

PARADIGM SHIFT OF JAPAN'S TSUNAMI DISASTER MANAGEMENT FOR ENHANCING DISASTER RESILIENCE

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We revisit the lessons of the 2011 Great East Japan Earthquake Tsunami disaster specifically on the response and impact to discuss the paradigm shift of Japan's tsunami disaster management policies and the perspectives for reconstruction and enhancing disaster resilience. Revisiting the modern histories of Tohoku tsunami disasters and pre-2011 tsunami countermeasures, we clarify how Japan's coastal communities have prepared for tsunami. The discussion mainly focuses on structural measures such as seawalls and breakwaters and non-structural measures of hazard map and evacuation. The responses to the 2011 event are discussed specifically on the tsunami warning system and efforts to identify the tsunami impacts. The nation-wide post tsunami survey results shed the light on the mechanisms of structural destruction, tsunami loads, and structural vulnerability to inform structural rehabilitation measures and land use planning.

Remarkable paradigm shifts in designing coastal protection and disaster mitigation measures were led with a new concept of potential tsunami levels; Prevention (Level 1) and Mitigation (Level 2) levels according to the level of protection and recurrence interval of tsunami hazards. The seawall is designed with the reference of Level 1 tsunami scenario, while comprehensive disaster management measures should refer to Level 2 tsunami for protection of human lives and reducing potential losses and damage. Throughout the case study in Sendai city, the proposed reconstruction plan was evaluated from the tsunami engineering point of view to discuss how the post 2011 paradigm was implemented to the coastal communities for future disaster mitigation. The analysis revealed that Sendai city's multiple protection measures for Level 2 tsunami will contribute on substantial reduction of the tsunami inundation zone and potential losses, combined with the effective tsunami evacuation plan.