

# GM Food and Sustainable Development

Dr. Afrina Rizvi

Associate Professor, Dept. of Mass Communication, Aligarh Muslim University, Aligarh, UP-202002 India

**Abstract-** Global food production has seen a phenomenal growth of almost three times in the last five decades. Unfortunately, still a sizeable section of people in developing and poor countries remain hungry and malnourished. New strategies are therefore needed to not only feed the hungry in an healthy and nourishing way but also to protect the environment from overuse of chemical pesticides and insecticides, thus maintaining a balance with nature too. Advances in agricultural biotechnology have led to genetically modified varieties of many plants and crops like cotton, maize, soya, tomato, and brinjal etc. In India too, a genetically modified variety of cotton, Bt cotton has been cultivated since 2002, which is said to provide resistance against bollworm. However, commercial use of Bt brinjal, a genetically modified variety of brinjal, has been put on hold. In the present scenario role of mass media become vital. Mass media are important not only for giving the real picture behind the use of a particular technology; they can also provide relevant information necessary to make a judicious choice about the kind of food one wants to have. Keeping this in view, contents of major English dailies are analyzed both quantitatively and qualitatively to find out how recent controversies over genetically modified food and crops are framed by these newspapers.

**Index Terms-** GM Food, Sustainable development, Agricultural Biotechnology, Bt brinjal, English Dailies

## I. INTRODUCTION

Owing to advancement in agricultural science and technology, global food production has almost trebled in the last 50 years. This phenomenal rise has somehow managed to keep pace with growth in human population and with efficient distribution policies of food grains; most of the global population could be covered. However, unfortunately, still a sizeable section of people in developing and poor countries remain hungry and malnourished. New strategies are therefore needed to not only feed the hungry in an healthy and nourishing way but also to protect the environment from overuse of chemical pesticides and insecticides, thus maintaining a balance with nature too. In other words easily affordable, nutritious food produced in a sustainable manner is the need of the hour. At the same time the environmental degradation caused by use of modern agricultural methods has to be reversed, as soil damage, ample and continuous supply of water and energy and overall change in climate continue to pose challenges and uncertainties for the farmers.

Advances in agricultural biotechnology have led to genetically modified varieties of many plants and crops like cotton, maize, soya, tomato, and brinjal etc. The general term used for such genetically manipulated varieties is GMO's or

genetically modified organisms and in most cases an extra gene is added to give resistance from pest and insects to these plants and crops. In India too, a genetically modified variety of cotton, Bt cotton has been cultivated since 2002, which is said to provide resistance against bollworm. However, commercial use of Bt brinjal, a genetically modified variety of brinjal, claimed to provide resistance against pests like Brinjal Fruit and Shoot Borer (BFBS) and fruit borer, has been put on hold.

While environmentalists like Vandana Shiva term GM crops a threat to country's biodiversity and stress upon the need to promote organic farming for sustainable and natural growth of agriculture in the future, a large number of scientists in India and abroad still favour cultivation of GM crops in a controlled manner for an improved yield.

All this makes the field of Agri-biotechnology highly controversial. Undoubtedly this particular field of biotechnology offers immense potentialities not only in terms of developing high yielding varieties but also creating such varieties as Bt Cotton and Bt brinjal which are pest resistant thus likely to yield better crops and benefits to the farmers.

However whether these varieties are sustainable and conducive to the environment remains a million dollar question. The debate gets more heated when it comes to cultivation of genetically modified varieties in developing countries like India. Besides their highly doubtful environmentally sustainable nature GMO's pose other kinds of problems too. When it comes to the interests of the small farmers and their dependence on Multinational Companies for seeds besides high levels of irrigation required for such varieties, no ready solutions seem to be available. Also in the absence of strict regulations of labelling of GMO's in the market, consumers too are likely to feel confused or cheated when it comes to making a choice between buying GMO's, organic or regular varieties of fruits and vegetables.

As evident, the branch of agricultural biotechnology is highly interdisciplinary and industrially oriented and thus enjoys considerable socio-economic and political significance. Biotechnology and genetics as themes have dominated the mass media too for the last 20 years in most of the developed world. In India too recent controversy on Bt Brinjal has brought the theme on the agenda of the mass media. Mass media can be effectively used to make science related issues understandable and thus making the general public aware of such issues having societal importance. An enlightened and aware public can effectively participate in the decision-making on scientific matters having societal impacts. In India, as the reader public is largely dependent on newspapers for information regarding science and technology, this particular mass medium has immense possibilities of making the general people aware on such issues.

In India, Mr Jairam Ramesh, ex Minister of State for Environment and Forests, announced a moratorium on the

environmental release of Bt Brinjal, a genetically modified variety of brinjal, after a series of countrywide consultations. The Ministry of Environment and Forests organized public meetings on Bt brinjal in seven cities between January 13 to February 6, 2010. On February 9, 2010, Mr Jairam Ramesh announced his decision to put the use of Bt brinjal on hold. Brinjal is India's second largest produced vegetable after potato.

It has been established that producing GM food which is highly input intensive produces long-term environmental impact. Such requirements, as very high irrigation puts unsustainable demands on aquifers and damage to aquatic ecosystems. Moreover data suggests that using GM technology has benefited mostly big farmers with large lands and irrigation facilities. There are serious concerns like that of loss of biodiversity too. After green revolution, intensive cultivation of high-yielding varieties resulted in the loss of many wild varieties with higher nutritional levels.

Advances in genetically modified varieties are mostly driven by private multi-national companies and in developing countries too their commercial cultivation are governed by global market laws. Green Revolution on the other hand was financed by public sector bodies.

Out of 1.6 billion hectares of the cultivated land area which is about 12 per cent of world's land area, 80 per cent is dependent on rains for irrigation. This area is responsible for producing 60 per cent of the world's crop. For the rest of crop production there is a very heavy strain on natural sources of water like rivers, lakes and aquifers for irrigation. According to latest estimates, about 70 per cent of all water taken from naturally occurring sources is used for irrigating the crops.

In the present scenario role of mass media become vital. Mass media are important not only for giving the real picture behind the use of a particular technology; they can also provide relevant information necessary to make a judicious choice about the kind of food one wants to have.

Researchers suggest that portrayal of an issue by the mass media also known as framing plays an important role in the formation of public opinion. Media framing could be defined as the ways in which the media choose to portray the issues they cover. Framing analysis has established the fact that the media imparts a certain perspective, or a "spin" to the events that they cover and this in turn might influence public attitude on an issue. Framing analysis has been called the second level of agenda setting.

According to Tankard media frame is a central organizing idea for news content that supplies a context and suggests what the issue is through the use of election, emphasis, exclusion and elaboration. Mass media, it is argued, frame social phenomena 'by ignoring it, blurring the news in the back section, repeating or stressing' thus suggesting what to think about or provide a way of thinking. Another function associated with framing is the assigning of responsibility for social problems. Today issues like stem cells, cloning and GM food and crops remain highly controversial and biotechnology seems to be setting new political agendas worldwide. As mentioned earlier in India Bt cotton is still not viewed favorably by a considerable section of the society and more transparency is demanded into the functioning of Genetic Engineering Approval Committee (GEAC) now renamed Genetic Engineering Appraisal Committee when it comes to

introducing GM food and crops into the market. Doubts and questions have already been raised regarding the safety of GM foods, the labeling of GM consumer products and the environmental impacts of GM crops. The role of MNC's in the agricultural economy remains highly questionable and governmental policies are also under public scanner.

Keeping this in view, contents of major English dailies are analyzed both quantitatively and qualitatively to find out how recent controversies over genetically modified food and crops are framed by these newspapers.

News frames are defined as "conceptual tools which media and individuals rely on to convey, interpret and evaluate information" (Newman et al.1992). Although journalists can use a multitude of ways to frame the news, the literature seems to point to at least four ways in which news is commonly framed (Valkenberg et al, 1999):

By emphasizing conflict between parties or individuals (conflict frame)

By focusing on an individual as an example or by emphasizing emotions (human interest frame)

By attributing responsibility, crediting or blaming certain political institutions (responsibility frame)

By focusing on the economic consequences for the audience (economic consequences frame)

Bucchi and Mazzolini (2007) talk of presence of a marked dualism as far as coverage of science by the daily press between two distinct journalistic genres. They have named these two genres respectively as science-popularization (science-oriented public communication of science) and science-as-news (problem-oriented communication of science). According to them the genre of science popularization depicts science as straightforward, consensual, and as bringing improvements to peoples' lives. The other genre of science-as-news pays closer attention to controversy and to the harmful consequences of the scientific enterprise.

## II. OBJECTIVES

To analyze the coverage of major English dailies both quantitatively and qualitatively on genetically modified food and crops.

To find out the frequency of news on GM food and crops in major English dailies

To find out the placement and sources of news of GM food and crops.

To ascertain in what tones, context and perspectives GM foods and crops are covered by major newspapers in India.

To find out how recent controversy over genetically modified food and crops are framed by these newspapers.

To find out the roles played by different stakeholders during nationwide public consultations on commercialization of Bt brinjal.

To find out the role played by NGOs and social activists in promoting public participation on the issue of commercialization of Bt brinjal.

### III. METHODOLOGY

Content analysis both quantitative and qualitative is used to assess the coverage of debate on GM food and crops in two major English dailies. For this study two English broadsheet dailies, The Times of India and The Hindu are analyzed. These two newspapers are selected because of their high circulation and their different political alignments.

The Times of India with a circulation of 3.43 million is the largest circulated English newspapers in the world across all formats. Aligned as classical liberal, it has a readership of 7.03 million.

The Hindu, with a circulation of 1.46 million, is the second-largest circulated daily English newspaper in India after Times of India. A left of centre newspaper, it enjoys a readership of 2.15 million.

Coverage of recent controversy regarding GM food and crops after the approval of Bt Brinjal for commercial use by Genetic Engineering Approval Committee on October 14, 2009

was followed by countrywide consultations on this issue which finally resulted in the moratorium imposed by Minister of Environment and Forest, Mr Jairam Ramesh.

Contents of the two newspapers were searched and analysed with the help of computer with unit of analysis being words. Online versions of the two newspapers The Times of India and The Hindu were analysed for a period of one year i.e. from October 1, 2009 to September 30, 2010. News stories and editorials were selected on the basis of Headline information. All the news stories as well as editorials having the words “Bt brinjal” in either the headline or lead paragraph were selected.

News content of the two newspapers on Bt Brinjal were also analysed for their frequency, sources and placement. To find out how recent controversy over genetically modified food and crops are framed by these newspapers, news was coded in four commonly used framed by the journalists (conflict, human interest, responsibility and economic consequences).

#### *News Coverage of GM Food and Crops*

	<b>The Hindu (N=49)</b>	<b>The Times of India (N=47)</b>
<b>Front Page</b>	12	06
<b>Editorial</b>	01	06
<b>Source of News</b>		
(a) By-line	18	20
(b) Special Correspondent	14	-
(c) Agencies	03	-
(d) Staff Reporter	13	21
<b>Number of words</b>	15188	25151

*Framing of GM Food and Crops*

	<b>The Hindu (N=49)</b>	<b>The Times of India (N=47)</b>
<b>Conflict</b>	22	19
<b>Human Interest</b>	22	28
<b>Responsibility</b>	01	-
<b>Economic</b>	04	-

IV. FINDINGS AND DISCUSSION

While The Times of India enjoys a better coverage (number of words being much higher) number of stories is almost equal suggesting thus that in case of The Times of India, there are more detailed news items.

However, there are 12 front page news stories in The Hindu against 6 of The Times of India which shows more prominence being given by The Hindu to the coverage of GM food and crops. On the other hand interestingly, The Times of India carries six editorials against one of The Hindu. As far as sources of news are concerned, both the newspapers seem to rely on their own staff and networks, at the same time giving almost equal number of by-lines.

Columns in The Times of India are written by such people as activists, regular columnists and corporate.

Columns in The Times of India are written by such people as activists, regular columnists and corporate.

As far as framing of news on GM food and crops is concerned there is a marked difference. While The Times of India relies heavily on human interest frame with 28 out of its 47 news stories written in this particular frame, The Hindu is presenting news items in mainly two frames; conflict and human interest. Rest of the news stories in The Hindu are presented in responsibility and economic frame.

News stories written in human interest frame in both the newspapers raise such issues as nationalism, reliance on foreign firm at the cost of indigenous knowledge and loss of biodiversity apart from health concerns.

The Hindu being left of centre also raises the issue of dependence on Monsanto, an American seed giant for cultivation

of Bt brinjal. Mahyco, a subsidiary of Monsanto is responsible for distribution of Bt brinjal seeds in India.

News stories written in conflict frame show NGOs, farmers and social activists articulating their views against commercial cultivation of Bt brinjal. Authorities both scientific and political (ministers) are shown pitted against each other.

While the Agriculture Minister Mr. Sharad Pawar is all for Bt brinjal, Minister of Science, Technology and Earth Sciences supports the scientists but would not mind more field trials. Scientists such as Swaminathan, father of Green Revolution and Bhargava are openly against commercial use of Bt brinjal.

V. CONCLUSION

When it comes to covering controversies on science which by their very nature are political newspapers seem to be taking clear stands which become apparent from their editorials. Moreover importance of commercial introduction of Bt brinjal in Indian market has added further scope for debate.

- [1] Bucchi M, Mazzolini RG (2007) Big science, little news: Science coverage in the Italian daily press, 1946–1997. In: Bauer M, Bucchi M (eds) *Journalism, Science and Society: Science Communication between News and Public Relations*. New York: Routledge, pp. 53–70.
- [2] Gamson WA, Modigliani A (1989) Media discourse and public opinion on nuclear power: A constructionist approach. *American Journal of Sociology* 95: 1–37.
- [3] Iyengar S (1991) *Is Anyone Responsible? How Television Frames Political Issues*. Chicago: University of Chicago Press.
- [4] Fjæstad B (2007) Why journalists report science as they do. In: Bauer M, Bucchi M (eds) *Journalism, Science and Society: Science Communication between News and Public Relations*. New York: Routledge, pp. 123–131.
- [5] Goffman E (1974) *Frame Analysis*. New York: Free Press.

- [6] Gitlin T(1980) *The Whole World is Watching*. Berkeley: University of California Press.
- [7] Nisbet MC (2010) Knowledge into action: Framing the debates over climate change and poverty. In: D'Angelo P, Kuypers JA (eds) *Doing News Framing Analysis: Empirical and Theoretical Perspectives*. New York: Routledge, pp. 43–83.
- [8] Nissani M (1999) Media coverage of the greenhouse effect. *Population and Environment* 21 (September): 27–33.
- [9] Gamson WA (1992) *Talking Politics*. New York: Cambridge University Press.
- [10] Newman, W. R., Just, M.R., & Crigler, A. N. (1992). *Common knowledge: News and the construction of political meaning*. Chicago: University of Chicago Press.
- [11] Valkenburg, P. M., Semetko, H. A., & de Vreese, C. H. (1999). The effects of news frames on readers' thoughts and recall. *Communication Research*, 26, 550-569.

#### AUTHORS

**First Author** – Dr. Afrina Rizvi, Associate Professor, Dept. of Mass Communication, Aligarh Muslim University, Aligarh, UP-202002 India