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Wildfires' 'killer haze' tracked with Twitter as it spreads

The thick smog from wildfires can take lives
Thierry Falise/Getty

By **Chris Baraniuk**

When Indonesia's peatlands burn, the thick smog that fills the air can be deadly. Haze from wildfires there last year may have led to more than 90,000 deaths, according to one US study.

To help it keep on top of active fires and save lives, the Indonesian government is trying out a tool that monitors references to haze on social media.

Called Haze Gazer, the tool taps Twitter data to reveal where haze hotspots are – as well as how locals respond to government-issued evacuation notices. The software was built by a team from the University of Kassel in Germany and the United Nations Global Pulse office in Jakarta. Global Pulse is a programme set up to use big data for humanitarian ends. The researchers say Haze Gazer is now being used in the Indonesian president's situation room.

The government has previously had no way to track citizen's movements in real time. "They asked what kind of information is available," says Jong Gun Lee at Pulse Lab Jakarta. The team suggested looking at Twitter because Indonesia has the fifth-largest number of Twitter users in the world, producing 4.1 billion tweets in 2016.

Revealing movements

To test whether Twitter could be used to monitor wildfire haze, the researchers analysed 29 million tweets posted in 2014 by more than 575,000 people from the Indonesian island of Sumatra – about 1 per cent of the island's population. Using geolocation data attached to tweets with hashtags mentioning the haze, the team were able to map hotspots as they appeared.

During peatland fires, government sensors on the ground monitor the air quality in local areas. Lee says data from the tweets matched up with readings from the sensors.

The tweets also revealed people's movements. When air quality gets especially bad, authorities issue evacuation notices via television, radio and SMS messages. Haze Gazer can reveal whether people are acting on that advice. "When we looked at mobility patterns together with air quality we could see people leaving bad air quality areas," says Lee.

Weight of responsibility

But in some places people didn't seem to move away. The team is now conducting field research to find out why locals in some areas were more reluctant to evacuate than others.

Twitter data has been used for similar purposes before. Three years ago, researchers used it to improve emergency response times during floods in Jakarta, for example.

But Kathleen Carley, a social scientist at Carnegie Mellon University in Pittsburgh, Pennsylvania, who has done research in Indonesia, warns that Twitter would only ever reveal information about a fraction of the population. And most tweets are not geotagged, limiting their usefulness. Indonesians also speak many different languages, making it harder to identify patterns from tweets.

Using tweets to check if people are moving after an evacuation notice could be useful, says David Jones, CEO of Rescue Global, a non-profit NGO working in disaster risk reduction and response.

But, like Carley, he thinks it is important to be aware of the limitations of Twitter data. It would be risky to place too much trust in it, he says. Organisations face a lot of liability when making decisions about where to send first responders or aid, for example.

"I've seen data ignored in operation centres because people have said, 'Yeah, that might be right but if it's wrong, we'll go to jail'," he says.

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