ESCAP/WMO
Typhoon Committee

MEMBER REPORT
Japan

ESCAP/WMO Typhoon Committee
17th Integrated Workshop
(Video conferencing)
29-30 November 2022

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UNITED NATIONS
Economic and Social Commission for Asia and the Pacific

World Meteorological Organization

CONTENTS

I. Overview of tropical cyclones which have affected/impacted Member's area since the last Committee Session

1. Meteorological Assessment (highlighting forecasting issues/impacts)

In 2022, 11 tropical cyclones (TCs) of tropical storm (TS) intensity or higher had come within 300 km of the Japanese archipelago as of 4 November*. Three made landfall, and the country was affected even by those that did not make landfall. The TCs are described below, with their tracks shown in Figure 1.
*The track/intensity commentary provided here is subject to change once best-track data are finalized.

(1) TY MALAKAS (2201)
MALAKAS formed as a tropical depression (TD) over the sea around the Chuuk Islands at 06 UTC on 6 April 2022 and moved westward. It changed its move north-northwestward before it was upgraded to tropical storm (TS) intensity over the sea around the Caroline Islands at 00 UTC on 8 April and gradually moved northwestward. It was upgraded to typhoon (TY) intensity over the sea east of the Philippines at 00 UTC on 12 April and turned northeastward. Keeping its northeastward track, it reached its peak intensity with maximum sustained winds of 90 kt and a central pressure of 945 hPa over the same waters at 18 UTC the next day. It transitioned into an extratropical cyclone over the sea east of Japan by 12 UTC on 15 April. It entered the sea around the Aleutian Islands and crossed longitude 180 degrees east before 00 UTC on 18 April.

(2) TS AERE (2204)
AERE formed as a tropical depression (TD) over the sea east of the Philippines at 12 UTC on 30 June 2022 and moved northwestward. It was upgraded to tropical storm (TS) intensity over the same waters at 18 UTC the same day and moved north-northeastward. After changing its move northwestward, it reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 994 hPa near Okinawa Island at 06 UTC on 2 July. It crossed Okinawa Island with TS intensity around 14 UTC the same day and moved northwestward and then turned northeastward. It landed near Sasebo City, Nagasaki Prefecture with TS intensity before 21 UTC on 4 July. It transitioned into an extratropical cyclone over the northern part of Kyushu Island by 00 UTC on 5 July. It moved eastward over the Seto Inland Sea toward the Kii Peninsula and entered the Pacific Ocean. It further moved over the waters east of Honshu Island and dissipated over the waters south of Hokkaido Island at 18 UTC on 10 July.

(3) TS SONGDA (2205)
SONGDA formed as a tropical depression (TD) over the sea west of the Mariana Islands at 12 UTC on 26 July 2022 and moved northwestward. Keeping its northwestward track, it was upgraded to tropical storm (TS) intensity at 12 UTC 28 July over the sea south of Japan. It reached its peak intensity with maximum sustained winds of 40 kt over the waters southwest of Kyushu Island at 12 UTC on 29 July. Its central pressure was 1000 hPa at that time and lowered to 996 hPa at 00 UTC on 31 July. It decelerated and changed its move northward over the Yellow Sea. It weakened to TD intensity at 18 UTC on 31 July and dissipated over the same waters at 12 UTC on 1 August.

(4) TS TRASES (2206)
TRASES formed as a tropical depression (TD) over the sea south of Okinawa Island at 12 UTC on 29 July 2022 and moved west-northwestward. It gradually changed its move northward and was upgraded to tropical storm (TS) intensity, and at the same time, reached its peak intensity with maximum sustained winds of 35 kt and a central pressure of 998 hPa over the same waters at 00 UTC on 31 July. Keeping its northward track, it weakened to TD intensity over the waters near the

western coast of the Korean Peninsula at 12 UTC on 1 August and dissipated over the northern part of the Korean Peninsula 12 hours later.

(5) TS MEARI (2208)

MEARI formed as a tropical depression (TD) over the sea west of Minamitorishima Island at 18 UTC on 8 August 2022 and moved west-northwestward. It was upgraded to tropical storm (TS) intensity over the sea south of Japan at 12 UTC on 11 August, and turned north-northeastward. It reached its peak intensity with maximum sustained winds of 40 kt over the same waters at 12 UTC on 12 August. Its central pressure was 1000 hPa at that time and lowered to 998 hPa 12 hours later. MEARI gradually turned northeastward, and passed around Omaezaki, Shizuoka Prefecture with TS intensity before 06 UTC on 13 August and then landed on the Izu Peninsula, Shizuoka Prefecture with TS intensity around 0830 UTC the same day. Its central pressure further lowered to 996 hPa over the sea east of Japan at 06 UTC on 14 August keeping its peak intensity of maximum sustained winds of 40 kt. It transitioned into an extratropical cyclone over the sea around the Kuril Islands by 12 UTC the same day. It gradually turned northward, and crossed latitude 60 degrees north before 18 UTC on 16 August.

(6) TY HINNAMNOR (2211)

HINNAMNOR, after forming as a tropical depression (TD), it was upgraded to tropical storm (TS) intensity over the sea east of Minamitorishima Island at 06 UTC on 28 August 2022 and moved westward. It was upgraded to typhoon (TY) intensity at 06 UTC on 29 August. It reached its peak intensity with maximum sustained winds of 105 kt with a central pressure of 920 hPa over the sea south of Japan at 12 UTC on 30 August. After a slight weakening, it intensified again to the same peak intensity at 00 UTC on 1 September. Moving south-southwestward, it turned sharply northwestward over the sea south of Okinawa Island on 2 September and gradually changed its move northeastward. It transitioned into an extratropical cyclone over the Sea of Japan by 12 UTC on 6 September.

(7) TY MUIFA (2212)

MUIFA, after forming as a tropical depression (TD), it was upgraded to tropical storm (TS) intensity over the sea east of the Philippines at 00 UTC on 8 September 2022 and moved northwestward. It was upgraded to typhoon (TY) intensity over the sea south of Okinawa Island at 00 UTC on 10 September. It reached its peak intensity with maximum sustained winds of 85 kt with a central pressure of 950 hPa over the same waters at 18 UTC on 10 September. It moved northwestward after meandering northward, and hit the coast of China on 14 September. It transitioned into an extratropical cyclone over the waters north of the Shandong Peninsula by 00 UTC on 16 September.

(8) TY NANMADOL (2214)

NANMADOL, after forming as a tropical depression (TD), it was upgraded to tropical storm (TS) intensity over the waters south of the Ogasawara Islands at 18 UTC on 13 September 2022 and moved eastward. After changing its move northward, it further changed its move westward and was upgraded to typhoon (TY) intensity over the sea south of Japan at 12 UTC on 15 September. It reached its peak intensity with maximum sustained winds of 105 kt with a central pressure of 910 hPa over the same waters at 18 UTC on 16 September. It moved northwestward, and landed in Kagoshima Prefecture on 18 September. After moving up through Kyushu Island, it moved over the Honshu Island and entered the Sea of Japan. It landed near Niigata City on 19 September and transitioned into an extratropical cyclone over the sea east of Japan by 00 UTC on 20 September.

(9) TS TALAS (2215)

TALAS, after forming as a tropical depression (TD), it was upgraded to tropical storm (TS) intensity over the waters south of the Kii Peninsula at 00 UTC on 23 September 2022 and moved northward.

Its peak intensity was when it was upgraded to TS with maximum sustained winds of 35 kt with a central pressure of 1000 hPa. It changed its move northeastward and transitioned into an extratropical cyclone over the waters south of Shizuoka Prefecture by 00 UTC on 24 September.

(10) STS KULAP (2217)

KULAP, after forming as a tropical depression (TD), it was upgraded to tropical storm (TS) intensity over the waters south of the Ogasawara Islands at 00 UTC on 26 September 2022 and moved westward. After changing its move northward, it was upgraded to severe tropical storm (STS) intensity near the Ogasawara Islands at 18 UTC the same day. It reached maximum sustained winds of 60 kt with a central pressure of 975 hPa at 18 UTC on 28 September over the sea east of Japan, and its central pressure further lowered to 970 hPa over the same waters 6 hours later. It transitioned into an extratropical cyclone over the sea far off east of Japan by 06 UTC on 29 September.

(11) TY ROKE (2218)

ROKE, after forming as a tropical depression (TD), it was upgraded to tropical storm (TS) intensity over the sea south of Japan at 12 UTC on 28 September 2022 and moved northward. After changing its move northeastward, it was upgraded to Typhoon (TY) intensity over the same waters at 12 UTC on 29 September. It reached its peak intensity with maximum sustained winds of 70 kt with a central pressure of 975 hPa over the same waters six hours later. It transitioned into an extratropical cyclone over the sea east of Japan by 18 UTC on 1 October.

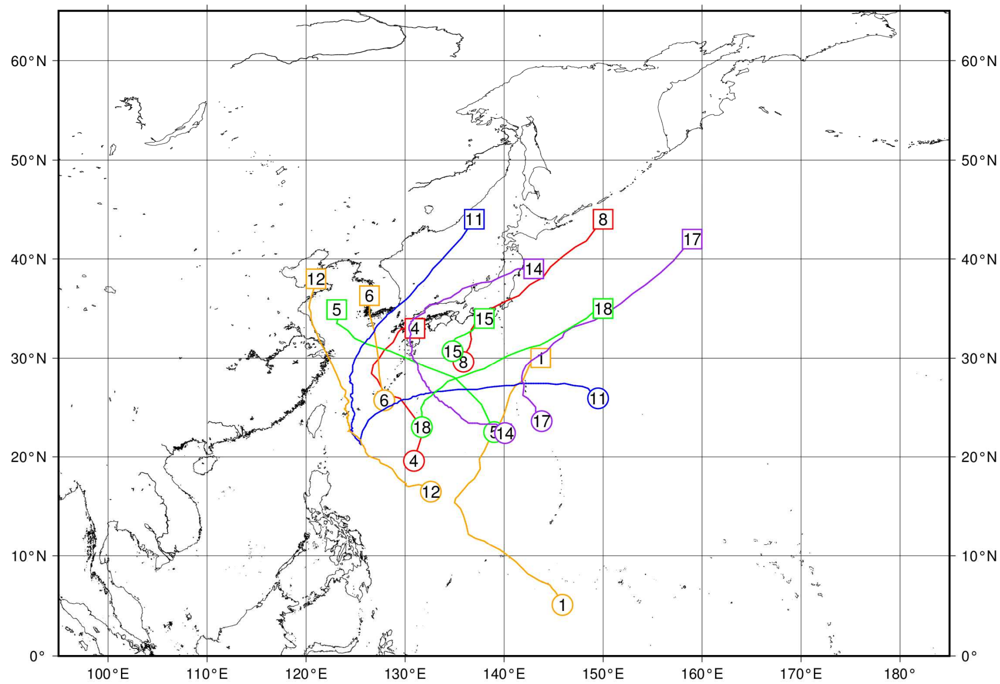

Figure 1: Tracks of the eleven named TCs affecting Japan in 2022

The numbered circles represent the genesis point of each named TC, while the squares show the dissipation point. The last two digits of the identification number for each named TC are shown.

2. Hydrological Assessment (highlighting water-related issues/impact)

In 2022, eleven tropical cyclones had approached Japan as of 15 November, with three making landfall and some causing flooding.

1) Typhoon Nanmadol and Tropical Storm Talas (September 2022)
These tropical cyclones brought heavy rain to the Kyushu and Chubu regions, causing 49 rivers to overflow, inland flooding and 107 sediment disasters. A record 129 dams were pre-discharged based on rainfall forecasts as Nanmadol approached.

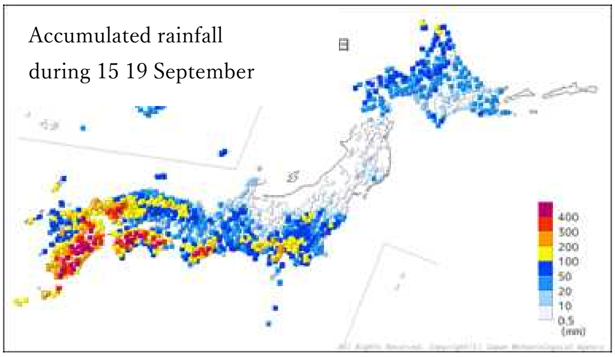

Figure 2: Total rainfall for the period of Nanmadol (Sept. 14 –19 2022)

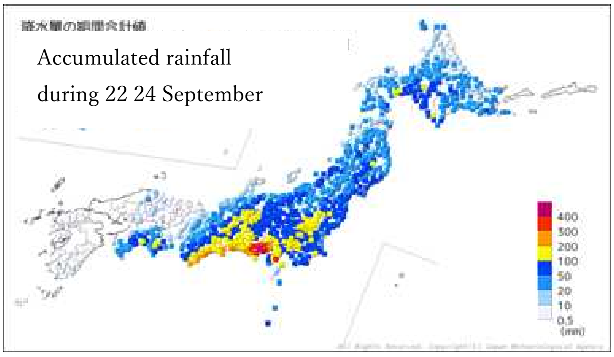

Figure 3: Total rainfall for the period of Talas (Sept. 22 – 24 2022)

Figure 4: Otagawa River (Hiroshima prefecture)

Figure 5: Futamata River (Shizuoka prefecture)

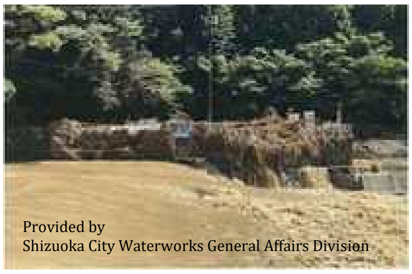

Figure 6: Okitsu River (Shizuoka prefecture)

3. Socio-Economic Assessment (highlighting socio-economic and DRR issues/impacts)

Damage Caused by Tropical Cyclones in 2022

As of October 20, 2022, 21 tropical cyclones had developed, of which 11 approached Japan and 3 made landfall.

Nanmadol (2214) developed to tropical storm intensity over the sea around the Ogasawara Islands at 3:00 on September 14 (JST). It further developed and made landfall near Kagoshima at around 19:00 on September 18 with typhoon intensity, and then passed northward over Kyushu Island before turning eastward on the morning of September 19 and transitioning into an extratropical cyclone at 9:00 on September 20. During the period, unprecedented precipitation and storm conditions were observed in the Kyushu region and other parts of western Japan.

Five people died, 19 were seriously injured and 134 suffered minor injuries. Ten houses were destroyed, 15 seriously damaged, 870 partially damaged, 784 inundated above floor level, and 655 inundated below floor level.

A total of 430,201 households experienced power blackouts in the district covered by Kyushu Electric Power and elsewhere, and water supplies were disrupted at 12,769 households in the Kyushu region and elsewhere.

Tropical Storm Talas (2215) developed about 300 km south of Cape Muroto at 9:00 JST on September 23. It moved northeast toward the Kinki and Tokai regions before transitioning into an extratropical cyclone offshore of Tokaido at 9:00 on September 24. During its passage, Shizuoka Prefecture experienced hazardous and long-lasting rainfall, and several heavy-rain bulletins were issued.

Three people died and 6 suffered minor injuries. Five houses were completely destroyed, 9 seriously damaged, 101 partially damaged, 4,093 inundated above floor level, and 4,270 inundated below floor level.

A total of 119,230 households experienced issues with electricity in the district covered by Chubu Electric Power, and water supplies were disrupted at 76,043 households in Shizuoka Prefecture.

4. Regional Cooperation (highlighting regional cooperation and related activities)

1) Asian Conference on Disaster Reduction 2021

Date: 14(Wed.) - 16(Thu.) December 2021
Location: Online
Theme: Time for Change and Transformation: the Road to Resilient Asia

2) 4th Asia-Pacific Water Summit (postponed from October 2020)

Date: 23 (Sat.) – 24 (Sun.) April 2022
Location: Kumamoto, Kumamoto Prefecture, Japan
Theme: Water for Sustainable Development – Best Practices and Connecting to the Next Generation

II. Summary of Progress in Priorities supporting Key Result Areas

1. Upgrade to Tropical Cyclone Heat Potential (TCHP) products on the Numerical Typhoon Prediction (NTP) website

Main text:
Upgrades to the Japan Meteorological Agency's MOVE/MRI.COM-JPN ocean data assimilation system in October 2020 included improved resolution and the adoption of a four-dimensional variational data assimilation (4D-Var). In accordance with this improvement, the Tropical Cyclone Heat Potential (TCHP) product was upgraded with a high resolution of approximately 0.1 degrees, which allows detailed monitoring of TCHP structures.

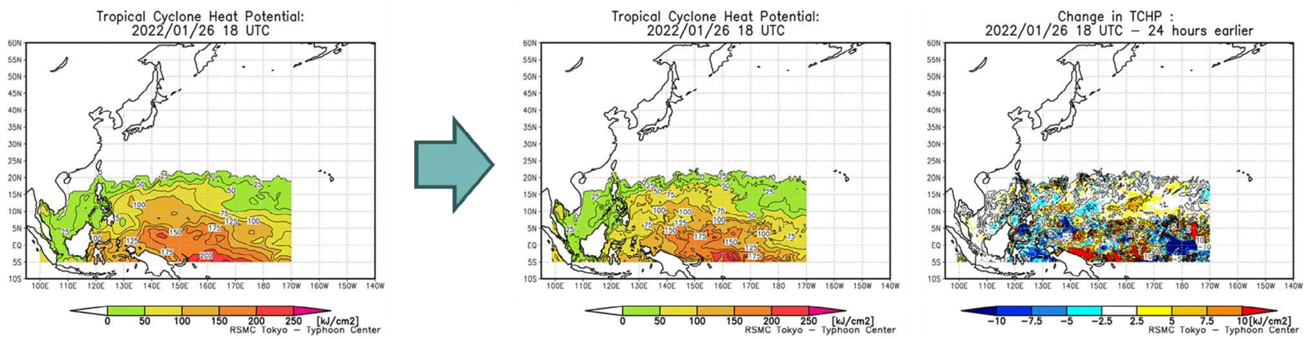

Figure 7: Former TCHP product (left) and updated version (center, right)

Identified opportunities/challenges, if any, for further development or collaboration:
Ongoing focus will be placed on improving NTP website content.

Priority Areas Addressed:
<u>Meteorology</u>

- Enhance the capacity to monitor and forecast typhoon activities particularly in genesis, intensity and structure change.

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2. Attachment training in 2022

Main text:
The 21st ESCAP/WMO Typhoon Committee Attachment Training course was held from 11 to 13 January 2022. The RSMC Tokyo – Typhoon Center has run these annual courses since 2001 with the support of the WMO Tropical Cyclone Programme and the Typhoon Committee in order to enhance the tropical cyclone (TC) analysis and forecasting capacity of Committee Members. Due to the ongoing COVID-19 situation, the course was held online (as in 2021) with 55 attendees from eight Typhoon Committee Members (China; Hong Kong, China; Macao, China; Malaysia; the Republic of Korea; Thailand; the USA and Viet Nam).

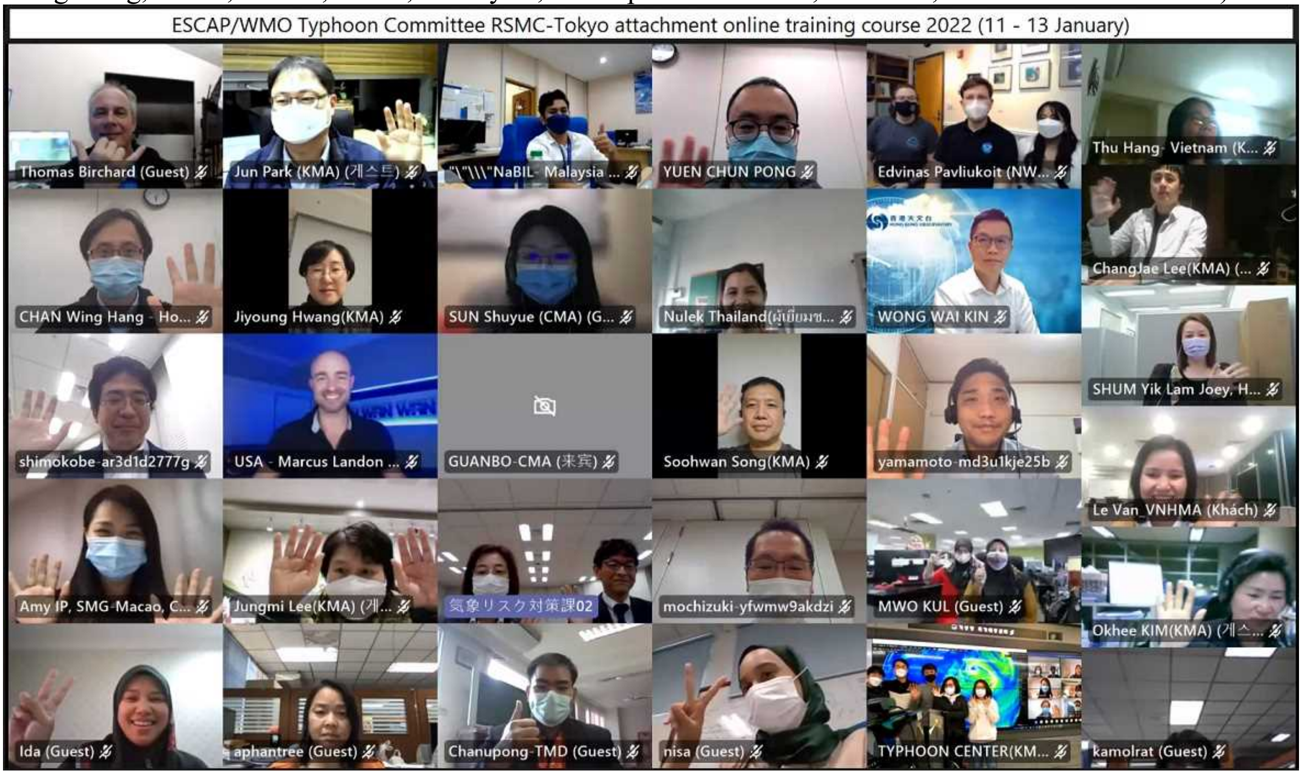

Figure 8: Attendees and Tokyo Typhoon Center staff (13 January 2022)

Identified opportunities/challenges, if any, for further development or collaboration:
Ongoing focus will be placed on enhancing training course quality.

Priority Areas Addressed:
<u>Meteorology</u>
- Enhance the capacity to monitor and forecast typhoon activities particularly in genesis, intensity and structure change.
- Develop and enhance typhoon analysis and forecast techniques from nowcast to medium-range, and seasonal to long-range prediction.
- Enhance and provide typhoon forecast guidance based on NWP including ensembles, weather radar and satellite related products, such as QPE/QPF.
- Promote communication among typhoon operational forecast and research communities in Typhoon Committee region.
- Enhance training activities with TRCG, WGH, and WGDRR in accordance with Typhoon Committee forecast competency, knowledge sharing, and exchange of latest development and new techniques.

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3. Operational Satellite Switchover from Himawari-8 to Himawari-9

Main text:
The Japan Meteorological Agency plans to switch operation from its Himawari-8 satellite to its Himawari-9 unit on 13th December 2022. Himawari-9 carries the same Advanced Himawari Imager (AHI) sensor equipment as Himawari-8, and will conduct observations from the same orbital position (140.7°E) with the same observation sequence. Slight differences may be observed due to individual sensor characteristics between Himawari-8 and Himawari-9. Results of comparison will be provided on the Meteorological Satellite Center website in due course. For technical details, see https://www.data.jma.go.jp/mscweb/en/oper/switchover.html.

(1) For HimawariCloud users
HimawariCloud users will be able to access Himawari-9 data in a similar way to Himawari-8 data, with the current HimawariCloud account remaining valid. No additional procedures are needed for users to receive Himawari-9 data.

(2) For HimawariCast users
HimawariCast users will not need to modify receiver system settings (data format/quality or antenna orientation) in relation to the switch.

The Japan Meteorological Agency will continue to provide stable distribution of Himawari observation data, which is essential for typhoon monitoring in the Asia-Pacific region.

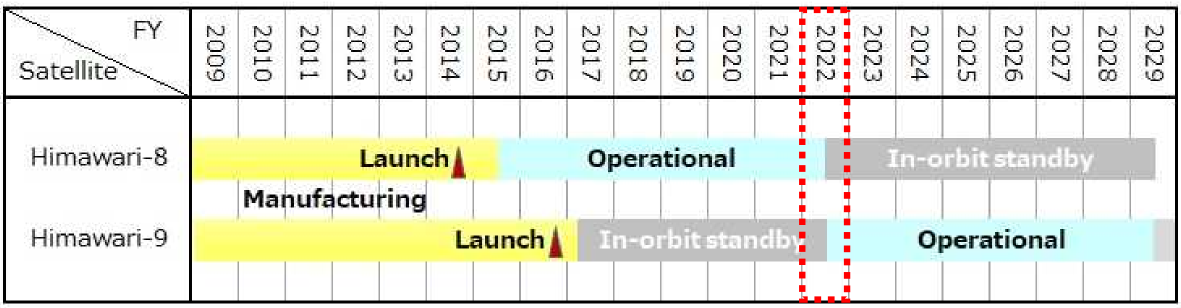

Figure 9: Himawari satellites schedule

Identified opportunities/challenges, if any, for further development or collaboration:
It is important to deliver accurate data continuously even after the operational satellite is switched from Himawari-8 to Himawari-9.

Priority Areas Addressed:
<u>Integrated</u>

- Enhance collaborative activities with other regional/international frameworks/organizations, including technical cooperation between TC/AP-TCRC and TC/PTC cooperation mechanism.

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4. Upgrade of JMA's Global Ensemble Prediction System

Main text:
JMA upgraded its Global Ensemble System (Global EPS) in March 2022 to incorporate recent GSM developments, including enhanced horizontal resolution (40 to 27 km), improved sea surface temperature boundary conditions, and updating of the initial perturbation amplitude (Yamaguchi et al. 2022). The increased horizontal resolution allows the model to resolve TCs better. Consequently, the central pressures of TCs are deepened on average to make them closer to verification values (Figure 10).

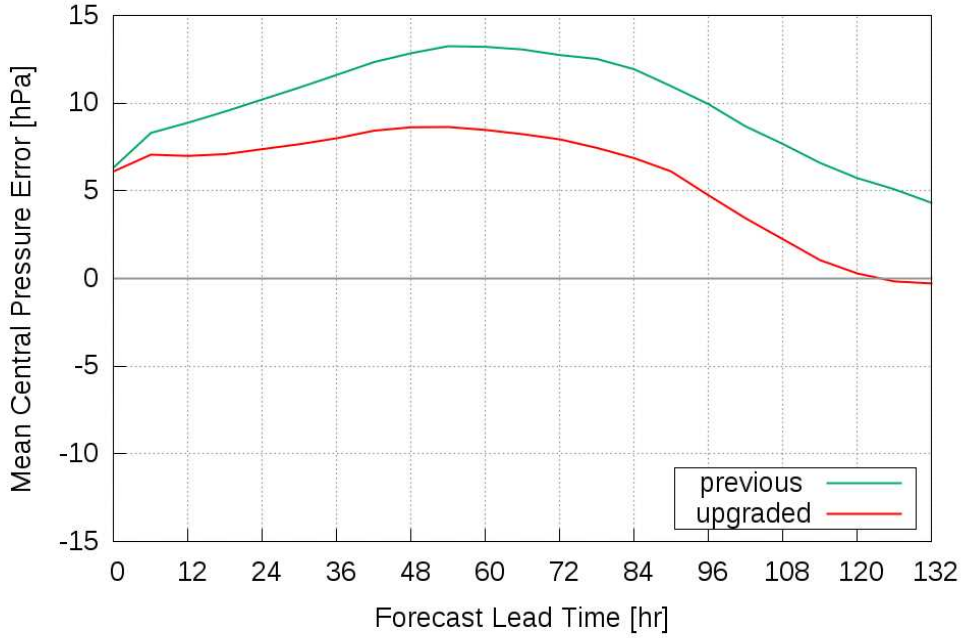

Figure 10: Average TC central pressure forecast errors of the GEPS (control member) for the western North Pacific as a function of forecast time up to 132 hours
The red and green lines represent mean central pressure errors for the upgraded and previous GEPSs, respectively.

References

Yamaguchi, H., Y. Adachi, S. Hirahara, Y. Ichikawa, T. Iwahira, Y. Kuroki, C. Matsukawa, R. Nagasawa, K. Ochi, R. Sekiguchi, T. Takakura, M. Ujiie and H. Yonehara, 2022: Upgrade of JMA's Global Ensemble Prediction System. WGNE. Res. Activ. Earth Sys. Modell., 52. 6.9-6.10.

Identified opportunities/challenges, if any, for further development or collaboration:
Ongoing focus will be placed on improving NWP accuracy.

Priority Areas Addressed:
Meteorology
- Enhance the capacity to monitor and forecast typhoon activities particularly in genesis intensity, and structure change.
- Develop and enhance typhoon analysis and forecast technique from short to long term.

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5. Upgrade of Storm Surge Watch Scheme model and related products

Main text:
In order to enhance support for Members of the Typhoon Committee in storm surge disaster mitigation, the Japan Meteorological Agency (JMA) upgraded its Storm Surge Watch Scheme (SSWS) model in August 2022. The upgrade includes:

- The model has been enhanced to a new version that uses the finite volume method (FVM) with an unstructured (triangular) grid (see Figure 11).
- The grid resolution around coastal regions has been increased from two minutes (approx. 4 km) to 1.5 km.
- The model domain has been expanded to cover most of RSMC Tokyo – Typhoon Center's area of responsibility (Figure 11).
- The number of ensemble members has been increased from 6 to 52, using whole 51 ensemble members of JMA's Global EPS.
- The forecast period has been extended from 72 to 132 hours.

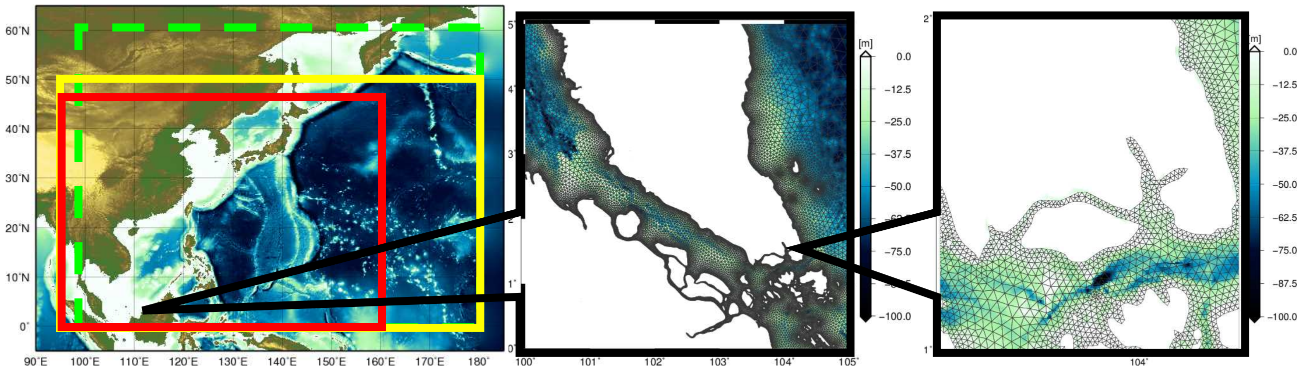

Figure 11: Region and grid of the Storm Surge Watch Scheme (SSWS) model
Left: Area of the new model (yellow), the previous model (red), and RSMC Tokyo – Typhoon Center's area of responsibility (dashed green). Middle and right: Unstructured grid of the new model.

Based on these improvements, JMA has updated the SSWS graphical products on its Numerical Typhoon Prediction (NTP) web resource (https://tynwp-web.kishou.go.jp/). In addition to deterministic SSWS forecasts, probabilistic forecast maps based on SSWS ensemble forecasts are also provided. The SSWS page on the site provides maps of variables such as ensemble mean, ensemble max, ensemble spread, 1-, 2- and 3 m-exceeding probabilities, and third-quartile height (Figure 12). Time-series probabilistic charts (i.e., plume diagrams, boxplots and exceeding-probability bar graphs) are now also provided on the site (Figure 13).

Identified opportunities/challenges, if any, for further development or collaboration:
In order to verify storm surge prediction, data from sea level observation conducted during storm surge events are needed. Provision of such data from Members would be appreciated.

Priority Areas Addressed:
<u>Meteorology</u>

- Enhance RSMC capacity to provide regional guidance including storm surge, responding to Member's needs.

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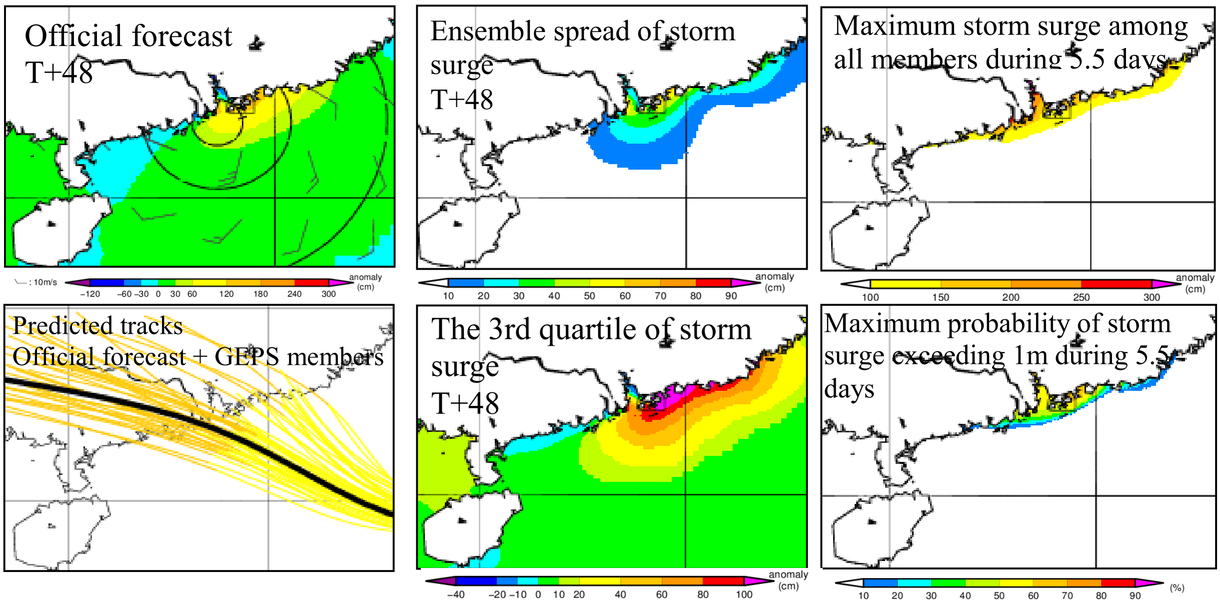

Figure 12: SSWS maps for TY Ma-on in 2022

The forecast was initialized at 00 UTC on 23 August 2022.

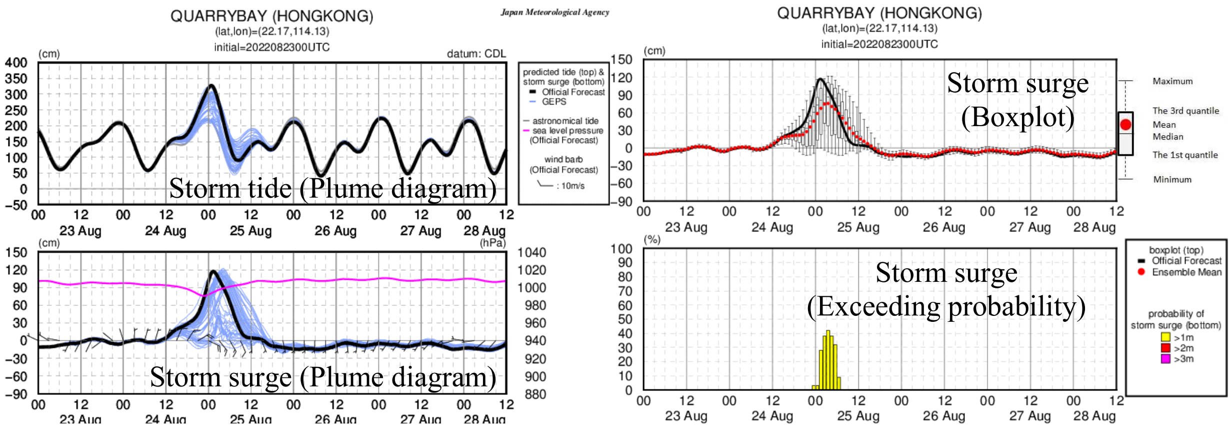

Figure 13: SSWS time-series charts

Charts for Quarry Bay in Hong-Kong are shown. The forecast was initialized at 00 UTC on 23 August 2022.

6. Provision of information on the probability of warnings for storm surges

Main text:

The Japan Meteorological Agency (JMA) has started providing information on the probability of warnings for storm surges up to five days ahead.

JMA issues step-wise disaster mitigation information with different lead times to help prevent/mitigate damage from natural phenomena such as torrential rain, storm winds and storm surges. For example, warnings are issued to local municipalities and via the media to the general public several hours before hazardous weather conditions are expected, and individual municipalities then make decisions within the lead time on whether evacuation orders should be made. Shorter lead times result in higher accuracy of forecasts for target areas, durations and intensities. In this way, warnings are used by municipalities to decide immediate specific responses to upcoming hazardous situations.

Information on the probability of warnings is also issued daily for meteorological phenomena with longer lead times. This is provided to local municipalities when warning-level phenomena are expected within the next five days. The information levels are High (significant probability of a warning level) and Mid (lower probability but some potential for a warning level). The longer lead time increases prediction uncertainty, but the information can be used to prepare for hazardous situations earlier.

Information on the probability of warnings is issued for heavy rain, storm winds, high waves and heavy snow. Recent technical enhancement has been seen in storm surge prediction, including the introduction of ensemble models, extended prediction times and higher resolution. These improvements have made possible specific evaluation for the probability of warning-level storm surges within the next five days and issuance of early warnings for storm surges newly started from the current typhoon season. Information on the probability of warnings allows early decision making and preparation for storm surges, and further support for disaster prevention response is provided to local municipalities, the media, the public and others.

Table 1 Example of Probability of Warning

Kagoshima: Tanegashima Yakushima Region			9/18		9/19			9/20	9/21	9/22	9/23
			12-18	18-24	0-6	6-12	12-24				
Heavy Rain	Probability of warnings		[High]	[High]		[High]		–	–	–	–
	Maximum hourly		80	50	50	40	20				
	Maximum 3-hour		160	100	100	80	40				
	Maximum 24-hour				150-200						
Storm	Probability of warnings		[High]	[High]		–		–	–	–	–
	Maximum wind speed	Land	50	35	25	20	20				
		Sea	50	35	25	20	20				
High Wave	Probability of warnings		[High]	[High]		[High]		–	–	–	–
	Wave height		14	11	9	8	6				
Storm Surge	Probability of warnings		[High]	–		–		–	–	–	–

[High] : A warning is currently in effect, or phenomena with levels of intensity exceeding the warning criteria are expected.

[Mid] : Phenomena may have levels of intensity exceeding the warning criteria.

Note: This information does not include storm surge height forecasting.

Identified opportunities/challenges, if any, for further development or collaboration:

Ongoing focus will be placed on effective use of information on probability warnings for storm surges.

Priority Areas Addressed:

Meteorology

- Enhance and provide typhoon forecast guidance based on NWP including ensembles, weather radar and satellite related products, such as QPE/QPF.

UNITED NATIONS Economic and Social Commission for Asia and the Pacific

World Meteorological Organization

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7. Development of a seasonal TC forecast product

Main text:
JMA has evaluated a preliminary seasonal TC forecast product for the western North Pacific region based on the JMA/MRI-Coupled Prediction System version 3 (CPS3) – a seasonal ensemble prediction resource implemented in February 2022. Inter-annual variabilities in the frequency and distribution of TC genesis in the WNP were well represented in CPS3. The correlation between the predicted occurrences of TC genesis and best-track analysis for the hindcast period of 1991 – 2020 was 0.40.

Identified opportunities/challenges, if any, for further development or collaboration:
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Priority Areas Addressed:
Meteorology
- Develop and enhance typhoon analysis and forecast techniques from nowcast to medium-range, and seasonal to long-range prediction.

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8. 4th Asia-Pacific Water Summit

Main text:
The 4th Asia-Pacific Water Summit was held in Kumamoto on April 23 – 24, 2022 with the theme of "Water for Sustainable Development - Best Practices and the Next Generation." Approximately 5,500 people[*1] attended online and in person, including heads and ministers of states and governments from 30 countries[*2] in the Asia-Pacific region, to discuss various water-related issues. His Majesty the Emperor of Japan made some observations and gave a speech at the opening ceremony, and Fumio Kishida, Prime Minister of Japan, announced the Kumamoto Initiative for Water. The Kumamoto Declaration, expressing the determination of heads of state and government to contribute, was adopted at the Heads of State and Government Meeting.
Under the Kumamoto Initiative for Water, Japan contributes to the resolution of water-related social issues in the Asia-Pacific region, developing quality infrastructure by:
- Developing and providing hybrid technology to develop dams, sewerage systems and agricultural facilities in order to reduce water-related disaster risks via climate change adaptation, and also to reduce greenhouse gas emissions for climate change mitigation.
- Providing satellite data to fill gaps in ground observation data.
- Sophisticating the evaluation of water-related disaster risks via the use of AI/IoT-based forecasting and analysis technologies.
- Supporting human resource development in the field.

Figure 14: The scene of the beginning of the Heads of State and Government Meeting

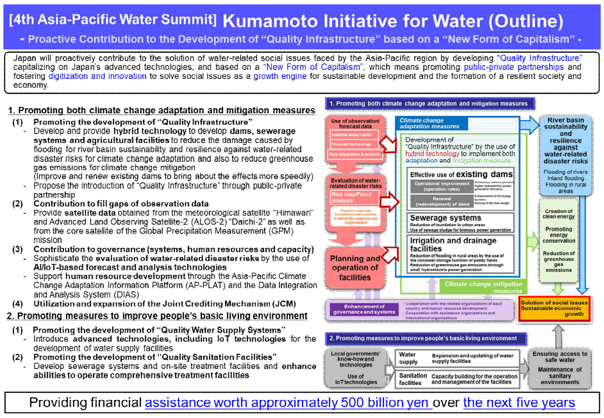

Figure 15: Kumamoto Initiative for Water (Outline)

*1 Total number of participants in the programme (preliminary report)
*2 Number of participating countries, including Japan, in the Heads of State and Government Meeting and High Level Statement Segment

Identified opportunities/challenges, if any, for further development or collaboration:

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Priority Areas Addressed:

<u>Integrated</u>

- Enhance collaborative activities with other regional/international frameworks/organizations, including technical cooperation between TC/AP-TCRC and TC/PTC cooperation mechanism.

<u>DRR</u>

- Promote international cooperation of DRR implementation project.

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9. 11th TC WGH Meeting (in Tokyo, Japan), 18-19 October 2022

Main text:

The 11th Meeting of the Typhoon Committee Working Group on Hydrology (WGH) was hosted in-person and online on 18 – 19 October 2022 by Japan's Ministry of Land, Infrastructure, Transport and Tourism and chaired by Dr. Mamoru Miyamoto from ICHARM (the International Centre for Water Hazard and Risk Management). This was the first time in three years that the conference had been held in-person.

The 40 attendees from 11 countries/regions engaged in constructive discussions on the theme of "Effective Use of Science and Technology towards Building a Resilient Society." Presentations were given on each country's situation and Annual Operating Plans.

Figure 16: 11th WGH Meeting group photo

Identified opportunities/challenges, if any, for further development or collaboration:

-

Priority Areas Addressed:

<u>Integrated</u>

- Enhance collaborative activities with other regional/international frameworks/organizations, including technical cooperation between TC/AP-TCRC and TC/PTC cooperation mechanism.

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10. Asian Conference on Disaster Reduction 2021

Main text:

The Asian Conference on Disaster Reduction (ACDR) 2021 was held on 14 – 16 December 2021, once again in an online format.

The basic theme of last year's ACDR was "Can We Adapt to the New Normal?" This reflected the idea that developments like the climate crisis and COVID-19 are prompting people to adapt by reconsidering the wide range of activities that encompass everyday living and economic activity. Member countries and experts acknowledged the current state of the crisis and discussed the need for change in a wide range of areas based on the keywords of Crisis, Adaptation, and New Normal. It was suggested that significant changes are needed toward a sustainable society that takes into consideration the needs of vulnerable groups.

ACDR2021 provided an environment to further develop these ideas with focus on disaster risk reduction (DRR) and to discuss desirable global goals and how to realize them. The basic theme "Time for Change and Transformation: The Road to a Resilient Asia" provided a platform for member countries to share updates and discuss future actions focusing on the sub-themes of (1) Developing DRR Technologies that Meet Local Needs to Create a Safe, Secure, and Livable Society, (2) Strengthening Disaster Preparedness: Education and Awareness Raising for Promoting Proactive Disaster Risk Reduction Actions, and (3) Investing in Disaster Risk Reduction for a Resilient Society.

A total of 264 people from 36 countries attended, including representatives from member countries, international organizations, the private sector, and academic/research institutes.

Figure 17: ACDR2021 attendees

ACDR2021
Date:
14 December 2021 (Tue)
- Opening & Keynote Session
- High Level Round Table

15 December 2021 (Wed)
- ADRC Steering Committee
- Session 1: Developing DRR Technologies that Meet Local Needs to Create a Safe, Secure, and Livable Society
- Session 2: Strengthening Disaster Preparedness: Education and Awareness Raising for Promoting Proactive Disaster Risk Reduction Actions
- Side Event: Public and Private Seminar for Disaster Risk Reduction

16 December 2021 (Thu)
- Session 3: Investing in Disaster Risk Reduction for a Resilient Society Introduction
- Closing Session

Figure 18: ACDR2021 Program

ACDR2021 provided a forum for the discussion of policies, projects, activities and approaches that will facilitate change and transformation toward a more resilient Asia. It included keynote speeches, a high-level round table discussion, thematic sessions, and side events (website: https://acdr.adrc.asia/home/acdr2021).

Identified opportunities/challenges, if any, for further development or collaboration:

-

Priority Areas Addressed:

<u>Integrated</u>

- Enhance collaborative activities with other regional/international frameworks/organizations, including technical cooperation between TC/AP-TCRC and TC/PTC cooperation mechanism

<u>DRR</u>

- Enhance Members' disaster risk reduction techniques and management strategies.
- Promote international cooperation of DRR implementation project.
- Share experience/knowhow of DRR activities including legal and policy framework, community-based DRR activities, methodology to collect disaster-related information.

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11. ADRC Visiting Researcher Program

Main text:

Since 1999, ADRC has been conducting Visiting Researchers (VR) Program. The objectives of the VR Program were (1) to accumulate the latest disaster information, disaster management policy, laws, plans and budget of member countries for strengthen their disaster resilience; (2) to analyze policies through the collection and survey of good practices of the DRR measures of member countries. (3) to develop effective capacity development programs and tools based on needs and priorities of VRs and their countries; and (4) to continue improving the VR program considering their feedback.

As of November 2022, 121 officials from 27 member countries have participated in the program so that ADRC has been contributing to human resource development as well as sharing disaster information in member countries.

In FY2021, ADRC conducted online VR program due to the COVID-19 pandemic. Four Visiting Researchers were selected from Armenia, Mongolia, Vietnam, and Pakistan.

Figure 19: VR Program

The online program was conducted from 3 to 29 March 2022, where a total of eight lectures were made by experts of various fields such as disaster management in Japan, mainstreaming DRR, disaster management of flood, earthquake and landslide, local disaster management, school DRR education and inclusive DRR.

Identified opportunities/challenges, if any, for further development or collaboration:

-

Priority Areas Addressed:

Integrated

- Enhance collaborative activities with other regional/international frameworks/organizations, including technical cooperation between TC/AP-TCRC and TC/PTC cooperation mechanism

DRR

- Enhance Members' disaster risk reduction techniques and management strategies.
- Promote international cooperation of DRR implementation project.
- Share experience/knowhow of DRR activities including legal and policy framework, community-based DRR activities, methodology to collect disaster-related information.

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