How STEM can help save lives in Tsunami prone areas

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Abstract

This poster is about how tsunami warning systems can be used in Tsunami prone regions. Tsunamis are devastating natural forces that are dominant in Southeast Asia, where there are a lot of developing countries that cannot recover quickly when a disaster strikes. With tsunamis come a lot of loss of life because tsunamis can be deadly. One of the best ways to prepare for a tsunami is to know in advance that a tsunami is coming. If you know that a tsunami is coming, you have time to leave the coastal area. Approximately 65% of Indonesians (about 171 million people) live within 50 miles of the coast. Moreover, coastal resources have been used for further economic growth in countries within that region. For example, these economic sectors account for 25% of the GDP and 20% of the workforce in Indonesia. Further income inequality in this region will drive more people away from their homes and towards the coastal areas where there is an influx of new jobs in manufacturing, fishing, and agriculture. This will mean that there will be more people in this area with high risk of tsunamis, intensifying the need for a reliable tsunami warning system that will keep the hundreds of millions of people in this situation safe. The tsunami warning system should be able to meet multiple criteria, including, but not limited to, keeping costs low, maximizing warning time, and minimizing false alarms to avoid loss of public trust in the system. This system will have multiple parts, including the warning system and all the components that make it work. This poster makes an excellent example that ties into STEM in many ways. For the science portion, it relies on concepts of geology, such as how tsunamis are created, ways to detect tsunamis, and their impacts. We need to tie in technology in multiple parts of the system. First of all, we need to determine how to warn the public in the event of a tsunami, whether it be through mobile alerts/social media or possibly an alarm system throughout the region. We will also need to work out the technology needed to detect tsunamis, from the sensors to the control rooms. This includes learning the types and specialties of each sensor that could be used. Engineering will be a big part of this system, especially factoring into its design and deployment. We will need to use our knowledge of sensor types and tectonic plate boundaries in the area to make a prototype warning system. Mathematical equations and software simulation tools will be used to calculate the probability of a tsunami within a certain period of time and the effectiveness of the warning system. In conclusion, this poster demonstrates that knowledge in STEM is critical to help solve real world problems.