

City of Sendai



Tohoku University
International Research Institute
of Disaster Science



Joint research project

Sendai Edition

Summary of the Midterm Review of the Sendai Framework for Disaster Risk Reduction

Data Edition

March 2023

1 Major Natural Disasters that Occurred During the Evaluation Period

(1) Earthquakes

Year and Date	Earthquakes	Overview of the Earthquakes
June 14, 2008	2008 Iwate-Miyagi Nairiku Earthquake	Magnitude: 7.2 Maximum seismic intensity in Sendai: 5 upper
February 27, 2010	2010 Chile Earthquake	Magnitude: 8.6 Major Tsunami Warning issued in Miyagi Prefecture
March 11, 2011	The Great East Japan Earthquake	Magnitude: 9.0 Maximum seismic intensity in Sendai: 6 upper Major Tsunami Warning issued in Miyagi Prefecture
August 30, 2012	Earthquake off the Coast of Miyagi Prefecture	Magnitude: 5.6 Maximum seismic intensity in Sendai: 5 upper
December 22, 2016	Earthquake off the Coast of Fukushima Prefecture	Magnitude: 7.4 Maximum seismic intensity in Sendai: 4 Tsunami Warning issued in Miyagi Prefecture
February 13, 2021	Earthquake off the Coast of Fukushima Prefecture	Magnitude: 7.3 Maximum seismic intensity in Sendai: 5 upper
March 20, 2021	Earthquake off the Coast of Miyagi Prefecture	Magnitude: 6.9 Maximum seismic intensity in Sendai: 5 upper Tsunami Advisory issued in Miyagi Prefecture
May 1, 2021	Earthquake off the Coast of Miyagi Prefecture	Magnitude: 6.8 Maximum seismic intensity in Sendai: 5 lower

Source: Major Disasters Sendai City Has Experienced in the Past (material on Sendai City website) and Sendai City Community Disaster Prevention Plan (Common Version)

(2) Major Storms and Floods

Year and Date	Disaster Category	Disaster Name	Meteorological Record Around Sendai
September 20–21, 2011	Flood and storm	Typhoon Roke	Total rainfall: 318.0 mm (September 20–21) Maximum rainfall per hour: 51.0 mm Maximum windspeed: 23.2 m/s
June 19–20, 2012	Flood and storm	Typhoon Guchol	Total rainfall: 134.5 mm (June 19–20) Maximum rainfall per hour: 31.0 mm Maximum windspeed: 23.2 m/s
September 30, 2012	Flood and storm	Typhoon Jelawat	Total rainfall: 26.5 mm (September 30–October 1) Maximum rainfall per hour: 11.5 mm Maximum windspeed: 26.3 m/s
September 10–11, 2015	Flood	Typhoon Etou	Total rainfall: 271.5 mm (September 10–11) Maximum rainfall per hour: 50.0 mm
October 12–13, 2019	Flood and storm	Typhoon Hagibis	Total rainfall: 383.5 mm (October 11–13) Maximum rainfall per hour: 63.5 mm Maximum windspeed: 30.4 m/s

Source: Major Disasters Sendai City Has Experienced in the Past (material on Sendai City website) and Sendai City Community Disaster Prevention Plan (Common Version)

2 Details of the evaluation on Global Targets

(1) Results of Monitoring Assessment for Targets A–D

Global Target		Assessment Result (All Disasters)		Status	
Assessment Index		Annual Average (2005–2014)	Annual Average (2015–2021)	✓: Achieved ✗: Not achieved	
A	Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015				
	A-1 (combined)	Disaster mortality and missing people per 100,000	5.22/100,000	0.03/100,000	✓ -99%
	A-2	Disaster mortality per 100,000	4.99/100,000	0.03/100,000	✓ -99%
	A-3	Missing people by disaster per 100,000	0.24/100,000	0.00/100,000	✓ -100%
B	Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015				
	B-1 (combined)	Number of people directly affected by disasters per 100,000	7,899/100,000	508/100,000	✓ -94%
	B-2	Number of people who were injured by or fell sick due to a disaster per 100,000	22/100,000	1/100,000	✓ -97%
	B-3	Number of people whose residence was damaged	48,061	2,946	✓ -94%
	B-4	Number of people whose residence was completely destroyed	6,340	2	✓ -100%
	B-5	Number of people whose foundation for life was either damaged or lost	28,060	2,599	✓ -91%
C	Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030				
	C-1 (combined)	Direct economic loss caused by disasters compared to GDP	2.98%	0.05%	✓ -98%
	C-2	Direct agricultural loss caused by disasters	7,369 million yen	439 million yen	✓ -94%
	C-3	Direct economic loss of other production facilities that were either damaged or completely destroyed by disasters	11,342 million yen	11 million yen	✓ -100%
	C-4	Direct economic loss of housing sector due to disasters	99,109 million yen	10 million yen	✓ -100%
	C-5	Direct economic loss from critical infrastructure either being damaged or completely destroyed by disasters	12,007 million yen	1,966 million yen	✓ -84%
	C-6	Direct economic loss from cultural heritage either being damaged or completely destroyed by disasters	17 million yen	0 million yen	✓ -100%
D	Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030				
	D-1 (combined)	Damage to critical infrastructure caused by disasters	137 cases /100,000 people	5 cases /100,000 people	✓ -96%
	D-2	Number of health facilities either completely destroyed or damaged by disasters	39	15	✓ -62%
	D-3	Number of educational facilities either completely destroyed or damaged by disasters	27	20	✓ -26%
	D-4	Number of other critical infrastructure departments and facilities either completely destroyed or damaged by disasters	1,364	19	✓ -99%
	D-5 (combined)	Number of disruptions to basic services caused by disasters	5,742 cases /100,000 people	12 cases /100,000 people	✓ -100%
	D-6	Number of disruptions to educational services caused by disasters *	20	29	✗ 45%
	D-7	Number of disruptions to health services caused by disasters	19	4	✓ -77%
	D-8	Number of disruptions to other basic services caused by disasters	60,078	99	✓ -100%

*D-6 “Number of disruptions to educational services caused by disasters” refers to the number of schools that had to be closed, but does not count the duration of closure (it includes incidents such as temporary closures caused by heavy rainfall).

(2) Results of Monitoring Assessment for Targets A–D (Earthquakes and Tunamis)

Global Target		Assessment Result (All Disasters)		Status	
Assessment Index		Annual Average (2005–2014)	Annual Average (2015–2021)	✓: Achieved ✗: Not achieved	
A Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015					
A-1 (combined)	Disaster mortality and missing people per 100,000	5.22/100,000	0.00/100,000	✓	-100%
A-2	Disaster mortality per 100,000	4.99/100,000	0.00/100,000	✓	-100%
A-3	Missing people by disaster per 100,000	0.24/100,000	0.00/100,000	✓	-100%
B Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015					
B-1 (combined)	Number of people directly affected by disasters per 100,000	7,895/100,000	309/100,000	✓	-96%
B-2	Number of people who were injured by or fell sick due to a disaster per 100,000	22/100,000	1/100,000	✓	-97%
B-3	Number of people whose residence was damaged	48,061	2,381	✓	-95%
B-4	Number of people whose residence was completely destroyed	6,340	0	✓	-100%
B-5	Number of people whose foundation for life was either damaged or lost	28,019	1,000	✓	-96%
C Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030					
C-1 (combined)	Direct economic loss caused by disasters compared to GDP	2.98%	0.03%	✓	-99%
C-2	Direct agricultural loss caused by disasters	7,347 million yen	60 million yen	✓	-99%
C-3	Direct economic loss of other production facilities that were either damaged or completely destroyed by disasters	11,342 million yen	3 million yen	✓	-100%
C-4	Direct economic loss of housing sector due to disasters	99,109 million yen	0 million yen	✓	-100%
C-5	Direct economic loss from critical infrastructure either being damaged or completely destroyed by disasters	12,005 million yen	1,652 million yen	✓	-86%
C-6	Direct economic loss from cultural heritage either being damaged or completely destroyed by disasters	17 million yen	0 million yen	✓	-100%
D Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030					
D-1 (combined)	Damage to critical infrastructure caused by disasters	137 cases /100,000 people	4 cases /100,000 people	✓	-97%
D-2	Number of health facilities either completely destroyed or damaged by disasters	39	15	✓	-62%
D-3	Number of educational facilities either completely destroyed or damaged by disasters	27	19	✓	-31%
D-4	Number of other critical infrastructure departments and facilities either completely destroyed or damaged by disasters	1,363	6	✓	-100%
D-5 (combined)	Number of disruptions to basic services caused by disasters	5,742 cases /100,000 people	1 cases /100,000 people	✓	-100%
D-6	Number of disruptions to educational services caused by disasters	20	0	✓	-98%
D-7	Number of disruptions to health services caused by disasters	19	4	✓	-77%
D-8	Number of disruptions to other basic services caused by disasters	60,078	12	✓	-100%

(3) Results of Monitoring Assessment for Targets A–D (Storms and Floods)

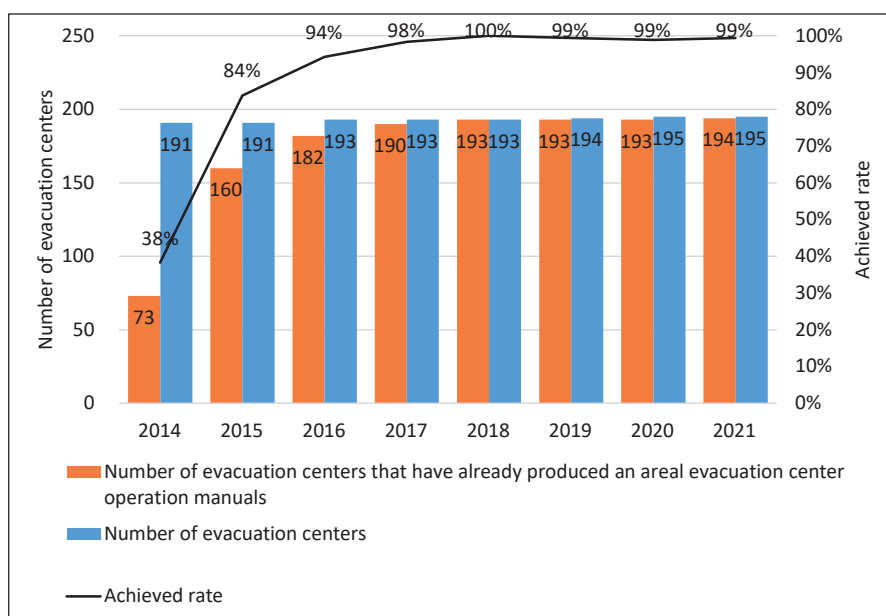
Global Target		Assessment Result (All Disasters)		Status	
Assessment Index		Annual Average (2005–2014)	Annual Average (2015–2021)	✓: Achieved ✗: Not achieved	
A Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015					
A-1 (combined)	Disaster mortality and missing people per 100,000	0.00/100,000	0.03/100,000	✗	Increase
A-2	Disaster mortality per 100,000	0.00/100,000	0.03/100,000	✗	Increase
A-3	Missing people by disaster per 100,000	0.00/100,000	0.00/100,000	✓	-
B Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015					
B-1 (combined)	Number of people directly affected by disasters per 100,000	4/100,000	200/100,000	✗	4988%
B-2	Number of people who were injured by or fell sick due to a disaster per 100,000	0/100,000	0/100,000	✓	-
B-3	Number of people whose residence was damaged	0	565	✗	Increase
B-4	Number of people whose residence was completely destroyed	0	2	✗	Increase
B-5	Number of people whose foundation for life was either damaged or lost	41	1,599	✗	3772%
C Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030					
C-1 (combined)	Direct economic loss caused by disasters compared to GDP	0.00%	0.01%	✗	2712%
C-2	Direct agricultural loss caused by disasters	22 million yen	379 million yen	✗	1651%
C-3	Direct economic loss of other production facilities that were either damaged or completely destroyed by disasters	0 million yen	9 million yen	✗	Increase
C-4	Direct economic loss of housing sector due to disasters	0 million yen	10 million yen	✗	Increase
C-5	Direct economic loss from critical infrastructure either being damaged or completely destroyed by disasters	1 million yen	314 million yen	✗	21751%
C-6	Direct economic loss from cultural heritage either being damaged or completely destroyed by disasters	0 million yen	0 million yen	✓	-
D Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030					
D-1 (combined)	Damage to critical infrastructure caused by disasters	0 cases /100,000 people	1 cases /100,000 people	✗	7267%
D-2	Number of health facilities either completely destroyed or damaged by disasters	0	0	✓	-
D-3	Number of educational facilities either completely destroyed or damaged by disasters	0	1	✗	Increase
D-4	Number of other critical infrastructure departments and facilities either completely destroyed or damaged by disasters	0	13	✗	6614%
D-5 (combined)	Number of disruptions to basic services caused by disasters	0 cases /100,000 people	11 cases /100,000 people	✗	Increase
D-6	Number of disruptions to educational services caused by disasters	0	28	✗	Increase
D-7	Number of disruptions to health services caused by disasters	0	0	✓	-
D-8	Number of disruptions to other basic services caused by disasters	0	87	✗	Increase

(4) Results of Monitoring Assessment for Targets E–G

Global Targets	Evaluation	Status
Changes in numbers regarding Sendai City's measures	Trends of Change	✓:Achieved ✗:Not achieved

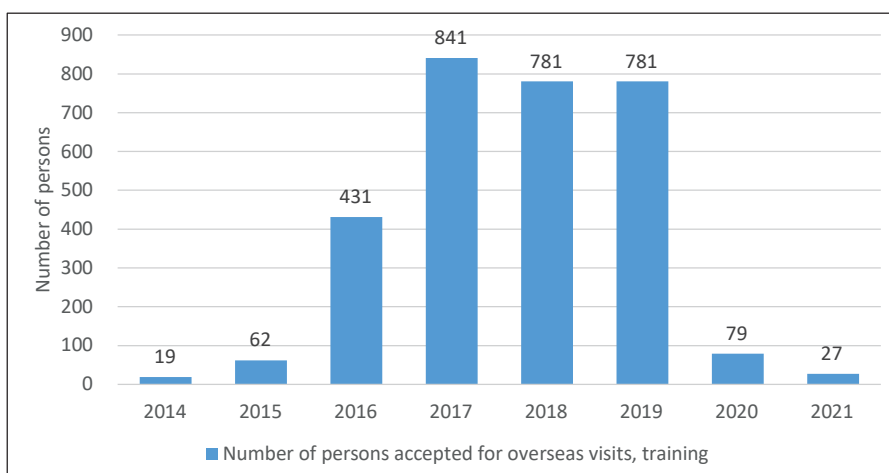
E Substantially increase the number of countries with national and local disaster risk reduction strategies

Number of evacuation centers that have already produced an areal evacuation center operation manuals	Since the Great East Japan Earthquake, steadily promoting the production of the areal evacuation center operation manuals in cooperation with local communities.	✓
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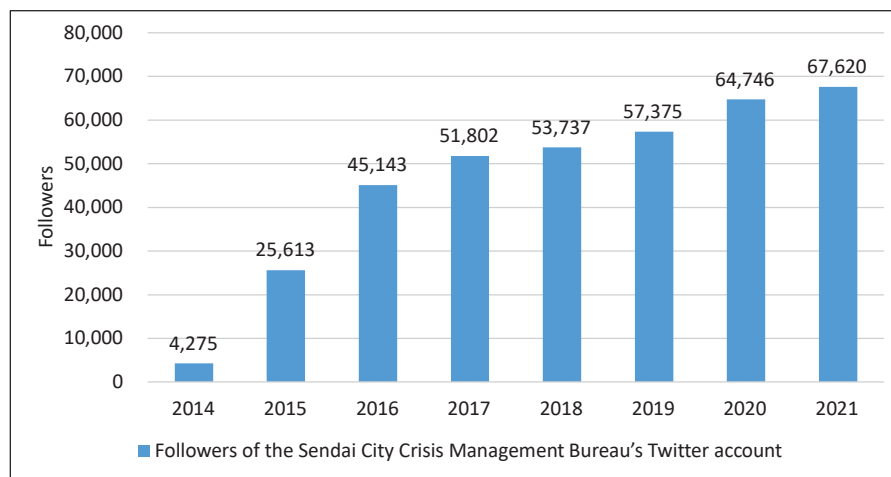
F Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework

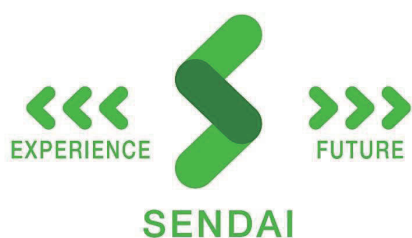
Number of persons accepted for overseas visits, training	The number of overseas visits has dramatically decreased due to the COVID-19 pandemic	✓
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Global Targets	Evaluation	Status
Changes in numbers regarding Sendai City's measures	Trends of Change	✓:Achieved /:Not achieved

G	Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people	
Followers of the Sendai City Crisis Management Bureau's Twitter account	Disseminating a wide range of information in cooperation with TV, radio, and other media, and also on Twitter.	✓





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