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Science and Communication: A Comparative study of Bt. Brinjal Controversy with Agora, Greek (Greece)

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Abstract

With the Peoples Science Movement (PSM) in India, citizens have come out better organized. They acknowledged that knowledge is power and sought science, technology, and research to generate information that they could offer their children or grandchildren. Today, media has enabled citizens to access information previously stored in information warehouses or libraries. Today, the citizen's role has gone beyond spectatorship or consumption to the need to participate as a scientist, a man of knowledge with technical skills for survival. Using science and technology tools, people can now participate in decision-making processes and create community changes previously left only to experts. This study evaluates the controversy surrounding the BtBrinjal, which emerged in India in 2009, with the Modern Agora (forum, participation and interactivity). The study finds that the efforts carried out in bringing consensus followed the same path of an agora where citizens from all sections of society- media persons, politicians, farmers, scientists, and activists engaged in consultation under science and technology, were engaged for its closure- a model designed to enhance public acceptance of science and technology by policymakers in the country.

Keywords: Science and Technology, BtBrinjal, Agora, People's Science Movement.

Introduction

In India, western science sowed the seed of western thought through geological and botanical surveys by inaugurating Asiatic Society of Bengal in 1784. They further provided strength to it by establishing three universities at Bombay, Calcutta and Madras in 1854. The purpose was to understand local culture, and natural resources to get economic benefits out of it. In a way, this helped the citizens to become normative and to created intellectuals like Raja Ram Mohan Roy and Swami Vivekananda, who can understand science, to evaluate Hindutva ideologies and to remove superstations prevailing during that era. This initiated a new trend 'pizza effect'[1], which we come across very frequently even today also.

The history of science and technology in India reveals how modern designs built and influences the national and social life of every Indian citizen. The citizens become spectator to great acts of Big Science[2]. During emergency in 1975, Indian citizens came out better organised via Peoples Science Movements (PSM). Citizens began to recognize that knowledge is power and they no longer left only for delegating the tasks of research and development to the scientists, but want science and technology, research for their own communities, which can have provision of choices, and they can leave for their grandchildren.

"With the rise of the Internet, citizens now have access to information that was previously stored in information warehouses, large databases, or library catalogues. By using technologies such as geographic information systems, citizens can analyze the information they gather in new and dynamic ways. This information is being used to tackle a variety of community-based issues, from health services to urban planning and economic development. Citizens are using the tools of science and technology to create community change, and they are beginning to participate in decision-making processes on highly technical issues that were previously left to experts from universities or federal research laboratories"[3]. The time has arrived where citizen's role goes beyond spectatorship or consumption to the need of participation- citizen as a scientist, a man of knowledge, with technical skills for survival.

This paper tries to explore the controversy of BtBrinjalon the metaphor of Modern Agora[4] framework- the controversy, which emerged in India during 2009 and attempts to examine whether modern agora fits to it or not. The controversy of BtBrinjal is chosen for this study because many scholars have extensively researched it. However, examining it from Agora's perspective is a novel approach not been previously explored. The data for this study gathered through literature reviews.

Brief on theoretical frame work and its suitability

In ancient Greece, there was a concept of Agora, a word derived from the ancient verb 'ageiro' that means to gather to congregate and to assemble. In Modern Greece, it is a marketplace. It was the place of a market where citizens met for daily business of everyday life, and a place where philosophers

debated ethics. There was a separate place called 'Pnyx' hill- a law court where 'Boule' (council of 500 elected members) prescribed the agenda for the assembly- 'Ekklesia' (assembly of more than 6000 citizens) both met in the Agora. There was an equal right of speech in the assembly to all citizens. The Chairman, elected by the lot on the day of each new Ekklesia assembly, supervised the debate, conducted under the set rules with fines imposed on those that breached them. The role of Agora was to link the concept of citizenship and Agora as a space for meeting place for citizens of the community, a place for general public debate as such as an essential element in the organization and functioning of democracy[4]. This study evaluates the BtBrinjal controversy on three major criteria of Modern Agora- forum, participation and interactivity of Modern Agora.

Overview of sector, area, research problem

"Brinjal is the major vegetable crop in India and is vulnerable to many diseases caused by insects, pests, fungi, bacteria and viruses. Use of conventional chemical pesticides not only damages the environment, including the biotic and abiotic components, but also affects human health"[5]. The **BtBrinjal** is a transgenic Brinjal created by inserting a crystal protein gene from the soil bacterium 'Bacillus *thuringiensis'* into the genome of various Brinjal cultivars. These Brinjal plants are resistant to lepidopteran insects. It is produced by a technique of genetic engineering also known as recombinant DNA technology. BtBrinjal is the first genetically modified food crop in India that has reached the approval stage for commercialization.

In India during 2000-02, transformation and greenhouse breeding to study the growth, development and efficacy of BtBrinjal started, including field trials. In 2005-06, Ms. Aruna Rodrigues and others filed a Public Interest Litigation (PIL) suit in the Supreme Court of India requesting to stop the field trials due to the threat of contamination of non-GE crops by GE pollen and seed. However, meantime, large-scale field trials for the production of BtBrinjal started. Mahyco-Monsanto Biotech Ltd. submitted bio-safety data to the Genetic Engineering Approval Committee (GEAC) in May 2006, which approved in 2007. In June 2006, civil society questioned the GEAC on the need for BtBrinjal and raised issues concerning the Bt toxin, the inadequacy of the summary data and testing, and the lack of transparency in corporate research. In response, on 22 September 2006, the Supreme Court of India directed GEAC not to grant fresh approvals for any GE crop field trials until further court orders[6].

In February 2007, the Supreme Court requested the Ministry of Environment & Forests (MoEF) to appoint special invitees to GEAC and to seek stringent protocols, independent testing, and long-term studies on the chronic effects of GE food. On 25th August 2008, the GEAC released the BtBrinjal bio safety data on the MoEF website. In May 2008, thousands of citizens protested in New Delhi against BtBrinjal. They launched the 'I am no lab rat' campaign against BtBrinjal. A documentary film 'Poison on the Platter' launched in various cities of India[6].

On 9 February 2010, Mr. Shri Jairam Ramesh, the then Minister of Environment & Forests, Government of India, declared a moratorium on BtBrinjal stating, "It is my duty to adopt a cautious, precautionary principle-based approach and impose a moratorium on the release of BtBrinjal till such time independent scientific studies establish, to the satisfaction of both the public and professionals, the safety of the product from the point of view of its long-term impact on human health and environment, including the rich genetic wealth existing in Brinjal in our country"[6]. In August 2013, the Indian Parliamentary Standing Committee on Agriculture released "Cultivation of Genetically Modified Crops—Prospects and Effects" and recommended investigating the approval process of BtBrinjal and halting all field trials of GE crops in the country.

The paper identifies and focuses on the process adopted by the Minister of State for Environment and Forests (MoEF), Government of India, to carry out national wised consultations during January and February of 2010. There are very few cases where the Indian government has decided to seek nationwide consultation for an agricultural product, and that is when every citizen actively participated during the green revolution. This could be the impact of the previous (anti) People's Science Movements. Some of the science movements, which occurred near the period of the BtBrinjal Controversy, were the movement in India for Nuclear Disarmament (MIND) during 1998, India Catholic Students Federation, the National Fish Workers Forum, Goa during 1993 and Kinara Bachao Samiti (KBS) and Umbargaon Taluka Bandar Hatao Sangharsh Samiti (UTBHSS) movement in Gujarat during 1999. These citizen science movements compelled the governments to reconsider their decision or to drop the project.

Movement in India for Nuclear Disarmament (MIND) started just a month after the nuclear weapon test of May 11 and 13, 1998. The government declared India a nuclear weapon power country. It escalated the arms race in the subcontinent and increased nuclear insecurities all around. MIND's critique was on the environmental and social cost of the nuclear energy project and lobbying for policy and social change at the domestic and international level and a move towards global disarmament[7].

In Goa, even though in Goa, there were incidences of more than 50 fishermen's deaths due to the attack from mechanized boats during 1970-85, the Indian government continued awarding licenses to foreign trawlers for fishing in Indian water. The India Catholic Students Federation, the National Fish Workers Forum, Goa, agitated against this via the People's Science Movement. After a long struggle, in June 1993, the Supreme Court of India finally banned monsoon trawling in Goa[8].

In Gujarat, farmers went against the port and industrial projects under the Special Economic Zone (SEZ) in Umargaon in south Gujarat during 1999 and in 2001, at Positra in Saurashtra. The local people, fisher folk and farmers were alarmed when some received notices from the state government to acquire their land for the proposed project to build a port in Umargoan. They formed village committees called Kinara Bachao Samiti (KBS) and Umbargaon Taluka Bandar Hatao Sangharsh Samiti (UTBHSS). The agitations continued for 15 months. Both cases went to the court. As a result, in 2012, the court banned the development activities at Positra, whereas at Umargaon, the project was on halt until the final decision arrived by the court.

In all three cases, people's engagement with science was missing. The citizens were compelled to agitate against the government through 'Andolans'. A court or an international platform was seen as a place for an appropriate closure. Consideration of a nationwide consultation on BtBinjal by the government might be a result of these experiences and therefore decided to engage the public under the issue of BtBinjal and beyond a consumer. It was a surprise to citizens because even though the Genetic Engineering Approval Committee (GEAC) cleared BtBrinjal as a commercial crop in October 2009, the government still decided to seek the opinion of citizens by ruling the typical deficit model of science communication of the Indian Government.

An extensive consultation process occurred. "More than 9,000 written submissions, some of them of book length, were presented to the minister. Wider deliberation through media and other informal public events occurred in parallel with the official consultations as fallout, besides the public opinion solicited by the MoEF through email"[9]. One can say that the government attempted at most to involve citizens from all fields like industry, civic society, scientists, farmers, and politicians and lay experts. The results of these consultations can be summarized as; i. BtBringal is beneficial to farmers because it is insect resistant, increases yields, and is more cost-effective and will have minimal environmental impact. ii. The production and use of BtBrinjal can cause possible adverse impacts on human health and bio-safety, livelihoods and biodiversity. iii. Growth of BtBrinjal was seen as becoming a problematic weed in future.

Civil society was outraged against the government ranging from engaging parliamentarians, submissions to ministries, inputs to policy, membership of Committees, legal action as well as street demonstrations, militant physical action like burning GM crops on trial plots and alike. Even though the issue involved genetic engineering and biotechnology in agriculture, MoEF clarified that, its concerns are "limited to what to do with the GEAC recommendation on the commercialization of BtBrinjal and not with the larger issue of genetic engineering and biotechnology in agriculture"[9].

Evaluation BtBrinjal on the characteristics of Modern Agora

Forum: For this study, when the controversy of BtBrinjal applied to the characteristics of Modern Agora, the study finds that both physical and virtual space was provided to the participants while discussing the issues of BtBrinjal. The MoEF created the physical space through direct interaction and consultations and virtual space created by the media and the internet. The condition of Modern Agora- direct physical or virtual space, to the participants, was satisfied. In Modern Agora, the forum has defined physical or virtual space for discussion.

The primary objective of this nationwide consultation was on the 'commercialization of BtBrinjal' as clarified by the MoEF, but as mentioned by Jayram Ramesh, there were various related issues like health, animal, biosafety and environment associated with it. In a way, it was clear that the issue of BtBrinjal was not solely based on the commercialization of BtBrinjal but also on other aspects closely related to society. This characteristic of Bt. Brinjal's forum satisfies the condition of Modern Agora, which mentions that the forum is formed primarily, but not solely on a single issue-based.

With the court's intervention, the whole process was halted for the next two planting seasons. BtBrinjal was an agricultural issue in a country where more than 60% of the population depends on agriculture. This agenda was a boom for the Indian economy and to draw political mileage by the government since India has the second largest population in the world- a place with large consumers. One can easily make this when "Jairam Ramesh, the then minister of MoEF, initiated public consultations in seven cities across the country during the months of January and February 2010"[9]. Similar to Modern Agora, where the forum meets on issue-based debate linked to political decisions and for making agenda.

Participation: Citizens from all sections of society—media persons, politicians, farmers, scientists, and activists—were given equal opportunity to question or challenge the speakers, to the extent that then Dr. Ramadoss, Health and Family Welfare Minister, publicly opposed GE crops, specifically the BtBrinjal, which is again a characteristic of the forum of Modern Agora under which the participants have equal rights and opportunities to speak.

The shared values and norms among the participants were seen when the civil society showed their agitation, politicians came out in favour of BtBrinjal, the scientists had differences of opinion among them, and the media started educating the society through films. Some activists even stopped the commercialization of BtBrinjal seed during the food festivals held during 2008-2209 around the country, drawing thousands of people[6]. This shows that the participants not only shared common values on the BtBrinjal but also had informal control

over the activities carried across the nation against the government on the issue of BtBrinjal as of Modern Agora.

Interactivity: When GEAC released its summary of Biosafety data on BtBrinjal in June 2006, the civil society questioned its inadequacy in testing and transparency. In August 2006, GEAC decided to constitute a committee Chaired by Dr. Deepak Pental. Civil society again objected to the appointment of Dr. Pentalas as a Chair, and subsequently, he withdrew from the Chair's position. Side by side, in October 2006, an independent expert committee was formed by civil society to investigate the issue of bio-safety regarding Bt Brinjal. This committee found that the GEAC report lacked independent sampling scrutiny, breached protocols, had issues with animal feeding studies, and failed to compare Bt Brinjal's efficacies.

In January 2009, GEAC once again constituted an expert committee. The committee declared that BtBrinjal was safe for environmental release. A huge outrage carried out by civil society against this, and as a result, the Minister decided to put the report up on the Ministry's website for public feedback and to hold a series of public consultations to decide on the 'public and national interest'. This series of incidents clearly defines that there were opportunities available with each participant to share their views during which they could question the government's speaker and even challenge the speaker through scientific evidence as Modern Agora's characteristics. This shows that the debate has refined day-by-day and is confined to some specific aspects of BtBrinjal, sharing an indirect norm on the debate among the members of various sections of civil society. This characteristic once again falls in line with the interactivity process of Modern Agora.

Conclusion

After evaluating the issue of BtBrinjal on the modern Agora characteristics, the study finds that it fits in as Modern Agora except here due to Information Technology- media and the internet (email), it cannot be ensured that whether children, adolescents and women participated during the consultation process or not. The business was BtBrinjal. The Ekklesia consisted of citizens from media, industries, laboratories, agriculture, politics, and lay experts. The Pnyz was the supreme court of India. The Demos participated physically by attending interactive sessions and virtually through postcards, media and emails. Since the democratic government constitutes the Supreme Court, it can be considered that the Chairperson of this Ekklessia was the Supreme Court was nominated by the Demos. The only difference here is that the rules were set not by the participants but by the Supreme authority, a top-down approach rather than a bottom-up approach. All Demos were given equal opportunity to participate, speak, and share their opinion. The Indian government has implemented the Right to Information Act, which has created more and more agoras where people are engaged in science and technology from its inception to its implementation. This has increased the public gauge and social acceptance of technology and has forced the government to share scientific assessment reports or reports of expert committees on technologies in the public domain, inviting public comments on the project to the government's decision.

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