; cost of production is about Rs. 8,800/ more for the former. Although the yield is slightly higher in *Bt*, by one quintal, net profit per hectare is more in organically produced cotton by Rs. 12,000/ha (an official evaluation of various cultivations by the Maharashtra Government Table 4).

Table 4: Comparison of various methods of cultivation and yield

	Traditional	IPM-based	Organic	Bt Cotton
Total cost of cultivation (in Rs.)	18,305	13,305	10,595	19,480
Yield per hectare in quintal	13	14	15	16
Gross income per hectare (in Rs.)	29,900	32,200	34,500 + 5700 (intercrop)	36,400
Net Profit per hectare (in Rs.)	11,595	18,895	29,605	17,320

(VII) GM crops are hazardous to health

35. There are indisputable evidences showing that GM food/crops are hazardous not only to human health but to animals and ecosystems.
36. The first genetically modified food that came to the market was a tomato, called “flavr savr” which was rejected even by rats! Those who ate them developed small lesions in their guts
37. GM maize fed rats had loss of weight and were less healthier than those fed with non-GM maize
38. Study at the Institute of Higher Nervous Activity and Neurophysiology of the Russian Academy of Sciences shows that 25 of the 45 (55.6per cent) offspring of GM-soy fed rats died within three weeks, while the mortality of the non-GM fed offspring was 3 of the 33 (9per cent). In addition, growth abnormalities were also found to be high in the GM soy fed rats. It indicates that pregnant women may endanger their unborn babies, if they eat GM food
39. Valvilov’s Agrarian University in Russia reports that GM soy (Monsanto’s herbicide –resistant Roundup Ready) fed mice showed histological changes in the liver, kidney and testes
40. A study in the University of Urbino showed damages to cells in the liver, pancreas and testes of young mice fed with GM soya
41. GM potato fed rats showed changes in the size and weight of the body organs; liver, heart and brain got smaller. Also the immune system of the rat got weakened.

- 42 In Australia, GM peas fed rats showed allergic reactions and lesions and hence, the team abandoned research on GM peas
- 43 Researchers in Nebraska in the USA found that soybean modified with the gene of Brazil nut, could induce fatal allergies in people sensitive to Brazil nuts.
- 44 Glyphosate from Monsanto's herbicide (Roundup) when used on genetically engineered plants tolerant to it can eventually get into food chain. It is to be noted that Glyphosate reduces the functioning of human placental cells and blocks the synthesis of estrogens and disrupts hormonal balance.
- 45 L-Tryptophan, a staple dietary supplement sold in the market, when genetically modified killed 37 people within months of its introduction in the market. Further, 1535 people were permanently disabled with Eosinophilia Myalgia Syndrome.
- 46 The only human feeding trial on GM food was with GM soy and the results published in Nature Biotechnology shows that when GM soy products were eaten by man, the gene inserted into the soy was transferred to the bacteria in the intestine. This could lead to producing potentially allergenic proteins.
- 47 . Britain's Food Standard Agency (FSA) reports that antibiotic resistance marker genes from GM foods can make their way into the bacteria of human intestine, just after one meal.
- 48 . A study published in Applied and Environmental Microbiology in 1999 shows that human consumption of GM food resulted in transfer of antibiotic resistance gene present in the GM to bacteria which are normally present in human saliva and respiratory tract. These bacteria could thus become resistant to antibiotics which may lead to potentially uncontrollable epidemics.

- 49 . Antibiotic resistant bacteria, used in most GM crops, are found in the guts of bees feeding on GM rapeseed
- 50 . A study conducted in Madhya Pradesh by a civil society recorded that the people handling *Bt* cotton suffered allergic reactions. “23 patients, including 10 severe cases, showed symptoms of allergy within five hours of gathering, lifting and even touching the cotton”
- 51 . Even people living around *Bt* corn field developed skin, respiratory and intestinal symptoms and fever during the period of pollination. Blood test of 39 people showed immune response to the *Bt* toxin.
- 52 . In 2006, around 12,000 sheep are estimated to have died due to toxicity after grazing on *Bt* cotton in Warangal district alone.
- 53 . In 2007 and 2008 such incidents have been reported from the districts of Adilabad, Medak and Kammam in Andhra Pradesh, in addition to Buldana and Yavatmal districts of Maharashtra.
- 54 . Farmers in the US reports that the pigs and cows fed with GM corn became sterile; many sheep fed on GM cotton plant died; cow, chicken, water buffalos and horses also had the same effect.
- 55 . The prestigious medical journal “Lancet” issued a warning that GM foods should never have been allowed into the food chain. Britain’s Medical Association with 100,000 physicians and Germany’s Medical Association with 325,000 physicians issued similar statements.
- 56 . The National Academy of Science in the USA reports that GM products introduce into our bodies and into the environment several new allergens, toxins, disruptive chemicals, soil-polluting ingredients, mutated species and several intern protein combinations.

- 57 American Academy of Environmental Medicine Calls for a Moratorium on GM foods because: GM food poses serious health risks in the area of toxicology, allergy and immune function, reproductive health, metabolic, physiologic, and genetic health
- 58 A comprehensive compilation of the health impacts with scientific details are available in Jeffrey M. Smith's "Genetic Roulette" published in 2007. None of the instances of negative impacts given in the book has been challenged by Monsanto or the other GM corporate world. It by itself is a proof for its reliability and confirms beyond doubt the evidences against GM dangers.
- 59 It is now abundantly clear that GM food and crops are hazardous to the health and would lead to irrevocable damages. However, pro- GM lobbies argue that the GM food is safe, but without any convincing evidences. ***Results of the study sponsored directly or indirectly by those trying to sell the technology should be viewed critically, if not rejected. No company will say that its product is poor.***

(VIII) GM plants genetically contaminate the native crop and wild varieties

60. One of the most serious dangers of GM is contamination of wild varieties and also closely related non- GM crop varieties by the gene of genetically modified plants by cross pollination, amounting to losing our original local biodiversity. FAO reported recently that this could result in the reduction of species locally and on a global scale.
61. Widespread gene contamination in the maize varieties in Mexico was reported by the Mexico's Environment Ministry; the contamination rates had gone to 35 per cent in the remote villages. Mexico, the primary centre of maize genetic diversity, has one of the world's most vital reservoirs of

genetic material, both wild and developed by indigenous farmers over millennia.

62. An interesting episode that makes the bio-safety regulations laughable is the contamination of a native variety of canola by GM canola grown in the neighbouring field. The presence of GM canola in the non-GM local variety, made Monsanto to file a suit against its owner as it had no license to grow GM Canola and finally the owner had to pay penalty. The actual law breaker was the “bee” which helped in cross pollination!!

63. Gene contamination of the local long grain rice in the USA from the field trials of a GM variety, called “Liberty Link,” owned by the biotech giant, Bayer, is a classical example. When Bayer was taken to the Court by the farmers in the US for contaminating their local variety, the Giant reported to have claimed that ‘it was an act of God.” The episode caused loss of 63per cent of US rice export, while the contamination spread to at least 30 countries. Major importers such as EU and Philippines closed their market to the US rice. Total loss to the farmers was around \$253 million. However, it is not very clear whether the contamination took place in the field or just mixing up of the rice from GM and non- GM varieties.

64. In Texas, 500,000 bushels of soya destined for human consumption were contaminated with genes from maize genetically modified by the US firm Prodigene to produce a vaccine for treating a stomach disease afflicting pigs.

65. Biotech giants’ refusal for labelling the GM products, obviously anticipating rejection in the market, makes things worse for the consumers, as they are unable to distinguish the non- GM from GM.

66. It is reported that there are 39 cases of gene contamination from GM crop to non-GM crop in 23 countries during 2007 and more than 200 such cases in 57 countries in the last 10 years.
67. Genetic contamination by cross pollination from GM to non-GM crops is probably a blessing in disguise for the biotech companies, because when larger areas are contaminated they could as well argue that their crop need not be regulated as they are already in the food chain. And when most varieties are contaminated, we will be left with no other option, but to go in for GM. The same is the case with GM products also, if the GM crops are widely accepted. This is clear from the statement of Don Westfall, Vice President of the US Food Industry Consultancy, Promar International, that “the hope of the (GM) industry is that over time the market will be flooded (with GM) that there’s nothing you can do about it. You just surrender”

(IX) GM poses threats to non-target species and ecosystems

68. A two year study shows that long-term exposure of Monarch butterflies to *Bt* maize pollen lead to the loss of 20 per cent of its population, as they failed to reach the adult stage. It is reported that beneficial ladybird beetles were fewer in *Bt* maize than in non-*Bt* maize, because their food sources such as aphids and pollen in the former area are contaminated by the *Bt* toxin.
69. A study reported in the Proceedings of the National Academy of Sciences, USA in 2007 shows that *Bt* toxin from pollen and agriculture wastes from *Bt* corn fields entered into adjacent streams which affected the growth of caddis flies. More detailed study by the same team shows that high doses of pollen in the stream kill as many as 43 per cent of the caddis flies which would eventually affect the food-chain in the stream.

70. Australian CSIRO reports that the exudes from the roots of GM plants containing toxic protein into the soil alters the soil organisms and their activities. Transgenic material finds their way to soil also through crop residues such as straw or stubble left over in the field and ploughed in. *Bt* cotton exudes a toxin during decomposition. The Scientific Advisory Panel of the US Environmental Protection Agency (EPA) reports that "*Bt protein is likely to be present in the rhizophore not only throughout the life of the crop, but perhaps long after the crop is harvested*".
71. In a soil bacteria, antibiotic resistant gene from biotech beetroot was detected.
72. Gene transfer between closely related microorganisms is a natural phenomena in the evolution of microbial communities. Introduction of toxins at this level would mean tampering with the natural process of evolution which would be disastrous.

(X) GM endangers the food security and sovereignty

73. Adoption of GM crops eventually would lead to the disappearance of the country's rich variety of cultivars evolved through centuries by our farming communities and also would endanger the wild varieties.
74. The country has already committed a mistake with the introduction of Green Revolution which disarmed farmers of their traditional asset, by introducing high yielding varieties displacing the traditional varieties and the generations of knowledge inextricably associated with them. Introduction of GM technology makes the situation still worse making the farmer a true "farm-refugee." It would make the farmer and the food chain itself under the control of a few multinational corporate bodies like Monsanto, as the farmer has to buy the expensive seeds only from the corporate body each season. The farmers will be denied the right to sow what he wants to sow in his own land, amounting essentially denial of the fundamental right of the farmer. It certainly is totally unacceptable to a democratic country like ours.

75. Eventually, we will be forced to restrict our food choice to a few varieties dictated and driven by the market interests of a few multinationals. Essentially colonising every Indian's free choice of food.
76. It may be noted that propriety right of almost 93% of the *Bt* technology (Bollgard I and Bollgard II) goes to one multinational company, namely Monsanto and, the farmers have paid up to Rs. 1400/ crores as royalty during the period 2002 -2005 alone.
77. It is not only the awful draining of farmers' pocket that matters, more dreadful is the irrecoverable loss of the fundamental right of the farmers on their own seeds and the subsequent disgraceful scenario of the nation prostrating its food sovereignty at the feet of multinational companies.
78. With the 72 crops under different stages of GM research and the approval of GEAC for 14 crops for field trial gave a strong signal to the impending disaster to the country's food sovereignty. The argument that India should develop its own capabilities in GM research in crops has also to be seen on the light of the necessity for it and the immense financial commitment that it requires. According to FAO, it costs a minimum of \$ 36 million to produce one GM variety and another \$5-6 million in regulatory costs to bring it in the market. Can India afford that kind of investment, that too for a research impregnate with disasters?

(XI) GM poses threats to organic farming and sustainable agriculture

79. Green Revolution's high yield varieties accompanied by chemical pesticides and fertilizers not only failed to offer a sustainable agriculture system, but killed the soil vitality and contaminated the air, water and food. The country is now promoting, although not adequately, organic farming. It is to the credit of the Government of Kerala that it has declared its intention to do away with chemical farming and convert the entire cultivation by organic in a phased manner to ensure food security. The State has already adopted an Organic Farming Policy. Government of Sikkim has already declared as an organic State. It is hoped that the Government of India would also declare a clear organic farming policy for the country and phase out the chemicals from the agriculture fields with a definite time frame. Irrespective of the pressures from the pesticide lobby and with a single slogan of providing poison free food and environment to India's citizens.
80. However, organic farming and GM crops are mutually incompatible. The former is sustainable, holistic in approach going with the essential rules of nature, while the latter is unsustainable, single issue approach violating all

rules of nature unmindful of the perpetual irreversible adverse impacts that it would create to the system and environment.

81. Genetic contamination of organic crops by GM crops by cross pollination is the most important issue, as the pollen drifts miles together depending on the agency which carries it, birds, bees or wind.
82. It is often impossible to protect the organic products from GM products as learned from experience elsewhere.
83. According to a report of the US Environmental Protection Agency, analysed by the Union of Concerned Scientists, the loss to US organic maize growers was \$ 90 million in annual income because of the GM contamination.
84. Survey of the Organic Farming Research Foundation show that one in 12 organic farmers in the US had already suffered direct costs or damage because of GM contamination.
85. The cost involved in protecting conventional and organic crops from GM contamination is predicted to be extremely high. One such prediction shows that it would add 41 per cent to the cost of producing non-GM oilseed rape and up to 9 per cent to the cost of producing non-GM maize and potatoes.
86. Already it is reported that in the US many organic farmers have been unable to sell their produce as organic due to GM contamination. This will certainly happen in India also if we promote GM crops.

(XII) GM poses threats to the traditional medical practices in India

87. Traditional medicines are based mainly on natural products or derivatives there from. Therefore, any genetic contamination will affect the therapeutic values of the concerned item.
88. Ingredients of many Ayurveda medicines consist of rice, ragi, barley, ginger, mustard, pepper, cardamom, bitter gourd, gooseberry, brinjal, papaya, yam, and the like. Some of these are in the pipeline waiting for the GEAC's approval for field trial. If these are genetically modified, certainly their therapeutic values would change, with what dimension it would be, nobody could predict. Ayurvedic Medical Association of India has already passed a resolution against GM crops.
89. However, the notoriety that the GM has acquired the world over, its introduction will give a fatal blow to our traditional health care system and the revenue earned there from.

(XII) GM is not a solution for hunger and malnutrition

90. One of the claims made by the proponents of the GM is that it is the lasting solution for hunger and malnutrition. There cannot be a more false claim than this. The GM's comparatively lower production, increased demand for pesticide/herbicide, health hazards to man and livestock and, the overall high production cost coupled with poor consumer choice would expose the overblown claim of the biotech giants.
91. The claim that GM crops offer increased production and genetic modification is solely responsible for the marginal increase, wherever it took place, is totally fallacious. After all, the genetic modification was done not for increasing productivity, but to avoid the yield loss due to the insect pest or the weeds. In both cases they become tolerant to GM, ineffective eventually. Therefore, the technology has failed totally, exposing the hollowness of the claim.
92. In the USA itself, one of the major promoters of GM crops, the USDA (United States Department of Agriculture) reports that there is no economic gain or loss from some of the GM crops.
93. Moreover, most of the GM crops are not meant for feeding the poor; it is meant for feeding cattle and to produce agro-fuels to run the cars. Worse still is that food producing lands in the US are being diverted to agro-fuel production with GM seeds, amongst others. It is reported that a third of Monsanto's seed sales in 2007 were from GM corn meant for production of ethanol.
94. After all, hunger is not related to production failures alone, it is more related to distribution failures, reflecting the weak commitments of the political leaderships and the bureaucrats. There are published reports of starvation deaths while tonnes of grains getting rotten in the warehouses. GM crops can do nothing about it, even if we hypothetically accept the pro-GM claim that it would accelerate production.

(XIII) GM is not a solution for malnutrition

95. Solving malnutrition is yet another hollow claim of the biotech giants. However, during the past decade and half of the GM research no solid evidence could be produced to support this claim. On the other hand, GM crop might alter nutritional composition. One of the often quoted illustrations to substantiate their claim is the Golden Rice.
96. The cultivated rice does not have a chemical, Beta Carotene, which the body converts to Vitamin A molecule. The Golden Rice is produced by inserting certain genes of daffodils and a bacteria into the rice to modify the metabolic pathways to produce Beta Carotene. However, it is reported that an adult should eat 9 kg of rice in a day to get the required Vitamin A, while this could be solved by just eating two carrots or leafy vegetables, pumpkin, mango, drumstick. And there exists several alternatives, which are economical and non-hazardous to health and environment, to meet the Vitamin A requirement of people.
97. M. S. Swaminathan after observing that “more than half of all children under the age of five are malnourished, 30 per cent of new born are significantly underweight, and 60 of percent women are anaemic”, did not suggest that GM is the answer. Instead, he suggested that “we should accelerate our efforts to ensure physical, economic, social and ecological access to balanced diet and clean drinking water for all and forever.”
98. It is clear that GM will neither solve hunger nor malnutrition. If at all, it will aggravate hunger and change the composition of food, the impact of which would be unpredictable.

(XIV) Bio-safety regulations

99. Discussion on bio safety regulations is not worth the while, because even if the regulations are stringent, very often we fail to follow or seriously implement them. Cultivation of GM cotton in Gujarat prior to the approval of the GEAC in 2002 is a disastrous example. The question that lingers is that what action has been taken against this serious violation of law. Did anyone get punishment? Even if someone was made a scapegoat, the damage done to the environment remains there, and perpetuating.
100. However, insistence on bio-safety regulations itself is a clear indication that otherwise our local varieties and the non-GM crops are unsafe from GM crops. One of the regulations stipulates minimum distance to be maintained between the non- GM and GM crops which varies according to the species. For Brinjal, it was 200 m in India. Whether it was adequate is not clear. The gene contamination of Canola, from GM to non-GM in Canada mentioned earlier shows how unscientific is the regulation. Moreover, in a country like ours where most farmers have small holdings, maintaining such a distance would be just impossible.
101. Proper studies have not yet been done to frame the bio-safety regulations. The guidelines evolved from studies in the greenhouse conditions can never be adequate to assess the impact of the GM plant on the biodiversity, ecology, environment and health.
102. The duration of studies conducted to assess the GM food on experimental animals is totally inadequate to come to a scientific conclusion. It would take generations to display the impacts. A mere 90 days observation would be totally misleading.
103. Moreover, in most bio-safety decisions, the Government is depended on the data generated by the industries who supplied the seeds. It may be noted that the GEAC had approved the release of GM brinjal on the basis of the examination of the bio-safety data provided by the Mahyco. Analyses of the same data by an independent agency, namely Committee for Independent Research and Information on Genetic Engineering based in France concluded that Bt brinjal release into the environment for food, feed

or cultures may present a serious risk for human and animal health and the release should be forbidden. And quite incredibly, the Government accepted the industry's demand of confidentiality of the data, rejecting the public demand for the same! It is relevant at this context to note that Monsanto had to publish the data on a 90 day study on rat feeding on Bt corn on orders from a German Court. Independent scientists on examination of the data found that the GM corn was toxic.

104. The most important question based on the principles of biological sciences is that what control can anyone have on the changes within an organism brought in by alteration of its gene and also those changes the new organism may cause to the ecosystem?

(XV) Ethical issues concerning GM

105. Ethical issues are yet another important point. We certainly cannot interfere with the natural process of evolution by creating new species of our choice for the benefit of a few biotech firms. By creating GM organisms for the present, purported to remove hunger from the world, we are violating the inter-species and inter-generational equity principles.

(XVI) Whether GM can be considered as Science?

106. GM cannot be considered as science, as it goes against the basic principles of organic evolution. Proponents of GM often say that there is nothing new in GM, because cross pollination has been taking place for millions of years and, hybrid varieties are also being produced to enrich agriculture. But they deliberately hide the essential fact that cross pollination is between closely related organisms; It is not between fish and a tomato, or between a firefly and mango!

(XVII) Public debate on GM

107. There were no national debates involving local farmers, agricultural scientists, experts from various related disciplines on the desirability of introduction of GM crops, before the Bt cotton was approved by the GEAC in 2002. Farmers' opinion is the most vital, because it is their fundamental right to choose what they want to sow in their farmland. Similarly, consumers should also have been consulted as the new technology denies their choice of food.
108. When the public debates were conducted in different regions of the country in the case of Bt Brinjal, under the direct leadership of the then Minister for Environment and Forest, Mr. Jairam Ramesh, the Indian citizens crowded the venues and out-rightly rejected the proposal of introducing Bt Brinjal. This has to be taken as a national consensus against the GM crops and food in the country
109. Again, when the Government of Kerala conducted a national workshop on GM crop which was attended to Ministers/representatives of 11 states of India, the resolution was unanimous that India should be GM free, if not there should be a moratorium on GM for at least 50 years.

(XVIII) Forceful attempt to impose GM on an unwilling nation

110. The Government of India by introducing a Bill, namely Biotechnology Regulatory Authority of India (BRAI) 2011, is essentially trying to bulldoze all the criticisms against introducing GM crops and food in the country. The provisions of the Bill is the most draconian that independent India would have never seen before. Even protest against GM or criticising GM can be sufficient reasons for arrest, incarceration and fine!
111. According to the provisions of BRAI, the entire agriculture and, biotechnology in the country will be regulated by a three full and two part-

time members which form the Biotechnology Authority. All could be biotechnologists. There is no representative of Ministries of Agriculture and Forest and Environment, and National Biodiversity Authority. The bill is to be laid in the parliament.

(XIX) **Green Revolution and Gene Revolution**

112. We made one serious intervention in the agriculture sector in the name of Green Revolution, by introducing high yield varieties. It had the desired effect; the production had gone up which was its sole motive. In the meantime, let us also accept that it was the one single factor which caused destruction of our agro-biodiversity and contamination of food. It is also to be noted that grown parallel to the food grains is the abundance of hospitals in the country. The health impacts and the loss of biodiversity as a result of Green Revolution have not yet been assessed. However, it has become a history now. GM is the second major intervention which is at its initial stage.
113. In this context, one major point to be noted is that the soil polluted by chemical farming, if left fallow for couple of years, can be converted for organic farming. The chemicals will break down with varying periods, although some of them persist for decades. Contrary to this, genetic pollution through GM crops can alter the life in the soil forever. Therefore, potential harm from GM is more severe than from chemical farming.
114. Another striking difference between the 'green revolution' and the current 'gene revolution' of genetic engineering is that the participants of the green revolution was scientists of public research institutions and farmers of India dedicated to increase India's agricultural productions, whereas those in the gene revolution are a few multinational biotech giants from the West whose interest is only to make profitable business.

(XX) World organizations' and distinguished scientists' valued opinion on GM

115. IUCN, the largest conservation body in the world, at its World Congress in 2004 at Bangkok asked for a moratorium on further release of GM organisms until such time that they can be demonstrated, beyond any reasonable doubt, to be safe for biodiversity, human health, and animal health.
116. The UN Agriculture Assessment (also known as IAASTD - International Assessment of Agricultural Science and Technology for Development) sponsored by the World Bank in partnership with the UN Food and Agriculture Organisation, the UN Environment Programme, the UN Development Programme, the World Health Organisation, governments, civil society, private sector and scientific institutions [<http://www.agassessment.org>], altogether consisting of 400 agricultural scientists from various countries, says that **“such techniques as genetic engineering are no solution for soaring food prices, hunger and poverty.”** It further says that “there is the urgent need to move away from destructive and chemical-dependent industrial agriculture and to adopt environmental modern farming methods that champion biodiversity and benefit local communities.” Learned opinion of 400 eminent scientists across the world should certainly prevail over the commercial interests of multinational corporate bodies.
117. **The UN Special Rapporteur, Olivier de Schutter in his reports “Agro-ecology and the Right to Food”,** presented at the 16th Session of the United Nations Human Rights Council [A/HRC/16/49] and "Seed policies and the right to food: enhancing agro-biodiversity and encouraging innovation" presented to the UN General Assembly (64th session) (UN doc. A/64/170) state that **“States should implement public policies supporting the adoption of agro-ecological practices by “making reference to agro-ecology and sustainable agriculture in national strategies...”**
118. M. S. Swaminathan while concluding his remarks on GM crops warns that “initiation of exploitive agriculture without a proper understanding of the various consequences of every one of the changes introduced into

traditional agriculture, and without first building up a proper scientific and training base to sustain it, may only lead us, in the long run, into an era of agricultural disaster rather than one of agricultural prosperity.”

119. In the present context, we have substantial quantum of data to reject the GM technology in order to avoid an era of ‘agricultural disaster’
120. The Biotechnology Task Force Report of 2004 by M. S Swaminathan recommended that biodiversity hot-spots like the Western Ghats should be kept free of GM crops. The Task Force further recommended that other agro-biodiversity rich regions in the country should also be kept GM free. This means most of the states have to be protected from GM contamination. Such protection of particular state surrounded by states with GM crops is just impossible and impracticable because of the inadvertent gene transfer by various means explained earlier.
121. It may be noted that the US Food and Drug Administration does not approve of any GM crop as safe for human consumption.
122. European Parliament has asked for a ban on introduction of GM organisms and evaluation of the potential threats posed by the GM introduction.
123. Nobel laureate in medicine, Dr. George Wald out-rightly rejects GM technology saying that *“Recombinant DNA technology faces our Society with problems unprecedented not only in the history of science, but of life on Earth. It places in human hands the capacity to redesign living organisms, the products of three billion years of evolution. Such intervention must not be confused with previous intrusions upon the natural order of living organisms: animal and plant breedingAll the earlier procedures worked within single or closely related speciesOur morality up to now has been to go ahead without restriction to learn all that we can about nature. Restructuring nature was not part of the bargain. This direction may be not only unwise, but dangerous. Potentially, it could breed new animal and plant diseases, new sources of cancer, novel epidemics”*
124. Bypassing all these lessons, experiences and warnings, if we opt for GM crops, it amounts to consciously accepting a perennial disaster and evil. In

other words, we are deliberately destroying our own biodiversity and diversity of food, inviting unknown diseases, and pushing farmers to increasing financial burden and, causing irrevocable damage to our farming system evolved over millennia. Above all, ushering in GM crop is synonymous with ushering in multinational corporate bodies and prostrating the nation's food sovereignty at their feet. It certainly is an insult to the conscience of this great nation.

125. In case, the Government is adamant to introduce the GM crops forcefully with the backing of the proposed draconian bill (BRAI), depending totally on the unfounded claims of the multinational corporate bodies that the GM would be the solution for hunger and that it would not cause any negative impacts on agriculture, biodiversity, ecology, environment and health, while unmindful of all the deleterious impacts hitherto known and recorded, the Government must change Section 79 of the proposed bill which reads as “ No suit, prosecution, or other legal proceedings shall lie against the Central Government, the Authority and other bodies constituted under this Act or any officer of the Central government, or any member, Chief Regulatory Officers and other employees of such Authority and bodies or any other officer acting under this Act for anything which is in good faith done or intended to be done under this Act or the rules or regulations made thereunder.”

126. Although such provision is seen in certain Acts, the present case is totally different, because here the Bill is brought in knowing full well the adverse impacts of the GM crops, and that some of the top most scientists and, the citizens of this country have intimated the Government against it. Therefore, the action is done here not with good faith and hence, the officers responsible are liable to be punished. Section 79 may have to be amended as *“in the aftermath of the introduction of GM crop, if anything untoward happens, such as health problems caused by GM crop or food, loss of biodiversity, genetic contamination, poor yield compared to pre-GM period, negative impacts on environment and economic loss to the farmers due to GM crop, the officials involved in the introduction of GM crop, including the members and Chairman of the Biotechnology Regulatory Authority, its senior officials and the concerned Minister should be made responsible for it and given vigorous punishments”*

127. Whatever may be the punishment given to those who are responsible for the crime, it will not undo the damage done; as the damages are irreparable.

128. In the light of all these, it would be prudent for the nation to take a precautionary action: impose a moratorium on GM crops and food for the next 50 years. Let the world debate over it and come to a conclusion. Let us learn the impacts of GM in countries which have gone for it.
