

**SUMMARY OF TYPHOON COMMITTEE ROVING SEMINAR 2019
(Beijing, China, 11-13 November 2019)**

I. Organization

1. The Typhoon Committee Roving Seminar (TCRS) 2019 with the theme on “Quantitative Precipitation Estimation and Forecasting (QPE/QPF)” was successfully held on 11-13 November 2019 in Beijing, China. It was organized by ESCAP/WMO Typhoon Committee (TC) and hosted by the China Meteorological Administration (CMA) of China.
2. The Seminar was attended by 34 participants from Bangladesh(1), China (21), Hong Kong, China (2), Macau, China (1), Lao PDR (1), Maldives (1), Myanmar (1), Singapore (1), Sri Lanka (1), Thailand (3), Viet Nam (1). Three resource persons came from Hong Kong, China, Japan and Singapore and one representative came from Typhoon Committee Secretariat (TCS). The list of participants is given in Attachment A.

II. Opening

1. The opening ceremony of TCRS 2019 was hosted by Mr. Zong Zhiping, Deputy Director of National Meteorological Center, CMA, Mr. Wang Zhiqiang, Deputy Director of CMA Training Center and Mr. Clarence Fong, Meteorologist of TCS.
2. Mr. Zong and Mr. Wang welcomed all participants from China and other countries. In order to encourage knowledge sharing, TCRS 2019 was organized in conjunction with the 4th CMA Typhoon Training Programme which was held on 11-21 November 2019. The two events shared the same programme in the first three days.
3. Mr. Fong expressed his gratitude to CMA for hosting the Roving Seminar as it was one of the main activities of the TC which has been coordinated by the TRCG since 2003. He also expressed his gratitude to the resource persons for sharing valuable experience in QPE/QPF among TC Members.

III. Seminar Programme

1. Mr. Woo Wang-chun from the Hong Kong Observatory of Hong Kong, China presented Topic A on “Nowcasting system and related QPF forecast products”.
2. Mr. Erik Becker from National Environment Agency of Singapore presented Topic B on “Raingauge and radar data processing for QPE/QPF”.
3. Prof. NAKAKITA Eiichi from Kyoto University of Japan presented Topic C on “Radar and typhoon related rainfall prediction and their applications in flood forecasting”.
4. A technical visit to National Meteorological Centre (NMC), CMA Public Meteorological Service Centre (PMSC) and National Satellite Meteorological Centre (NSMC) was conducted in the afternoon of 13 November 2019.
5. The Roving Seminar Programme is given in Attachment B.

IV. Proposals and Recommendations

1. The participants gave a warm appreciation to the three resource persons for their presentations and useful advice on the relevant topics.
2. During the wrap up discussion, participants shared their experience in their forecasting office for QPE/QPF and expressed gratitude to the resource persons. The resource persons encouraged the participants for further collaborations and assistance, for example, to download and set up the SWIRLS nowcasting system. The Feedbacks and recommendations collated from the participants are summarized in Attachment C.
3. Suggestions from the resource persons and organizers for future reference:
 - (a) Climate change topics;
 - (b) Some lectures on new and upcoming technologies like phased array radar.

V. Closing

1. The resource persons and participants expressed their gratitude to CMA and TCS for hosting this seminar and for their warm hospitality.
2. The resource persons and Mr. Clarence Fong of TCS presented the attendance certificates to the participants.
3. The Roving Seminar was closed on 13 November 2019.

**List of Participants of the Typhoon Committee Roving Seminar 2019
(Beijing, China, 11-13 November 2019)**

Members	Name of Participants
Bangladesh(1) China (21)	Ms. Kawsar Parvin 柳龙生 刘达 胡海川 刘爽 崔园园 李杨 张喜平 蔡晓杰 杨茜茜 许琪 孙莎莎 刘春霞 郭春迺 刘乐 李玉梅 胡田田 严睿恺 付超 吕润清 吴琼 孙舒悦
Hong Kong, China (2)	Mr. Chong Man Lok Ms. Yum Ka Yee
Macau, China (1)	Mr. Mui Hong Kei
Lao PDR (1)	Ms. Chao Khaemeuy
Maldives (1)	Mr. Ahmed Nazeer
Myanmar (1)	Ms. Cho Lwin Thu
Singapore (1)	Mr. Boh Wei Ze, Darryl
Sri Lanka (1)	Mr. P. G. Yasarathna
Thailand (3)	Mr. Kamol Promasakha Na Sakolnakhon Ms. Prapaporn Wongsaming Ms. Duangporn Kaewbungwan
Viet Nam (1)	Ms. Ngo Thi Kim Duyen
Resource persons	Mr. Woo Wang Chun Mr. Erik Becker Prof. Eiichi Nakakita
TCS	Mr. Clarence Fong

Typhoon Committee Roving Seminar 2019 Final Programme

Dates and Venue: 11-13 November 2019, CMA Headquarters, Beijing

Main Theme: Quantitative precipitation estimation and forecasting (QPE/QPF)

Topic A – Nowcasting System and related QPF forecasting products

(Mr. W C Woo from the Hong Kong Observatory, Hong Kong, China)

Topic B – Raingauge and radar data processing for QPE/QPF

(Mr. Erik Becker from National Environment Agency, Singapore)

Topic C – Radar and typhoon related rainfall prediction and their applications in flood forecasting *(Prof. NAKAKITA Eiichi from the Kyoto University, Japan)*

Seminar Schedule:

Seminar Schedule:			
	Day 1 (11 Nov, Mon)	Day 2 (12 Nov, Tue)	Day 3 (13 Nov, Wed)
AM	Opening Ceremony & Group Photo (0900 - 0945)	C1: Early Detection of Baby-Rain-Cell Aloft in a Severe Storm and Risk Projection for Urban Flash Flood (0900 - 1030)	B3 : Radar-Based Nowcasting and Verification Techniques (0900 - 1000)
	<i>Tea Break (0945 - 1015)</i>	<i>Tea break (1030 - 1100)</i>	<i>Tea Break (1000 - 1030)</i>
	Experience Sharing by Member Representatives ^(a) (1015 - 1200)	A2 : Probabilistic QPF & Impact-based Forecasting/Warning (1100 - 1200)	C3: Hybrid Ensemble Forecast of Typhoon Related Rainfall and Its Applications into Flood Forecast (1030 - 1130)
			Wrap-up Discussion (1130 - 1230)
<i>Lunch (1200 – 1330)</i>			<i>Lunch (1230-1400)</i>
PM	A1 : RSMC for Nowcasting & SWIRLS Nowcast System (1330 - 1500)	B2 : Radar Precipitation and Rain-Gauge Adjustment Techniques (1330 - 1500)	Technical Visit to CMA facilities/sites (to be confirmed)
	<i>Tea Break (1500 - 1515)</i>		
	B1 : Radar and Rain-Gauge Data Quality and Processing (1515 - 1615)	C2 : Radar Based Nowcast of Typhoon Related Rainfall and its Orographic Effects (1515 - 1615)	
	<i>Tea Break (1615 - 1630)</i>		
	Key operational technology of the QPE and QPF in CMA (1630 - 1730)	A3 : Nowcast of Thunderstorm, Hail and Gust and Satellite Nowcast Applications (1630 - 1730)	

(a) One of the participants from each Member will be invited to represent his/her weather services to deliver a 10 minutes presentation regarding the use of QPE/QPF in his/her

Service.

Day 1 11 November 2019 (Monday)

Time	Tasks
0830-0900	Registration and Greeting
0900-0945	Opening speech: - Representative(s) from CMA
	Welcome speech: - Mr. Clarence Fong, Meteorologist, UN ESCAP/WMO Typhoon Committee
	Introduction of the program / speakers by TCS
	Group photos
0945-1015	<i>Tea break</i>
1015-1200	Participant self-introduction and experience sharing by Members Representatives (about 10 min each)
1200-1330	<i>Lunch</i>
1330-1500	Topic A1 : RSMC for Nowcasting & SWIRLS Nowcast System (W C Woo)
1500-1515	<i>Tea Break</i>
1515-1615	Topic B1 : Radar and Rain-Gauge Data Quality and Processing (Erik Becker)
1615-1630	<i>Tea Break</i>
1630-1730	Invited lecture : Key operational technology of the QPE and QPF in CMA (CAO Yong)

Day 2 12 November 2019 (Tuesday)

Time	Tasks
0900-1030	Topic C1 : Early Detection of Baby-Rain-Cell Aloft in a Severe Storm and Risk Projection for Urban Flash Flood (NAKAKITA Eiichi)
1030-1100	<i>Tea Break</i>
1100-1200	Topic A2 : Probabilistic QPF & Impact-based Forecasting/Warning (WC Woo)
1200-1330	<i>Lunch</i>
1330-1500	Topic B2 : Radar Precipitation and Rain-Gauge Adjustment Techniques (Erik Becker)
1500-1515	<i>Tea Break</i>
1515-1615	Topic C2 : Radar Based Nowcast of Typhoon Related Rainfall and its Orographic Effects (NAKAKITA Eiichi)
1615-1630	<i>Tea Break</i>
1630-1730	Topic A3 : Nowcast of Thunderstorm, Hail and Gust and Satellite Nowcast Applications (WC Woo)

Day 3 13 November 2019 (Wednesday)

Time	Tasks
0900-1000	Topic B3 : Radar-Based Nowcasting and Verification Techniques (Erik Becker)
1000-1030	<i>Tea Break</i>
1030-1130	Topic C3 : Hybrid Ensemble Forecast of Typhoon Related Rainfall and Its Applications into Flood Forecast (NAKAKITA Eiichi)
1130-1230	Wrap-up Discussion (attended by all participants and lecturers)
1230-1400	<i>Lunch</i>
1400-1800	Technical Visit (TBC)

TRCG ACTIVITIES EVALUATION FORM

Roving Seminar 2019
(Beijing, China, 11 – 13 Nov 2019)

**24 responses (out of 21 participants + 3 lecturers)
(not all questions answered by responders)**

Part A: Event Logistics

<i>Expectation levels as indicated number of responders</i> (P = participants; R = resource persons)	Below expectation ☹		Met expectation 😊		Exceeded expectation 😄	
	P	R	P	R	P	R
1. Overall administration/organization	0	0	6	2	15	1
2. Pre-event arrangement and liaison	1	0	4	1	16	2
3. Venue facilities	2	0	8	2	11	1
4. Informative announcements and instructions	0	0	8	2	13	1
5. Travel arrangements	3	0	6	2	12	1
6. Funding arrangements	1	0	7	2	13	1
7. Accommodation	0	0	8	1	13	2
8. Refreshments	2	0	7	2	12	1
9. Social events and visitors' information	2	1	5	1	13	1
10. Helpfulness and friendliness of organizers	2	0	4	1	15	2

Specific points for improvement, if any:

Suggest reserving a table for lunch

More Q&A or discussion after each lecture/ showing

Need Tea or coffee serve during tea breaks

International breakfast we need coffee, snack break, etc.

Tourist spot visit for all

Hope to get a copy of the PPT for these lectures.

The projector screen is too small to see.

Field visit and practical work and some example.

Part B: Technical Contents (from participants only)

	A – Lectures by Mr. W.C.WOO	B – Lectures by Mr. Erik Becker	C – Lectures by Prof. NAKAKITA Eiichi
	A	B	C
Interest in Topic (1 to 5 ; from disinterested to most interested)			
Topic Contents (1 to 5 ; from irrelevant to topic to most relevant)			
Topic Organization (1 to 5 ; from loosely structured to well-structured)			
Lecture/Workshop Presentation (1 to 5 ; from poor to excellent)			
Training or Practical Material (1 to 5 ; from ill-prepared to well-prepared)			
Language (1 to 5 ; from hard to understand to easy to follow)			
Effectiveness (1 to 5 ; from little understanding gained to much understanding gained)			

Objectives and Scope (L = too narrow; M = just right; R = too wide)			
Emphasis (L = too theoretical; M = just right; R = too practical)			
Length (L = too short; M = just right; R = too long)			
Technical level (L = too elementary; M = just right; R = too difficult)			

Part C: Follow-ups

1. (For Lecturers) Any views on considerations in selecting future lecturers and participants?

2. What operational benefits (new ideas, skills or methodology) you think would be gained from your experience in the event?

- How to process make use of radar data
- HKO SWIRLS system & deep learning
- Nowcasting techniques currently implemented by HKO & JMA
- Get the new method to develop for Radar-nowcasting
- short-to-very short range nowcasting, QPE/QPF which can adapt for the future TMD project.
- Get more experienced in rainfall forecast from radar, in the future, maybe applying now forecast for my region.
- QPE and QPF techniques and case study on severe storm, heavy rain and flash flood.
- Need more practice how to do QPE/QPF in the poor technique countries. The workshop a QPE/QPF will be very useful for the next organization of Roving Seminar.

- Learned some new skills about the supercell tracking, data revision methods. We should pay more attention to the details of operational businesses.
- Blending of the radar & NWP
- Application of radar to solve local problems
- Require a study on how to approach different weather system and postmodern case study and QPE and QPF

3. Any foreseeable opportunity for operational implementation of the above benefits?

Answer: Yes, benefits likely to be felt in about

(a) a couple of years or less	
(b) in 2 – 5 years	7
(c) in 5 years or more	
(d) no foreseeable opportunity	3

4. (For Lecturers) Any views on future topics that may generally help to improve Members' capacity in QPE/QPF?

- Climate Change
- Some lectures on new and upcoming technologies like phased array radar.

5. (For Lecturers) Any specific suggestions, assuming you have the opportunity to visit local forecasting offices, for host Member to enhance its capacity in QPE/QPF?



The participants of the Roving Seminar taking a group photo at the CMA Training Center of China Meteorological Administration with the resource persons and representative from Typhoon Committee Secretariat.