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October 10, 2018

Fulbright Specialists Program
Proposal Form

- **Project Description:** (Describe the project. In order to provide the best possible matches of specialists with program requests, please be very specific as to the type and scope of work that the specialist would engage in)

On October 8, 2005, a magnitude 7.6 earthquake struck Muzaffarabad, 100 kilometers north of Islamabad. 87,000 people were killed, including 18,000 students buried under collapsed school buildings. More than 140,000 were seriously injured. At least 3 million homes were destroyed. Stone barns fell down, killing more than a quarter million farm animals. Communication networks went off-line. Hospitals, police and rescue services were paralyzed. Survivors seeking help found that the roads to the outside world were blocked by landslides. Many survivors froze or starved during the harsh winter that followed.

The Muzaffarabad earthquake of 2005 occurred at the western end of the Himalayan fault system. A century earlier, on 4 April 1905, a magnitude 7.8 earthquake occurred in the Kangra Valley killing more than 20,000 people and destroying 90% of the structures in nearby Dharamshala, India. Between these two epicenters is a 200-300 kilometer long segment of the Himalayan fault system that has not produced a major earthquake since 1555. This is the Kashmir seismic gap. This is the section of the Himalayan fault system that is adjacent to Islamabad.

Although seismologists cannot predict when the next major earthquake will strike northern Pakistan, they agree that the earthquake of 2005 established the endpoint of a 200 kilometer long section of the Himalayan fault system along which there have been no great earthquakes for almost 500 years. This so-called “Kashmir seismic gap” has the potential to unleash an earthquake of magnitude 8.5 – roughly 30 times more destructive than the Muzaffarabad earthquake of 2005.

It is my intent to spend 30 days in and around Islamabad to …

- Evaluate Pakistan’s current state of earthquake preparedness
- Teach workshops in seismology, seismic safety, and disaster planning
- Consult with government officials and public servants on disaster response
- Advise engineers, architects and home owners on retrofitting their buildings
- Meet with local seismologists to determine whether interseismic strain accumulation or other precursor phenomena have been measured or observed
- Distribute information on preparing for and surviving an earthquake

- **Project Purpose:** (Describe the project objectives and provide the background on the issues and institutions involved.)

Earthquake prediction is still in its infancy. There has never been an officially recognized prediction of a major earthquake in which location, magnitude and date have all been accurately predicted. However, by identifying seismic gaps, seismologists have been able to foretell the location and magnitude of a few major earthquakes in recent years, such as northern Sumatra (2004) and central Chile (2010).

What sets the Kashmir seismic gap apart from the others is the region's demographics, terrain and political situation. Islamabad's population has grown from 56,000 in 1965 to 2 million today. The combined Islamabad-Rawalpindi metropolitan area is now 5 million. With such rapid population growth, the region's power, water, transportation and communication systems may be unable to accommodate so many potential earthquake victims.

The Kashmir earthquake will occur east of Islamabad, perhaps on the Riasi Fault in the Pir Pinjal mountains. These mountains, with peaks above 4000 meters, are home to almost 10 million people, many of whom may have limited earthquake awareness. Most of their stone buildings will collapse in a strong earthquake, just as they did in the Muzaffarabad earthquake of 2005. The isolation of these villages and the exceptionally difficult terrain will complicate rescue, relief and recovery efforts.

Much of the region affected by the pending earthquake is disputed territory. The Kashmir Valley has been the scene of demonstrations, riots, human rights abuses, terrorist attacks and military conflict ever since the partition of India in 1947. Currently, the province of Azad Kashmir (pop. 2.6 million) is administered by Pakistan. Jammu (pop. 3 million) and Kashmir (pop. 4 million) are administered by India. The border between Pakistan and India is contested. How Pakistan and India coordinate their relief efforts after a major earthquake will be a true test of humanity and diplomacy.

The combination of a population boom, proximity to a seismic gap, remote rural communities, and Kashmir's political hotspot creates a planning and logistical nightmare for Islamabad, the nearest major city to the epicenter.

As a seismologist, my purpose is to promote the global public health issue of how to live safely on our dynamic planet through courses, workshops and seminars on the following topics:

- Seismology
- Planetary physics
- Geologic hazards
- History of local fault systems
- Earthquake engineering
- Earthquake preparedness
- Disaster response, relief and recovery

- **Project Impact on the Host Institution:** (Please comment on the project's potential impact on the host institution.)

I anticipate finding receptive audiences for my workshops and special programs at:

- The Pakistan Meteorological Department (PMD)
- Quaid-e-Azam University's Earth Sciences Department
- The National University of Science & Technology's Institute of GIS
- The United States Educational Foundation in Pakistan
- The US Embassy in Islamabad
- Schools, government agencies, hospitals and civic centers

My experiences in Indonesia, Chile, Haiti and Japan may be especially of value to Zahid Rafi, Ameer Hyder and others at the Seismology Division at the PMD in Islamabad.

I will also be available as an advisor or mentor for students interested in pursuing research in these earthquake-related fields, and to give talks to the general public.

- **Project Dates:** (Please give specific project dates.)

I am available to come to Islamabad immediately, or on any dates that are convenient to your organization. If you would like specific project dates, I would propose the following:

Arrive: March 1, 2019
Depart: March 30, 2018

- **FSP Scholar's Information:** (Email, Phone & weblink)

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www.zoa.com/terremoto This weblink will take you to a 24-page pamphlet written in Spanish titled "Terremoto Preparate" explaining how to cope with living in an earthquake disaster area. In 2010, I coordinated the earthquake response and relief efforts to the magnitude 8.8 earthquake that struck the central Chilean coast. As my volunteer staff collected and distributed emergency supplies, setup medical centers, and built temporary shelters, they handed out 7000 copies of this pamphlet to the earthquake survivors. Timely information -- presented in a manner that everyone can understand -- is essential in a situation like this. As part of my earthquake preparedness project in Islamabad, I would propose to distribute a similar booklet in and around the expected epicentral area.

- **Host Institution Information:** (please give us the contact details for your host in Pakistan)

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- **Justification for the visit:**

For much of my professional career, I've been involved with humanitarian projects in support of victims of natural disasters, and assisting at schools and hospitals in developing nations. Some of my best friends are the people I have collaborated and worked with on these projects.

When I'm not volunteering, teaching or consulting, I write and speak on travel. My personal mission is to encourage Americans to visit, work or volunteer in other countries. I'm a firm believer that one of the best ways to promote World Peace is for people around the world to get to know each other. Working with other people, living in their culture, and making friends are the best ways to achieve this goal. This is especially true today with respect to America's relationship with Islamic countries.

I've never been to Pakistan, so I don't know the status of Pakistan's earthquake awareness or preparedness. I'm not familiar with the local building codes or whether they're uniformly enforced. I'd like to see for myself the status of Islamabad's power, water, transportation and communication systems. I'd be thrilled to meet with local seismologists, especially at the PMD, to find out if they've observed any earthquake precursor phenomena.

By sharing my previous experiences as a seismologist in Sumatra (2004), Haiti (2010), Chile (2010) and Japan (2011), I can exchange important information with the USEFP, the PMD and other government and public agencies regarding earthquake prediction, preparation, seismic engineering, disaster response and relief and recovery … while possibly saving thousands of lives.