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U.S. University Offers Help for Earthquake Damage in Bam, Iran

Catholic University develops architectural, urban designs

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Washington -- A U.S. university is offering to help restore an ancient city in Iran that was devastated by an earthquake a year ago. The School of Architecture at Catholic University in Washington has conducted a semester-long study of the 2,000-year-old city of Bam and come up with architectural and urban designs that could be used by Iranian authorities to restore the city.

The "**Bam Studio**" project at Catholic University has brought together 13 graduate students with interests in architecture, urban design, landscape, cultural heritage and historic preservation.

Led by Iranian-born architect **Mina Marefat**, the students immersed themselves in Persian history and culture for 15 weeks, focusing on the architectural origins of the Bam arg, or citadel, that is reputed to be world's oldest mud-brick fort still in existence. The group is studying how to restore that historical treasure with modern earthquake-proof materials and techniques without loss of its original appeal. Similarly, much of the city is to be rebuilt with modern materials while retaining traditional styles.

The Bam Studio project is linked with the Islamic Cities project at the Library of Congress, also directed by Marefat, who helped organize an international conference titled "**Bam, Past and Future**" at the library December 14.

Participants included eminent Iranian architects based in Canada and France, and earthquake reconstruction engineers from the United States. The theme of the conference was how to safely restore Bam's rich cultural heritage through modern earthquake-proof technology that would withstand future disasters.

Bam represents "the historic fabric of Persian land, culture and people," Marefat said. Located in the southeastern province of Kerman between two mountain ranges, Bam is a small oasis town on the edge of the Dasht-e Lut or Lot's Desert, where water is supplied by underground irrigation canals, or qanats. The citadel, built on a 650-foot-high hill, dates back to the pre-Christian Achaemenids when Darius called himself the "King of kings." But it was under the Sassanians in the third century that Bam began to flourish, and by the 10th century it became an important city on the Silk Road to China.

Randolph Langenbach, an expert in the field of seismic vulnerability who visited Bam in April, said the 12-second earthquake that registered at 6.6 on the Richter scale was unusual in its "high frequency of vertical shakes." The December 26, 2003, quake killed an estimated 30,000 people and injured 30,000 in a total population of around 115,000.

Langenbach said that most of the damage was done to buildings built or renovated during the past 30 years and that 200-year-old houses in the old walled city did not suffer any significant damage.

Langenbach said that the renovation of old buildings in Bam during the past 30 years did not blend with the traditional construction methods, and that produced structural weaknesses that caused the buildings to collapse during the earthquake.

Bijan Khazai, a scholar at the Earth Institute at Columbia University, New York, said the World Bank had given \$220 million and the Iranian government, \$15 million to be used mostly for building new homes for the earthquake victims of Bam.

Khazai said that a "housing bazaar" has been set up in Bam where models of houses are displayed and where one can purchase building materials.

Keyvan Khosrovani, based in Paris, said that a laboratory was needed to test earthquake-proof models of buildings just like aircrafts are tested before flight. "Replicas of the old architecture must be preserved with new materials," he said.

Hossein Amanat, based in Canada, said there should be "respect for the past," but one should be "contemporary" in rebuilding Bam. He suggested that the city of Bam should be separated from the citadel and that the use of "local materials and local know-how" would create "sustainability" for the restoration of Bam. He said "green roofs" with vegetation and solar panels to harness the ample sunlight for energy would be useful for Bam.

However, one of the invitees to the conference who did not make it could have had the most immediate impact. He was **Morteza Kazemi**, the economic and cultural adviser to the Ministry of Culture and Islamic Guidance in Iran. Marefat said he got a visa finally, thanks to the U.S. State Department, but flights from Iran to the United States were all booked.

Summarizing his 16-page submission in Persian, Marefat said Kazemi envisioned the reconstruction of Bam to include an art therapy center for traumatized children and a memorial park for the dead. She said Kazemi also proposed building "a musical park" where Bam children could play on donated musical instruments in remembrance of Iraj Bastami, a Bam musician who resided in the United States and died in the earthquake while visiting his home city.

Kazemi was one of three Iranian officials and architects Marefat had invited for the conference. She said Kazemi would visit the United States eventually and she hoped that the Bam Studio project would get the attention of Iranian government officials through him.

A more immediate need, she said, was funding to get her graduate students of the Bam Studio project to visit Bam and see things firsthand.

"My students in America, none of them Iranian, all have learned something fundamental and deep, some of it life-transforming from this project. It would be a wonderful opportunity for them to visit Bam, if we had the funding," Marefat said in an interview.

Similarly, the preservation specialists of the Iranian Cultural Heritage Organization that she met during her visit to Bam could visit the United States for mutual benefit, she added.

"Persian architecture can become a bridge between the East and West. We owe it to future generations of Bam to learn from this experience," Marefat said.

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