

**REPORT on Activities of Working Group on Disaster Risk Reduction  
(WGDRR) of TC in 2021**

(item 8 of Tentative Programme for TC 54th Session)

*(Submitted by WGDRR)*

**ACTION REQUIRED:**

The Working Group is invited to:

- A. Review the activities of TC WGDRR conducted in 2021
- B. Approve the recommendations and AOPs with the related budget of WGDRR in 2022

**APPENDIX:**

- I. Draft text for Inclusion at Session Report
- II. Progress Report on activities of Working Group on WGDRR in 2021

**ANNEX**

- I. Implementation Status Success Indicators of WGDRR Annual Operating Plans in 2021
- II. Implementation status Success Indicators of WGDRR Annual Operating Plans in 2022.

# APPENDIX

## I. Draft text for inclusion at Session Report

### 1. Disaster Risk Reduction Component

During the 16<sup>th</sup> Intergrated Working Group DRR parallel vitrual meeting on December 2, 2021, the Working Group reviewed its activities and its Annual Operating Plans (AOPs) for 2021. Please refer to Appendix II for details.

As the COVID -19 travel restrictions were still on throughout the 2021, most of the WGDRR projects 2021 were not able to carry out.

Dr. Jongseol Lee was nominated as the Chair of WGDRR by the WGDRR members as he take the post as the Director General of NDMI in 3 December, 2021.

The Working Group expressed their sincere appreciation to the Chair Dr. Sang Kwon Lee and the Vice Chairs Mr. Marcus Aydlett and Dr Yuntae Kim for their contribution and effort in the past years.

Members from China, Hong Kong China, Laos PDR, NDMI Korea, USA and Vietnam presented their report during the parallel meeting.

The Working Group passed the following AOPs 2022

- 1) AOP1. Capacity Building / Knowledge Sharing (NDMI)
  - (a) Initially a seminar regarding capacity building was proposed to be held in Palau in August 2021. Due to the outbreak of COVID-19 around the world, NDMI decided to postpone the seminar to 2022.
- 2) AOP2. Setting up Early Warning and Alert System (NDMI)
  - (a) Since 2013 NDMI has launched the project for strengthening capabilities of disaster risk reduction with various countries. Similar project in Lao PDR was implemented in 2021. Feasibility studies such as site visit, land survey and meetings with local office was conducted and it was planned to install early warning and alert systems in Houaphanh and Xaisomboun Province in 2022.
- 3) AOP3. WGDRR Annual Meeting
  - (a) Owing to the COVID situation, WGDRR annual meeting has been using online mode since 2020. If the situation in 2022 permits, it will get back to face to face meeting in Korea. If not, it will still be online meeting.

- 4) AOP4. Benefit Evaluation of Typhoon DRR (STI)
  - (a) The project named "Benefit evaluation of typhoon disaster prevention and preparedness" aims to promote the research relating to this topic. Recent work focused on development and improvement of more specific level in a region on risk assessment technique and the potential risk assessment model's resolution.
  - (b) STI will continue to work on the research of Benefit Evaluation of Typhoon DRR which was funded by STI. However, as the COVID19 situation still going on, foreign scientists cannot come to Mainland China for fellowship research. If the situation allows, the fellowship program will resume again and STI will help to do the funding.
  
- 5) AOP5. Sharing Information related to DRR (NDMI)
  - (a) WGDRR will continue to exchange information and experience related to DRR through the forum on the TC website. Members are welcome to upload all kinds of DRR information such as data, video clips to the TC website.
  
- 6) AOP6. Making Education Videos related to DRR (HKO)
  - (a) Hong Kong Observatory will help to produce more education video related to DRR and the budget for 2022 will be USD2,000.
  
- 7) AOP7. Seminar for TC Crowd-sourcing high density non-conventional weather data (HKO)
  - (a) HKO proposed to arrange online seminar in replace of the face-to-face seminar. The online seminar will compose of two sessions on sharing the concept and experience of developing "My Weather Observation" and "Micro-climate Weather Station" by HKO. The members agreed with HKO's proposal.

## 2. Conclusion of WGDRR

On the basis of the information provided by the Members, the reports presented by project coordinator/leader and findings of the parallel session on WGDRR, the following conclusions were reached:

- 1) Dr. Jongseol Lee will serve as the Chair of WGDRR as he was assigned to be the Director General of NDMI to replace the former Chair, Dr Sang Kwon Lee in 3 December,2021.
  
- 2) With the continuous travel restrictions and risk of infection of COVID-19, most of the projects could not be carried out as planned. However, projects such as the educational video, DRR meeting and DRR information sharing were successfully implemented.
  
- 3) The 16<sup>th</sup> WGDRR annual workshop was unable to be held physically in Republic of Korea due to the Covid-19. Instead of the face to face workshop, a video meeting hosted by NDMI Korea was held on 5 November 2021 to discuss the issues related to WGDRRR activities. WG reviewed the AOPs implementation with the budget

expeditue in 2021 and proposed the plans for 2022. Besides the TC DRR members, ADRC ,WMO and ESCAP were also invited to join the meeting to give informative and valuable comment for WG.

- 4) WGDRR decided to continue conducting the projects which can improve capacities of disaster management among TC Members through the project of information exchange and sharing such as participation in the important DRR world conferences, organizing the expert team to selected member state and using effective platform to exchange DRR information, as well as holding the WGDRR annual meeting.
- 5) WGDRR decided to continue the projects related to public education on DRR for promotion in the coming future which can raising public awareness on typhoon related disasters.
- 6) At the WGDRR annual meeting, HKO expressed that they can continue providing videos especially related to tropical cyclone or severe weather for TC DRR public education use. The project will be led by HKO.
- 7) HKO proposed to arrange online seminar in replace of the face-to-face seminar. The online seminar will compose of two sessions on sharing the concept and experience of developing "My Weather Observation" and "Micro-climate Weather Station" by HKO. The members agreed with HKO's proposal.
- 8) The project of Capacity Building/Knowledge Sharing in DRR. Due to the travel restriction by the pandemic, it has been cancelled for implementation in 2021 and WGDRR decided to postpone the project until 2022 subject to the situation related to travel restriction and situation of the pandemic.
- 9) For implementation of the proposed projects in 2022, WGDRR proposed the request of **USD 12,000** to be allocated TCTF for the following items:
  - (a) To allocate USD **10,000** budget of TCTF in 2022 for Capacity Building/Knowledge Sharing in DRR
  - (b) To allocate USD **2,000** budget of TCTF in 2022 for Making Education Video related to DRR

10) Discussion of the Priorities for WGDRR draft of the Strategic Plan 2022-2026. Members agreed the following priorities and corresponding KRAs.

WG	Priorities	Key Result Area KRA						
		1	2	3	4	5	6	7
DRR	Provide reliable statistics of mortality and direct disaster economic loss caused by typhoon-related disasters for monitoring and the targets of the Typhoon Committee	X					X	
	Enhance Members' disaster risk reduction techniques and management strategies			X	X	X		X
	Evaluate socio-economic benefits of disaster risk reduction for typhoon-related disasters		X	X	X	X		
	Promote international cooperation of DRR implementation project		X	X	X	X		X
	Share experience/know how of DRR activities including legal and policy framework, community-based DRR activities, methodology to collect disaster-related information.	X			X	X		X

- KRA 1: Enhance capacity to monitor the impacts of tropical cyclone related disasters, including reduction of mortality rates and direct economic losses, and strengthen tropical cyclone related disaster risk reduction (DRR) activities in various sectors.
- KRA 2: Enhance capacity in tropical cyclone forecast and disaster risk prediction using multi-hazard impact-based forecasts, risk-based warnings, understandable information designed in collaboration with users, and cutting-edge information technology, leveraged from the latest advances in big data analytics, artificial intelligence, machine learning, and social science to support early warning systems, decision making and disaster response.
- KRA 3: Improve flood mitigation measures and integrated water resource management to reduce the impacts of flooding caused by tropical cyclones.
- KRA 4: Strengthen capacity development activities in meteorology, hydrology, DRR and civil protection sectors, to enhance nationally to locally coordinated mechanisms for tropical cyclone early warning information to reach the last mile; and combine public awareness with the appropriate response to protect life and property from tropical cyclones.
- KRA 5: Promote visibility and enhance Typhoon Committee's Regional and International collaboration mechanisms to build partnerships, enhance capacity development, share best practices, and encourage active participation of international organizations in the disaster risk reduction programmes.
- KRA 6: Create a framework for cooperative scientific research on tropical cyclone and related disciplines, particularly in relation to climate change, and include support for translating research outcomes to services by developing relevant experiments, research projects, conducting field surveys, and publishing and promoting research findings.
- KRA 7: Enhance the resilience of vulnerable communities, especially coastal communities, to tropical cyclone impacts.

### 3. Recommendations for Implementation in 2022

On the basis of the conclusion, the WGDRR made the following recommendations:

- 1) To request NDMI to organize the team to the selected member for the project of capacity building and knowledge sharing in DRR
- 2) To request NDMI to continue supporting the development and improvement of the early warning and alert systems related to typhoon disaster in the participating members
- 3) To request NDMI, Republic of Korea to continue supporting and hosting the WGDRR Annual Workshop in 2022 in ROK.
- 4) To request STI, China to continue conducting the research of the project of benefit evaluation of typhoon disaster prevention and preparedness.
- 5) To encourage the Members to share information related to DRR on the established forum of TC Website.
- 6) To request Hong Kong to continue providing WGDRR with a video related to typhoon disaster or severe weather and translate it into English version (voiceover and subtitle) for Members use on DRR public education.
- 7) To request HKO to conduct the Seminar for TC Crowd-sourcing high density non-conventional weather data
- 8) To request the Typhoon Committee to approve the proposed projects and related budget in 2022.
- 9) As Dr. Yuntae Kim retired the role of Vice chair on 14 January, 2022, Dr. Woojung Choi (NDMI) replaced Dr Kim's role of Vice Chair on 15 January, 2022.

As from Jan 15, 2022, the Vice Chairs of WGDRR are:  
Dr. Woojung Choi(NDMI), Mr. Marcus AYDLETT(NOAA)

## II. Progress Report on activities of Working Group on WGDRR in 2021

### 1. Introduction

The Working Group of Disaster Risk and Reduction (WGDRR) continued to implement a series of projects according to the plan outline from the 53th TC Session. However, most of the face to face programs or projects are hindered by the COVID travel restrictions and was replaced by virtual meetings.

### 2. Components of the WGDRR

WGDRR Member (Focal points)

<i>Chair</i>	Dr. Sang Kwon Lee (Republic of Korea) until 2 Dec , 2021 Dr. Jongseol Lee (Repubic of Korea) from 3 Dec, 2021
<i>Vice Chairs</i>	Mr. Marcus Aydlett (USA) Dr. Yuntae Kim (Republic of Korea)until 14 Jan, 2022 Dr. Woojung Choi (Republic of Korea ) from 15 Jan, 2022
<i>Focal Points</i>	National Committee for Disaster Management (Cambodia) Mr. Wang Yawei (China) Mr. Kim Chol (DPR Korea) Mr. W Kong (Hong Kong, China) Mr. Soshi Murakawa (Japan) Mr. Norio Egawa (Japan) Ms. Shoko Kabuto (Japan) Mr. Shuhei Yasumatsu (Japan) Ms. Akhom Thammalangsy (Lao PDR) Mr. Ho Su Hon (Macao, China) Ms. Che Siti Noor bint koh Poh Lee (Malaysia) Mr. Bernardo Rafael R Alejandro IV, CESO IV (Philippines) Dr. Chihun Lee (Republic of Korea) Mr. Cheong Wee Kiong (Singapore) Mr. Saharat Wongsakulwiwat (Thailand) Mrs. Nguyen Thi Xuan Hong (Vietnam)

### 3. Organization of the 16<sup>th</sup> Working Group Disaster Risk and Reduction Virtual Meeting in Nov 2021

A video conference for the 16th Working Group meeting of ESCAP/WMO Typhoon Committee (TC) Working Group on Disaster risk and reduction (WGDRR) was organized by the National Disaster Management Institute (NDMI) on November 5, 2021 to discuss on the implementation status of the Annual Operation Plan in DRR aspects.

The meeting was convened by Dr Yuntae Kim, Vice Chair of WGDRR, with around 30 members and representatives from ESCAP, WMO, ADRC, Thailand, Malaysia, Lao PDR, Vietnam, USA, China (Shanghai, Hong Kong and Macau) and TCS participating. Dr Chihun LEE from NDMI was the moderator of the meeting.

During the meeting, the 2021 AOP implementation status was reviewed as follow

(1) AOP1. Capacity Building / Knowledge Sharing (NDMI)

- (a) Initially a seminar regarding capacity building was proposed to be held in Palau in August 2021. Due to the outbreak of COVID-19 around the world, NDMI decided to postpone the seminar to 2022.

(2) AOP2. Setting up Early Warning and Alert System (NDMI)

- (a) Since 2013 NDMI has launched the project for strengthening capabilities of disaster risk reduction with various countries. Similar project in Lao PDR was implemented in 2021. Feasibility studies such as site visit, land survey and meetings with local office was conducted and it was planned to install early warning and alert systems in Houaphanh and Xaisomboun Province in 2022.

(3) AOP3. WGDRR Annual Meeting

- (a) Owing to the COVID situation, WGDRR annual meeting has been using online mode since 2020. If the situation in 2022 permits, it will get back to face to face meeting in Korea. If not, it will still be online meeting.

(4) AOP4. Benefit Evaluation of Typhoon DRR (STI)

- (a) Dr. Shengming Tang from Shanghai Typhoon Institute (STI), China Meteorological Administration presented the progress of the benefit Evaluation of Typhoon DRR.
- (b) The project named "Benefit evaluation of typhoon disaster prevention and preparedness" aims to promote the research relating to this topic. Recent work focused on development and improvement of more specific level in a region on risk assessment technique and the potential risk assessment model's resolution.
- (c) STI will continue to work on the verification of the empirical rainfall estimation model for Tropical Cyclones over Western North Pacific for the needs of assessing the long-term risk (STIRM) as well as multi-scale modelling and validation of Tropical Cyclone rainstorm waterlogging using multi-source precipitations. Furthermore, a novel wind field dynamical downscaling method (STIDM, Shanghai Typhoon Institute Downscaling Model) based on aerodynamical parameters (wind speed-up ratio) of the two-dimensional terrain was proposed.

(5) AOP5. Sharing Information related to DRR (NDMI)

- (a) WGDRR will continue to exchange information and experience related to DRR through the forum on the TC website. Members are welcome to upload all kinds of DRR information such as data, video clips to the TC website.



(6) AOP6. Making Education Videos related to DRR (HKO)

- (a) A video about “Fujiwhara Effect” was translated into English with voiceover and subtitles as the coming education video related to DRR. Hong Kong Observatory shared the video during the meeting and no further comment was received from the members. The video was uploaded to the Typhoon Committee website for members to use on public education on DRR.

(7) AOP7. Seminar for TC Crowd-sourcing high density non-conventional weather data (HKO)

- (a) Referring to the last WGDRR annual meeting, it was originally planned to conduct a face-to-face seminar (around 3 days) in the 4th Quarter of 2021 for experience sharing on concept and methodology of Tropical Cyclone crowd-sourcing high density non-conventional data. However, as the COVID-19 pandemic remained, it was considered still not suitable to host such face-to-face meeting due to safety and travelling considerations. While it was uncertain how long the pandemic would last for, instead of further postponement, HKO proposed to arrange online seminar in replace of the face-to-face seminar. The online seminar will compose of two sessions on sharing the concept and experience of developing "My Weather Observation" and "Micro-climate Weather Station" by HKO. The members agreed with HKO's proposal.

During the meeting, the 2021 WGDRR 2021 Budget Status was reviewed as follow

Project No	Name of Project	Proposed Budget USD	Expenditure USD
AOP1	Capacity Building/Knowledge Sharing in DRR	\$10,000	--
AOP2	Installation of Early Warning System related to typhoon disasters	Funded by NDMI	--
AOP3	WGDRR Annual Meeting	Funded by NDMI	--
AOP4	Benefit Evaluation of Typhoon Project	6,000	\$0
AOP5	Sharing Information related to DRR	No need	--
AOP6	Making video related to DRR	2,000	1,735
AOP7	Seminar for TC Crowd-sourcing high density non-conventional weather data	12,000	0
	Total	30,000	1,735
	Balance USD	28,265	

The only expenditure for 2021 DRR was the expected production fee USD1,735 of the educational video by Hong Kong Observatory. AOP6

The participants expressed their appreciation to National Disaster Management Institute (NDMI) for their kind contribution and continued support on WGDRR activities and Hong Kong Observatory for making educational videos for the past years.

The participants extended their further appreciation to the Working Group Chairs, Dr. Yuntae Kim and Mr. Marcus Aydlett for their contribution and effort in the past years.

#### 4. WGDRR AOP 2022 and Budget

<b>Project No</b>	<b>Name of Project</b>	<b>Working Plan 2022</b>	<b>Proposed Budget USD</b>
<b>AOP1</b>	Capacity Building/Knowledge Sharing	Knowledge Sharing meeting will continue in Palau if situation permits.	10,000
<b>AOP2</b>	Installation of Early Warning System related to typhoon disasters	Will implement a new project in Toledo City and Municipality of Dumanjug in Philippines	Funded by NDMI
<b>AOP3</b>	WGDRR Annual Meeting	Face to face meeting in Korea if situation permits.	Funded by NDMI
<b>AOP4</b>	Benefit Evaluation of Typhoon Project	Fellowship research if situation permits. Research on Benefit Evaluation of Typhoon projects will be continued.	Funded by STI
<b>AOP5</b>	Sharing Information related to DRR	Sharing information in TC website forum.	No need
<b>AOP6</b>	Making video related to DRR	Making more educational videos by HKO.	2,000
<b>AOP7</b>	Seminar for TC Crowd-sourcing high density non-conventional weather data	Hosting an online seminar by HKO, after the 54 <sup>th</sup> TC Session in 2022.	No need
<b>TOTAL</b>			USD12,000

## ANNEX

### I. Implementation for WGDRR AOPs in 2021 with the success indicators

SP's KRA and SG	NO	Objective	Action	Other WGs Involved	TCS Responsibility	Quarter Completed	Project leader/Other Organizations Involved	Success Indicators	Funding Required USD	Funding Sources	Completed YES/NO
KRA3 KRA4 KRA5	1	Capacity Building /Knowledge Sharing	To organize an expert team to Palau for DRR information and capacity building exchange	Invite other WGs to join	Coordination and participation	Third	NDMI And participating members	Conducted the Mission in the selected member state	10,000	NDMI and TCTF	No
KRA2 KAR3 KRA4 KRA5	2	Installation of warning systems related to typhoon disaster	To develop and improve the installed EW and Alert Systems in the members' state in order to improve the capacities of resilience for typhoon related disaster		Coordination	Fourth	NDMI	NDMI assigned experts to Laos and Vietnam to install and maintain the systems	Unspecific	NDMI	Yes

SP's KRA and SG	NO	Objective	Action	Other WGs Involved	TCS Responsibility	Quarter Completed	Project leader/Other Organizations Involved	Success Indicators	Funding Required USD	Funding Sources	Completed YES/NO
KRA1 KRA4 KRA5	3	Organizing the WGDRR Annual Meeting	To organize the annual meeting to follow up on the working group's activities and information exchange	AWG Members	Coordination and participation	Second	NDMI and TC DRR Members	The meeting was held in ROK	Unspecified	NDMI	No
KRA1 KRA4 KRA5	4	Benefit Evaluation of Typhoon Project	To promote the research concerning benefit evaluation of typhoon disaster prevention and preparedness.		Coordination and participation	Second/ Third	STI, China	Conducted a research fellowship for TC Member in STI, China	6,000	TCTF	No
KRA2 KRA3 KRA4 KRA5	5	Sharing information related to disaster risk management	To share information such as policies or mechanism related to DRR among TC Members via the forum established on TC Website		Establishment of the forum on TC website for facilitating the information sharing	Fourth	NDMI and TCS	Members shared the information on the forum	No need		Yes

SP's KRA and SG	NO	Objective	Action	Other WGs Involved	TCS Responsibility	Quarter Completed	Project leader/Other Organizations Involved	Success Indicators	Funding Required USD	Funding Sources	Completed YES/NO
KRA2 KRA3 KRA4 KRA5	6	Making educational video related to DRR	To produce a video related to DRR education for raising public awareness.		Coordination	Third/ Fourth	NDMI	Completed the video with English subtitle and voiceover and shared with TC Member	1,735	TCTF	Yes
KRA2 KRA3 KRA4 KRA5	7	Seminar for TC Crowd-sourcing high density non-conventional weather data	HKO organize a Seminar and WG to coordinate the Member to take part in		Coordinate	Fourth	Hong Kong and participating members	The Seminar was successfully held in Hong Kong	12,000	TCTF	No

- KRA 1: Enhance capacity to monitor mortality and direct economic loss caused by typhoon-related disasters.
- KRA 2: Enhance capacity to generate and provide accurate, timely and understandable information using multi-hazard impact-based forecasts and risk-based warnings.
- KRA 3: Improve typhoon-related flood control and integrated water resource management.
- KRA 4: Strengthen typhoon-related disaster risk reduction activities in various sectors, including increased community-based resiliency with better response, communication, and information sharing capability.
- KRA 5: Enhance Typhoon Committee's Regional and International collaboration mechanism.

ANNEX

**II. WGDRR AOPs in 2022 with the success indicators**

SP's KRA and SG	NO	Objective	Action	Other WGs Involved	TCS Responsibility	Quarter Completed	Project leader/Other Organizations Involved	Success Indicators	Funding Required	Funding Sources	Completed YES/NO
KRA3 KRA4 KRA5	1	Capacity Building /Knowledge Sharing	To organize an expert team to Palau for DRR information and capacity building exchange	Invite other WGs to join	Coordination and participation	Third	NDMI And participating members	Conducted the Mission in the selected member state	USD10,000	NDMI and TCTF	
KRA2 KAR3 KRA4 KRA5	2	Installation of warning systems related to typhoon disaster	To develop and improve the installed EW and Alert Systems in the members' state in order to improve the capacities of resilience for typhoon related disaster		Coordination	Fourth	NDMI	NDMI assigned experts to Philippines to install and maintain the systems	Unspecified	NDMI	
KRA1 KRA4 KRA5	3	Organizing the WGDRR Annual Meeting	To organize the annual meeting to follow up on the working group's activities and information exchange	AWG Members	Coordination and participation	Second	NDMI and TC DRR Members	The meeting was held in ROK	Unspecified	NDMI	

SP's KRA and SG	NO	Objective	Action	Other WGs Involved	TCS Responsibility	Quarter Completed	Project leader/Other Organizations Involved	Success Indicators	Funding Required	Funding Sources	Completed YES/NO
KRA1 KRA4 KRA5	4	Benefit Evaluation of Typhoon Project	To promote the research concerning benefit evaluation of typhoon disaster prevention and preparedness.		Coordination and participation	Second/ Third	STI, China	Conducted a research fellowship for TC Member in STI, China. /Organized online seminar		STI	
KRA2 KRA3 KRA4 KRA5	5	Sharing information related to disaster risk management	To share information such as policies or mechanism related to DRR among TC Members via the forum established on TC Website		Establishment of the forum on TC website for facilitating the information sharing	Fourth	NDMI and TCS	Members shared the information on the forum	No need		
KRA2 KRA3 KRA4 KRA5	6	Making educational video related to DRR	To produce a video related to DRR education for raising public awareness.		Coordination	Third/ Fourth	NDMI	Completed the video with English subtitle and voiceover and shared with TC Member	USD2,000	TCTF	
KRA2 KRA3 KRA4 KRA5	7	Seminar for TC Crowd-sourcing high density non-conventional weather data	HKO organize an online Seminar for members to take part in		Coordinate	First/Second	Hong Kong and participating members	The Seminar was successfully held in Hong Kong	No need		



- KRA 1: Enhance capacity to monitor mortality and direct economic loss caused by typhoon-related disasters.
- KRA 2: Enhance capacity to generate and provide accurate, timely and understandable information using multi-hazard impact-based forecasts and risk-based warnings.
- KRA 3: Improve typhoon-related flood control and integrated water resource management.
- KRA 4: Strengthen typhoon-related disaster risk reduction activities in various sectors, including increased community-based resiliency with better response, communication, and information sharing capability.
- KRA 5: Enhance Typhoon Committee's Regional and International collaboration mechanism.