



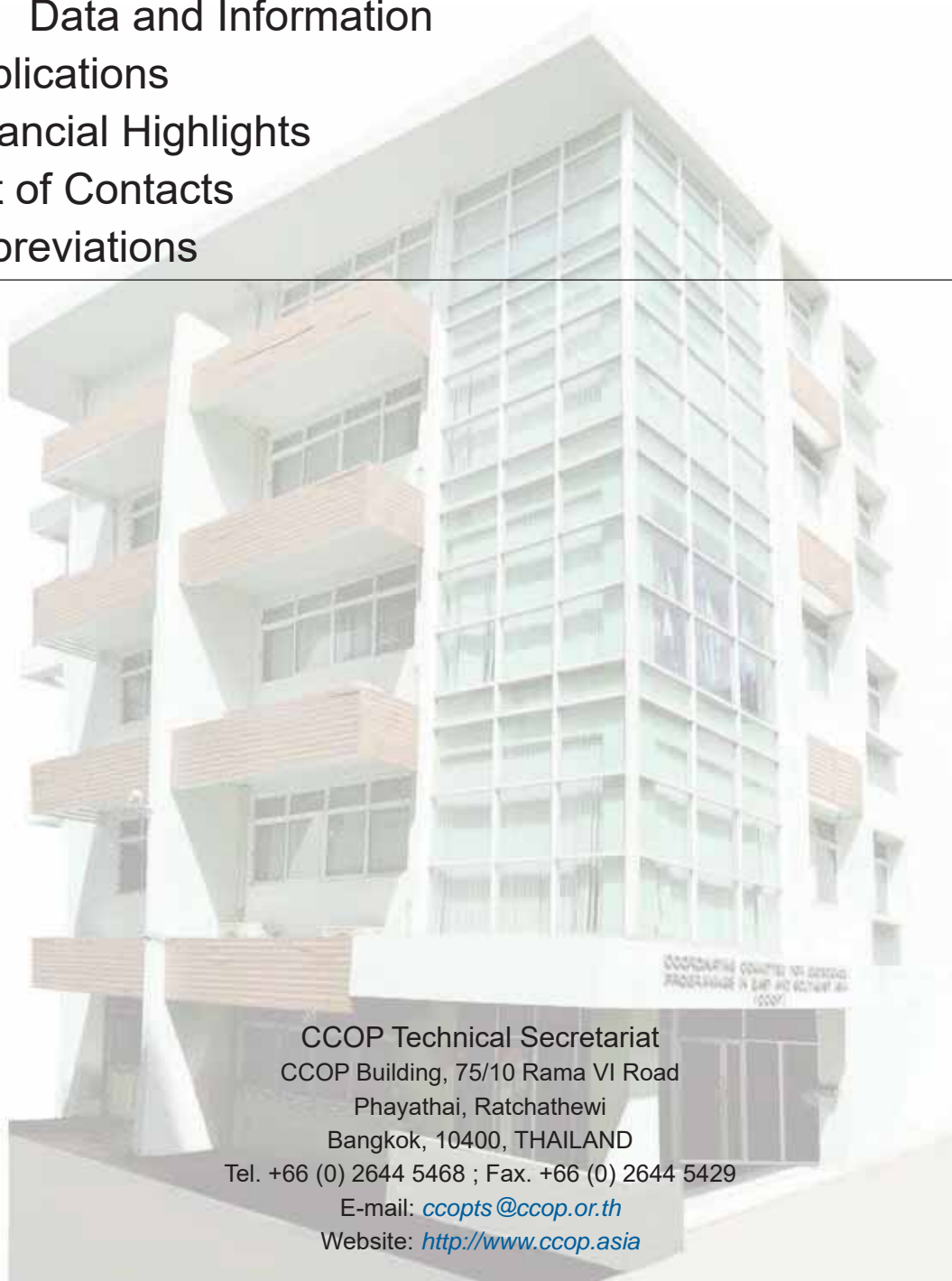
Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP)

CCOP ANNUAL REPORT 2020

**CCOP Technical Secretariat
Bangkok**

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MESSAGE FROM THE CHAIRPERSON

First and foremost, I would like to express my profound gratitude to all the Permanent Representatives from Member Countries for re-electing me as the Chairman of the CCOP Steering Committee for another term starting 2020 until 2021.

However, as I will officially retire early January in 2021, this will be my last Chairperson's Message for the CCOP Annual Report, having served as the Chairperson of CCOP Steering Committee since 2018. I am therefore fortunate to have been given the opportunity to serve and lead this organization for the past three years.

The year started on a bright note with the inclusion of Brunei Darussalam as the 16th Member Country of CCOP on 1st January 2020. This indeed is a milestone to be proud of, as for the first time since its inception in 1967, CCOP has grown from 4 founding members to a full membership of 16 countries within the East Asia and Southeast Asia region.

However, the year 2020 will also be remembered as the year the world has to face with the Covid-19 pandemic which has caused tragic loss of life and massive disruptions to global socio-economic order. My heartfelt condolences reach out to those who have lost their loved ones during these difficult times.

Despite the lockdowns imposed in most countries to curb the transmission of the virus, the CCOP Technical Secretariat was able to undertake the main activities that had been planned for the year. This include the 74th and 75th Steering Committee meetings and the 56th Annual Session which were conducted virtually online for the first time.

Notwithstanding the constraint faced due to the pandemic, the Steering Committee was able to deliberate and finally approved the new CCOP Strategic Plan for the period 2021-2025. With this new Strategic Plan, CCOP aims to address five main geoscientific issues which has been identified as important in the next decade namely, digital transformation involving geoinformation and big data; environmental and climate change; geohazards; water resources, groundwater and hydrogeology; and energy resources both conventional and unconventional oil & gas.

On behalf of CCOP, I would like to sincerely thank Dr Young Joo Lee, the Director of CCOPTS and his team for their hard work, patience and persistency in ensuring the smooth administration of the Technical Secretariat despite the challenges and limitations of the virtual platforms.

I am also grateful for the help and support from the Advisory Group, all Member Countries, Cooperating Countries and Organizations.

As aforementioned, my chairmanship will end prematurely early next year, hence, I hope you will all extend the same staunch support to the Vice Chairperson of the Steering Committee, Dr Sommai Techawan, the Permanent Representative of Thailand to CCOP, who will be the Acting Chairperson of the CCOP Steering Committee until a new Chairperson is elected.

Finally, let us all hope that the COVID-19 pandemic will be brought under control in the not-too-distant future and that we will all be able to return to our normal routines. I believe that, with the resilience that CCOP has built up since its beginning, we will bounce back on our feet as soon as the pandemic is over, ready to accomplish the goals set in the CCOP's 2021-2025 Strategic Plan.

2020 has definitely left an indelible mark in the pages of history and impacted our lives greatly but it is time to move on and leave the past behind. Let's hope that 2021 will be much better and bring us a brighter future.

"Stay Safe, Stay Healthy and Stay Strong"

Thank you.

Datuk Shahar Effendi bin Abdullah Azizi
Chairperson, CCOP Steering Committee



CCOP: VISION, MISSION AND STRATEGY

Vision: A premier intergovernmental Earth science organization in East and Southeast Asia

Mission: To contribute significantly to the economic development and sustainable management of the environment and improvement of the quality of life of its Member Countries by the application of Earth science knowledge.



STRATEGIC FOCUS:

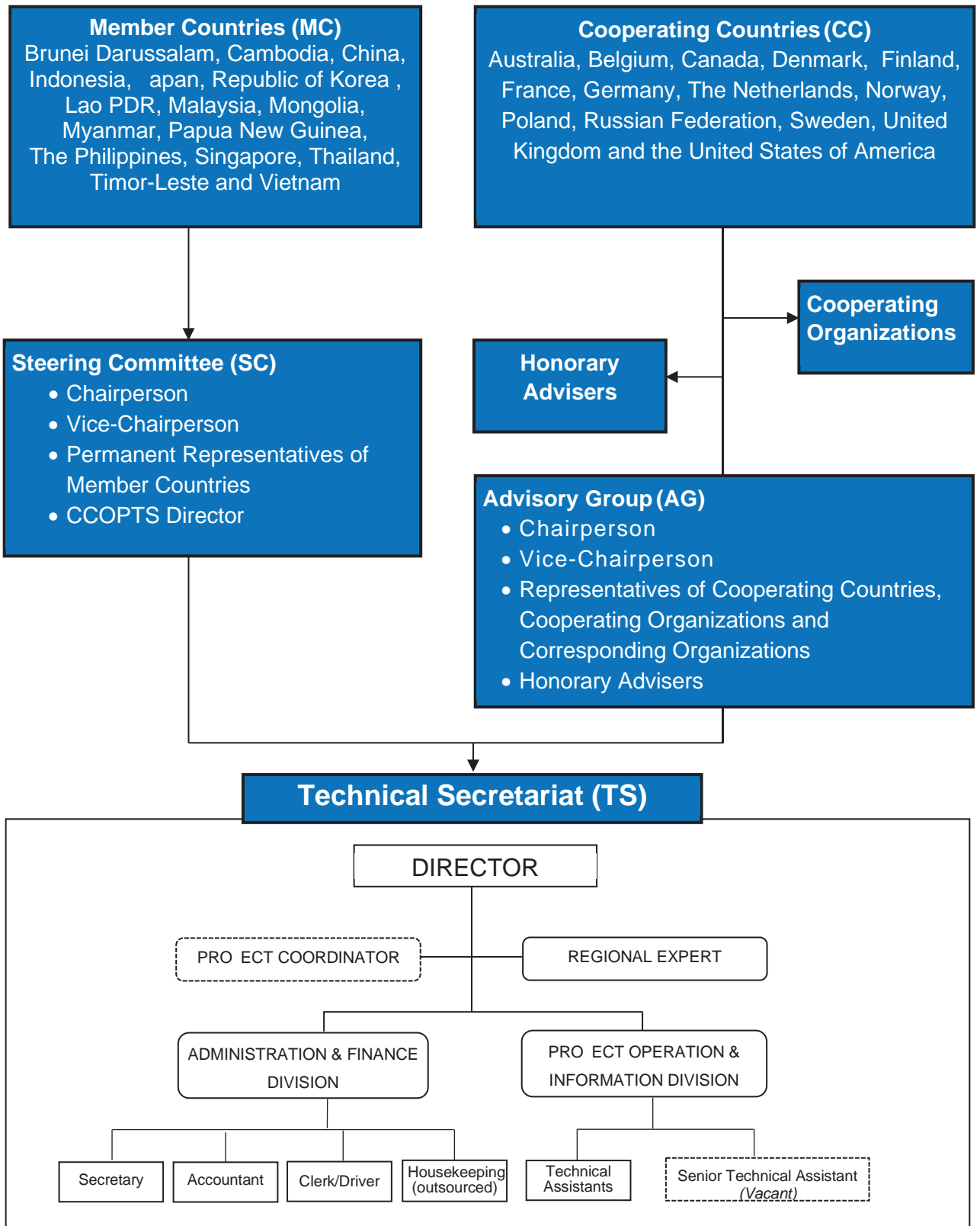
- **Outreach** – to enhance influence with decision makers, investors and the public through the provision of relevant Earth science information and to develop appropriate skills for communicating effectively with CCOP stakeholders.
- **Cooperation and Partnership** – to enhance the internal and external partnerships to improve the quality, reach application and impact of our Earth science information and knowledge.
- **Knowledge Enhancement and Sharing** – to manage, promote, share and exploit the region's Earth science information and skills.
- **Data and Information** – to advance sharing of data and information and integrate Earth science data across national boundaries.

Member Countries: Brunei Darussalam, Cambodia, China, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Singapore, Thailand, Timor-Leste and Vietnam.

Cooperating Countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, The Netherlands, Norway, Poland, Russian Federation, Sweden, United Kingdom and United States of America.

Cooperating Organizations: ASCOPE, CIFEG, CPC, EuroGeoSurveys, GETECH, IERI, IOC, IOMAC, IUGS, PETRAD, SPC, UN-ESCAP, UNEP, UNESCO, UKM, THE WORLD BANK and YES NETWORK.

MANAGEMENT AND ORGANIZATION



As of 31 December 2020, the CCOP Technical Secretariat (TS) has 10 personnel, comprising three professionals, six supporting staff, and one out-sourced staff.



CCOPTS during the 56th CCOP Annual Session, November 2020

COVID Outbreak



It has been a big adjustment for millions of people as we try to stop the pandemic of COVID-19 in order to prevent the overload of the healthcare system. CCOPTS worked from home during 25 March – 30 April 2020 in compliance with the Royal Thai Government's Emergency Decree. All CCOPTS's staff are on-call when necessary.

The Coronavirus Disease 2019 (COVID-19) has become the main cause of upheaval today and big concerns for the future earth. In Thailand, all holiday, i.e., Songkran Festival (Traditional Thai New Year) during 13-15 April, was cancelled due to the Government's policy to prevent major gathering and travelling of people around the country to prevent the uncontrollable outbreak of COVID-19. However, during a period of 13-30 April 2020, CCOPTS's staff had a weekly meeting every Monday in order to update all works done. During work-from-home period, some CCOPTS's staff still worked at CCOPTS every Monday-Wednesday-Friday. During "work-from-home" period, CCOPTS successfully used an on-line video conference using "Zoom" application for the Board of Management Meeting (BoM) held on 3 April 2020 at CCOPTS Headquarters all CCOPTS's staff were presented at the meeting. On 1 May 2020, all CCOPTS's staff go back to work in the office with a normal office environment.

The newly appointment of Permanent Representative of Member Country and Cooperating Country to CCOP.

COUNTRY	DESCRIPTION
Indonesia	On 10 August 2020, Dr Eko Budi Lelono was appointed as the Head of Geological Agency, Ministry of Energy and Mineral Resources, Republic of Indonesia succeeded Mr Rudy Suhendar as Permanent Representative of Indonesia to CCOP.
Singapore	On 23 January 2020, Associate Professor Adam Switzer , Principal Investigator, Asian School of the Environment, Earth Observatory of Singapore (EOS) & AXA-Nanyang Chair in Natural Hazards, Nanyang Technological University, Singapore succeeded Prof Kerry Sieh as Permanent Representative of Singapore to CCOP.
Vietnam	On 1 June 2020, Dr Le Quoc Hung , Deputy General Director, General Department of Geology and Minerals of Vietnam, Vietnam succeeded Mr Nguyen Van Nguyen as Permanent Representative of Vietnam to CCOP.
Cooperating Countries	Description
Belgium	On 12 February 2020, CCOPTS received an update detailed information from Yves Vanbrabant , Geologist, Acting Director of the Geological Survey of Belgium, Royal Belgian Institute for Natural Sciences, Geological Survey of Belgium (GSB), informed that Dr Vanessa Heyvaert , Geological Survey of Belgium has accepted to take the role of contact person for Belgium. Vanessa has a recognized expertise in geohazards related to extreme wave events in littoral environment in different parts of the world, including Southeast Asia (Thailand and Japan).
The Netherlands	November 2020, Dr Michiel van der Meulen , Chief Geologist, TNO/ Geological Survey of the Netherlands succeeded Mr. Cornelis Ary Bons as Representative of the Netherlands to CCOP.
Sweden	On 26 February 2020, CCOPTS received an update detailed information from Kaj Lax (MSc, PhD), Head of Department, Geological Survey of Sweden (SGU) appointed Ms Lisbeth Hildebrand , Senior Geologist – EU coordinator, Geological Survey of Sweden, as a contact person, for Cooperating Countries to CCOP.

Our Deepest Condolences

Dr. Father Henri Fontaine



We respectfully extend our sincerest sympathy and condolences upon the passing away of Professor Dr. Father Henri Fontaine. The death of such a great geoscientist filled the people of CCOP's Member Countries with deep sorrow and a sense of great loss.

Father Fontaine was renowned for his contribution to the geological work in the CCOP region. He had greatly contributed to geoscience work and study in a number of CCOP's Member Countries. His work provided new data on stratigraphy, palaeontology and palaeogeography in the region, which provided a good foundation on the study of geoscience for the present and future generations of geoscientists to continue their works.

CCOP Technical Secretariat would like to express deep and heartfelt condolences to the Fontaine family. May the Lord give the entire family strength and courage to bear this loss.

With sincere sympathy,
CCOP Technical Secretariat

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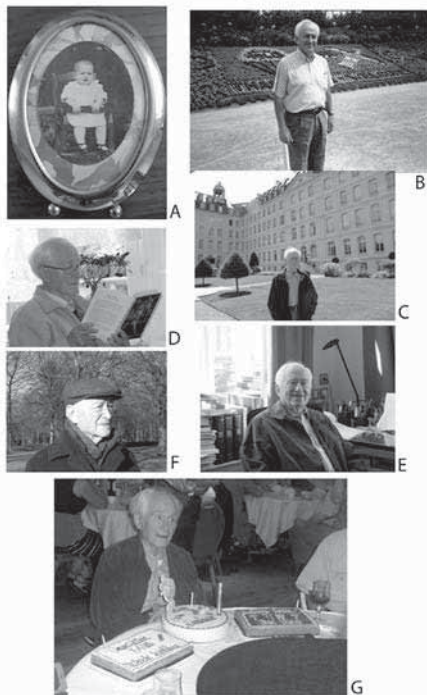


Fig. 4. A, 1925 St. Frazinbaek (Normandy); B, Summer 1949 St. Frazinbaek (Normandy); C, Spring 2014 Paris. MEP's garden; D, Spring 2015. 13620 Les Bains (Paris region); E, 2012 Paris. His room at MEP; F, Winter 2014. In the park of 13140 Les Bains; G, July 2018 Paris. Three cakes for his triple anniversary.

A, 1925 St. Frazinbaek (Normandy); B, Summer 1949 St. Frazinbaek (Normandy); C, Spring 2014 Paris. MEP's garden; D, Spring 2015. 13620 Les Bains (Paris region); E, 2012 Paris. His room at MEP; F, Winter 2014. In the park of 13140 Les Bains; G, July 2018 Paris. Three cakes for his triple anniversary.

who was the last chief of the Geological Survey of Indochina. E. Saurin showed him different collections of fossils particularly corals that were not yet identified. He advised H. Fontaine to study these fossils and to register at the University of Ha Noi for a

diploma. At the University, he met Pr. Jean Mercier who entrusted him to help students once a week to do their practical work. So, H. Fontaine had simultaneously to give lectures at the petit séminaire, to help J. Mercier's students at the Faculty of Sciences and to

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RESEARCH & KNOWLEDGE

Letter to the Editor

Bibliography of Henri Fontaine (1954 – 2015) with keywords and appendix

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(Received 17 January 2018; accepted 24 January 2018)

Abstract: This bibliography lists all publications by Henri Fontaine from 1954 to 2015. Out of 313 titles, he is sole or main author of 279 articles (with reference numbers from 20 to 298) and co-author of the remainder. These papers concern many countries of eastern Asia: Cambodia, China, South Korea, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand and Viet Nam. Some papers relate to other countries: Afghanistan, France, Iran, Oman. Most of the publications are about geology, palaeontology and stratigraphy. The remainder covers different fields: archaeology, biography, bibliography, flora, history of geological researches, religion, tektites and thermo-mineral springs.

Each reference gives key words about localities, subject of study, fossils and ages. An appendix covers subjects, geography, archaeological and geological ages with reference numbers.

Résumé: Cette bibliographie rassemble toutes les publications de Henri Fontaine, depuis 1954 jusqu'en 2015. Sur 313 titres, il est seul ou principal auteur de 279 articles (portant les numéros de référence de 20 à 298) et co-auteur du reste. Ces articles ont été consacrés à plusieurs pays de l'Asie de l'Est: Cambodge, Chine, Corée du Sud, Indonésie, Laos, Malaisie, Myanmar, Philippines, Thaïlande et Viet Nam. Certains articles sont relatifs aux autres pays: Afghanistan, France, Iran, Oman. Une large majorité de ces publications couvre la géologie, la paléontologie, et la stratigraphie. Le reste est destiné à de divers domaines: archéologie, biographie, bibliographie, flore, histoire de recherches géologiques, religion, sources thermo-minérales et tektites.

Chaque référence bibliographique donne des mots-clés sur les localités, sujets d'étude, fossiles et âges des sites. Enfin, un appendice couvre les sujets d'étude, la géographie, les âges archéologiques et géologiques avec les numéros de référence.

Keywords: Archaeology, Asia, bibliography, biography, corals, data, dating, fossils, geology, Indochina, limestone, mass extinction, palaeontology, religion, stratigraphy, tektites, thermal springs

1. Introduction

This bibliography lists all publications by Henri Fontaine from 1954 to 2015. Out of 313 titles, he is sole or main author of 279 articles (with reference numbers from 20 to 298) and co-author of the remainder. These papers concern several countries, they treat several topics, and they are studies of material belonging to various ages. These data are summarized in the following.

In order to sustain national research and to develop local periodicals, these publications have appeared mainly in different bulletins published in Southeast Asia. Some of these bulletins have disappeared because of political events (Archives Géologiques du Viet Nam, Saigon; Bulletin de la Société des Études Indochinoises, Saigon; *Travaux de Géologie*, Huf). Other periodicals still exist, but more or less regularly.

All the research has been possible, on one hand thanks to the support of the Foreign Missions of Paris and temporarily the Ministry of the Foreign Affairs of France, on the other hand thanks to the cooperation of the Governments of Cambodia (General Department of Mineral Resources), China (Chinese Academy of Geological Sciences at Beijing, Institute of Petroleum Geology at Jiangling, Guangzhou Marine Geological Survey, Nanjing Institute of Geology and Palaeontology), Indonesia (Geological Research and Development Centre, Bandung), Korea (Korea Institute of Geology, Mining and Materials (KIGAM)), Malaysia (Minerals and Geoscience Department), Philippines (Bureau of Mines and Geosciences), Singapore (Specialist Services, Division of the Public Works Department), Thailand (Department of Mineral Resources, Chulalongkorn University, Mahidol

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HIGHLIGHTS FOR THE YEAR 2020

74th CCOP Steering Committee (SC) Virtual Meeting

The 74th CCOP Steering Committee (SC) Meeting has been postponed due to the Coronavirus Disease 2019 (COVID-19) outbreak. The global phenomena of the contagious COVID-19 have greatly impacted on much of the international travels especially in the CCOP region. We have monitored the situation with careful consideration on all the factors including the outbreaks situation in many countries and CCOP Member Countries policy on international travels and quarantine requirement. In order to prevent and minimize the outbreak of COVID-19 among CCOP Member Countries and for the safety of all CCOP Member Countries' delegation, we decided to rescheduled the 74th CCOP Steering Committee Meeting to 22-25 June 2020, Siem Reap, Cambodia. We made this decision based on information, advice and consultation with the General Department of Petroleum, Ministry of Mines and Energy, Cambodia and CCOP Member Countries. "THE SAFETY OF OUR DELEGATIONS AND TEAM IS OUR FIRST PRIORITY."

The 74th CCOP Steering Committee (SC) Meeting was held virtually using the Zoom application hosted by the CCOP Technical Secretariat on 24 June 2020. The Meeting was attended by delegates of the following Member Countries (MC): **BRUNEI DARUSSALAM, CAMBODIA, CHINA, INDONESIA, JAPAN, REPUBLIC OF KOREA, LAO PDR, MALAYSIA, MONGOLIA, MYANMAR, PHILIPPINES, SINGAPORE and THAILAND**. Also present were **Mr Ioannis Abatzis** and **Dato' Yunus Abdul Razak**, Chairperson and Vice-Chairperson of the CCOP Advisory Group (AG) respectively, **Dr Martin Smith**, Representative of UK to CCOP and Facilitator of the CCOP Strategic Plan Working Group, and the Director and staff of the CCOP Technical Secretariat (CCOPTS).



Group photo of Permanent Representative of Member Countries to CCOP during attended 74SC Online

During the opening session **Dr Young Joo LEE**, CCOPTS Director, and **Mr Ioannis Abatzis**, AG Chairperson delivered the welcoming remarks. **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson of the CCOP Steering Committee, Permanent Representative of Malaysia to CCOP and Director-General of Department of Mineral and Geoscience Malaysia, officially opened the 74th CCOP Steering Committee Meeting.

Before commencing the agenda matters, **Datuk Shahar** welcomed the new Permanent Representative of Singapore to CCOP, **Associate Professor Adam Douglas Switzer**, Associate Chair (Academic), Asian School of the Environment and Principal Investigator, Earth Observatory of Singapore (EOS), Nanyang Technological University. He also invited the Permanent Representative of Indonesia to CCOP, Rudy Suhendar, who has retired as Head of the Geological Agency of Indonesia since 1 June 2020, to deliver some farewell remarks.

The CCOPTS Director tabled the CCOP Progress Report covering the period 1 January to 31 December 2019 and 1 January – 31 May 2020. The report included the administration and personnel, finance, technical cooperation and project support, technical activities, fellowships and grants, and publications.

Regarding the CCOP Family Database, the CCOPTS will safeguard privacy protection, and will ensure that upon publishing this online, note on privacy protection be made visible for the users to be reminded. In the same manner, CCOPTS will make certain that security and confidentiality of data compilation projects will be taken into account, and copyright notice will be made available once data is published.

The Indonesia Delegation confirmed hosting the UnCon Project Final Meeting in Bali, Indonesia this year, however this will depend on the COVID-19 pandemic situation whether hosting this meeting within year 2020 is feasible or not.

Regarding waiving the arrears of the annual cash contribution of Papua New Guinea and Timor-Leste as agreed at the 73rd SC Meeting, November 2019, Chiangmai, Thailand, the CCOPTS has already officially communicated this to both countries, and still has not received any response.

The CCOPTS will carry on making follow-ups.

The CCOPTS confirmed the receipt of the Philippines' annual cash contribution for 2020. The Philippines and Singapore Delegations informed the Meeting that its governments gave instruction of no foreign travels within year 2020. However, for virtual CCOP meetings, both countries confirmed their participation.

Thailand Delegation informed the Meeting that they have already submitted to their Government official request for the increase of Thailand's annual cash contribution to CCOP to USD 50,000 in year 2021. Thailand Delegation conveyed their recommendation of having CCOP online/virtual workshops under the 'new normal' situation, which can also reduce costs in workshop organizations without the travel costs.

The Meeting acknowledged with appreciation China and Thailand's efforts for increasing its annual cash contribution to CCOP.

The Meeting congratulated the CCOPTS for successfully carrying out CCOP activities, especially the organization of the first virtual CCOP Steering Committee Meeting, amidst the ongoing pandemic.

On 11 December 2019 at the 19th ASEAN Senior Officials Meeting on Minerals (ASOMM), Bangkok, Thailand, CCOPTS received official letter signed by **Dr Nor Imtihan Binti Haji Abdul Razak**, Permanent Secretary (Planning, Land Use and Environment), Ministry of Development, Brunei Darussalam's indication that Brunei Darussalam will officially join CCOP as member country from 1 January 2020. The Meeting officially accepted Brunei Darussalam as CCOP Member Country, and tasked the CCOP to arrange the official signing of documentation signifying CCOP membership of Brunei Darussalam.



Consequently, the Meeting welcomed the designated Permanent Representative of Brunei Darussalam to CCOP, **Mr Norazmi bin Othman**, Acting Director of the Department of Water Services, Public Works Department, Ministry of Development.



Dr Dhiti Tulyatid, CCOPTS Regional Expert, presented the draft CCOP Strategic Plan 2021-2025. The Meeting endorsed the presented CCOP Strategic Plan 2021-2025 and expressed appreciation for the painstaking work in developing the plan as well as congratulated the Working Group, Dr. Martin Smith and the CCOPTS for the job well done. The Meeting tasked the CCOPTS

to revise the plan taking into consideration the comments raised by the Meeting.

Dr Martin Smith commended **Dr Dhiti Tulyatid** and CCOPTS for an excellent job in drafting the CCOP Strategic Plan, embedding the characteristics of CCOP such as building lasting partnerships, shared learning, regional influence, and promoting geoscience. He pointed out that the action plan that follows, is an important document which would demonstrate how the Strategic Plan will be implemented. The action plan has to be written with priorities in mind, it should address items such as the funding model, the importance of the COVID-19 impact as well as the monitoring and evaluation of the 3 challenges that were set out in the plan.



Mr Ioannis Abatzis commended CCOP for its flexibility as evident during this pandemic, adapting to the situation such as carrying out activities and meetings virtually. He encouraged maintaining this flexibility in the Action Plan that follows. On behalf of the AG, he expressed sincere appreciation for the efforts and dedication put by everybody involved in drafting the CCOP Strategic Plan 2021-2025, and conveyed that the AG are ready to help whenever their assistance or advice are requested by the SC.



On the 56th CCOP Annual Session (56AS) and the 75th CCOP Steering Committee Meeting (75SC) planned to be held on 1-7 November 2020 in Lombok Island, Indonesia, the Indonesia Delegation expressed their regrets that they will

not be able to host these meetings this year since its government budget is prioritizing COVID-19 pandemic preventive and mitigation efforts. However, Indonesia Delegation expressed their willingness to host the CCOP Annual Session in any year after.

Malaysia Delegation confirmed hosting the 76SC in March/April 2021 and offered their turn to host the 58AS and 79SC in November 2022 to Indonesia, to which Indonesia Delegation gladly accepted. Consequently, Malaysia Delegation indicated to host the 60AS and 83SC in November 2024.

Since Cambodia was not able to host this SC meeting due to the pandemic situation, Cambodia Delegation will host the 80SC in March 2023.





Meeting unanimously endorsed Thailand Delegation's proposal of **Dr Adichat Surinkum**, former CCOPTS Director, as CCOP Honorary Adviser. The AG congratulated SC for its wisdom to appoint **Dr Adichat** as Honorary Advisor. His vast experience will surely contribute to the betterment of both AG and CCOP.

Mongolia Delegation informed the Meeting that Mongolia Government Cabinet approved the establishment of National Geological Survey, and Mongolia is having a Parliamentary Election. As result of the election a new Government will be appointed in a couple months. So in the next Steering Committee Meeting a new organization (National Geological Survey) will represent Mongolia. Mongolia will keep the CCOPTS posted on the development.



Group photo of the Chairperson of the CCOP Steering Committee and Permanent Representatives of CCOP Member Countries

56th CCOP Annual Session, 3-4 November 2020, Bangkok, Thailand

The 56th CCOP Annual Session of the Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP) was held at Conference Room, Petch Building at Department of Mineral Resources (DMR), Bangkok, Thailand on 3-4 November 2020 hybrid with Zoom Meeting. It was organized by the Royal Thai Department of Mineral Resources (DMR), Ministry of Natural Resources and Environment, together with the CCOP Technical Secretariat (CCOP TS).

The Session was attended by representatives of the following Member Countries: **BRUNEI DARUSSALAM, CAMBODIA, CHINA, INDONESIA, JAPAN, REPUBLIC OF KOREA, LAO PDR, MALAYSIA, MONGOLIA, MYANMAR, PHILIPPINES, SINGAPORE, THAILAND and VIETNAM.**

From the Cooperating Countries, **AUSTRALIA, CANADA, DENMARK, FINLAND, GERMANY, THE NETHERLANDS, RUSSIAN FEDERATION, and UNITED KINGDOM** were in attendance.

From the Cooperating Organizations, **EuroGeoSurveys, IERI, IUGS, PETRAD, SPC, UNESCO- Jakarta, YES Network and Universiti Kebangsaan Malaysia (UKM)** attended the session. Also present at the Meeting were the Honorary Advisers of CCOP. The staff of the CCOP Technical Secretariat (CCOPTS) were also in attendance.



The Welcome Address was delivered by **Dr Sommai Techawan**, Vice-Chairperson of CCOP Steering Committee, Permanent Representative of Thailand to CCOP, Director-General of the Department of Mineral Resources (DMR), Thailand. Special Messages were delivered by: **Mr Ioannis Abatzis**, Chairperson of the CCOP Advisory Group, Representative of Denmark to CCOP, Chief Geoscientific Adviser, Geological Survey of Denmark and Greenland (GEUS); and **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson of CCOP Steering Committee, Permanent Representative of Malaysia to CCOP, Director-General of the Department of Mineral and Geoscience Malaysia (JMG). **H.E. Mr Varawut Silpa-archa**, Minister of Natural Resources and Environment of Thailand delivered the opening speech via a recorded video.



H.E. Mr Varawut Silpa-archa, Minister of Natural Resources and Environment of Thailand delivered the opening speech via a recorded video.

Mr Montri Luengingkasoot, First Deputy Permanent Representative of Thailand to CCOP, Deputy Director-General, Department of Mineral Resources (DMR), Thailand, was appointed Chairperson of the Session; **Dr Le Quoc Hung**, Permanent Representative of Vietnam to CCOP, Deputy Director-General, General Department of Geology and Minerals of Vietnam (GDGMV); and **Dr. Dhiti Tulyatid**, Regional Expert of CCOP Technical Secretariat as Vice-Chairpersons.

Dr Young Joo LEE, Director of CCOP Technical Secretariat (CCOPTS), summarized the Progress Report of CCOP including organizational changes (personnel), reorganize and systemize CCOPTS, the current financial situation, technical activities and cooperation and support from Cooperating Countries and Organizations during the year 2019-2020 with emphasis on the progress during 1 January to 31 December 2019 and 1 January – 30 September 2020.

Member Countries, Cooperating Countries and Organizations had filed their written reports prior to the commencement of the Annual Session. The Member Countries' reports are available from the CCOP website, <http://ccop.asia/activity/458> , along with the presentation files.



Group photos of participants during the 56th CCOP Annual Session (Virtual Meeting)

Dr Young Joo LEE, CCOPTS Director, presented CCOP's New Initiatives and Proposed CCOP Workplan 2021 for the information, comments and suggestions by the Session.



The CCOPTS Director reported that the 57th CCOP Annual Session will be held in Hanoi, Vietnam during November 2021 after the ASOMM meeting, and will be hosted by the General Department of Geology and Minerals of Vietnam (GDGMV) and other related government agencies in Vietnam. The exact date in November will be confirmed later with CCOPTS.

The Session conveyed acknowledgments to Chairperson of the CCOP Steering Committee, **Datuk Shahar Effendi bin Abdullah Azizi**, who has greatly contributed to the success of CCOP over the past several years. Datuk Shahar has been elected by the Steering Committee to be the Chairperson for the term 1 January 2018 to 2019 and re-elected for 2020-2021. He is currently the Permanent Representative of Malaysia to CCOP and Director-General of the Department of Mineral and Geoscience Malaysia (JMG).



The Session conveyed acknowledgments to Chairperson of the CCOP Steering Committee, **Datuk Shahar Effendi bin Abdullah Azizi**

The 75th CCOP Steering Committee Virtual Meeting, 5 November 2020, Bangkok, Thailand

The 75th CCOP Steering Committee (SC) Meeting was held virtually using the Zoom application hosted by the CCOP Technical Secretariat and Department of Mineral Resources (DMR), on 5 November 2020. The Meeting was attended by delegates of the following Member Countries (MC): BRUNEI DARUSSALAM, CAMBODIA, CHINA, INDONESIA, JAPAN, REPUBLIC OF KOREA, LAO PDR, MALAYSIA, MONGOLIA, MYANMAR, PHILIPPINES, SINGAPORE, THAILAND and VIETNAM. Also present were **Ioannis Abatzis** and **Dato' Yunus Abdul Razak**, Chairperson and Vice-Chairperson of the CCOP Advisory Group (AG) respectively, the Director and staff of the CCOP Technical Secretariat (CCOPTS).

Dr Young Joo LEE, CCOPTS Director, delivered the welcoming remarks. **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson of the CCOP Steering Committee, Permanent Representative of Malaysia to CCOP and Director-General of Department of Mineral and Geoscience Malaysia officially opened the 75th CCOP Steering Committee Meeting.



The 75th CCOP Steering Committee (SC) Meeting was held virtually using the Zoom application

In addition to the presentation of the progress report at the recently concluded 56th CCOP Annual Session (56AS), the CCOPTS Director highlighted the following.

- After the successful 56AS, the CCOPTS will compile follow-up actions on the presentations made by the Cooperating Countries and Organizations, and make a priority list which will be presented at the next SC meeting if permitted. CCOPTS has already started actions in reconnecting with the Cooperating Countries, and three of them were present at the 56AS.
- CCOPTS is strengthening contact with UNESCAP and UNESCO-Jakarta. The CCOPTS Director is working towards having a collaborative project with UNESCAP. There's an ongoing initiative on groundwater which the UNESCO-Jakarta is spearheading, in partnership with CCOP and other agencies, for the Adaptation Fund.
- CCOPTS is currently doing a CCOP Manual for the organization of CCOP Annual Sessions and Steering Committee Meetings (AS/SC Manual), for reference and guidance of the host country.
- CCOPTS has started plans for renovating the CCOP website to be more functional.
- CCOPTS informed that ASOMM has contracted the University of Queensland to evaluate the ASOMM project on mineral database. The University of Queensland contacted CCOP, and had shown interest of collaboration with CCOP especially with the GSi project.
- CCOPTS informed that ASOMM has contracted the University of Queensland to evaluate the ASOMM project on mineral database. The University of Queensland contacted CCOP, and had shown interest of collaboration with CCOP especially with the GSi project.
- ADB and Norway's interest to collaborate with CCOP on CCS and CCUS.

Cambodia Delegation informed that, Cambodia's Annual Cash Contribution for year 2020 will be delayed.

Thailand Delegation confirmed to increase of Thailand's annual cash contribution to CCOP from USD 40,000 to USD 50,000 from year 2021. The Meeting expressed appreciation to Thailand Delegation for their efforts in increasing Thailand's annual cash contribution to CCOP.

The Meeting endorsed the presented Action Plan for the CCOP Strategic Plan 2021-2025, with appreciation to the CCOP Strategic Plan Working Group as well as to its facilitator, **Dr Martin Smith** and the CCOPTS for the painstaking work done in developing the plan.

The Meeting endorsed in principle the following initiatives presented by the CCOPTS Director and tasked the CCOPTS to continue efforts in seeking and finalizing required funding, and to report progress at next SC meeting.

- CCOP as regional partner of the World Community of Geological Surveys (WCOGS) to cover Asia region
- CCOP Groundwater Project: Raising capacity for sustainable Groundwater Management and securing clean water in ASEAN (Funding Source: ASEAN-ROK Cooperation Fund)
- DDE (Deep-time Digital Earth) Project
- UNFC Project: Regional Capability Building of East and Southeast Asian Countries on Sustainable Resources Management
- Urban Geology Project: Capability Building and Practice on Urban Geology and Resilient City Deep Groundwater: Submarine Aquifers

The Meeting endorsed in principle the following project proposals from China and requested China to provide more detailed information regarding the project implementation plan.

New Proposals by Qingdao institute of Marine Geology (QIMG), CGS

- CCOP-QIMG (CGS) Book Project: Coastal erosion and mitigation in Asian Countries.
- Global Earth Observation (GEO) Cooperative Project: GEO-Delta and Estuary

New Proposals by China Institute for Geo-Environmental Monitoring, CIGEM, CGS

- CCOP-CGS Information Construction of Geological Disaster Prevention and Control with Community as a unit
- CCOP-CGS Cooperative Research on Dynamic Assessment of Geological Hazard Risk and Technical Theory of Management and Control.

The Meeting endorsed the CCOP Budget 2021 proposed and presented by the **CCOPTS Director** with the following comments.

Brunei Darussalam Delegation informed that they are not sure how much they can increase their annual cash contribution in the next year, and will update the CCOPTS on this matter.

Malaysia Delegation remarked that due to the pandemic, they would like to put on hold the increase of their next year's annual cash contribution to CCOP.

Malaysia Delegation confirmed hosting the 76th CCOP Steering Committee Meeting in Melaka, Malaysia during early April 2021 depending on the COVID-19 pandemic situation. The exact date in April 2021 as well as the venue will be informed to the CCOPTS as soon as finalized.

As announced by Vietnam Delegation at the 55th CCOP Annual Session concluded yesterday, the **CCOPTS Director** reiterated that the 57th CCOP Annual Session and the 77th CCOP Steering Committee Meeting will be organized in Hanoi during November 2021 in conjunction with the ASEAN Senior Officials Meeting on Minerals (ASOMM) which will also be hosted by the General Department of Geology and Minerals of Vietnam (GDGMV).

The Lao Delegation informed that the ongoing pandemic has affected the country economically, and this may affect their ability to host the 59th CCOP Annual Session and 81st CCOP Steering Committee Meeting in November 2023. Moreover, there will be changes in their Ministry, which may also impact hosting events in 2023. The Lao Delegation will report again in the next SC meeting on this matter.

Listed in the table below is the scheduled hosting timetable.

AS	SC	Year	Country	AS	SC	Year	Country
56	75	2020	CCOPTS (Thailand)	58	79	2022	Indonesia
	76	2021	Malaysia		80	2023	Cambodia
57	77	2021	Vietnam	59	81	2023	Lao PDR (<i>*tbc</i>)
	78	2022	Mongolia	60	83	2024	Malaysia

*tbc: to be confirmed

The Japan Delegation presented the update on the CCOP-GSJ MAMEA Project, Compilation and Publication of a revised “Magnetic anomaly map of east Asia 1: 4,000,000” (2016-2020). The Japan Delegation informed that the official publication of the map images and grid data sets will be released in December 2020 in electronic form and acknowledged the project’s contact persons from the Member Countries as well as the CCOPTS for their intensive contribution to the project.

As announced, **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson of the CCOP Steering Committee 2020-2021 will retire from office at the end of 2020. According to CCOP’s Terms of Reference (March 2006), **Dr Sommai Techawan** being the Vice-Chairperson, will act as Chairperson from January 2021 until his retirement on September 2021.

The Meeting tasked the CCOPTS to check back all CCOP’s administrative documents on the procedures of election of SC Chairperson and Vice-Chairperson, especially on the terms of office, and whether an election will have to be conducted in the next CCOP Steering Committee Meeting in April 2021.

The Meeting supported the CCOPTS Director’s proposal of buying a new official car for CCOP, and took note of the savings of CCOPTS operational budget in the future by selling the old car and buying a new one every 5 years.

The 56th CCOP Annual Session Thematic Session 2020 “Geoscience towards New Normal and Future Earth”

Due to the COVID-19 pandemic, the CCOP Technical Secretariat, in cooperation with the Royal Thai Department of Mineral Resources, co-hosted the online CCOP 2020 Thematic Session “Geoscience towards New Normal and Future Earth” during 15-16 December 2020, 9:00-17:00, Bangkok Time at DMR’s Conference Room, second floor, DMR HQ.

The Opening Session started with welcome addresses delivered by **Mr Niwat Maneekhut**, Deputy Director-General, Department of Mineral Resources (DMR), Thailand. Special messages were delivered by **Dr Young Joo LEE**, Director of CCOP Technical Secretariat. Opening Addresses delivered by **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson of CCOP Steering Committee, Permanent Representative of Malaysia to CCOP, Director-General of the Department of Mineral and Geoscience Malaysia (JMG).



The online CCOP 2020 Thematic Session was very successful attended online via ZOOM Application, YouTube and offline by 194 participants with 39 speakers from CCOP Member Countries (8), Cooperating Country (3) and Cooperating Organization (2) that provided updated development in geoscience and good discussion among participants. There were 2 sessions with technical sub-topics; (1) Geology and Mineral Resources, (2) Groundwater, Geo-Data & Information, Geo-Environment, Climate Change, Hazard & Urban Geology. The over one-third of our participants and presenters are young and women geoscientists from our community. Abstract Volume of the 56AS Thematic Session is now available for download from the CCOP webpage, <http://ccop.asia/56as75sc/56asts2020-abstractvolume.pdf>.

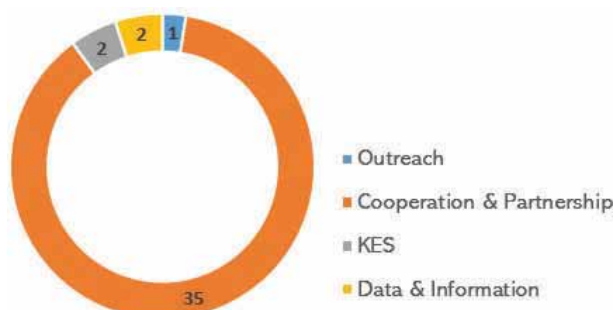
As announced, the Thematic Session was livestreamed to CCOP YouTube Channel which are accessible through the linkd, <https://youtu.be/ZT9XNHYqZpc> (Day 1) and <https://youtu.be/5LF0rHoZ3ew> (Day 2).



TECHNICAL PROGRAMMES AND ACTIVITIES

In 2020, a total of 40 training/workshop activities were carried out and most activities were conducted online due to the COVID-19 pandemic. With strategic focus on capacity building, knowledge sharing and technology transfer; the workshops, training courses, symposiums, working group meetings and expert visits were conducted during the reporting period and Member Countries participation were highly appreciated.

Summary of CCOP Member Countries' Participation in Technical Activities



DATE/VENUE	ACTIVITY	STRATEGIC GOAL
13-22 Jan 2020 <i>Pusan & Seoul, KR</i>	<i>IUGS 74th Executive Committee Meeting and visit KOGAS, KIOST, GTCK</i>	Cooperation
14-15 Feb 2020 <i>Bangkok, TH</i>	CCOP Strategic Plan 2021-2025: Brainstorming Meeting (Cancelled)	Cooperation
27 Feb 2020 <i>Bangkok, TH</i>	<i>The International Seminar on "Bangkok The Underwater City: Countermeasures"</i>	Cooperation
2-8 Mar 2020 <i>Delhi, IN</i>	<i>36 IGC (Postponed to 16-21 August 2021)</i>	Outreach
24 March 2020 <i>Siem Reap, KH</i>	CCOP Select Finance Committee Meeting (Cancelled)	Cooperation
29 Apr 202	CCOP-KIGAM 2020 GW Project Meeting via Zoom Application	Cooperation
20 May 202	The first CCOP Strategic Plan Working Group Video Conference via Zoom Application	Cooperation
28 May 2020	CCOPTS-GAI Zoom Meeting	Cooperation
1 Jun 2020	CCOP join the Stay Strong! Campaign	Cooperation
8 Jun 2020	CCOPTS-GDGMV Zoom Meeting	Cooperation
24 Jun 2020	74 th CCOP Steering Committee Virtual Meeting	Cooperation
29 Jun 2020 <i>10:00am UTC</i>	World Community of Geological Surveys (WCOGS): A World Community platform in the making for Geological Survey Organisations, Zoom Meeting	Cooperation
1 Jul 2020	ASOMM Working Group Online Meetings: 17 th Working Group on Mineral Information and Database (WGMID) Meeting	Cooperation
13 Jul 2020 <i>11.00-11.30</i> <i>Bangkok Time</i>	Consultation online meeting with Technical Secretariat CCOP and Space Applications Section, ICT and Disaster Risk Reduction Division, UNESCAP via Microsoft Teams Application	Cooperation
27-31 Jul 2020 <i>08.30-12.00am</i> <i>(Beijing time)</i>	Online Conference on Geology of SE Asia "Hunting the Next Generation of Resources and New Plate Tectonics" via ZOOM Application	Cooperation
29 Jul 2020 <i>14.00 to 15.30</i> <i>CEST (Geneva time)</i>	Webinar on Application of UNFC to Petroleum Total Resource Management: Status and Outlook	Cooperation
29 Jul -2 Aug 2020 <i>Satun, TH</i>	Pre-revalidation Evaluation of Satun UNESCO Global Geopark	Cooperation
26-28 Aug 2020 <i>Bangkok, TH</i>	Brain-storming Meeting / Seminar on "The Development of Driven Mechanism on Geopark of Thailand" and "Policy Frameworks on the Conservation and Management of Geosites and Geoparks of Thailand over the next five years"	Cooperation
8 Sep 2020 <i>UN ESCAP Office,</i> <i>Bangkok, TH</i>	CCOP-UN ESCAP offline meeting	Cooperation

DATE/VENUE	ACTIVITY	STRATEGIC GOAL
8 Sep 2020 15.00, Bangkok Time	CCOP-ADB online Meeting on CCSM Project	Cooperation
11 Sep 2020 CCOP Office BKK, TH	CCOP-DMR Offline Meeting on preparation of the 56 th CCOP Annual Session and 75 th CCOP Steering Committee Meeting	Cooperation
10 Sep 2020 13.30 to 18.30 BJT (Beijing time) Hybrid meeting	Online International Symposium of Resilient City Dialogue on resilient cities between Europe and Asia: new opportunities and cooperation to face the challenges	Cooperation
10 Sept 2020 14.00 to 15.30 CEST (Geneva time)	Webinar on Sustainable and integrated natural resource management Values, principles and requirements	Cooperation
21 Sep 2020 2 pm Bangkok Time	CCOP-ADB Online Meeting on CCSM Project Plan	Cooperation
28-29 Sep 2020 Chengdu, China Hybrid meeting	UNECE-CCOP-IFEDC UNFC/PRMS Session: Resources Management, Technology and Practice, IFEDC 2020	Cooperation
15 Oct 2020 15.00 – 17.00 Bangkok Time	2 nd Meeting of the CCOP Strategic Plan Working Group	KES
14 Oct – 13 Nov	Recruitment: CCOP-IERI Internship Program (2021 Spring Semester), GIST	Data and Information
20-21 Oct 2020 13:00-16:00 Bangkok Time	CCOP-KIGAM Geoscience Data Repository (GDR) Project First Working Group Virtual Meeting/Workshop	Cooperation
30 Oct 2020 13:00- 14:00 Bangkok Time	CCOP and The University of Queensland's Sustainable Minerals Institute (SMI)	Cooperation
3-4 and 5 Nov 2020 BKK, TH Hybrid Meeting	56 th CCOP Annual Session & 75 th Steering Committee Meeting	Cooperation
10 Nov 2020 13:00-14:00 Bangkok Time	Online Meeting: CCOP and Science & Technology Councillor, Innovation Norway & Royal Norwegian Embassy, Singapore	KES
9-30 Nov 2020	ISGeo Online training course for geo-experts: "Online Lecture on Geological Mapping and Mineral Exploration, Groundwater, Oil and Gas Hydrate	Cooperation
17-19 Nov 2020 15:00-16:45 UK Time	WCOGS Webinar: Responding to societal needs with 3D geology: An international perspective	Cooperation
3 Dec 2020 15:45 – 16:45 Singapore Time	Twentieth ASEAN Senior Officials Meeting online on Minerals (20 th ASOMM)	Cooperation
4 Dec 2020 16:00-17:20 Bangkok Time	Establishing the CCOP Research Centre on Urban Geology Between CCOP and Nanjing Center of China Geological Survey	Outreach Data & Info
8 Dec 2020 9:00-17:30 Bangkok Time	The 5 th International Workshop on CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia (GSI) Project (Zoom Virtual Meeting)	Cooperation
15-16 Dec 2020 BKK, TH Hybrid Meeting	The 56 th CCOP Annual Session Thematic Session 2020 "Geoscience towards New Normal and Future Earth"	Cooperation

OUTREACH

In 2020, the outreach initiatives carried out include attending technical meetings, giving lectures, discussions and telephone conferences. The activities are reported in accordance to the 2020 CCOP Workplan.

WEB-GIS

Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project

The Japanese-funded CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project scheduled for 2015 – present, aims to develop new geoinformation integration and sharing system using international standards and free and open-source software among CCOP countries.

The 5th International Workshop of the CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project was held virtually using Zoom Meeting on 8 December 2020, hosted by the CCOP Technical Secretariat (CCOPTS). It was attended by 26 participants from the member countries (Brunei Darussalam, Cambodia, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Myanmar, Mongolia, Papua New Guinea, Philippines, Thailand, and Vietnam) and CCOPTS. The objectives of the workshop are to update the progress of the GSi Project and status of data uploading in each of the CCOP Member Countries, and to discuss future actions and strategies for the project's phase II, 2021-2025.

Dr Young Joo LEE, CCOPTS Director welcomed all the participants and officially opened the virtual workshop.

Dr Shinji Takarada, the GSi Project Leader and **Dr Joel Bandibas**, the GSi system developer, updated the workshop on the progress of the project and the recent developments of the GSi information system. To date there are two thematic and project portal sites already accessible via the GSi Web System as follows.

- CCOP-GSJ Groundwater Project: https://ccop-gsi.org/gsi/ccop_water/
- Asia-Pacific Region Geological Hazards Information System, <https://ccop-gsi.org/gsi/geohazard/>
- Recent updates of the GSi Web System include the following.
- GSi Main Portal and GSi Generated WebGIS Site updates
- New Expandable Forms for Presenting/Capturing Metadata
- New Interface for Uploading Spreadsheet Data
- New Color Picker for Defining/Editing Legends
- New Interface for Adding Catalogs at GSi Generated Sites

Each country national coordinator (or representative) presented progress of data upload with suggestions and recommendations for GSi Phase II as well as the GSi Web System. As of May 2020, there are 825 map layers accessible via the GSi system main site, <https://ccop-gsi.org/main>. Newest portal is from Brunei Darussalam, a new CCOP Member Country, <https://ccop-gsi.org/gsi/brunei/index.php>, containing 20 map layers.

Dr Takarada presented the plan for GSi Phase II (2021-2025) including strategies, targets and workplan as follows.

CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project Phase II (2021-2025)

Scope:

- Compile various geoscientific information in CCOP countries, and construct a database on an open Web, using the world standard formats and GIS,
- Each member country is responsible for updating the database and maintaining the data quality,
- Upload various geoscience data and maps with the GIS format,
- Establish a geoinformation infrastructure in Asia and for the world, through a public-friendly system.
- Promote mutual collaborations among CCOP member countries.

Duration: Year 2021 – 2025

Targets:

- Compile various geoscientific information in CCOP countries, and construct a database on an open Web, using world standard formats and GIS.
- Promote digitization of geoscience data in CCOP countries in high quality
- Establish geoinformation comprehensive database and infrastructure in Asia and for the world
- Make practical applications using the available data in the GSi system
- Make interface of the GSi main system for easy use by the public.

Scope and Goal:

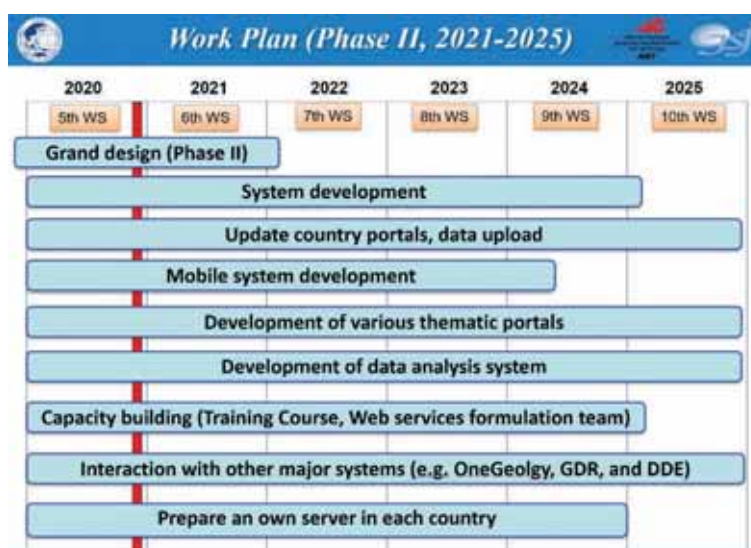
- Geoinformation Sharing
- Deliver our Geoscience Knowledge to Society
- International Standardization
- Capacity Building

Specific Goals

1. Increase quantity and quality of the data (1000 data > 2000 data, with high quality data - Attribute Table, Metadata, & pop-up info)
2. System development and improvement (Comprehensive Asian database)
3. Develop thematic portals (Make More Thematic Portals)
4. Data Analysis (Online Hazard Assessment)
5. Mobile System (Develop Mobile Applications)
6. Collaboration with other major projects (e.g. OneGeology, CCOP GDR, IUGS DDE)

Workplan 2021-2025

1. Increase quantity and quality of the data on the GSi system.
2. Original Vector Data download (if available).
3. System development and improvement.
4. Data Analysis system (eg. hazard assessment)
5. Develop thematic portal sites (eg. hazards information and natural resources)
6. Make interactions with other major international projects (eg. OneGeology, CCOP GDR, IUGS DDE).
7. Promote mutual collaborations among member countries.



It was agreed that phase II workshops will be thematic, and data to bring for the hands-on exercise will be relevant to the selected theme.



Group photo of Participants at the 5th CCOP GSI International Workshop was held virtually using Zoom Meeting

PUBLICATIONS

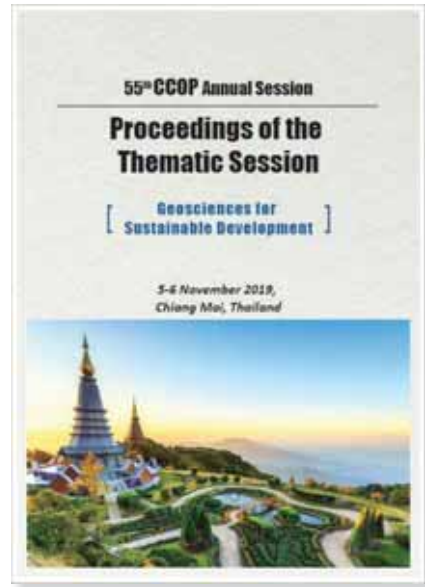
Proceedings of the 55th CCOP Annual Session “Geoscience for Sustainable Development”

This is the proceedings of the Thematic Session, “Geosciences for Sustainable Development” held at the 55th CCOP Annual Session on 5-6 November 2019, Chiang Mai, Thailand. There were a total of 44 papers for oral presentations and 12 papers for poster presentations delivered with approximately 150 participants attended at the Thematic Session.

A total of 21 papers were presented in this proceedings volume. The papers were grouped into three subthemes, which are

1. Geo-resources for the society: Mineral, Groundwater, Fossil Fuel Resources and Geological Conservation Sites;
2. Geo-environments for the Society: Climate Changes, Global Warming, Natural Disasters and Land-use Planning; and
3. Geo-education for the Society: Geopark and Geotourism.

The Thematic Session has successfully provided a venue for the exchange and sharing of updated information, networking and reunion of CCOP delegates of the Member Countries, Cooperating, Countries and Organizations, as well as other participants. The 174-page publication is available both electronically and in printed book. Its PDF file can be downloaded from this link, <http://ccop.asia/56as75sc/56asts2020-abstractvolume.pdf>.



CCOP Annual Report 2019

The CCOP Annual Report for 2019 is now available both in printed and digital formats. The report summarizes the projects and activities carried out during the year 2019, the financial standing and more.

With a total of 71 colored pages, the digital file (reduced resolution) with about 4.7MB size can be downloaded from this link, <http://www.ccop.asia/download/2020/CCOP-AR2019.pdf>.



GW-9: Technical Report of the CCOP-GSJ Groundwater Project Phase III



The Groundwater Project Phase III started in February 2015 aiming at the development of groundwater database in the CCOP region and three groups, the DB Groups I and II, and the Public Policy Group were formed to promote the project smoothly.

The CCOP-GSJ-DGR Groundwater Project Phase III Meeting was held in Chiang Mai, Thailand on 13-15 February 2019. It was the final project meeting for the Phase III and attended by 27 participants from Cambodia, China, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Thailand, Vietnam and the CCOP Technical Secretariat. In the meeting, participants confirmed the progress of the project from March 2018 to February 2019, and discussed the outcome of the Phase III including the publication of this technical report (GW-9).

This “Technical Report on CCOP Groundwater Project Phase III” consists of the followings which the CCOP-GSJ-GA Groundwater Project Phase III Meeting in Bali, Indonesia, decided partially revised GW-7 and GW-8:

1. Report on the present status and future plan of hydrogeological maps in each country,
2. Explanation documents on the groundwater database of the country’s capital city or representative area registered on the GSi Groundwater Portal by the DB Groups I and II.
3. Public policy for the groundwater observation system created/proposed/developed by the Public Policy Group.

This report is of 218 colored pages, and is available in printed and digital formats. Its pdf file is around 8.5MB filesize, and can be downloaded from this link, <http://ccop.asia/pdf/publication/GW-9.pdf>.

GW-10: Report of the CCOP-GSJ-GAI Groundwater Project Phase IV Kick-off Meeting, 2-4 December 2019, Bali, Indonesia

The CCOP-GSJ-GAI Groundwater Project Phase IV Kick-off Meeting was held in Bali, Indonesia on 2-4 December 2019. The meeting was hosted by Geological Agency of Indonesia (GAI). It was attended by 28 participants from Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Thailand, Vietnam and the CCOP Technical Secretariat. In the meeting, participants confirmed the outcome of the CCOP-GSJ Groundwater Project Phase III and discussed the plans for the Phase IV.

Each CCOP member country made a presentation on the topic of “Issues and improvement ideas for the Phase III Groundwater Database” (DB1 & DB2 Groups) and “Present hydrogeological data and problem for making groundwater database” (Public Policy Group). All the member countries discussed on the groundwater database compilation planned for the Phase IV.

This publication compiles all the country reports presented in the CCOP-GSJ-GAI Groundwater Phase IV Kick-off Meeting. It is of 217 colored pages, and is available in printed and digital formats. Its pdf file is around 6MB filesize, and can be downloaded from this link, <http://ccop.asia/pdf/publication/GW-10.pdf>.



Publication of CCOP Paper on GSL

CCOP paper entitled “Building the future of the geoscience community in Asia: CCOP beyond history and borders” was published at the Geological Society, London, Special Publications, 499, 261-281, 30 June 2020, <https://doi.org/10.1144/SP499-2019-215>.

More information about submitting a proposal and producing a book for the Society can be found at <https://www.geolsoc.org.uk/proposals>.

Building the future of the geoscience community in Asia: CCOP beyond history and borders

Young Joo Lee, Dhiti Tulyatid, Marivic Uzarraga, Jisoo Kwak and Juhee Seo

Geological Society, London, Special Publications, 499, 261-281, 30 June 2020, <https://doi.org/10.1144/SP499-2019-215>

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Abstract

The Coordinating Committee for Geoscience Programmes in East and SE Asia (CCOP) is an intergovernmental geoscience organization based in Bangkok, Thailand. CCOP currently comprises 15 member countries in East and SE Asia; it has provided venues for various geoscientific programmes and activities in the region for over 50 years. At its inception, CCOP conducted work in geological surveys, exploration and technological cooperation in the extraction of off-shore petroleum and mineral resources in the region. In response to the needs of member countries, CCOP projects have become increasingly diverse over time, especially in the areas of groundwater resources, geohazards, global climate change and urban geology. Facing the imminent fourth industrial revolution, CCOP compiles, manages and utilizes large amounts of data collected and accumulated by its member countries, and increasingly focusses on data sharing, education and capacity building. With the vision of becoming a premier intergovernmental Earth science organization in East and SE Asia, CCOP's mission is the application of Earth science to make significant contributions to the economic development and sustainable environmental management of its member countries, enhancing their quality of life. To fulfil this mission, CCOP has developed four strategic foci: (1) outreach; (2) cooperation and partnership; (3) knowledge enhancement and sharing; and (4) data and information. Organization and management of CCOP are governed by a steering committee formed of permanent representatives from the 15 member countries and guided by recommendations from an advisory group comprising representatives from cooperating countries and organizations. The steering committee considers and endorses projects and activities planned and proposed by the technical secretariat, which oversees the management of the organization, implementing all approved plans for the benefit of all member countries as well as cooperating countries and organizations. CCOP has played important roles in providing venues for activities and collaboration on various Earth science topics, including energy and mineral resources, groundwater, geohazards, global climate change, urban geology, geoscience big data, education and outreach. CCOP also publishes regular and special publications describing its activities. In the future, CCOP will encourage non-members in the region to join as official member countries, and will further strengthen its network by conducting joint Earth science research projects with cooperating countries and organizations. CCOP will also pursue sustainability in research by establishing a system to continually nurture new Earth scientists. Furthermore, CCOP will build a cooperative network with geoscience communities in other regions to promote a sustainable Earth.

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Suggested articles

CCOP STRATEGIC PLAN 2021-2025

The First CCOP Strategic Plan Working Group Video Conference via Zoom Application

On 20 May 2020 (03:00-05:00 p.m., Bangkok), the first CCOP Strategic Plan 2021-2025 Working Group was carried out successfully via Zoom at meeting Room I, first Floor, Department of Mineral Resources in Bangkok, Thailand. The Department of Mineral Resources (DMR) hosted for the use of meeting room for CCOPTS and Thai participants. There were a total of 34 persons participated in the meeting. These included 25 people from 14 CCOP Member Countries: – Brunei Darussalam (3), Cambodia (2), China (3), Indonesia (1), Japan (2), Republic of Korea (3), Lao PDR (1), Malaysia (1), Mongolia (1), Myanmar (1), the Philippines (1), Thailand (4), Singapore (1) and Vietnam (1). Dr Martin Smith (UK) participated and facilitated the Strategic Plan session.

The Opening Speech was made by **Dr Young Joo LEE**, CCOPTS Director. Followed by all participants introduce themselves. **Dr Dhiti Tulyatid**, CCOPTS Regional Expert presented the progress report and introduction to the first draft of the CCOP Strategic Plan 2021-2025.

Dr Martin Smith of the British Geological Survey as facilitator introduced the discussion for the first draft of the CCOP Strategic Plan 2021-25 with a presentation on the topics of WHY?, a strategy to address a changing landscape requiring a step change in thinking and approach or is it business as usual? WHAT is the direction of travel? Is it a question of survival or growth as we align to the growing global challenges? CCOP should aim to address country solutions and recognise the emerging digital transformation and opportunities across the SE&E region.

Dr Young Joo LEE informed all SPWG that after getting consensus from CCOP Member Courtiers and have discussion with SC Chairperson that CCOP is supposed to have VDO conferencing for the upcoming the 74th CCOP Steering Committee Meeting on 24 June 2020.

Dr Dhiti Tulyatid encouraged all SPWG to send feedback to TS by the end of the week (23 May 2020) so that he could prepare the final draft from next week onward. The revision of the first draft will be sent to all SPWG again for consideration before being proposed to the upcoming CCOP Steering Committee Meeting. Hopefully we will have one offline meeting of SPWG during August or September this year. CCOPTS will keep updating information with SPWG. The Meeting was adjourned at 17:00 hr.



The 2nd Meeting of the CCOP Strategic Plan Working Group

On 15 October 2020, 15:00 – 17:00 hr (Bangkok), the CCOP Strategic Plan 2021-2025 Working Group Second Video Meeting was carried out via Zoom at CCOP Meeting Room, Second Floor, CCOP Building, Bangkok, Thailand. There were a total of 34 persons participated in the meeting. These included 23 people from 11 CCOP Member Countries:– Brunei Darussalam (3), Cambodia (2), China (2), Indonesia (1), Japan (2), Republic of Korea (3), Lao PDR (1), Malaysia (4), Myanmar (1), the Philippines (1), Thailand (1), and Vietnam (2). Dr Martin Smith (UK) participated and facilitated the Strategic Plan session. There were eight persons from CCOP TS participated in the meeting.



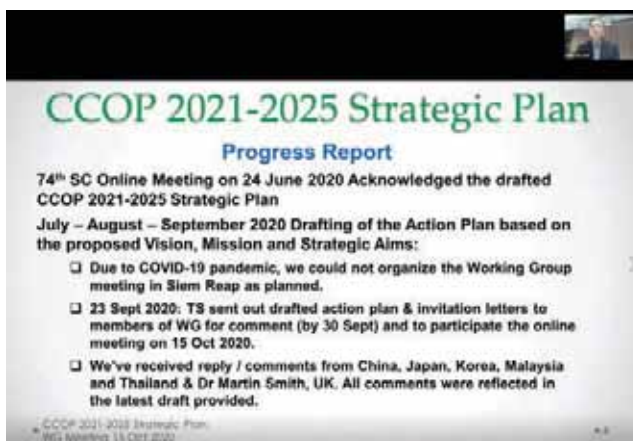
The Opening Speech was made by **Dr Young Joo LEE**, CCOPTS Director. **Dr Dhiti Tulyatid**, CCOPTS Regional Expert presented the progress report and introduction to the drafted Action Plan of the CCOP Strategic Plan 2021-2025. **Dr Martin Smith** of the British Geological Survey, UK, raised the following points for discussion,

- He noted in general terms that Geoscience Education in the West is experiencing a significant decline as fewer students are enrolling in geology subjects at universities.
- It is a good thing that CCOP support the engagement of Young Earth Scientists and the encouragement of the new generation to involve in CCOP's related activities.
- CCOP is a fine example of an international organization that works on cooperation and partnership with diverse cultures with good opportunity on cross-boundary regional geoscience projects.
- It is recommended that CCOP has a procedure on project / activity monitoring, evaluation, especially respect to the SDGs.

The meeting (especially Malaysia, **Dr Smith**, Japan, the Philippines and CCOP TS) discussed the Strategic Aim I: Provision of Geoscience Solutions, Advice and Reliable Information through Cooperation and Partnership:

- Objective 3: To promote the establishment of the expert groups for E&SE Asia. The Expert Group could be formed according to each task/discipline and multidisciplinary group. The latter is aimed to tackle some topic like the Climate Change, etc. For the mechanisms of how these two points can be addressed, CCOP TS can make use of its Rules and Procedures of CCOP: Rule 4: Establishment of Regional Expert Pool. The expert group then later can meet, discuss and work on activities related to Objective 3.
- Objective 3: To promote the establishment of the International Centre of Excellence (ICE), which should be formed in the later years.

Dr Martin Smith thanked all members of the Strategic Plan Working Group for their contribution to this drafted Action Plan. The CCOP TS informed the meeting that this drafted Action Plan will be considered and acknowledged and approved by the Steering Committee at the 75th Steering Committee Meeting to be held online on 5 November 2020. The Meeting was adjourned at 15:30 hr.



COOPERATION AND PARTNERSHIP

In the year 2020, CCOP continued to collaborate with its MCs, CCs and COs to implement the planned activities and adopt activities in new areas of concern. Outreach activities have continuously been developed, thanks to generous support by funding agencies and in-kind contribution by member countries, to optimize the benefits of the partly sponsored programmes. The table below summarizes the cooperation and activities of the Member countries, Cooperating Countries and Cooperating Organizations.

Table of Technical Activities with Member Countries, and Cooperating Countries & Organizations in 2020

COUNTRY	CCOP TECHNICAL ACTIVITIES
1) Member Countries	
Japan	<p>GSJ support financially and technically the following activities:</p> <ul style="list-style-type: none"> i. Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project ii. CCOP-GSJ Groundwater Project Phase IV
Republic of Korea	<p>KIGAM support financially and technically the following projects:</p> <ul style="list-style-type: none"> i. Vulnerability assessment to climate change of groundwater system in Greater Mekong Subregion and comparative study of groundwater dependent ecosystem ii. Geoscience Data Repository (GDR) system of CCOP Member Countries <p>KIGAM and IS-Geo continued to support and organize training courses:</p> <ul style="list-style-type: none"> i. ISGeo Online training course for geo-experts: “Online Lecture on Geological Mapping and Mineral Exploration, Groundwater, Oil and Gas Hydrate, 9-30 November 2020
Thailand	<p>The Royal Thai Department of Mineral Resources (DMR) co-hosted the following activities:</p> <ul style="list-style-type: none"> i. The first CCOP Strategic Plan Working Group Video Conference via Zoom Application, 20 May 2020 at meeting Room I, first Floor, Department of Mineral Resources in Bangkok, Thailand. ii. The 56th CCOP Annual Session and 75th CCOP Steering Committee Virtual Meeting, 3-4 and 5 November 2020 at meeting Room I, first floor, Department of Mineral Resources in Bangkok, Thailand. <p>DMR continues to support the siting of the Permanent Office Building for CCOPTS in DMR Complex, Bangkok, Thailand.</p>
2) Cooperating Countries	
United Kingdom	<p>The British Geological Survey (BGS) provided support to the development of a strategic plan and discussion around a draft business plan.</p>
United States of America	<p>The Geological Society of America (GSA) manages the ‘Terman Fund’ for the EAGER Award Project for CCOP Member Countries, which has been resumed in 2019 per the decision of the 72nd CCOP Steering Committee Meeting in March 2019, Samui Island, Thailand.</p>
3) Cooperating Organizations	
IERI	<p>CCOP-IERI Internship at GIST</p>
IUGS	<p>SoutheastAsia Deep-time Digital Earth (DDE), under the framework of the International Union of Geological Sciences (IUGS) recognized Big Science Program - Deep-time Digital Earth (DDE) officially initiated at the 73rd IUGS Executive Committee Meeting in Beijing, aims to establish linked earth big-data hubs for the Southeast Asia. This task is undertaken by the Sun Yat-sen University and relevant institutes in southeast Asian countries and coordinated by the Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP).</p>
UNESCO	<p>Update proposal of The Adaption Fund Title “Groundwater resources in the Greater Mekong Subregion: Collaborative management to increase climate change resilience.”</p>

The International Seminar on "Bangkok the Underwater City: Countermeasures"



On 27 February 2020, **Dr Young Joo LEE** attended the International Seminar on "Bangkok the Underwater City: Countermeasures" at C ASEAN Auditorium, CW Tower. Opening ceremony by Chief Executive Officer Ministry of Natural Resources and Environment (MONRE).

There are guest speakers on 7 topics which are;

1. **Bangkok: The Underwater City: Situation 2020** by *Wim J.F. Simons, Tu Delft, Netherlands*
2. **Geologist Viewpoint** by *Dr. Sommai Techawan, President of Geological Society of Thailand*
3. **Geographer Viewpoint** by *Assoc. Prof. Dr. Wichai Pansnshiran, Faculty of Social Science, Srinakharinwirot University*
4. **Architectural and Urban Planning Viewpoint** by *Assist. Prof. Dr. Wijitbusaba Marome, Faculty of Architecture and Planning, Thammasat University*
5. **Engineering Viewpoint** by *Prof. Dr. Chalermchon Satirapod, Faculty of Engineering, Chulalongkorn University*
6. **Art and Cultural Viewpoint** by *Assoc. Prof. Roj Khunanake, Director of Thai Khadi Research Institute, Thammasat University*
7. **Lawyer Viewpoint** by *Assist. Prof. Chukeat Noichim, School of Law, Mae Fah Luang University*

CCOP-KIGAM 2020 GW Project Meeting via Zoom Application

On 29 April 2020 (14:00-15:00, Bangkok), Korea Institute of Geoscience and Mineral Resources (KIGAM) and CCOP Technical Secretariat team had online meeting via zoom application on the CCOP-KIGAM 2020 GW Project; Title: "Vulnerability assessment to climate change of groundwater system in Greater Mekong Subregion and comparative study of groundwater dependent Ecosystem". **Dr Eunhee LEE**, KIGAM gave presentation on project summary, expected activity and project plan for year 2020.



The consensus for the meeting is as following

- CCOP will set up and coordinate international platform by contacting MRC, UNESCO, IGRAC, IWMI, etc. and explore possibility for collaboration. CCOP will try to support this project by AKCF fund, once AKCF fund is successfully secured. For the installation of GDE monitoring network in GMS, we prioritize countries such as, Cambodia, Thailand, Vietnam, Lao PDR and Myanmar.
- CCOP will contact to Cambodia and Lao PDR and ask for Groundwater level data set and send to KIGAM.
- Meeting agreed to have one offline meeting in August by this year depending on the global situation of COVID-19 pandemic.
- Meeting agreed that most important goal for year 2020 is 'site selection' for GDE monitoring.
- Meeting agreed to have capacity building or training for Cambodia and Lao PDR in either Korea or other Mekong Countries, if budget is allowed.

CCOPTS-GAI Meeting via Zoom Application

On 28 May 2020 at 10:00 (Bangkok Time), CCOP Technical Secretariat and Geological Agency of Indonesia's team had online meeting via zoom application about the 74th CCOP Steering Committee Meeting, 24-25 June 2020 and the preparation of the 56th CCOP Annual Session and 75th CCOP Steering Committee Meeting, 1-7 November 2020.

Mr Rudy Suhendar, Head of GAI, and PR of Indonesia to CCOP reported on the current situation of preparation of the 56th CCOP Annual and 75th Steering Committee Meeting and also proposed that 56AS & 75SC in Lombok will be postponed to next year or 2022.

During the meeting, **Dr Young Joo LEE**, Director of CCOPTS informed that the 74th CCOP Steering Committee Meeting is confirmed that will have VDO conference on Wed 24 June 2020, (13:00 – 16:30, Bangkok Time) and CCOPTS already send out the invitation letter to all MCs to join the VDO conference. CCOP will confirm about the venue of the 56th CCOP Annual and 75th Steering Committee Meeting in the 74th Steering Committee Meeting.

After consultations with CCOP Member Countries, and recommendation from the CCOPTS, the Chairperson of the CCOP Steering Committee (SC), **Datuk Shahar Effendi bin Abdullah Azizi** decided to hold the 74th CCOP Steering Committee Meeting as scheduled, on 24 June 2020 via Zoom Meeting, from 13:00-16:30 (Bangkok time). This is the first ever virtual meeting of the CCOP Steering Committee. Let us all move forward, while adapting to the “new normal”.



About the scheduled UnCon15 workshop, LEMIGAS and KIGAM has the intention to have UnCon15 workshop in Bali. However due to COVID19 pandemic in Indonesia, **Dr Eko**, GAI will contact to **Mr Pannaju**, LEMIGAS and share information with CCOPTS.

Mr Rudy Suhendar, Head of GAI and PR of Indonesia to CCOP, informed that he will be retired from 1 June 2020. CCOPTS all thanked **D Rudy Suhendar** for his strong support to CCOP as a PR of Indonesia to CCOP.

CCOP join the Stay Strong! Campaign

On 1 June 2020, The President of Korea Institute of Geoscience and Mineral Resources (KIGAM, **Dr Bok Chul KIM**) recommended **Dr Young Joo LEE**, Director of CCOPTS to join the Stay Strong! Campaign, Corona Overcoming SNS Relay hosted by the Ministry of Foreign Affairs of Korea. Sincere thanks to President Bok Chul KIM of KIGAM for paving this opportunity for us to contribute to this helpful campaign in invigorating the populace in this trying time.

Nowadays, global world is struggling with the COVID-19 Pandemic. This kind of global infectious disease can be seen many times in human history and can be expected to continue plaguing mankind in the future. We believe that the fight against the Corona virus, which interferes with all human lives, can be defeated and prevented through rapid and accurate information sharing of the global community. CCOP, as an intergovernmental organization, will strive to make our planet safer and will vigorously exert efforts towards the most efficient information sharing in order to overcome this worldwide situation.

We hope that the rapid and accurate global information sharing through international networks will help eradicate Corona and ensure that all human beings have a safe life on the planet.

We recommend this Relay of “Stay Strong” to be continued by **Datuk Shahar Effendi Abdullah Azizi**, Director General of the Department of Mineral and Geoscience Malaysia (JMG) & Chairperson of the CCOP Steering Committee and **Dr Sommai Techawan**, Director-General of the Department of Mineral Resources (DMR) of the Royal Thai Government & Vice Chairperson of CCOP Steering Committee.



CCOPTS-Vietnam/GDGMV Zoom Meeting

On 8 June 2020 at 10:00 (Bangkok Time), CCOP Technical Secretariat and New Permanent Representative of Vietnam to CCOP had online meeting via zoom application about hosting the 57th CCOP Annual Session and 77th Steering Committee Meeting.

Dr Young Joo LEE, Director of CCOPTS expressed appreciation and welcome for **Dr Le Quoc Hung**, Deputy Director General of General Department of Geology and Minerals of Vietnam (GDGMV) as a new Permanent Representative (PR) of Vietnam to CCOP and introducing each other between CCOP Technical Secretariat and Permanent Representative of Vietnam. **Dr Le Quoc Hung**, PR of Vietnam to CCOP and Deputy Director of GDGMV informed that Vietnam has been preparing the Hosting of CCOP 57th Annual Session and 77th Steering Committee which will be convened late October to early November of 2021.



CCOP Technical Secretariat and New Permanent Representative of Vietnam to CCOP had online meeting

World Community of Geological Surveys (WCOGS): A World Community Platform in the Making for Geological Survey Organisations, Zoom Meeting

On 29 June 2020 at 17:00 Bangkok time, representatives of the Geological Survey of Canada (Daniel Lebel), the United States Geological Survey (Vic Labson), and the EuroGeoSurveys (Slavko Solar) co-convened the first meeting of the World Community of Geological Surveys (WCOGS), with participation from some 100 individuals, most being executives or senior managers of geological surveys from around the world. CCOP was invited to join the WCOGS Post-COVID19 Leaders Forum. **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson of the CCOP Steering Committee and Director-General of the Department of Mineral and Geoscience Malaysia (JMG) was one of the panelists during the discussion "Perspectives on Post-COVID19 context and prospective actions by Geological Surveys"

Following an introduction to the WCOGS initiative, three stage-setting presentations by the President of the Geological Society of America and social scientists from the USGS outlined the challenges to geoscience, and the benefits of thinking out of the box and seizing the opportunity of the changes occurring through this dramatic period of world events. Much guidance and encouragements were offered in the development of a Community of Practice of GSO, as part of WCOGS.

The participants at the event on 29 June indicated that they were pleased with the event content and format, and that the meeting provided many valuable insights for participants, such as through the results of the on-line polling. Many indicated that they would be interested in supporting the development of future events.

The past meeting agenda is available on the YouTube video description with a schedule to help you get to the various parts of the event. An edited version of the launch Webinar is now available here: (https://www.youtube.com/watch?v=QVCVPAHL_YA).



Datuk Shahar Effendi bin Abdullah Azizi, Chairperson of the CCOP Steering Committee and Director-General of the Department of Mineral and Geoscience Malaysia (JMG) was one of the panelists during the discussion "Perspectives on Post-COVID19 context and prospective actions by Geological Surveys"

17th WGMID Meeting: ASOMM Working Group Online Meetings

The 4th ASOMM's Joint Working Group Meeting and Associated Meetings (17th WG Meeting) to be hosted by Singapore from 30 June to 2 July 2020. Due to the pandemic situation of COVID-19, ASEAN Member States (AMS) has decided to convene the meeting via the online platform.

CCOP was invited to participate in 17th Working Group on Minerals Information and Database (17th WGMID) meeting, which will be held on 1 July 2020 at 14.00 - 16.00 (Singapore Time GMT+8). Specific timeslot dedicated to CCOP is at 15.20-15.35, and the agenda for CCOP is "AGENDA ITEM 4: PRESENTATION BY THE COORDINATING COMMITTEE FOR GEOSCIENCE PROGRAMMES IN EAST AND SOUTHEAST ASIA (CCOP)". CCOPTS Director, Dr Young Joo LEE presented on the "CCOP's activities relevant to establishment of data and information on minerals" that relevant with the works of WGMID, and potential cooperation/ collaboration with ASEAN in 2020 – 2021 (specific to the minerals information and database).



Consultation online meeting with CCOP Technical Secretariat and Space Applications Section, ICT and Disaster Risk Reduction Division, UNESCAP via Microsoft Teams Application

On 13 July 2020 at 11.00-11.30, Bangkok Time, CCOP Technical Secretariat and Space Applications Section, ICT and Disaster Risk Reduction Division, UNESCAP team had a consultation online meeting via Microsoft Teams Application. The meeting agenda included main activities and focus areas of UNESCAP and CCOP, and discussion on potential areas of cooperation between two organizations.

CCOPTS Director, **Dr Young Joo LEE** gave a brief presentation about the past cooperation with UNESCAP and key focus areas of CCOP including member countries. **Mr Keran Wang** gave a brief presentation about UNESCAP activities and current projects of the division, mainly focusing on the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030), which was adopted by senior government officials on 18 October 2018. **Dr Young Joo LEE** and **Mr Keran Wang** had common understanding on potential benefits from partnerships and collaborative actions of the two organizations.

Both agreed to continue the consultations between the two organizations, in particular focusing on the following themes 1) Smart Urban and Geology, 2) Big Data and Geospatial Information for land, marine and resource management, and 3) Climate Change and Global Warming, through integration of geospatial data and applications. Both agreed to share resources in respective events including projects and programme under development.



CCOP Technical Secretariat and Space Applications Section, ICT and Disaster Risk Reduction Division, UNESCAP team had consultation online meeting via Microsoft Teams Application.

Online Conference on Geology of SE Asia “Hunting the Next Generation of Resources and New Plate Tectonics” via ZOOM Application

On 27-31 July 2020, The Coordinating Committee for Geoscience Programs in East and Southeast Asia (CCOP), along with Qingdao Institute of Marine Geology (QIMG), China Geological Survey (CGS), and Qingdao National laboratory for Marine Science and Technology (QNLN), co-organized online conference on Geology of SE Asia “Hunting the Next Generation of Resources and New Plate Tectonics” via ZOOM Application.

CCOP recommended Associate Professor Adam Switzer, Permanent Representative of Singapore to CCOP, Principal Investigator, Asian School of the Environment, Earth Observatory of Singapore & AXA-Nanyang Chair in Natural Hazards, Earth Observatory of Singapore (EOS), Nanyang Technological University as lecturer. His lecture was scheduled on 31 July 2020 at 9:00-11:00 (Beijing Time) on a topic “Marine Geohazards in southeast and east Asia”. CCOPTS Director, **Dr Young Joo LEE**, chaired the session, and discussed on Sea Level Rise and its impact on Cities in SE Asia.

(BJT)	Presenter	Affiliation	Title	Chair
13:00-13:15	Peter Lunt	Qingdao Institute of Marine Geology, China Geological Survey	Presenting the status of CCOP activities	Young Joo Lee
13:15-13:30	Chris Morley	Qingdao Institute of Marine Geology, China Geological Survey	Presenting the status of CCOP activities	Young Joo Lee
13:30-13:45	Sabin Zahirovic	Qingdao Institute of Marine Geology, China Geological Survey	Presenting the status of CCOP activities	Young Joo Lee
13:45-14:00	Chris Elders	Qingdao Institute of Marine Geology, China Geological Survey	Presenting the status of CCOP activities	Young Joo Lee
14:00-14:15	Adam Switzer	Qingdao Institute of Marine Geology, China Geological Survey	Presenting the status of CCOP activities	Young Joo Lee

ZOOM ID: 133-3422-1689
 ZOOM ROOM sign-in and zoom link: <https://zoom.us/j/13334221689>
 For Zoom download link: <https://zoom.us>

Conference Sponsor:
 Qingdao Institute of Marine Geology, China Geological Survey
 State Key Laboratory of Marine Geology and Environmental Geosciences
 The Coordinating Committee for Geoscience Programs in East and Southeast Asia

2020 Online Conference on Geology of SE Asia
Hunting the Next Generation of Resources and New Plate Tectonics

Adam Switzer, Nanyang Tech. Univ. of Singapore

Title:
 A series of linked talks on geology of SE Asia,
 Talk 5: Marine Geohazards of SE Asia

Chaired by: Young Joo LEE
 Director of CCOP

Beijing Time: 9:00-10:00 am, 31 July

ZOOM ID: 133-3422-1689
 ZOOM ROOM sign-in and zoom link: <https://zoom.us/j/13334221689>
 For Zoom download link: <https://zoom.us>

Conference Sponsor:
 Qingdao Institute of Marine Geology, China Geological Survey
 State Key Laboratory of Marine Geology and Environmental Geosciences
 The Coordinating Committee for Geoscience Programs in East and Southeast Asia

Pre-revalidation Evaluation of Satun UNESCO Global Geopark

On 29 July to 2 August 2020, The Department of Mineral Resources invited **Dr Dhiti Tulyatid**, Regional Expert, CCOP TS, to be one of three members of the Evaluastor Group to re-evaluate Satun UNESCO Global Geopark in the preparation for the revalidation of the geopark in Satun Province, Thailand to be conducted by the evaluators from UNESCO in 2021. Other evaluators include **Mrs Savitri Suwansathit**, Social Science Expert, and **Assistant Prof Dr Krit Won-in**, Kasetsart University. Satun UNESCO Global Geopark cooperated with the Department of Mineral Resources.



On 29 July 2020 at 15:00 **Mr Veeranan Pengchan**, Governor of Satun Province opened the Meeting on the Pre-revalidation of Satun Golbal Geopark at See Sea Resort, La-ngu District, Satun Province. The Satun Geopark Administration Vice-directors, **Mr Songphop Warinsa-at** (Administration Section); **Asst. Prof Dr Pongsak Tongnueakhaeng** (Tourism Information & Education Section); and **Mr Rattapong Worawongsongkram** (Conservation and Protection Section), and **Ms SamLEE Lakkanawong** (Sustainable Development Section & Chief Executive of the Kamphaeng Subdistrict Administrative Organization) led the discussion in response to eight comments given by the UNESCO evaluators when the park was firstly evaluated to become a global geopark. **Mr Narongrit Thungprue**, Satun Geopark Director also welcomed and looked after the evaluation team.

The evaluation team had visited a number of places and sites during the visit. These included:

30 July 2020: Tambon Nathon Administration Office, Thungwa District: Nathon Homestay & Ton Khlum Basketry Centre; Satun UNESCO Global Geopark Museum, Khuan Khong Nepenthes Local Enterprise Group and Satun Paphiopedilum niveum Group; Sungai Upe Pepper Local Enterprise Group; the Mangrove Forest Natural Dyed Fabric Local Enterprise Group; the Exhibition on Biodiversity and the Local Wisdom research studies carried out by scientists from the National Science and Technology Development Agency (NSTDA)

31 July 2020: Khao Noi Fossils Site; Urai Thong Cave; Geosite and education exhibitions from Satun Community College (**Dr Wandee Suthaphanich**, Director); Thungwa District Nonformal and Informal Education Centre; Kamphaeng Witthaya School; Satun Kindergarten School; Ban Bo Chet Luk School; Thungwa Worawit School. These schools has adopted and created their local Geopark Lessons for their schools. Mu Ko Phetra National Park (**Mr Witthaya Buaphol**, Head).

1 August 2020: Visited local enterprise groups: Panya Batik; Kopi Na Kha; Satoui Champada Cake & Bakery by Zen. The evaluation group had a summary meeting with the geopark and stakeholders at the meeting room, Office of Kamphaeng Administrative Organization.

Dr Dhiti Tulyatid gave comments to **Mr Narongrit Thungprue** and his team of Satun Global Geopark the following comments:

1. Satun over the past year has greatly improved. Local communities have made very good progress in developing the geopark as a whole.
2. Beware of the expansion of all dimensions and be ready for these changes.
3. Interpretation is very important. By the end of this year, there will be a lot of results coming from all R&D currently carried out in the area, especially those from NSTDA. Thus it is suggested that the geopark have an interpretation team to compile and integrate information of all counterparts.
4. In addition to 3 above, the geopark needs to manage good interpretation, i.e., set a theme for the park and related geosites and other sites; designate qualified geoguides; etc.
5. It is recommended that the geopark make use of BigData to study visitors and their preferences to plan the park business plan/model.
6. It is recommended that the park prepare emergency plans for various situations, i.e., pandemic/new normal; earthquake/tsunami; coastal erosion; storm surge; etc.
7. Local Wisdom to International market.
8. The geopark should explore the Web / Internet; Facebook, etc.



Ton Khlum Basketry Centre



Mu Ko Phetra National Park



NSTDA R&D Group, Tha Nam Aoy



Khuan Khong Nepenthes Local Enterprise Group
Suan Khuan Khong



Su-ngai Upe Thai Pepper Group

Brain-storming Meeting / Seminar on “The Development of Driven Mechanism on Geopark of Thailand” and “Policy Frameworks on the Conservation and Management of Geosites and Geoparks of Thailand Over the Next Five Years”

The Brain-storming Meeting / Seminar on “The Development of Driven Mechanism on Geopark of Thailand” (26-27 August 2020) and “Policy Frameworks on the Conservation and Management of Geosites and Geoparks of Thailand over the next five years” (28 August 2020) were held at Suan Dusit University. **Dr Dhiti Tulyatid**, Regional Expert, CCOP TS represented CCOP in this meeting.

The secretariat of the meeting presented on the mechanism development to drive Geoparks of Thailand. Related information included, but not limited to, information on Thailand national committee on the promotion on geosite conservation and geopark establishment; UNESCO’s Global Geoparks and other initiatives (World Heritage, Ramsar, MAB, etc.), International Geoscience and Geoparks Programme (IGGP); International Geoscience Programme (IGCP); Global Geopark Network (GGN); European Geoparks Network (EGN); Asia Pacific Geoparks Network (APGN); Latin American and the Caribbean Geoparks Network (LACGN); African Geoparks Network (AGN); Canadian National Committee for Geopark (CNCG); National Geopark Network of China; Korean National Geopark Secretariat; and Janese Geoparks Network (JGN).



A group photograph of key persons in the meeting (Left-to-right: **Dr Dhiti Tulyatid** (CCOP); (Phetchabun Geopark); **Mr Narongrit Thungprue** (Satun Global Geopark); **Dr Tawsaporn Nuchanong**; **Dr Sommai Techawan** (DMR DG); **Dr Apasisi Suwannanon** (Dean, the Graduate School, Suan Dusit University); **Dr Nattaphan Khejoranan** (Suan Dusit University); **Mr Surachai Siripongsatian**; (Director and Deputy-director of Samphanbok Geopark).

The meeting found that Geoparks management body should be public organization or independent administrative organization, or a specific legal body. The management body should be able to link between government administration and the local communities / business.

The proposed drafted strategic plan:

Vision: To develop the geopark administrative system of international standard; build network, knowledge and conscience on the sustainable conservation of local geo-heritages.

Mission:

1. To promote the conservation and control wise use of georesources;
2. To manage geosites and geoparks through the integration of all stakeholders and to balance the integration of geoheritage and geotourisms with economic and social development.
3. To promote and develop the knowledge system, awareness and participation in the conservation and sustainable management of geoheritage for the community as well as develop measures to cope with natural hazards.

4. To integrate and build participation on conservation and management of geoh heritage at all levels from local to regionals and globally to ensure the cooperation and security of national geoparks.
5. To promote, increase potential and use of research work on geoh heritage conservation, apply IT on capability building on the management of geosites and geoparks.

The meeting also drafted out the Masterplan: the conservation and management of geosites and geoparks of Thailand.

CCOP- UN ESCAP meeting

On 8 September 2020, 10:00 - 11:00 (UTC+7 Bangkok time), Consultation Meeting between ESCAP and CCOP was held at United Nations Conference Centre (UNCC) Bangkok, Room G. CCOPTS Director, **Dr Young Joo LEE**, together with **Dr Dhiti Tulyatid**, Regional Expert, **Ms Marivic Pulvera Uzarraga**, Project Manager and **Ms Thanitnunth Invakul**, Technical Assistant attended the meeting.

Mr Keran Wang, Chief of the Space Applications Section of ICT and Disaster Risk Reduction Division (IDD) shared a short VDO presentation about UNESCAP's COVID-19 action and responses. **Dr Young Joo LEE**, Director of CCOPTS delivered a brief presentation about brief history, past cooperation with UNESCAP, and key focus areas of CCOP.

CCOP proposed ESCAP to develop a joint project to strengthen the partnerships of both organizations and delivered short presentation on the concept of Urban Geology. Currently CCOP still did not have a project on Urban Geology, but CCOP have good experiences and hold some expert groups consisting of member countries and cooperating countries such as GTK (Finland), BGS (United Kingdom), CGS (China), KIGAM (Korea) and GSJ (Japan).

Ms Tiziana Bonapace, Director of IDD presented key focus work areas of IDD. **Mr Keran Wang** introduced a brief status and work related to the Secretariat of United Nations Global Geospatial Information Management for Asia and the Pacific (UN-GGIM-AP) and the projects for Association of Southeast Asian Nations (ASEAN) Secretariat. The current study area on urban geology is in Songkhla, Thailand, Bandung and Makassar in Indonesia. There will be a hybrid of meeting & training course in Songkhla Province, Thailand at the end of November this year. **Mr Tae Hyung KIM** also gave briefly about the on-going project on Asia Pacific Geospatial Data Platform and invited CCOP to the workshop to be held in the middle of October 2020.



Consultation Meeting between ESCAP and CCOP was held at United Nations Conference Centre (UNCC) Bangkok, Room G



Both agreed to continue the consultations between the two organizations to explore the cooperative areas and projects, in particular focusing on the following themes 1) Smart Urban and Geology, 2) promotion of sharing geospatial data in the Asia Pacific region through the cooperation in implementing the Asia Pacific Geospatial Data Platform, 3) Marine data and 4) resource management. Both also have the common understanding that the partnerships between the two organizations create synergy and support member countries better in the Asia Pacific region. In this context, both agreed to share resources in organizing and implementing regional events together including projects and programmes.

Online International Symposium of Resilient City, Dialogue on Resilient Cities Between Europe and Asia: New Opportunities and Cooperation to Face the Challenges

On 10 September 2020, 16.30-17.50 Beijing Time, CCOPTS Director **Dr Young Joo LEE** was invited as keynote speaker to the Online International Symposium on Resilient City that organized by World Young Scientist Summit (WYSS) that has **Dr Meng WANG** as Executive Secretary. During the Session “Dialogue on resilient cities between Europe and Asia” new opportunities and cooperation to face the challenges”, **Dr Young Joo LEE** gave presentation on “Activities of CCOP for Geohazards and Resilience”.

CCOP was invited to be the list of Support Organization together with ACUUS and other organizations. This is an initiative to develop greater awareness of scientific integrity and identify opportunities to develop global initiatives frameworks to promote a research on the resilient City.



CCOPTS Director **Dr Young Joo LEE** was invited as keynote speaker to the Online International Symposium on Resilient City that organized by World Young Scientist Summit (WYSS)

CCOP-ADB Online Meeting on CCSM Project Plan

On 21 September 2020 at 14:00 Bangkok Time, **Mr Darshak Y Mehta**, Sector Advisory Service Division (Consultant), Asian Development Bank (ADB) has online meeting via ZOOM Application with CCOP Technical Secretariat about future collaborate on CCSM project, and also would like to share current status of CCOP CO₂ Storage Mapping Program or CCS-M project. **Mr Darshak Y Mehta**, ADB has shared about coal powerplant, new energy and CBM in Myanmar, India and Bangladesh.

CCOPTS Director **Dr Young Joo LEE**, gave brief introduction of CCSM Project. CCOPTS Regional Expert **Dr Dhiti Tulyatid**, gave a brief presentation and summary report about the past activities of CCSM project and proposed to renew on CCOP-KIGAM on CCS Program. In early 2021, ABD and CCOP has planned to arrange online/ off line seminar / workshop focus on case study and monitoring gas storage site in either China or Indonesia, invite expert form CCOP Member Country, and sponsor some part financially. Both agreed to continue sharing resources in respective events including CCS projects and progarmme.

UNECE-CCOP-IFEDC UNFC/PRMS Session: Resources Management, Technology and Practice, IFEDC 2020

The Coordinating Committee for Geoscience Programs in East and Southeast Asia (CCOP), along with the International Field Exploration and Development Conference (IFEDC), and the United Nations Economic Commission for Europe (UNECE), co-organized the UNFC/PRMS Session: Resources Management, Technology and Practice, at the 2020 International Field Exploration & Development Conference (IFEDC2020: <http://www.ifedc.org/2020>) during 28-19 September 2020 in Chengdu, China. The theme of 2020IFEDC is “Efficient Development of Oil and Gas Driven by Digitalization”. Details The main topics of the Session include: (1) Resource classification and management system, specification and coding; (2) Resources and reserves evaluation technology and case study; (3) Integrated and sustainable resources management technology; and (4) Digital tools and database in resources evaluation and management. This was a hybrid conferences with about 20 technical sessions.

On 28 September 2020, 14:00 -18:00 Beijing Time, CCOPTS Director **Dr Young Joo LEE** was invited as Co-Chairs via online in Session 11, UNFC/PRMS: Sustainable Resources Management, Technology and Best Practice and gave presentation on “CCOP and UNFC related activities”, sharing discussion that UNFC session in coming IFEDC 2020 will be a good opportunity to further promote global technical exchange and cooperation.

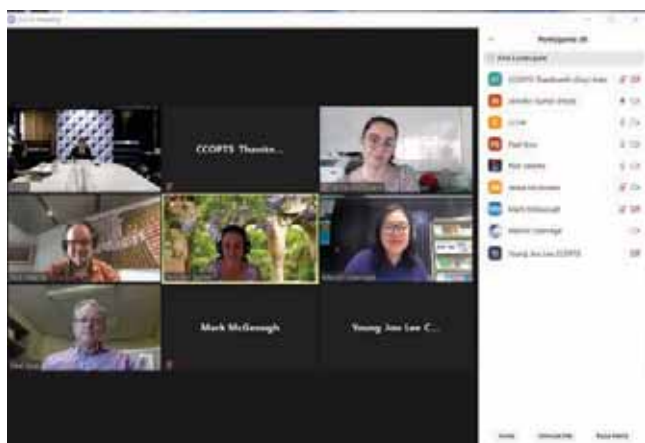


CCOPTS Director **Dr Young Joo LEE** was invited as Co-Chairs via online in Session 11, UNFC/PRMS: Sustainable Resources Management, Technology and Best Practice

CCOP and The University of Queensland's Sustainable Minerals Institute (SMI)

On 30 October 2020, 13:00 - 14:00 (Bangkok Time), CCOP TS and The University of Queensland's Sustainable Minerals Institute (SMI) team had an online meeting via Zoom Application on a review of the ASEAN Minerals Information Database System (AMDIS) and preliminary consultations. **Dr Young Joo LEE**, Director CCOPTS gave presentation on CCOP introduction, CCOP Activity on WGMID activities under CCOP-ASEAN cooperation and potential collaboration with ASEAN.

Dr Jennifer Gunter, SMI had discussed on the role CCOP, the future directions of the CCOP and platform of GSi project among CCOP Member States, and how CCOP operate GSi workshop. **Ms Marivic** explained briefly on GSi portal. **Dr Mark McGeough** had questioned to **Dr LEE**, Director CCOPTS that have any interested to encourage the GSi project into Business sector. **Dr LEE** replied that CCOP is intergovernmental organization and CCOP Member Countries are most from government organization. Main purpose of GSi project is to develop a new geoinformation integration and sharing system using international standards and free open-source software among CCOP Member Countries. Meeting agreed to find the opportunity of collaboration on AMDIS among CCOP, SMI and ASEAN.



CCOP TS and The University of Queensland's Sustainable Minerals Institute (SMI) team had meeting online via Zoom Application on a review of the ASEAN Minerals Information Database System (AMDIS)

Online Meeting: CCOP and Science & Technology Councillor, Innovation Norway & Royal Norwegian Embassy, Singapore

On 10 November 2020, 13:00 - 14:00 (Bangkok Time), CCOP TS Director **Dr Young Joo LEE** and TS staffs had meeting online via Zoom Application with **Dr Per Christer Lund**, Science & Technology Councillor, Innovation Norway & Royal Norwegian Embassy, Singapore on Carbon Capture Storage (CCS) activities and future collaboration. **Dr Young Joo LEE** gave a brief presentation on CCOP introduction, its activities related to CCS and the current situation.



Dr Per Christer Lund gave briefly purpose of this meeting that has the intension to reconnect with CCOP about CCS project and sharing information on Singapore-Norway Science on last week. Norwegian Government through Technology Centre Mongstad (TCM) has interested in Carbon Capture Storage and decarbonization in South East Asia and ASEAN countries. TCM together with Singapore Institute of Technology focus their works on CO₂ Capture and Storage in developing low-carbon technology and climate change.

CCOPTS stated its intention to continue CCUS project with a focus on the mapping of potential sites in East and Southeast Asia and is still looking for funding. **Dr Lund** indicated that outlook on any CCUS project should rely on the Carbon Market and it should be Government Initiative. **Dr Lund** also mentioned that apart from CCUS, “Geothermal” is another topic of interest for future cooperation. During discussion, meeting agreed to find the opportunity of future collaboration on CCS among CCOP and Innovation Norway & Royal Norwegian Embassy, Singapore.

Twentieth ASEAN Senior Officials Meeting on Minerals (20th ASOMM)

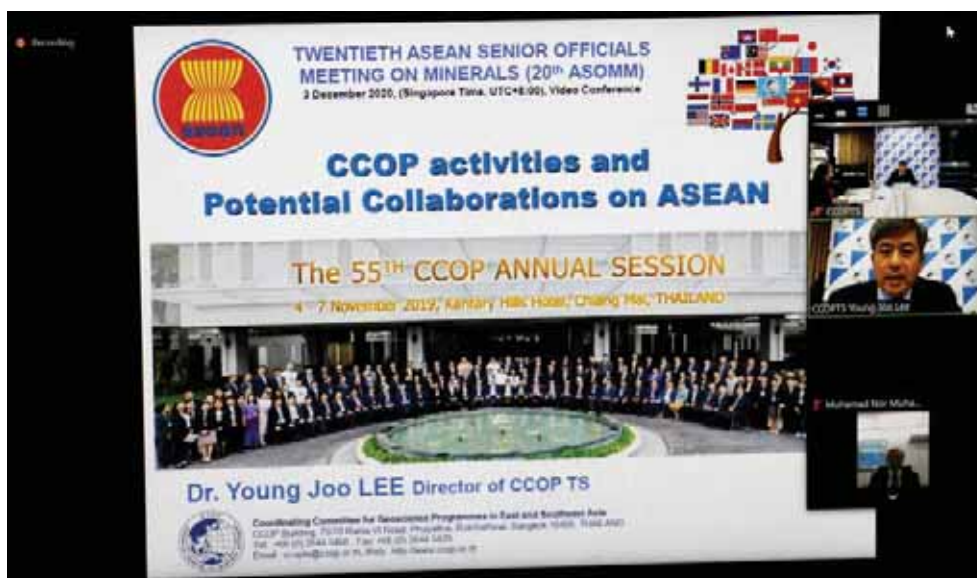
On 3 December 2020, 15:45 - 16:45 (Singapore Time), the Twentieth ASEAN Senior Officials Meeting on Minerals (20th ASOMM), Video Conference was hosted by Singapore. Due to the pandemic situation of COVID-19, ASEAN Member States (AMS) have decided to convene the meeting via the online platform.

CCOP was invited to join the consultation with international organizations and partners involved such as AMS, ASEC, AFMA, IGF, and USGS on prospects of future cooperation under AMCAP Phase 2: 2021-2025. CCOPTS Director **Dr Young Joo LEE** gave a presentation on the CCOP activities and Potential Collaborations on ASEAN that focused on the WGMID activities and Critical Minerals under CCOP-ASEAN cooperation.

The Chair of ASOMM (Singapore) briefly explained the objective of the AMCAP Phase 2 Consultation with International Organisations (IOs)/Partners. The ASOMM Chair subsequently invited the IOs/Partners to present perspectives on the: (a) global minerals development outlook, key challenges for ASEAN and their coverage region in the near to medium term, and views on how ASEAN should meet these challenges; and, (b) potential collaboration in specific programmes with ASEAN under AMCAP Phase 2 (2021-2025) to meet the challenges:

- i. ASEAN Federation on Mining Association (AFMA);
- ii. Coordinating Committee for Geoscience Programme in East and Southeast Asia (CCOP);
- iii. Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF); and,
- iv. United States Geological Survey (USGS).

ASEAN Member States also shared views in response to the IOs/Partners’ presentations/ briefings more on critical minerals topic.



CCOPTS Director **Dr Young Joo LEE** presented on the CCOP activities and Potential Collaborations on ASEAN

Establishing the CCOP Research Centre on Urban Geology between CCOP and Nanjing Center of China Geological Survey

The online meeting was opened at 16:00 on 4 December, 2020 via Zoom Application. **Dr Young Joo LEE**, Director of the CCOP Secretariat, gave a welcome address and introduced the delegates from CCOPTS who attended the meeting. **Dr Siqi Shu** introduced the delegates from the Nanjing Center of CGS attending the meeting.

Dr Siqi Shu first introduced the general situation and achievements of the urban geological survey of the Nanjing Center of CGS, and proposed to cooperate with CCOP to establish the CCOP Research Center on Urban Geology in Nanjing, China. **Dr Siqi Shu** introduced the ideas for the establishment of the Centre and believed that the research Centre should: establish an expert think tank for international urban geological cooperation and development, become an international urban geological cooperation exchange platform, build an international urban geological information sharing platform, undertake international urban geological survey projects, and hold international academic annual meetings on Urban Geology.

Dr Young Joo LEE agreed with the proposal to establish the CCOP Research Centre on Urban Geology and hoped that relevant documents should be submitted to the steering committee of CCOP for approval as soon as possible.

It was agreed that:

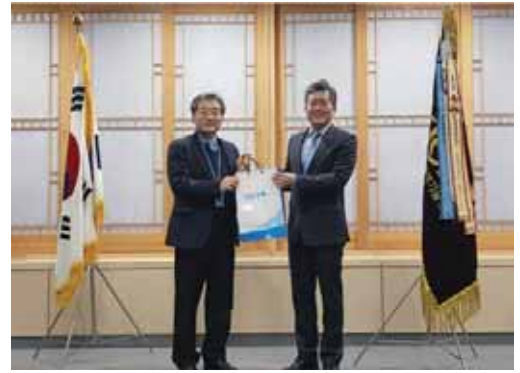
- The establishment of the CCOP Research Centre on Urban Geology is a very constructive proposal and worth promoting.
- The construction of the CCOP Research Centre on Urban Geology. It is great significance for improving urban resilience and ensuring sustainable urban development to form an international urban geological expert team, to integrate international geological scientific and technological advantages.

The meeting suggested that a brief plan of the establishment of CCOP Research Centre on Urban Geology should be submitted to the CCOP Secretariat as soon as possible.



CCOPTS Courtesy Visits and Visitors

On 14 January 2020, **Dr Young Joo LEE** paid a courtesy visit to the President of KIOST. He met Host Scientist, **Dr Joo-Hyung Ryu**, and discussed about possible collaboration between KIOST and CCOP for GOCI-II Joint Ocean reference Network (GI-JOON), Korea Institute of Ocean Science & Technology (KIOST), Busan, Republic of Korea.



From left to right:
Dr Kim Woong-Seo and **Dr Young Joo LEE**



On 15-18 January 2020, **Dr Young Joo LEE** attended the **74th IUGS Executive Committee Meeting** in Busan, Republic of Korea and have presentation on CCOP Activity. CCOP was invited as a found member of DDE for the IGC 36 Signing Ceremony that will be done on 5 March 2020.

On 20 January 2020, **Dr Young Joo LEE** visited **GTCK (Green Technology Center Korea)** and also visited **KBSI (Korea Basic Science Institute)**, Republic of Korea. Discuss possible collaboration on transfer technology to Member Countries of CCOP by developing machines for scientific analysis.



Visit to KBSI from left to right:
Dr Shin Hyung-Shik and **Dr Young Joo LEE**

On 21 January 2020, **Dr Young Joo LEE** visited **MOFA (Ministry of Foreign Affairs)** and attended a meeting with **Mr Sung-Wook Jo**, the director of ASEAN Cooperation Division to have discussions with AKCF on Groundwater issues of raising capacity for sustainable Groundwater Management and securing clean water in ASEAN of 1M USD for 5 Years. In addition, **Dr Young Joo LEE** met with **Mr Ryu Hak-Seok**, the First Secretary of International Energy Security Division, discussing the possible collaboration between CCOP and MOFA such as the continuation of internships.



During the meeting, from left to right: **Dr Young Joo LEE**, **Mr Kanok Intharawijitr**, **Dr Kasana Soonthornsaratul** and **Ms Supamittra Danpanich**.

On 27 January 2020, A courtesy visit of **Dr Young Joo LEE**, Director of CCOPTS and **Dr Dhiti Tulyatid**, Regional Expert of CCOPTS to **Mr Kanok Intharawijitr**, Executive Vice President, PTT Exploration and Production Public Company Limited (PTTEP) at head quarter office in Bangkok, Thailand. The purpose of visit was to express its gratitude to PTTEP and **Mr Kanok** for the support given to CCOP on the organizing of the UNFC workshop held in Chiang Mai on 5-6 November 2019; and seeking for support and collaboration on three proposed projects.

On 29 January 2020, **Dr Young Joo LEE**, Director and **Ms Marivic Pulvera Uzarraga**, Programme Manager, CCOP TS visited UNESCO Jakarta. Meeting with **Dr Khan** (Director) and **Dr Hans** (Senior Program Specialist, Groundwater, Environment) on more collaboration possibilities.



On 30 January 2020, **Dr Young Joo LEE** and **Ms Marivic Pulvera Uzarraga** visited Mission of the ROK to ASEAN. Meeting with **Ambassador Lim Sungnam**, **KO Park** and **SJ Son** and have discussion on AKCF project from CCOP. Meeting with AKPMT (ASEAN ROK Program Management Team), **Ms Bokhee Park** (Counsellor) **Mr SH Kim** & **Anggiet Yoga Ariefianto**, have discussion on how to prepare proposal for AKCF fund.

On 31 January 2020, Honorable Excellency 8th Secretary General of the UN **Mr Ban Ki-Moon** visited Bangkok to deliver Distinguished Person Lecture in UN ESCAP on Climate Change and Air Pollution in Asia. **Dr Young Joo LEE** was invited by Honorable Korean Ambassador **LEE Wook-Heon** to join dinner together with Secretary General **Mr Ban Ki-Moon** at the residence of Korean Ambassador in Thailand.



On 13 February 2020, **Dr Young Joo LEE** paid a courtesy visit to **Dr Hongjoo Hahm**, Deputy Executive Secretary of UN ESCAP in Bangkok. They had a very constructive discussion on how CCOP and UN ESCAP can collaborate and cooperate with each other on the subjects which can be mutually beneficial. They came up with the consensus that both organizations try best to find out projects in the field of Global Climate Change, Urban Geology and Big Data Platform of Marine environment.

On 27 February 2020, **Mr Shaun Versace**, Principal Geologist – Data & Resources, PanAust Limited, kindly visited CCOP TS Headquarters in Bangkok. **Dr Young Joo LEE**, Director, and **Dr Dhiti Tulyatid**, Regional Expert, CCOP TS, welcomed **Mr Versace** who has joined several of CCOP’s activities related to the application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC). **Dr Dhiti** introduced the proposed proposal on National Capability Building on Resources Management Project and extended the invitation to PanAust Limited to take part in the project as one of the partners. **Mr Versace** agreed to take the messages into the consideration of his colleagues back in Pan Aust Limited. However, on 25 March 2020, **Mr Sean Versace** sent a message to inform us that Pan Aust Limited would like to be involved and continue our communication as well as commit to providing any technical support.

On 11 September 2020, **Dr. Young Joo LEE** has the great honour to welcomed **Dr Sommai Techawan**, Director-General of Department of Mineral Resources (DMR) and his team to CCOPTS office. In the discussion on CCOP Meetings 2020, in cooperation with the Royal Thai Department of Mineral Resources (DMR), the 56th CCOP Annual Session was scheduled on 3-4 November 2020 and the 75th CCOP Steering Committee Meeting on 5 November 2020, the two meetings will be held online (via Zoom) at 13:00-16:00 Bangkok time.



Dr Young Joo LEE has the great honour to welcomed **Dr Sommai Techawan** and his team to CCOPTS office

On 9 October 2020 at 11:00, **Dr Young Joo LEE**, Director of CCOP TS, along with **Dr Dhiti Tulyatid**, Regional Expert, and **Ms Marivic Pulvera Uzarraga**, Manager: Project Operation and Information, officially visited **Mr Wisanu Tabtieng**, Director General, Department of Primary Industries and Mines, Ministry of Industry, Bangkok, Thailand. **Dr Young Joo LEE** briefly introduced CCOP and mentioned that there were several proposals such as Carbon Capture Utilization, Storage and Management (CCUS) and UNFC that CCOP would like to invite DPIM to collaborate on this initiative.



On 1 December 2020 at 10:00, **Dr Young Joo LEE**, Director of CCOP TS, along with **Dr Dhiti Tulyatid**, Regional Expert, officially visited **Mr Suriyan Vichitlekarn**, Executive Director; **Mr Madhurjya Kumar Dutta**, Director of Trade & Investment Facilitation Department; and **Ms Jutamas Thongcharoen**, ADC Program Manager at Mekong Institute (MI), Khon Kaen, Thailand for future collaboration on proposed proposals.

Dr Young Joo LEE gave a presentation on the introduction of CCOP and its activities that could be related to MI's activities through the cooperation with and application of KIGAM's technology. The proposed proposals include:

1. Integrated Approach for Remediating Arsenic-contaminated soil/water:
 - a. Contaminated soil washing (integrated remediation process for contaminated soils);
 - b. Soil bioremediation (Immobilisation of heavy metal contaminated soil using MICP process);
 - c. ECS for Water Treatment (heavy metal contaminated water (mine water, industrial waste water, livestock wastewater, etc.)).
2. Vulnerability assessment to climate change of groundwater system in Greater Mekong Subregion and groundwater dependent ecosystem: surface-groundwater monitoring and its application to climate change.
3. Other CCOP proposal includes "Raising capacity sustainable groundwater management and securing clean water in ASEAN" and "UNESCO-CCOP-IWMI-IGRAC Project on Groundwater resources in the Greater Mekong Subregion".



From left to right: **Dr Dhiti Tulyatid**; **Dr Young Joo LEE**; **Mr Suriyan Vichitlekarn**, Executive Director; **Mr Madhurjya Kumar Dutta**, Director of Trade & Investment Facilitation Department; and **Ms Jutamas Thongcharoen**, ADC Program Manager.

KNOWLEDGE ENHANCEMENT AND SHARING (KES)






CCOP-IERI Internship Program

The 73rd CCOP Steering Committee Meeting held in November 2019, Chiangmai, Thailand accepted the International Environmental Research Institute (IERI) as CCOP's Cooperating Organization. IERI is based in Gwangju Institute of Science and Technology (GIST), Republic of Korea.

CCOP-IERI Internship Program (2021 Spring Semester), GIST

The recruitment for the 2021 Spring Semester CCOP-IERI internship program was opened during 14 October – 13 November 2020 (1 month). The Internship period of 2021 Spring Semester is at Early March - End of July 2021. Due to the pandemic, selection process for the successful interns for Spring 2021 has been delayed.

The CCOP-IERI Internship Program was initiated from 2019, and to date, listed in the table below are those who were successfully granted internship at IERI.

INTERNSHIP PERIOD	NAME	ORGANIZATION/ COUNTRY
Oct 2020 – Jan 2021	 Ms Tseyenkhand Punsantsogvoo	Institute of Geography and Geoecology, Mongolian Academy of Sciences, Mongolia
	 Ms Nouvarat Prinpreecha	Department of Mineral Resources (DMR), Thailand
	 Ms Nguyen Quynh Anh	Vietnam Institute of Geosciences and Mineral Resources (VIGMR), Vietnam
Feb-Jun 2020	 Dr Manussawee Hengsuwan	Department of Groundwater Resources (DGR), Thailand
Sep-Dec 2019	 Ms Triwigati, Purnaning Tuwuh	Indonesia

ISGeo Online Training Course for Geo-experts: “Online Lecture on Geological Mapping and Mineral Exploration, Groundwater, Oil and Gas Hydrate

Due to the global spread of COVID-19, IS-Geo offered an online training course for geoscience experts from CCOP member countries. In 2020, 29 trainees from seven countries participated in the online course. The course took place from 9 to 30 of November, 2020 via IS-Geo YouTube channel. USB flash disks with lecture videos were also sent to the participants. The trainees who attended the online lecture and submitted the evaluation form by 2 of December 2020 will be invited to KIGAM, Korea, for a face-to-face course.

Module 1 - Geological Mapping and Mineral Exploration

In total, 12 trainees from CCOP Member Countries (Brunei Darussalam, Cambodia, Myanmar, Philippines, and Thailand) including 1 participant from CCOPTS attended the Geological Mapping and Mineral Exploration module.



Module 2 – Groundwater

In total, 6 trainees from CCOP Member Countries (Brunei Darussalam, Malaysia, Myanmar, and Thailand) attended the Groundwater module. The goal of this training course is to provide participants with a fundamental understanding of aquifer and its characterization method, focusing on hydraulic test such as pumping tests and slug test which can give us hydraulic conductivity, well productivity. To achieve this goal, the course combines lectures and field work. Specific learning objectives of the program are: (i) to develop fundamental knowledge on concepts and theories of groundwater flow and aquifer tests (ii) to develop practical know-how in hydraulic tests through exercises.



Module 3 - Oil and Gas Hydrate

In total, 7 trainees from CCOP Member Countries (Brunei Darussalam, Cambodia, Myanmar, and Thailand) attended the Oil and Gas Hydrate module. This course will first provide a comprehensive overview of the chemical and physical properties of the various forms of gas hydrate and hydrate-bearing sediments in nature. Secondly, it will overview the field and laboratory tools and procedures used to identify and quantify gas hydrate occurrences. The third session will focus on analyzing the production response and characteristics of gas hydrate reservoir systems through the review of a series of integrated field, laboratory, and modelling studies.

- Gas hydrate structures, stability, and physical properties
- Overview: Gas hydrate characterization
- Gas hydrate production: Modelling, laboratory, and field studies



The 2021 face-to-face course will not only cover theories but also practices such as hands-on activity, field work, data analysis and etc. However, due the COVID-19 pandemic, IS-Geo would like to postpone the decision of the face-to-face course until April 2021. Exact dates for the face-to-face course will be announced in April.

Currently in Korea, a two-week quarantine is required for all international arrivals. Due to the cost and time of the quarantine, if this policy continues until April, all face-to-face courses will be cancelled. The course will also be cancelled if there is a serious increase in number of COVID-19 cases.

Several trainees responded that the online lecture was 'appropriate for current situation' but 'it is one-way communication' and it 'lacks of decision and sharing experiences'. Thus, if it is not possible to organise a face-to-face course due to COVID-19, IS-Geo suggests an online Q&A course where trainees can ask their questions to the instructor.

DATA AND INFORMATION

CCOP-KIGAM Geoscience Data Repository (GDR) Project First Working Group Virtual Meeting/Workshop

Due to COVID-19 pandemic, the annual international workshop was held virtually using Zoom Meeting on 20-21 October 2020. There were 22 participants from the CCOP Member Countries consisting of members of the Project's Working Group as well as their team, and the CCOP Technical Secretariat. Countries represented are **Cambodia, China, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand and Vietnam.**

Dr Saro LEE presented the update of the GDR Project while **Dr Han** led the training on the usage of the GDR Web system. Member of the GDR Working Group from each CCOP Member Country made a presentation on the progress of the data uploaded and published to the GDR Web System. All the countries have limited data uploads since they are still learning to use the system which is still under improvement. However, it has been agreed that each Member Country will target to upload and publish at least 100 sample data to the GDR Web System each year. Furthermore, the country presentations also included challenges faced, as well as suggestions and recommendations for the Project and its system.

All the suggestions and recommendations as well as the challenges will be taken into account in the continuing development of the GDR system, with error corrections and stabilization. More feedback for the improvement of the system will also be accepted.

The creation of batch upload function will be the first and foremost to create, so as to facilitate faster submissions of data to the system. International Geo Sample Number (IGSN) will be issued for Geosamples. Installation of the GDR system at CCOPTS or Cloud server will be initiated.

The next workshop will be organized in April next year or later depending on the COVID-19 pandemic situation. If the workshop can be organized offline, all the GDR working group members participating will be required to bring data to upload to the GDR system, as well as a typical sample from their country to display at the CCOP Technical Secretariat office in Bangkok, Thailand. Target number of data upload for 2021 is at least 100 samples per organization or country.



Group photo of participants in the annual international workshop was held virtually using Zoom Meeting

FINANCIAL HIGHLIGHTS

From 1 January to 31 December, 2020, Member Countries' total cash contributions amounted to USD 440,000.00, consisting of Brunei Darussalam (USD 10,000), China (USD 60,000), Indonesia (USD 55,000), Japan (USD 60,000), Republic of Korea (USD 60,000), Malaysia (USD 50,000), Mongolia (USD 10,000), Myanmar (USD 10,000), Philippines (USD 40,000), Singapore (USD 10,000), Thailand (USD 40,000), Vietnam (USD 25,000) and Lao PDR cash contribution for 2019 (USD 10,000) was received in 2020.

The arrears cash contribution expected to receive from Cambodia for 2020 (USD 10,000), Lao PDR for 2020 (USD 10,000.00), Papua New Guinea for 2019 and 2020 (USD 50,000.00) and Timor-Leste for 2019 and 2020 (USD 20,000.00) (**Table 1**).

Table 1: Cash Contributions of Member Countries for 2018-2020
(Ending 31 December 2020)

Member Countries	2018 Contribution Received in 2018	2019 Contribution Received in 2019	2020 Contribution Received in 2020	Arrears Contribution Expected to Receive
Brunei Darussalam			*10,000.00	
Cambodia	10,000.00	10,000.00	-	10,000 (Y2020)
China	50,000.00	50,000.00	**60,000.00	-
Indonesia	40,000.00	55,000.00	55,000.00	-
Japan	50,000.00	60,000.00	60,000.00	-
Republic of Korea	60,389.80	60,000.00	60,000.00	-
Lao PDR	10,000.00	10,000.00	***10,000 (Y2019)	10,000 (Y2020)
Malaysia	50,000.00	50,000.00	50,000.00	-
Mongolia	-	10,000.00	10,000.00	-
Myanmar	5,000.00 (1/2) (Y2018)	10,000.00 5,000.00 (2/2) (Y2018)	10,000.00	-
Papua New Guinea	waived	-	-	25,000 (Y2019) 25,000 (Y2020)
Philippines	40,000.00	40,000.00	40,000.00	-
Singapore	10,000.00	10,000.00	10,000.00	-
Thailand	40,000.00	40,000.00	40,000.00	-
Timor-Leste	waived	-	-	10,000 (Y2019) 10,000 (Y2020)
Vietnam	25,000.00	25,000.00	25,000.00	-
Total	390,389.80	425,000.00	440,000.00	35,000 (Y2019) 55,000 (Y2020)

(The 74th CCOP Steering Committee Virtual Meeting, 24 June 2020, CCOPTS received official letter signed by **Dr Nor Imtihan Binti Haji Abdul Razak**, Permanent Secretary Planning, Land Use and Environment, Ministry of Development, Brunei Darussalam's indication that Brunei Darussalam will officially join CCOP as member country from 1 January 2020. The Meeting officially accepted Brunei Darussalam as CCOP Member Country, and tasked the CCOP to arrange the official signing of documentation signifying CCOP membership of Brunei Darussalam)

* Brunei Darussalam cash contribution contributed in 2020 (USD 10,000)

** China increased cash contribution for 2020 from USD 50,000 to USD 60,000

*** Lao PDR cash contribution for 2019 was received in 2020 (USD 10,000)

In addition to Member Countries' contributions, the amount of **USD 21,158.44** earned from the management of projects during January - December 2020 period which from "CCOP-KIGAM Groundwater Project: Vulnerability Assessment to Climate Change of Groundwater System in Greater Mekong Subregion and Comparative Study of Groundwater Dependent Ecosystem", 1st Installment 2020 (1/2) (USD 3,909.44) and 2nd Installment 2020 (2/2) (USD 4,304.49) and "CCOP-KIGAM Project: Sharing System Establishment of Digital Geological Sample Data in CCOP Countries", 1st Installment 2020 (1/2) (USD 6,142.96) and 2nd Installment 2020 (2/2) (USD 6,801.55) are shown in **(Table 2)**.

Other incomes during the period amounted to **USD 4,354.41** from interest earned (USD 1,374.75), processed from sale of publications (USD -), gain on current exchange rate (USD 24.57), miscellaneous incomes (USD 12.35) and unrealized gain on conversion currencies exchange rate (USD 2,942.74). The total income during the period was **USD 465,512.85**. The expenditure of **USD 369,854.04** was incurred from operation and administrative support. The Cash at Bank as of December 31, 2020 amounted to **USD 1,112,788.48**.

Other Fund (outstanding balanced) (**USD 171,475.25**) that consists of "BGR-CCOP International Training Course on Risk- Sensitive Spatial Planning for CCOP Member Countries" (BGR), Germany (USD 32,856.31), "CCOP- KIGAM Unconventional Oil and Gas Project: Assessment of Shale Energy Resources in Asia, (Phase I and Phase II)" (USD -2,182.46), "CCOP-KIGAM Groundwater Project: Vulnerability Assessment to Climate Change of Groundwater System in Greater Mekong Subregion and Comparative Study of Groundwater Dependent Ecosystem" (USD 64,488.77), "CCOP-KIGAM Project: Sharing System Establishment of Digital Geological Sample Data in CCOP Countries" (USD 71,274.68), "Research Project on GTC-CCOP Collaborative Research Agreement" (USD 374.26), "International Network of Raw Materials Training Centers, INTERMIN Project Number 776642", (USD 4,628.44) and "Promotional Booth at the 55th CCOP Annual Session" (USD 35.25).

The Technical Secretariat office premise is continuously provided by the Royal Thai Government, through the kind arrangements of the Department of Mineral Resources (DMR), Ministry of Environment and Natural Resources, at the CCOPTS Building, DMR Complex, Rama VI Road, Bangkok, Thailand.

Table 2: Management Income from Execution of Project and Activity
(January 1 - December 31, 2020)

Funding Source	Activities		Period	Amount (USD)
KIGAM	CCOP-KIGAM Groundwater Project: Vulnerability Assessment to Climate Change of Groundwater System in Greater Mekong Subregion and Comparative Study of Groundwater Dependent Ecosystem	1 st Installment 2020 (1/2)	1 March 2020	3,909.44
		2 nd Installment 2020 (2/2)		4,304.49
KIGAM	CCOP-KIGAM Project: Sharing System Establishment of Digital Geological Sample Data in CCOP Countries	1 st Installment 2020 (1/2)	1 March 2020	6,142.96
		2 nd Installment 2020 (2/2)		6,801.55
Total Project Management Income				21,158.44

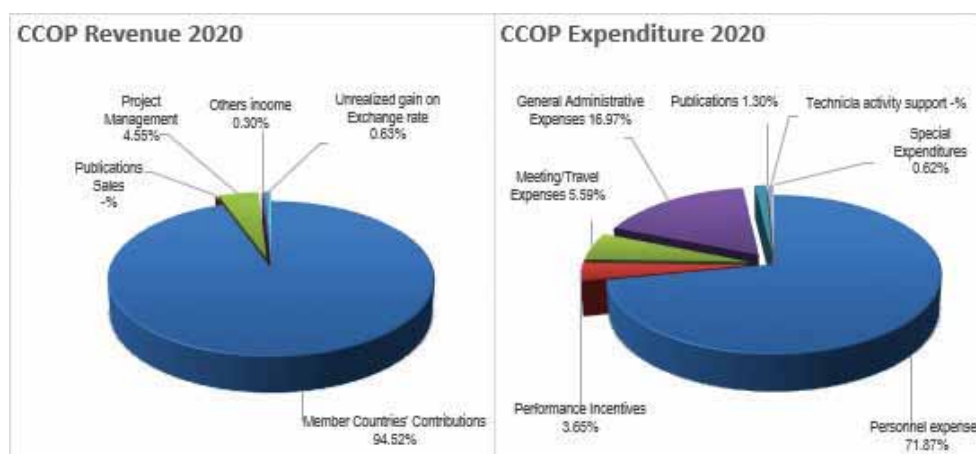


Table 3: CCOP Year-end Financial Statement as of 31 December 2020

DESCRIPTION	2019		2020	
	USD	USD %	USD	USD %
Fund Balance	836,900.24		852,026.49	
Income:				
<i>Member Countries' Contributions</i>	425,000.00	90.72	440,000.00	94.52
<i>Publications sales</i>	1,590.84	0.34	-	0.00
<i>Project management</i>	36,590.63	7.81	21,158.44	4.55
<i>Others income (Interest, miscellaneous income and gain on exchange)</i>	2,467.64	0.52	1,411.67	0.30
<i>Unrealized gain on Conversion Currencies Exchange rate</i>	2,848.57	0.61	2,942.74	0.63
Total Income	468,497.68	100.00	465,512.85	100.00
Expenditures:				
<i>Personnel expenses</i>	(255,924.02)	56.29	(265,814.20)	71.87
<i>Performance Incentives</i>	(23,412.89)	5.15	(13,516.52)	3.65
<i>Meeting/Travel Expenses</i>	(101,190.14)	22.26	(20,678.83)	5.59
<i>Extra Meeting/Workshop (Housing Subsidy for Jan-Mar 2019)</i> * Note: 1. Year 2019, CCOP received USD 5,000 from Geological Society of America. 2. Year 2018, CCOP advanced USD 5,000 for EAGER Grant (2010 Awardee) to Mr. Ir Johannes Hutabarat, Indonesia.	(5,150.40) *5,000.00	0.03	-	0.00
<i>General Administrative Expenses</i>	(66,513.21)	14.63	(62,773.17)	16.97
<i>Publications</i>	(3,759.78)	0.83	(4,791.30)	1.30
<i>Technical activity support</i>	(1,815.18)	0.40	-	0.00
<i>Special expenditures</i>	(1,857.67)	0.41	(2,280.02)	0.62
Total Expenditure	(454,623.29)	100.00	(369,854.04)	100.00
<i>Unrealized gain/(loss) on exchange rate for Retained Earning</i>	1,251.86		(734.05)	
<i>Income over/(under) expenses</i>	15,126.25		95,658.81	
<i>Tax payable</i>	-		-	
Year-end Balance	852,026.49		946,951.25	
<i>Adjustment to reflect actual cash inflow/outflow):</i>				
<i>Account payable</i>	(485.67)		96.54	
<i>Other Fund (outstanding balanced)</i> <i>BGR Project (USD 32,856.31)</i> <i>KIGAM Unconventional Oil & Gas Project, Phase I & II (USD -2,182.46)</i> <i>KIGAM Groundwater Project, Phase II (USD 64,488.77)</i> <i>KIGAM GDR Project (USD 71,274.68)</i> <i>KIGAM GTC Project (USD 374.26)</i> <i>INTERMIN Project (USD 4,628.44)</i> <i>Promotional Booth at the 55th CCOP Annual Session (USD 35.25)</i>	67,524.82		171,475.25	
<i>Office equipment (net)</i>	(6,017.39)		(6,178.20)	
<i>Advance</i>	(5,877.07)		(39.95)	
<i>Account Receivable</i>	(20.71)		(20.78)	
<i>Tax deductible</i>	1,553.05		492.17	
CCOP CASH AT BANK	907,642.64		1,112,788.48	

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ABBREVIATIONS

Below are the meaning of the abbreviations used in the context of this report.

- AG – Advisory Group
- AIST – National Institute of Advanced Industrial Science and Technology, Japan
- APGN – Asia Pacific Geoparks Network
- ASCOPE – ASEAN Council on Petroleum
- ASEAN – Association of Southeast Asian Nations
- ASOMM– the ASEAN Senior Officials Meeting on Minerals
- BGR – Federal Institute for Geosciences and Natural Resources, Germany
- BGS – British Geological Survey
- CC – Cooperating Country
- CCOPTS – CCOP Technical Secretariat
- CCS – Carbon Capture and Storage
- CCUS – Carbon Capture, Utilisation and Storage
- CGS – China Geological Survey
- CO – Cooperating Organisation
- CO₂ – Carbon Dioxide
- CPC – Circum Pacific Council
- DENR – Department of Environment and Natural Resources, Philippines
- DGM – Department of Geology and Minerals, Lao PDR
- DGSE – Department of Geological Survey and Mineral Exploration, Myanmar
- DMR – Department of Mineral Resources, Thailand
- DOE – Department of Energy, Philippines
- EAGER – East Asia Geoscience and Environmental Research
- EGAT – Electricity Generating Authority of Thailand
- EGS – EuroGeoSurveys
- EOS – Earth Observatory of Singapore
- ESCAP – Economic and Social Commission for Asia and the Pacific
- EU – European Union
- GAI – Geological Agency of Indonesia
- GDMR – General Department of Mineral Resources, Cambodia
- GETECH – Geophysical Exploration Technology
- GEUS – Geological Survey of Denmark and Greenland
- GIS – Geographic Information System
- GSC – Geological Survey of Canada
- GSi – Geoinformation Sharing Infrastructure
- GSJ – Geological Survey of Japan
- GTK – Geological Survey of Finland
- IGDP – Integrated Geophysical and Geochemical Data Processing
- Intermin – International Network of Raw Materials Training Centres
- IOC – Intergovernmental Oceanographic Commission

ABBREVIATIONS

Below are the meaning of the abbreviations used in the context of this report.

IOMAC – Indian Ocean Marine Affairs Cooperation
ISGeo – International School for Geoscience Resources, Republic of Korea
IUGS – International Union of Geological Sciences
JMG – Department of Mineral and Geoscience Malaysia
KES – Knowledge Enhancement and Sharing
KIGAM – Republic of Korea Institute of Geoscience and Mineral Resources
KNOC – Korean National Oil Company
MC – Member Country
MGB – Mines and Geoscience Bureau, Philippines
MEMR – Ministry of Energy and Mineral Resources, Indonesia
MLR – Ministry of Land and Resources, China
MME – Ministry of Mines and Energy, Cambodia
MONRE – Ministry of Natural Resources and Environment of Thailand, Vietnam
PETRAD – Petroleum Management and Administration, Norway
PTTEP – PTT Exploration and Production Public Company Limited
SC – Steering Committee
SEADPRI – Southeast Asia Disaster Prevention Research Initiative, Malaysia
SPC – Pacific Community in the Pacific Islands and Territories
UnCon – Unconventional Oil & Gas Project
UKM – Universiti Kebangsaan Malaysia
UN – United Nations
UNECE - United Nations Economic Commission of Europe
UNEP – United Nations Environment Programme
UNESCO – United Nations Educational, Scientific and Cultural Organization
UNFC – United Nations Framework Classification
VIGMR – Vietnam Institute of Geosciences and Mineral Resources



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