

Supplementary Table S3. Classification of challenge cards by DRR phase, social resilience attributes, and CBDRM (community-based disaster risk management) process and outcome indicators, based on Tanwattana and Toyoda (2018).

Challenge	DRR phase	Social resilience attribute	CBDRM process/outcome indicator
Challenge 1: Prepare an emergency kit	Preparedness	Leadership; community and individual preparedness; knowledge of risks and hazard consequences; access to economic resources	(6) Community-managed implementation; (4) Community risk management plan
Challenge 2: Design a donation box for people in need	Recovery	Social support; leadership; community inclusiveness; access to economic resources; problem-solving policies	(6) Community-managed implementation
Challenge 3: Understand the concept of return period	Prevention	Knowledge of risks and hazard consequences; adaptability and capacity to accept change; disaster management planning	(7) Community learning system
Challenge 4: Understand resilience and its different types	Prevention	Adaptability and capacity to accept change; shared community beliefs and values	(3) Building community ties and understanding; (7) Community learning system
Challenge 5: Understand material attachment and reflect on which objects would be hardest to leave behind	Preparedness	Shared community beliefs and values; sense of community and attachment; access to economic resources	(3) Building community ties and understanding; (7) Community learning system
Challenge 6: Self-protection measures when helping to clean the town	Recovery	Community preparedness; knowledge of risks and hazard consequences; diversity of skills and trained personnel; democratic and collaborative decision-making; problem-solving policies	(6) Community-managed implementation
Challenge 7: Analyse a flood risk map	Prevention and preparedness	Disaster management planning; knowledge of risks and hazard consequences; knowledge of community assets; physical spaces prepared and functional for response and recovery	(4) Participatory risk assessment and management; (3) Community hazard, vulnerability and capacity map
Challenge 8: Measures to reduce flood risk	Prevention	Disaster management planning; knowledge of risks and hazard consequences; diversity of skills and trained personnel; physical spaces prepared and functional for response and recovery	(5) Community planning for risk management; (4) Community risk management plan
Challenge 9: Identify protective measures on boats during tsunami risk	Response	Community and individual preparedness; disaster management planning; knowledge of risks and hazard consequences	(5) Community planning for risk management; (7) Community learning system

Challenge 10: Tsunami risk map	Prevention and preparedness	Disaster management planning; knowledge of risks and hazard consequences; knowledge of community assets; physical spaces prepared and functional for response and recovery	(4) Participatory risk assessment and management; (3) Community hazard, vulnerability and capacity map
Challenge 11: Understand how tsunamis occur	Prevention and preparedness	Community and individual preparedness; knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system
Challenge 12: Understand tsunami protection measures at the beach and the importance of warning others	Response	Community and individual preparedness; social support; collective efficacy; physical spaces prepared and functional for response and recovery	(3) Building community ties and understanding; (7) Community learning system; (8) Community early warning system
Challenge 13: Learn about the largest tsunami ever recorded	Prevention and preparedness	Knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system
Challenge 14: Heatwave drill and the importance of assisting the affected person	Response	Community and individual preparedness; social support; collective efficacy	(4) Participatory risk assessment and management; (6) Community-managed implementation; (7) Participatory monitoring and evaluation; (6) Community drill system
Challenge 15: Understand which people are at greater risk during a heatwave	Prevention and preparedness	Knowledge of risks and hazard consequences; community inclusiveness	(4) Participatory risk assessment and management; (7) Community learning system
Challenge 16: Understand which natural hazards may be influenced by climate change	Prevention	Knowledge of risks and hazard consequences; adaptability and capacity to accept change	(3) Building community ties and understanding; (7) Community learning system
Challenge 17: Understand volcanic hazards	Preparedness	Community and individual preparedness; knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system
Challenge 18: Understand the different types of volcanic eruption	Preparedness	Community and individual preparedness; knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system
Challenge 19: Identify active volcanoes using an interactive map	Preparedness	Disaster management planning; knowledge of risks and hazard consequences; knowledge of community assets; physical spaces prepared and functional for response and recovery	(4) Participatory risk assessment and management; (3) Community hazard, vulnerability and capacity map
Challenge 20: Earthquake risk map	Prevention	Disaster management planning; knowledge of risks and hazard consequences; knowledge of community assets; physical spaces	(4) Participatory risk assessment and management; (3) Community hazard,

		prepared and functional for response and recovery	vulnerability and capacity map
Challenge 21: Understand the difference between magnitude and intensity	Prevention and preparedness	Knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system
Challenge 22: Understand what a seismograph is and the types of waves it detects	Preparedness	Knowledge of risks and hazard consequences; diversity of skills and trained personnel	(3) Building community ties and understanding; (7) Community learning system
Challenge 23: Understand what earthquake aftershocks are	Preparedness and response	Adaptability and capacity to accept change; knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system
Challenge 24: Understand the difference between an earthquake swarm and earthquake aftershocks	Preparedness and response	Adaptability and capacity to accept change; knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system
Challenge 25: Discuss previous earthquake experiences with classmates and the measures taken	Response	Collective efficacy; shared community beliefs and values; community inclusiveness; sense of community and attachment; social support	(3) Building community ties and understanding; (6) Community drill system; (7) Community learning system
Challenge 26: Understand how earthquakes form and the different types that exist	Prevention and preparedness	Knowledge of risks and hazard consequences; adaptability and capacity to accept change; physical spaces prepared and functional for response and recovery	(3) Building community ties and understanding; (7) Community learning system
Challenge 27: Forest fire risk map	Prevention	Disaster management planning; knowledge of risks and hazard consequences; knowledge of community assets; physical spaces prepared and functional for response and recovery	(4) Participatory risk assessment and management; (3) Community hazard, vulnerability and capacity map
Challenge 28: Create a poster to raise awareness about forest fires	Prevention	Shared community beliefs and values; leadership; network connectivity	(3) Building community ties and understanding; (7) Community learning system
Challenge 29: Analyse what would happen if all volcanoes erupted	Preparedness	Knowledge of risks and hazard consequences; adaptability and capacity to accept change	(3) Building community ties and understanding; (7) Community learning system
Challenge 30: Understand what volcanic lightning is and how it is produced	Preparedness	Community preparedness; knowledge of risks and hazard consequences	(3) Building community ties and understanding; (7) Community learning system

Note: The numbering in parentheses refers to the CBDRM process and outcome indicators defined by Tanwattana and Toyoda (2018). As these are numbered in separate lists in the original framework, some numbers recur. The original numbering is retained here to preserve traceability to the source framework.