

Why Some Early Warning Systems Save Lives and Others Do Not

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A cyclone warning can arrive on time and still fail to save lives if people cannot act on the message. But why do warnings alone not prevent disasters? This thesis explores which factors influence the effectiveness of early warning systems (EWS). Based on interviews with practitioners from the Red Cross Red Crescent Movement working on EWS in Mozambique, the study shows that warnings are not only about technology and forecasting. Instead, it is the complex interaction of vulnerability factors like poverty, inequality, livelihoods, health, access to resources, and governance systems that determines whether a hazard turns into a disaster or whether it does not.

Every year, millions of people around the world are affected by disasters. Hazards like floods, cyclones, droughts, heatwaves, and tsunamis turn into disasters more often than necessary, killing many people and destroying the lives of many others. Early warning systems (EWS) are designed to reduce such harm by warning people before hazards strike. Yet, warnings alone do not prevent disasters. This study shows that receiving a warning does not automatically mean that people can act upon it. For instance, some families may refuse evacuation orders because of fear of losing their homes, crops, livestock, or other assets that are essential for their survival. Other people may lack needed transport, resources, physical or mental ability, money, or social support systems to evacuate to safety. One of the study's most important findings is that vulnerability is highly dynamic and complex. Household conditions, livelihoods, health situations, family dynamics, and economic realities can change quickly, especially after a hazard. As a consequence, this means that lists that identify vulnerable people can quickly become outdated. This leads to humanitarian organisations often heavily relying on local volunteers and community networks to understand changing needs on the ground. On top of that, vulnerability factors are intersectional, meaning that multiple vulnerabilities can intersect for just one person. Constantly changing vulnerability dynamics that intersect and mutually reinforce each other, also dependent on contextual realities, make vulnerability a complex issue to work with. The study also highlights enabling and constraining factors, such as by emphasising the importance of localisation, suggesting

that local actors play the leading role in disaster preparedness and response. While local actors may better understand why some people are unable to follow evacuation advice, localisation approaches still do not automatically guarantee inclusion or fairness, as existing power structures and inequalities in communities still influence whose voices are heard and whose needs remain invisible. Moreover, the study identifies major obstacles that make vulnerability integration difficult. Factors like limited funding, governance challenges, outdated vulnerability data, corruption, project timelines, and other needs often create barriers for effective EWS.

Imagine receiving a cyclone warning, wanting to act upon it, but having neither savings or a safe shelter, nor an alternative source of income if crops get destroyed. In such situations, the warning itself is likely not enough to reduce risk. The study, therefore, argues that reducing vulnerability is just as important as improving forecasting technology. Overall, the thesis concludes that vulnerability forms the foundation of whether EWS succeed or fail. Strengthening disaster preparedness, hence, requires more than better forecasts. It also requires reducing poverty, improving infrastructure, supporting livelihoods, strengthening institutions, improving the economy, and ensuring that communities themselves are included in decision-making processes. Hence, this study contributes to ongoing discussions about how EWS can be more people-centred and inclusive. It shows that effective EWS are not only about predicting hazards, but also about understanding the people they ought to protect, their lived realities, and the structural inequalities that shape their possibility to be safe.