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Media and Science in Disaster Contexts: Deliberations on Earthquakes in the Regional Press in Kerala, India*

Shiju Sam Varughese[†]

The close coupling between media and science becomes predominant in the context of public controversies over science during disasters like earthquakes. The paper discusses some crucial aspects of this dynamic by investigating the role of regional press in Kerala, India, in initiating and maintaining a public controversy over a series of micro earthquakes in 2001 amidst growing public skepticism over the competence of Earth Science to convincingly explain the phenomenon. The press employed various strategies to challenge the official scientific explanation of the phenomenon and broke open the ground for a spectrum of alternative interpretations and critical interventions, affirming greater public participation in science. Most of the experts continued to downplay the concerns raised by the media, but closure was attained when a lesser-known team of experts convincingly interpreted the geological events while participating in the deliberations. The paper analyses how the media played a crucial role in revealing and enhancing the entanglement of science with diverse actors and institutions during the controversy.

Science and the media are two important social institutions that shape contemporary social processes. Weingart (2002) points out that there is a loss of distance between the two, with serious impacts on knowledge production. “With the growing importance of the media in shaping public opinion, conscience and perception on the one hand and a growing dependence of science on scarce resources and thus on public acceptance on the other, science [becomes] increasingly media oriented” (Weingart 1998, 872). According to Hagendijk (2004), the regulation of our social world cannot completely be left to the experts because of increased participation in the regulatory process demanded by the public. The media often acts as a whistle blower attracting our attention to the problems involved in the regulation of our social world. Thus, the media has a crucial role today in linking the public with science.

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Public controversies over science offer a unique chance to observe the internal dynamics of scientific knowledge production and its entanglement with other social institutions (Wynne 1995), especially the media. The intertwining of science and the media becomes highly significant and interesting in the context of a fast erosion of public trust in science in post-disaster scenarios as showcased by the damage to Fukushima nuclear reactor in Japan after the massive 2011 earthquake and tsunami. The global media attention on the case was crucial in mobilizing public concern over the viability of nuclear power projects and challenging the attempt of the Japanese state and the nuclear science establishment to hide crucial information about, and the magnitude of, the disaster from public scrutiny. The involvement of the media in public engagement with science in a similar context will be explored here to throw light on some crucial aspects of this dynamic. This paper analyzes the role of regional press in Kerala, the southernmost state of India, in initiating and maintaining a public controversy over a series of micro earthquakes that brought to the fore the public skepticism over the competence of the earth sciences to convincingly explain the phenomenon and address the questions raised by the public.

The regional press in Kerala has great influence on the shaping of public opinion, as evidenced by the historical evolution of the institution. A strong newspaper reading culture still exists in the state, which was initiated through the efforts of the social reform movements and the nationalist movement in the early twentieth century. The exponential growth of the print media in the 1970s with the advent of new printing technologies catalyzed its expansion (Jeffrey 2000). The print media is growing even today in tandem with the television channels (Kunhikrishnan 2006, 32). Access to the internet is limited to the educated middle class, and newspapers still maintain their status as the prime medium of mass communication. The high rate of literacy in Kerala is also a major reason behind this.

The collapse of public trust in the state sponsored Science & Technology-oriented developmentalism during the Nehruvian era in India in the 1970s exacerbated the disenchantment with science (Raina 1997), which was also reflected in Kerala. The presence of a strong people's science movement like *Kerala Sastra Sahitya Parishad* (KSSP) catalyzed the creation of a strong culture of critical engagement with science. Public controversies over science that erupted through the regional press have thus become a common phenomenon in Kerala since then.¹ By following a controversy over earthquakes in 2001 through the five regional newspapers that are the largest in readership (*Malayala Manorama*, *Mathrubhumi*, *Madhyamam*, *Deshabhmani*, and *Kerala Kaumudi*), I will explore how the press contributed in shaping public attitude towards science

¹ A pilot survey conducted by me showed that there were forty two public controversies over science appeared in the regional press between 1990 and 2004.

in the region while exploring the major characteristics of this process, with an objective to underscore the implications of this for contemporary science in the post-Fukushima phase.

The controversy began when an earthquake of magnitude five on the Richter scale struck Kerala on December 12th, 2000, followed by another with a lower intensity on January 7th, 2001. These tremors raised great public alarm when they catalyzed fear about the possibility of a massive earthquake due to the persistence of micro-tremors reported from various parts of the state. The experts who are working in the earth sciences and related disciplines, however, did not see any threat from the tremors. The Centre for Earth Science Studies (CESS), Thiruvananthapuram, one of the prestigious government funded institutions in the region responsible for providing scientific explanations to similar geological phenomena, considered Kerala to be less seismically vulnerable based on their research on the tectonic structure of the region.

The CESS rejected any possibility of a looming catastrophe, leading to a controversy over the seismic vulnerability of the region. The newspapers interviewed scientists from national institutes who were considered as of higher epistemic authority by the public, and presented their opinions as alternative explanations. The *Malayala Manorama* and *Kerala Kaumudi* (8 January 2001, 1) pointed out that the argument of CESS remains negated as the recent studies carried out by national institutes revealed the presence of lineaments (fault lines) in the region. *Mathrubhumi* (8 January 2001, 1) quoted Dr. S.K. Srivastava of the Indian Meteorological Department (IMD), proposing that the tremors indicated the appearance of new fault lines in the Idukki zone of the region.² The newspaper also quoted Dr. B.K. Rastogi of the National Geophysical Research Institute (NGRI, Hyderabad) as suggesting that new tremors may follow.

The possible presence of lineaments and the probability of a devastating earthquake became a key topic of public deliberation in the following days. The newspapers continued to approach CESS for further explanations and published their opinion in the form of interviews and popular scientific essays. The journalistic reports appeared separately and this strategy helped the newspapers to create an impression that the scientific explanations were objectively reported. However, the news reports often contrasted the views of individual scientists to create an impression among the readers that there were ambivalences and ambiguities regarding the scientific understanding of the phenomenon.

The loss of trust in experts was aggravated by the continued occurrence of repeated tremors. The CESS scientists continued to argue that those were nothing but “after shocks” (*Deshabhimani*, 10 January 2001, 6; *Kerala Kaumudi*, 12 January 2001, 1), which was challenged by the regional press, employing three different

² The high ranges of Western Ghats passes through the Idukki district. There are fourteen dams in the district which always raised the fear of Reservoir Induced Seismicity (RIS).

strategies. The first involved a direct attack on the expertise of the scientists. The “Letters to the Editor” column turned out to be a crucial site of criticism, as it provided the newspapers with an opportunity to experiment with several alternative hypotheses and explanations.³ In a similar letter (*Mathrubhumi*, 13 January 2001, 4), the reader, who identified himself as a scientist who commenced his career in the CESS, criticized the scientists of the institute for their neglect of and incompetence in studying the tectonic structure of the region. Similar letters appeared in other newspapers as well. This strategy was not restricted to the letters to the editor only; *Deshabhimani* (10 January 2001, 6), for instance, pointed out that scientists at the CESS were capable of undertaking only a preliminary analysis and thus there was great discrepancy in their explanations. The public discontentment with and distrust of the scientific capabilities of CESS were explicitly articulated in these letters.

Secondly, newspapers began questioning the argument of the scientists that earthquakes cannot be predicted. The *Mathrubhumi* (8 January 2001, 4) suggested that the foreshocks, development of cracks in the rocks, presence of certain minerals and radon gas in the ground water, color change and the sudden rise and fall in water levels in wells could serve as indicators of earthquakes and also that geomagnetic changes and peculiar behavior of animals and birds that occur before an earthquake are well-known earthquake warnings. *Deshabhimani* (16 January 2001, 5) brought to public attention the successful earthquake prediction attempts of Chinese scientists based on animal and bird behavior. Both reports emphasized the unwillingness of experts to take into consideration the warnings of citizens regarding the micro changes in their locality just before the earthquake, which led to the failure in prediction.

The third strategy involved a conscious effort on the part of the press to report similar incidents of earthquakes from various parts of the world, further amplifying the fear of a looming disaster. They passionately reported even very small episodes of vibrations and related phenomena from every nook and corner of the state. All the newspapers gave great importance to a parallel incident of earthquake in El Salvador and Guatemala that claimed the lives of hundreds of people, and also another one in Japan.⁴

Amidst the height of public criticism and eroding trust, the CESS scientists continued with their standpoint that there was little chance for a major earthquake in the region. But the totally unexpected and massive earthquake of magnitude 6.9 on the Richter scale that killed more than 17,000 people in Gujarat, in western India, on January 26, 2001 was a great blow to the scientists. The regional press in Kerala covered the impact of the disaster widely and linked the event to the

³ The column is often used by the newspaper to give space to the discarded voices omitted from other news genres (Richardson and Franklin 2003, 184).

⁴ See the news reports on 15, 16, and 17 January 2001.

ongoing debate in Kerala. The occurrence of low intensity tremors in Gujarat one month prior to the massive earthquake was pointed out and the scientists were criticized for ignoring it. The recurrent instances of tremors in Kerala were alluded to be of a similar nature. In his letters to *Mathrubhumi* (5 February 2001, 4) and *Kerala Kaumudi* (6 February 2001, 4), a reader critiqued Indian scientists for discarding the possibility of prediction and demanded more serious research in this direction. In short, the newspapers were attempting to voice the public's fear regarding the possibility of a major disaster in Kerala similar to Gujarat by carefully constructing a catastrophe discourse, involving scientists and nonscientists in the deliberation.

The Gujarat earthquake created a legitimate backdrop for discussing larger issues about the tectonic structure of Indian peninsula in relation to the tremors in Kerala, and the press provided deliberative space for multiple voices, mixing up science with "nonscience." The newspapers published nonscientific and fringe theories, challenging the expert authority and acknowledging the nonscientists who maneuvered with scientific language and resources to devise alternative theories to circumvent the epistemological crisis. The claim of an Indian scientist about developing a technique to predict earthquakes accurately by following changes in "sunspot activity" based on images from NASA was debated (*Malayala Manorama*, 29 January 2001, 3). The *Madhyamam* (4 February 2001, 12) reported the "electro-magnetic theory" of P.N. Nair, who had been studying the emission of "electrons" in the atmosphere from the earth's core during periods of increased tectonic movements. A reader in his letter to the editor emphasized the lunar influence on tectonic activity (*Mathrubhumi*, 3 February 2001, 4). He found that eighty percent of the tremors appeared around full moon or new moon days. Another reader proposed a causal relationship between experimental nuclear explosions and earthquakes (*Deshabhimani*, 2 February 2001, 4). These alternative explanations introduce "an epistemological cross-space" between scientific and popular cultures (Levina 2009, 109). The importance being given to alternative science in the newspapers indicates that the experts from scientific institutions are not considered as having higher epistemic authority than other actors. Instead, experts have been invited to participate in public deliberations which generated a larger set of information and expertise than those that are utilized within the earth sciences.

At this juncture, well collapses began to be reported from various parts of the state, but experts did not pay much attention to the phenomenon. The CESS scientists consoled the public by explaining the phenomenon as caused by harmless "seismic seizures" in the post-earthquake period (*Malayala Manorama*, 1 February 2001, 9). The pervasiveness of the phenomenon created new problems for them when the local public demanded their visit to sites of well collapses for expert opinion. In several instances, the local public entered into heated arguments with experts, challenging the explanations being offered.

The public criticism of the lack of convincing explanation to the phenomena forced the government to appoint a research team comprising experts from various regional institutes led by CESS with the aim of obtaining closure to the controversy. The research team submitted their report to the government, substantiating the argument that the phenomenon was not earthquake related, but caused by the ground water pressure on the walls of the wells during the monsoon in June (*Malayala Manorama*, 21 June 2001, 9). The report's legitimacy was challenged when the conclusions from a parallel independent study by a team of scientists from the Kerala State Groundwater Department (KSGD)⁵ appeared in the press. The study proposed that the well collapses were initiated by tectonic vibrations in the earth's crust after the Gujarat earthquake and the groundwater pressure (*Mathrubhumi*, 7 July 2001, 1). This triggered deliberations leading to the formation of alliances among the regional scientists, divulging the internal tensions and ambivalences of science into full public view. The CESS director denied any possible relationship between earthquakes and well collapses, stating that not a single tremor had been reported from the region when the well collapses occurred (*Deshabhimani*, 24 July 2001, 12). The pros and cons were deliberated and the explanation provided by the KSGD scientists substantiated the fear of the public regarding the possible link the regional phenomena had with the Gujarat earthquake. The press and the public largely supported KSGD, a scientific institution with comparatively lesser epistemic authority in the public imagination. The formation of an "ethno-epistemic assemblage,"⁶ aligning a wide array of actors including the KSGD scientists against another assemblage formed around the CESS scientists, became more visible in the following days. The former gradually emerged as more powerful, leading to the closure of the controversy with the timely intervention of newspapers. Amidst heated public debates, *Malayala Manorama* went a step ahead by appointing its own research team comprising two nationally reputed scientists⁷ from outside the region for a second opinion, and they also confirmed the findings of the KSGD team (*Malayala Manorama*, 17 August 2001, 16). The role of *Mathrubhumi* also was crucial in attaining closure when it published the technical report of KSGD research team as a long article authored by the Coordinator of the research team (*Mathrubhumi Varanthappathippu*, 30 September 2001, ii). Thus the press played a proactive role in ending the epistemological crisis through the enunciation of a new ethno-epistemic assemblage that challenged the authority of state-sponsored science.

⁵ It is interesting to note that KSGD had representation in the official research team.

⁶ Irwin and Michael argue that the relationship between science and publics exists as alliances or assemblages which are "ethno-epistemic" in character. "By this term, we mean that they are locally situated, have [sic] more or less well-delineated identities ... and are, crucially involved in the 'establishment' of knowledge and the production of knowledge claims" (2003, 85).

⁷ They were Dr. Janardhan G. Negi (NGRI, Hyderabad) and Dr. Arun Bapat, a seismologist.

Controversies of this kind defy the conventional view that the media distort scientific explanations and confuse the public during disasters. The case we have discussed reveals a more complex dynamics. By contrasting scientific explanations from different institutional and disciplinary locations, the media open up the black box of science and disclose the internal tensions and ambivalences of knowledge production. This does not however imply that the debate in the media is non-beneficial to the scientists: public controversies provide a deliberative space for them to engage with a wide range of experts and nonscientists. One of the reasons behind the public acceptance of the propositions of the KSGD scientists was their willingness to engage with the questions raised and arguments floated in public. The media also creates a “trading zone” where the boundary between science and nonscience is blurred and the scientific language is accessed by various actors in their attempt to propose alternative theories. Formation of different ethno-epistemic assemblages is catalyzed by media, tearing apart singularities and fixed oppositions. The controversies staged by the media thus relocate science as a socially embedded entity beyond its positivist and authoritarian self image, revealing and enhancing its entanglement with diverse actors and institutions, initiating its democratization.

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