Indian and Pakistani nuclear ambitions: another barrier to effective earthquake relief

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The massive earthquake that devastated parts of Kashmir on Saturday, October 8, 2005, has revealed not only the incompetence and callousness of Indian and Pakistani authorities towards the victims but also a critical deficiency in the collection and usage of accurate spatial earthquake data that, if corrected, could provide critical information in mounting effective post-earthquake relief operations.

The Indian government has deliberately prohibited the country's seismic network maintained by the Indian Meteorological Department (IMD) from joining the Global Seismic Network (GSN). Such membership would have provided real-time data to Indian scientists to rapidly determine the immediate impact and probable spatial distribution of damage from the earthquake.

The Indian government has stayed out of the GSN because that network also serves as a monitoring system for the 1996 Comprehensive Test Ban Treaty (CTBT) that prohibits atmospheric, underground and underwater testing of nuclear weapons by the signatory states.

Pakistan and India have both shunned the treaty, as their ruling elites wish to utilize the development of nuclear weapons to enhance geopolitical status, to whip up national chauvinism among petty-bourgeois elements, and to politically divert the masses away from the appalling social realities in both countries.

Determining the geographical impact of the earthquake by other methods, such as by aerial surveys, is time-consuming and valuable time can be lost before the commencement of relief operations.

When earthquakes occur near a country's boundaries like the recent one in Kashmir, real-time data from at least three seismographs are essential in locating the earthquake's epicenter (a point on the earth's surface directly above the underground epifocal point where the earthquake originates). The determination of the epicenter, in turn, can lead to the production of ground-shaking intensity maps, which have played a crucial role in speeding aid to the victims.

The potential of such maps for saving lives and for relieving suffering can be gleaned from the color-coded map of probable ground-vibration-severity, shown in a graphic on U.S. Geological Survey Fact Sheet 097-95. This map http://geopubs.wr.usgs.gov/fact-sheet/fs097-95/ was produced by scientists of United States Geological Survey (USGS) and other institutions in the immediate aftermath of the 1994 Northridge earthquake in Southern California and made available to various government and relief agencies within hours of the disaster. If such maps had been generated and used in the aftermath of the Kashmir earthquake, thousands of victims could have been saved.

The handicap imposed on Indian scientists in assessing the various parameters of the Kashmir earthquakes was reported October 9 on the web site of a major English-language Indian newspaper, the *Hindu*.

In an article headlined "Experts Handicapped in Getting Assessments," the newspaper reported that the "Union Minister for Science and Technology Kapil Sibal is considering to move a proposal in the Cabinet to reevaluate India's stand against joining international seismic networks. *This is with a view to avoiding problems such as the ones faced by seismologists on Saturday while assessing the magnitude, location and other parameters of the earthquake that hit Muzaffarabad in Pakistan-occupied Kashmir*" (emphasis added).

Despite India being home to a large number of well-qualified scientists and engineers, the Science and Development Network web site in a January 2005 post-tsunami article reported the neglect of earth sciences in India. It pointed to a qualitative and quantitative deficiency of scientists in the disciplines of geophysics, geology, seismology and atmospheric science, notwithstanding the fact that the country is located in the

midst of one of the most seismically active regions on earth.

This has to be contrasted with government funding of space-related activities—directly benefiting its military ambitions—that has created both the educational infrastructure and a sizeable pool of specialists to support such activities.

If India is deemed deficient in earth sciences, it can safely be assumed that the situation in Pakistan, ruled by a succession of notoriously backward ruling elites, is nothing short of disastrous.

Successive Pakistani governments have channeled most of the country's resources towards the military and encouraged the hold of religion on the society at the expense of education and science. While a quarter of the country's annual budget is consumed by the military and an astounding half for servicing debts, only about 2 percent of the annual budget is spent on education. Even in India, close to 60 percent of the annual budget is consumed by debt and the military.

Additionally, in both countries, the engineering of buildings to withstand earthquakes is next to nonexistent as authorities do not bother to enforce building codes and/or take bribes, despite the fact that tens of millions of people have been severely impacted over the decades.

The poisoned political relations between the Indian and Pakistani governments have created great impediments to cooperation between the two countries' scientific communities that is so essential in monitoring and studying earthquakes.

India, being the stronger and larger of the two rivals, generally determines the political behavior of Pakistan at least with respect to nuclear weapons and, as a result, Pakistan insists that it will only sign the CTBT if India does so too.

The CTBT regime requires the erection of an International Monitoring System (IMS) comprising a global primary and auxiliary seismic network that would record seismic waveforms, a radio-nuclide monitoring network to collect atmospheric emissions of nuclear explosions, a hydro-acoustic network to record waves through water, an infrasound network that records very low frequency sound waves, and on-site inspections. Among these, the seismic networks play the most crucial role.

The treaty called on signatories to cooperate in setting up the IMS. When no such cooperation was forthcoming from the signatory states, the United States Congress—driven by a desire to maintain US nuclear dominance over its rivals—initiated the funding of a seismic network by requesting the Incorporated Research Institutions for Seismology (IRIS), a university research consortium dedicated to research of the earth's interior, to augment its Global Seismic Network (GSN).

Belonging to GSN is a prerequisite for obtaining both real-time and auxiliary data from the seismic networks. The GSN network provides high-quality seismic data from its digital stations located worldwide and is coveted by geoscientists in understanding the dynamic processes of the earth's core.

Although India does maintain a seismographic network of its own, it does not belong to IRIS through which it could obtain access to real-time data collected from GSN.

The absurdity of the attempt of India and Pakistan to maintain a veil of secrecy over the details of their nuclear programs is glaring given the fact that the data recorded by seismographic stations of GSN are more than sufficient to both detect and compute the intensity of all explosions up to a small threshold. The seismic signatures produced by nuclear explosions are easily discernible from the ones produced by earthquakes.

On October 10, the web site of the *Indian Express* reported, "The phantom of the nuclear bombs, continuing to stall India's assimilation into the global seismic monitoring network, results in crucial delays and time loss before disaster management authorities can be informed about the magnitude of the disaster."

Despite such acknowledgement the article stated, "[Science Minister] Sibal categorically ruled out any possibility of collaborating with Pakistan on sharing seismic data even though the hazard of earthquakes were a shared enemy between the neighbours."

Such an attitude exposes both the callousness and criminality of the ruling elite. Both governments view the impoverished masses with contempt and see them as expendable. This partly explains their lack of preparation for earthquakes and other disasters that have repeatedly afflicted the subcontinent over the decades. Those in power cannot be expected to rectify the situation because, in the final analysis, the ruling elites of both nations are representatives of a socioeconomic system that puts power and profits above human welfare.