BT BRINJAL IS UNDER 'LIFE SUPPORT': NO SUCCESS IN THE SECOND ROUND CULTIVATION

UBINIG, Bangladesh

Bt brinjal field cultivation has again failed to show its performance as a pesticide-free and profitable crop for the farmers in the second round. Four varieties of the controversial genetically modified eggplant known as Bt brinjal were given to 110 farmers in 19 districts through local offices of Bangladesh Agricultural Research Institute (BARI) and the Department of Agricultural Extension (DAE). UBINIG research team collected information from all the 19 districts and met 79 farmers to document their experiences. The evidences from the farmers prove that Bt brinjal has failed again in the second round field cultivation during 2014-2015. The field exercise failed to demonstrate a reasonable performance of the crop, the minimum that might graduate the technology for meaningfully scientific debate. It failed to prove any additional agronomic value to the farmer. The Bt brinjal promoters conducted the field cultivations violating precautionary scientific ethics, regulatory principles, directives from the Ministry of Environment and protests of farmer organizations and civil society. The second round field cultivation was done under more direct supervision of the promoter themselves (BARI and DAE officials) taking care like a patient in an intensive care unit under Life Support. In the modern and commercial medical care "Life Support" is being used to keep the dead persons 'alive' as long as the doctors and the relatives decide to accept the reality. Bt brinjal is a dead case; it is just kept under Life support waiting for a decision to stop it.

There are evidences that in the first round field cultivation in early 2014 with 20 farmers in 5 districts, the Bt brinjal promoters completely ignored the scientific precautionary ethics and international protocols and principles with regard to the release of GMOs in the environment, particularly in a biodiverse agro-ecological condition posing serious threat of bio-pollution and health hazards. The decision to increase in the number of farmers and the number of districts has no valid reason since the first round already showed a failure. No report on the field cultivation is publicly shared or available to discuss the findings, and the promoters did not clarify the issues and criticisms raised about the highly questionable field cultivation.

The second cultivation was not based on any request or demand from the farmers to get the saplings. In fact, the second round was in the field with newer farmers, who did not know anything about this technology, nor were at all aware of the debates and the experiences of the farmers who already incurred loss in the first round field cultivation. They were also unaware of the precautionary measures that must be taken to prevent potential biological pollution. The four varieties of Bt brinjal approved for field cultivation were Bt brinjal 1 (Uttara), Bt brinjal 2 (Kajla), Bt brinjal 3 (Nayantara) and Bt brinjal 4 (Ishwardi 006).

In the absence of a detailed report and explanation of the first round field cultivation the second round of field cultivation plan is based on false claims by the government and the ISAAA. The International Service for the Acquisition of Agri-biotech Applications [ISAAA Brief 47-2014] has given a report on the performance of Bt brinjal but there is no report published by BARI about the performance of first round of field cultivation. ISAAA without any basis considers the decision to approve the official release of four

genetically modified Bt brinjal for seed production and initial commercialization as a 'historic' decision. They create the history themselves.

BARI has been claiming about the advantages of cultivation of BARI Bt brinjal varieties that would bring economic benefits to the farmers and the country through (a) controlling the brinjal fruit & shoot borer (FSB), the main pest of brinjal in Bangladesh, which causes 50-70% damage to the brinjal fruit; (b) reducing the use of pesticides; and (c) reducing the cost of brinjal cultivation.

The selected farmers in the second round did not know about each other and had no connection. They were selected farmers because they were known to the Officials of Department of Agriculture Extension (DAE), were educated or were known as vegetable farmers. The selection process showed that Bt brinjal was given in the vegetable growing areas and to the vegetable growing farmers. This is an added risk for those areas.

UBINIG research team collected information from 79 farmers in 19 districts during 27 September to 9 October, 2015. The Bt brinjal plants were already harvested by March to April, having been in the field for 4 to 5 months.

In the field it was found that each farmer was given two Bt brinjal varieties mainly Bt brinjal 2 and Bt brinjal 3 along with control local or BARI developed varieties. The farmers in Jessore district complained that the Bt brinjal given to them was from a variety unfamiliar to them. This was Bt brinjal 2 (developed from Kajla local variety). Jessore farmers have been growing Chaga as a popular variety so the Bt brinjal that came out was not attractive to them. Same was the case with farmers in other areas. To the promoters, it is Bt brinjal 2 and they have no sensibility to the farmers' preferences and were just trying to cultivate the brinjal just as a mechanical product, disregarding farmer's choices and needs.

In the 19 districts visited, farmers in 13 districts received saplings from Bangladesh Agricultural Research Institution (BARI) and farmers in 11 districts received from the Department Agricultural Extension (DAE). However in 5 districts such as Chittagong, Meherpur, Kushtia, Pabna and Rangpur farmers received saplings/seeds both from BARI and DAE. In Meherpur and Kushtia, the farmers received saplings from On-Farm Research Department (OFRD) of BARI. In the districts such as Jessore, Pabna, Rangpur, Dinajpur and Chittagong BARI has regional research stations. At the same time in all the districts, there is Department of Agricultural Extension. Those districts which did not have BARI Research Stations, DAE took responsibility of distributing the saplings.

The selected farmers were given training after/before seed distribution ranging from 1 day to highest 4 days in the nearby Agricultural research centers. The training included land preparations, use of organic and inorganic fertilizers, the planting of the sapling by keeping recommended distance, use of pesticides, irrigation, fencing with net etc. The farmers were told that the officers will keep in touch with them.

During the field cultivation the farmers were extensively supervised by BARI and DAE officials. The DAE officials at Union, Upazila and district levels visited daily or at least weekly and supervised the growth of the plants. So in case of growth failures, the plants were replaced and also gave necessary advice to the farmers. According to the farmers, most of the time, the officials took care of the plants themselves as they had to show a good performance. This made the farmers inactive and they did not know the details of cultivation of Bt brinjal. They were also told that if any person or any journalist visits them for any information they should call them first and then answer. The UBINIG researchers had to wait sometime to get information as the farmer had to talk to an "official" before giving information.

However, besides the national level supervision by BARI scientists and officials, they were also supervised by some external agencies such as scientists from India, USA and Sudan. This happened mostly in the cases of Field Days or locally known as "*Math Dibosh*" observed to promote Bt brinjal. BARI Director General was accompanied by "foreigners" and was introduced to the farmers. At that time they knew that some of them were from USA, India and Sudan. The *Math Dibosh* was observed in almost all the districts and visits were made by the BARI and DAE officials along with foreigners on a regular basis. This means that the farmers alone could not carry out the cultivation and they needed intensive supervision, although it is a common vegetable except that it was not supposed to spray or use pesticides and was not supposed to be affected by FSB pest.

Fertilizer use exceeded recommendation guide

The farmers used fertilizers as recommended by the Deputy Agricultural Extension Officer (or the Block Supervisor) of Department of Agricultural Extension. The main fertilizers used were Cow dung, MoP, TSP, DAP, Urea, Zinc, Gypsum, Boron, oil cake, magnesium and even hormone. There was no particular reason given for the use of the fertilizers. However, it appeared from the field observation that Fertilizer Amendment as recommended by the Bangladesh Agricultural Research Council (BARC) vide Fertilizer Recommendation Guide – 2012 in Bangladesh (p.118) (www.barcaapps.gov.bd/documents/books/fertilizer recommendation guide - 2012.pdf) was not followed for cultivation of Bt brinjal varieties. No soil test was made in any of the Bt brinjal fields to assess the needs of kinds of fertilizers and the doses. A blanket dose for Nitrogen (N), Phosphorous (P), Potassium (K), Sulphur (S), Zinc (Zn) and Boron(B) for all the plots in addition magnesium was given for the two plots in Manikganj.

In the booklet distributed to farmers [*Bangladeshe Adhunik projuktir btbeguner jat udbhabon O utpadon projukti* by BARI, Gazipur, January, 2014, the recommended fertilizers are cow dung, urea, TSP and MOP.

Heavy doses of Pesticides in Bt brinjal

It is claimed by the promoters that Bt brinjal is pesticide free. The "***Poka bihin begun***" (no-pest brinjal) does not require use of pesticide for the most common pest called Fruit and Shoot Borer (FSB). In reality, the farmers had to use huge amount of pesticides recommended by the supervising authorities of BARI and DAE. These included Comfidor, Ektara, Admasar, Dithen M-45, Bavistin, Thiovit, Basudin, Furadan, Borax, Demsa granular, Vim powder, Admire, 200sl (Bayer crop science), Bleaching powder, Heckel, Salclox, Diazinon etc. There were many other Insecticides and Fungicide sprayed as provided by DAE.

In the booklet of BARI, organic pesticides such as Neem seeds, Neem oil, powder soap, Trix and chemical pesticides Malathion, Omite, Baviston were suggested for different pest/disease attacks.

In the second round field cultivation, pesticide use was more prominent than the first round. Different pesticides have been used in several times beginning from transplanting to growth, development, bearing and harvest of fruits. The major pests observed in the Bt brinjal field included virus, fungus, insect and mite. The virus infection included tulshi virus and mosaic virus. The fungi appeared as root rot, stem rot, wilting, leaf spot and fruit rot. The insect included aphid, leaf curling, whitefly, sucking insects, Fruit and shoot borer and many others. There was also infestation of red mite.

Thirty five types of pesticides including acaricide, insecticide and fungicide were sprayed several times in the Bt brinjal fields as per direction of the supervising officials.

Even banned insecticide were used

Five banned insecticides including Basudin, Bidrin, Darsbun, Diazinon and Furadan were used in different Bt brinjal fields. Thirty other pesticides used in Bt brinjal fields were not from the list of 76 pesticides recommended for brinjal crop production in Bangladesh (List of registered agricultural bio-pesticides and public health pesticides in Bangladesh, approved up to 65th pesticide technical advisory committee meeting). These banned insecticides were used in farmers' fields in Gaibandha, Kushtia, Manikganj, Mymensingh and Sherpur districts.

The most of common insects were aphid, whitefly and other sucking insects. There are many insecticides of lower toxicity recommended for these insects. Then why such highly toxic banned insecticides like Diazinon, Bidrin, Basudin, Furadan and Darsbun were used for Bt brinjal? Was it a pre-emptive strike against the attack of Fruit and shoot borer (*Leucinodes orbonalis*) or a desperate act of saving the crop from infection of Fruit and Shoot Borer (FSB)?

Interestingly the pre-emptive application of Basudin and Diazinon and spray of Darsbun after infestation of shoot borer, 2-3 times in the Bt brinjal fields were observed mostly in the fields of farmers in Sherpur district. Their fields were under constant supervision of the DAE, BARI and Indian experts. All the plant protection measures were taken as per the advice of the concerned scientist of BARI and the officers of DAE.

Bt brinjal has been created to be resistant to Fruit and shoot borer (*Leucinodes orbonalis*) commonly known as FSB. In the fields it was observed that insecticides were applied indiscriminately including those from the list of banned pesticides. It is an irony that the farmers were given signboards to show that Bt brinjal were pesticide free!

Poor performance of yield!

Bt brinjal was claimed to be profitable because the yield will be free from the loss from the FSB attacked brinjals. However, the yield performance was not according to the expectations of the farmers. There were as low as 10 kg of brinjals to 1.1 ton in the respective fields of the farmers.

Farmer Md. Abul Bashar in Jessore said that he had to incur cost of Tk. 25,000 for cultivating Bt brinjal in 22 decimal of land. He got over 1 ton, which he could sell only at Tk. 12000. The Net loss was Tk.13500. Farmer Md. Mosharraf Hossain spent Tk. 29,000, could sell only at Tk. 10000. Net loss was 19,000.

In Narsinghdi, Farmer Abul Hayat said: "*Crop was not at all good. Produced one maund of Kajla and three maunds of Nayantara variety of Bt brinjal. The farmer Abul Hayet incurred loss.*" But another farmer Abul Hossain in the same area said that he had good crop. Farmer Abul Hayat reacted to this information saying that Abul Hossain did not speak the truth. "his brinjal crop was also badly affected. He had lied to you because his close relative Dr. Asadullah is a scientist in the BARI. We cultivated Bt brinjal out of his patronization. If Abul Hossain now speaks the truth the onus of our loss will fall to Dr. Asadullah. In order to save Dr. Asadullah, he has narrated all that lies to you. On top of that the statement of the benefit that he mentioned was gained from cultivation of "Volanath" a local variety of brinjal cultivated after the damage of Bt brinjal crop by disease."

The farmers could not see any special benefit in cultivating Bt brinjal. On the other hand, the farmers in the nearby fields enjoyed better performances of their crops.

Marketing of Bt brinjal

Bt brinjals cultivated in the farmers' field were consumed by the farmers and also sold in the market. For consumption of Bt brinjals, the farmers were not told about any precaution or any potential hazards that might happen or should be noted by the farmers. For selling of the brinjals in the market they were only given a sign board that indicated that it was a "pesticide-free" brinjal. However, there were no separate selling of the Bt brinjals. So for consumers it was not possible to know which Bt brinjals were. In fact farmers found it difficult to sell Bt brinjal separately because it lost its freshness much more quickly than the normal brinjals. So for the farmers labeling was not in their interest which makes the consumers more at risk of not knowing which Bt brinjal is and which is not. The 79 farmers of Bt brinjals sold in 36 markets including the whole sale and open market.

With the increase in the number of districts, the threats are increasing particularly for the consumers because the Bt brinjals are being mixed with the normal brinjals. Consumers have no way to decide whether they want to consume the Bt brinjals separately; if they are "good for health" or "threat to health". This is also a clear violence of the Terms of approval and there has been no monitoring by the Ministry of Environment.

Most of the farmers consumed at home. Only in one case in Comilla they gave to the neighbors as well. But the taste of the brinjal was not liked by the farmers. However, for the scientists they can at least trace the farmers' families as those who consumed and can do some monitoring of health impacts.

The price of Bt brinjals has been very low as these could not attract the consumers by its look. The price range reported by the farmers is Tk. 2/kg to a maximum of Tk. 20/kg. The cost of production has been higher than the income received after selling of the brinjals. All the farmers could not give accurate estimates of the cost and income, but those who gave the following information.

In Jessore farmer Mintu Hossain, cost incurred in 22 decimal land was Tk. 25,000 and the income received was Tk. 12000 only, a net loss of Tk. 13500. In Narsingdi, farmer Abul Hayat incurred a loss of Tk. 15,000. Although government provided the inputs such as fertilizers, pesticides etc. free of cost, but yet the farmers had to spend money for land preparation, fencing and labor were incurred by farmers themselves. The net calculation of loss by farmers ranged between Tk. 15,000 to Tk. 30,000. In comparison they found that the fellow farmers cultivating local varieties could earn between Tk.70,000 to Tk. 100,000 from the same size of the field.

Farmers are not interested to grow Bt brinjal

The farmers in different districts did not know that Bt brinjal is a genetically modified brinjal. It was never explained to them. In some cases, farmers were given the saplings first and were given sign board with the name of Bt brinjal much later. They were given through some acquaintances, which they respected and took the saplings. They also found that the officials from DAE and BARI came regularly and supervised their plots. All inputs such as fertilizers, pesticides were given in kind by the DAE and BARI. But after the cultivation, marketing and consumption, the farmers were not at all attracted to this new 'variety' and gave different reasons for not cultivating Bt brinjal in future. One farmer in Jessore told Dr. Rafiqul Islam himself, when he visited his field on a Field Day that he would not grow Bt brinjal in future".

1. Farmers were given 'unfamiliar varieties" to their areas. In Jessore for example, Bt brinjal 2 (Kajla) and Bt brinjal 3 (Nayantara) are of blackish colour which is unfamiliar to the farmers of Jessore.

2. Economic losses due to lack of market demand and less price of Bt brinjals if they are sold separately.
3. Some farmers said that they may try to cultivate it if all inputs are given by the government. But farmers are not ready to spend their own money for its cultivation.
4. Many farmers said, "I will not cultivate Bt brinjal anymore and also tell other farmers not to cultivate it."
5. "It is like burning the finger, so others should keep themselves away from it".
6. "Bt brinjal is worthless crop. My money, land, labor and time were all wasted.; It is a bad experience".
7. Some farmers could not even have the experience of harvesting Bt brinjal because the plants died or the fruits fell before the harvest.
8. There were heavy infestation of whitefly and aphid in Bt brinjal and spraying of pesticides for control of pests. There were also need for regular spraying of fungicide and other insecticides.
9. The farmer in Comilla Muhammed Ali said: "*I was told that it was new variety of brinjal. The officers of Agriculture Extension did not tell me that it was Bt brinjal. After a few days of planting the DAE came with Bt brinjal field experiment sign board. I then asked them why you came to my field with an experiment. You should have done it in the land of the Agriculture Department. I told them I would not continue with something experimental. They requested me to continue with the crop. I complied with their request".*
10. Farmer in Pabna Shamsul Haque said: "I cultivated Bt brinjal with the hope of earning a good return. But in reality I have a big loss. The Agriculture officers assured me that there would be no insect infestation in Bt brinjal. The lease money of land was also promised to be given from the DAE. The DAE officers were right in their statement that there is no fruit borer in Bt brinjal. The fact is that there was no fruit in the plants of Bt brinjal. So there is no object for fruit borers to be there. My land is very fertile. I had lot of options for crops. I incurred a loss of about BDT 15-20 thousands. So I swear I shall not grow Bt brinjal in future"
11. Farmer in Pabna Babul Hossain said: I was told by the Agriculture officers that there would be no insect infestation and high yield of brinjal. The fact is just the reverse. There were many pests and little bearing of fruits. I have done whatever they advised. I used irrigation when they had asked, I applied fertilizer as they asked. I sprayed pesticides when they asked. But the result was just 'loss".
12. Few farmers said that they have saved the seeds and will try on their own to cultivate Bt brinjal to see if it grows. Pabna farmer Md. Almas Pramanik said: I have saved some seeds of Bt brinjal.
13. I shall grow it experimentally on my own. Based on the performance I shall decide whether to grow or not to grow in future.

Out of 79 farmers in different districts 58 (74%) farmers declared that due to incurring of loss they would not cultivate Bt brinjal anymore, and 16 (20%) farmers said they will do it only if the BARI or DAE provide all the support. Only one farmer showed interest to cultivate again.

We demand Bt brinjal cultivation must be discontinued because it is not economically viable, nor free from the use of pesticide

Bangladesh Agricultural Research Institution (BARI) and the Department of Agricultural Extension (DAE) tried all ways possible to make Bt brinjal field cultivation successful, but in two rounds it has shown nothing but miserable failures and most importantly it could not make brinjal cultivation free from pesticide use nor could it make it profitable crop. Bt brinjal project is based on false assumption, false information and false claims. Both the farmers and the consumers are becoming victims of such efforts to promote genetically modified crop in a biodiversity rich country like Bangladesh.

The approval for field cultivation was given by the National Committee on Biosafety, under the Ministry of Environment and Forest with 7 specific conditions to be fulfilled.

The first two conditions were to be filled by the authorities responsible for field cultivation of Bt brinjal before it was given to farmers. According to the Condition 3 of the approval there is a requirement for formation of a Field Biosafety Committee involving the concerned officer of the Department of Agriculture Extension, concerned scientists of the BARI Regional station, district and divisional level officers of the Ministry of Environment for Biosafety measures monitoring. BARI was supposed to propose the formation of the committee to the NCB. There was no such information available about the proposed committee. It is only the Agriculture Extension Officer who was looking after all aspects of production.

According to condition 5 the applicant institution and the concerned Ministry will have to take proper step on emergency basis in case there is any impact of Bt brinjal on account of environment and public health. The applicant institution will be responsible for any adverse impact on environment due to release of such technology. No such effort was seen on the ground.

According to the Condition 6 the proponent institution will take effective measure for labeling of Bt brinjal at the time of marketing. It was observed in the first round in Rangpur that Bt brinjal was being sold in the market along with normal local variety brinjals. The farmer was telling the customers that these were brinjal of the Government. There was no label indicating that those were genetically modified brinjal. In the second round, no labeling was there at the time of selling Bt brinjal. Out of seven conditions, at least four could be seen at the field for clear violations. (For details see 'Bt brinjals: Non-Compliance of Approval Terms')

The farmers were not involved in the cultivation but their fields and their names were being used to show that it was done by farmers. The consumers of Bt brinjals were not informed and no follow up health impact test was ever conducted. We demand the following:

1. The promoters including all stakeholders such as USAID, Cornell University and others directly or indirectly related in promoting GMOS in a biodiversity rich country must show the evidence that the first round field cultivation was successful and there are justification for a second round field cultivation. Mockery of science and manipulation of information must be stopped immediately. If there is no evidence and a credible public report that can be assessed and judged by both the scientists, civil societies and the farmers organizations desperately struggling to defend their environment, ecology and biodiversity and most importantly, the integrity and ethics of scientific research, any further move must be stopped and immediate measure must be taken to assess the damage already done in experimental areas.
2. If the first round cultivation was successful, the reason to drop the farmers of the first round in the second round cultivation must be explained. The first round farmers who did participate in the field cultivation must be compensated immediately for the economic loss they have incurred.
3. BARI with the GMO promoters must organize a public hearing on the issue and submit the first and second round report for public discussions.
4. To deal with the scientific, ethical and regulatory issues Government must include representative from civil societies, scientists not on the pay role of multinational or agencies and farmers organization in the Biosafety Committees at different level of decision making processes.
5. The government must publish a "White Paper" on the findings of the GM crop Bt brinjal to show incorporating the findings such as this report reflect balance and scientifically objective assessment of GMOs.