



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

CCOP ANNUAL REPORT 2019



*CCOP Technical Secretariat
Bangkok*

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Picture on cover page:

*Delegates of the 55th CCOP Annual Session,
Kantary Hills Hotel, Chiangmai, Thailand.*

MESSAGE FROM THE CHAIRPERSON

At the outset, I would like to express my gratitude to everybody who has contributed to make 2019 a fulfilling and successful year for CCOP.

2019 marked another exciting year of growth for CCOP. We are particularly pleased with the successful implementation of the four strategic goals as planned for the 2016 – 2020 period namely (i) Outreach, (ii) Cooperation & Partnership, (iii) Knowledge Enhancement and Sharing and (iv) Data & Information. Ensuing from this achievement, our next target would be on preparing our new Strategic Plan for 2021-2025 which would redefine CCOP's new strategic goals for the next 5 years. These goals are aimed at fulfilling the mission of CCOP, namely to contribute significantly to the economic development and sustainable management of the environment and to improve the quality of life in Member Countries.



I am very proud to note that, since its inception in 1966, CCOP has grown and flourished as an intergovernmental organization that has garnered much respect for its success in facilitating and coordinating the implementation of geoscience programmes in this region.

On behalf of CCOP, I would like to express my heartfelt appreciation to the Royal Thai Government, through the Department of Mineral Resources (DMR), Ministry of Natural Resources and Environment, together with the Department of Groundwater Resources, the Department of Marine and Coastal Resources, and the Department of Primary Industries and Mines, for graciously hosting the 55th Annual Session and also the 73rd Steering Committee Meeting in the historic Thai city of Chiang Mai.

The year 2019 also marked a change in CCOP Technical Secretariat Directorship. I would like to thank Dr Adichat Surinkum from Thailand, the immediate past Director of the CCOP Technical Secretariat (CCOPTS), whose tenure expired on 31st March 2019. We are very grateful for his capable leadership and valuable contributions during his 6 years of service.

We extend a warm welcome to Dr Young Joo Lee from the Republic of Korea who began his tenure as Director of CCOPTS on 1st April 2019. Under his efficient leadership in the past few months, CCOP has attained several visible milestones. We are confident that he will provide the necessary support in implementing our programmes in line with the 2030 Agenda for Sustainable Development and other international initiatives.

We also look forward with enthusiasm to having Brunei as the 16th CCOP Member Country on the 1st January 2020. With the new addition, let us soar together to greater heights.

And lastly, I would like to put on record my sincere gratitude to CCOP Member Countries for the overwhelming support in extending my CCOP Steering Committee Chairmanship for another term ending in 2021. We look forward indeed to exciting years ahead for CCOP.

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:

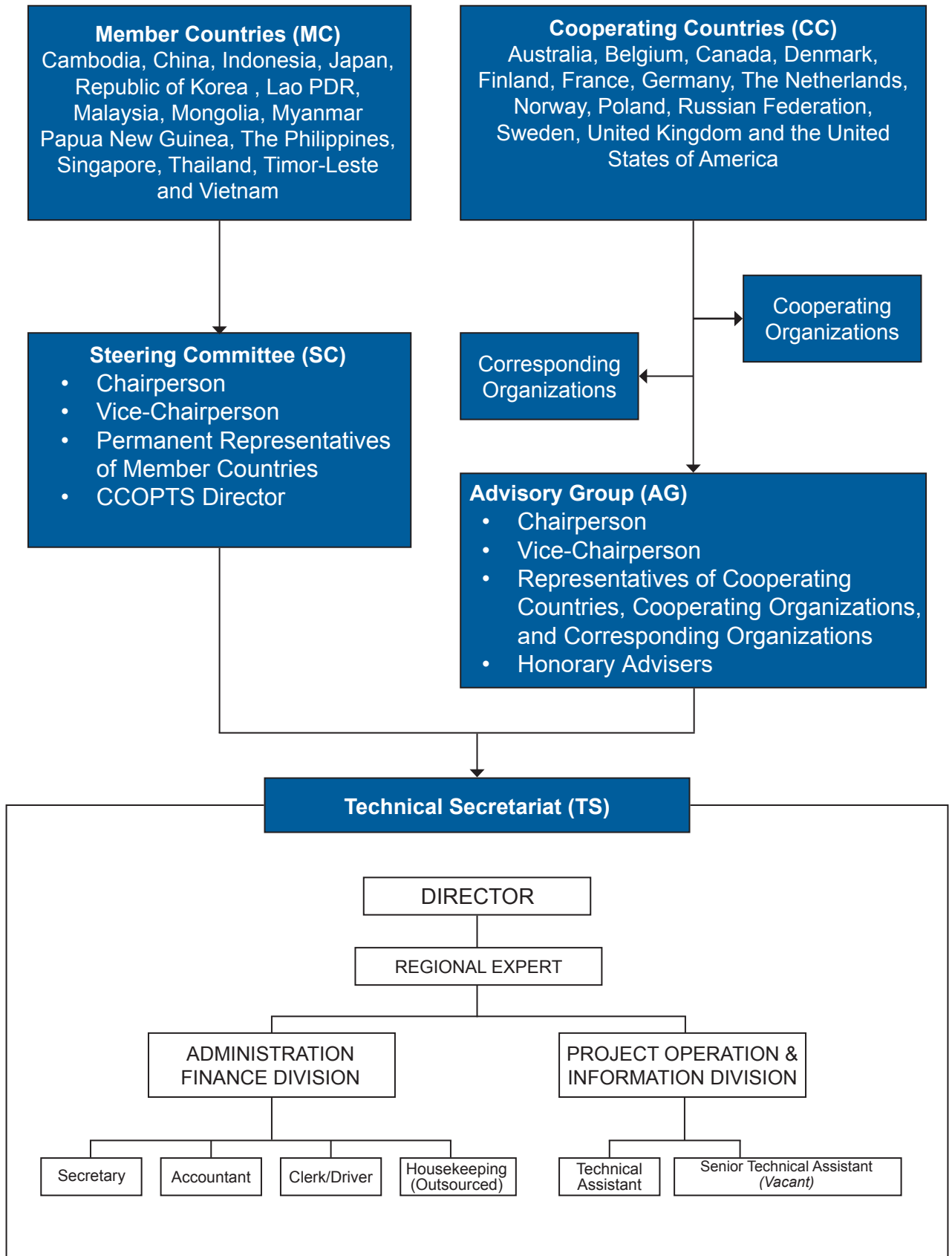
- **Outreach** – to enhance influence with decision makers, investors and the public through the provision of relevant Earth science information and to develop appropriate skills for communicating effectively with CCOP stakeholders.
- **Cooperation and Partnership** – to enhance the internal and external 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: 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, IOC, IOMAC, IUGS, PETRAD, SPC, UN-ESCAP, UNEP, UNESCO, UKM, THE WORLD BANK and YES NETWORK.

MANAGEMENT AND ORGANIZATION



As of 31 December 2019, the CCOP Technical Secretariat (CCOPTS) has 12 personnel, comprising three professionals, six supporting staff, two interns and one out-sourced staff.



CCOPTS with the Chairperson of the CCOP Steering Committee

New selected candidates for CCOPTS positions:

1 April 2019, **Ms Supason Lhuangsuwan** completed 3-month probation and signed a 2-year contract with CCOPTS as Assistant to Project Operation and Information Division and **Mr Thawat Phunsang** completed 4-month probation and signed a 2-year contract with CCOPTS as a Driver/ Clerk, Administration and Finance Division.

18 June 2019, **Ms Nicha Wudhiwanich** completed 3-month probation and signed a 2-year contract with CCOPTS as Secretary, Administration and Finance Division.

At the CCOPTS Director Hand-Over Ceremony and Oath taking of Incoming Director were held during the 72nd CCOP Steering Committee (SC) Meeting at Novotel Samui Resort, Chaweng Beach Kandaburi, Samui Island, Surat Thani Province, Thailand, on 4-7 March 2019.



CCOPTS Director Hand-Over Ceremony and Oath taking of Incoming Director

Witnessed by **Dato' Yunus Abdul Razak**, Vice-Chairperson of the CCOP Advisory Group (AG) and the outgoing CCOPTS Director **Dr Adichat Surinkum**, the Chairperson of the CCOP Steering Committee **Datuk Shahar Effendi bin Abdullah Azizi** officially appointed **Dr Young Joo Lee** as the Director CCOPTS for the term from 1 April 2019 to 31 March 2022. In the signing ceremony, **Dr Young Joo Lee** officially accepted the appointment and took an oath to exercise in all loyalty, discretion and conscience, the functions entrusted to him as an international civil servant of the CCOP.

On behalf of the CCOP Member Countries, the Chairperson of the CCOP Steering Committee, **Datuk Shahar Effendi bin Abdullah Azizi** presented a plaque of appreciation to **Dr Adichat Surinkum** in recognition of his significant and noteworthy contributions to CCOP as CCOPTS Director for the past 6 years.



The Chairperson of the CCOP Steering Committee presented a plaque of appreciation to **Dr Adichat Surinkum**

New appointments of Permanent Representatives and Deputy Permanent Representatives of Member Countries to CCOP:

COUNTRY	DESCRIPTION
Cambodia	The Ministry of Mines and Energy (MME), Cambodia has appointed Mr Keo Tourt , Deputy Director-General of Mineral Resource to be Deputy Permanent Representative of Cambodia to CCOP succeeding Mr Sieng Sotham .
China	Dr SHU Siqi , Director of International Cooperation Division of Science & Technology and International Cooperation Department, China Geological Survey (CGS) succeeded Dr CHEN Zheng as Deputy Permanent Representative of China to CCOP.
Republic of Korea	Dr Kwang-Eun Kim has been appointed Vice President, Korea Institute of Geoscience and Mineral Resources (KIGAM) and succeeding Dr Weon Seo Kee as Deputy Permanent Representative of the Republic of Korea to CCOP.
Mongolia	Mr Kherlen Khishigjargal , Chairman, Mineral Resources and Petroleum Authority of Mongolia (MRPAM) has been appointed Permanent Representative of Mongolia to CCOP. Mrs Sunjidmaa Byambaa , Head of Geology and Exploration Division, Mineral Resources and Petroleum Authority of Mongolia (MRPAM) has been appointed Deputy Permanent Representative of Mongolia to CCOP.
Thailand	Dr Sommai Techawan has been appointed Director-General, Department of Mineral Resources (DMR) and succeeding Dr Tawsaporn Nuchanong as Permanent Representative of Thailand to CCOP. The Department of Mineral Resources (DMR), Thailand has appointed Mr Montri Luengingkasoot , Deputy Director-General to be the First Deputy Permanent Representative of Thailand to CCOP.

MESSAGE OF CONDOLENCE:



All of us at CCOP respectfully extend our sincerest sympathy and condolences upon the passing away of the late **Mr John Baga “Arutex” Arumba** on 22nd June 2019.

The late **Mr John Baga Arumba** was Acting Deputy Secretary, Department of Mineral Policy and Geohazards Management, Papua New Guinea (PNG), and Permanent Representative of PNG to CCOP until his untimely death. He served the PNG Government for over 27 years since 1992. The death of **Mr John Arumba** has filled the people who have worked with him through our Member Countries, Cooperating Countries and Organizations in the CCOP’s activities with deep sorrow and a sense of great loss. He had been one of the best friends to all colleagues working with CCOP. We will surely miss him for a very long time.

We would like to express our deepest and heartfelt condolences to his wife Mrs Josephine Arumba, children Jethro, Joe, Joy, Jill and grandson John Arumba Jr. May God’s comfort and peace be upon you always.

The Late **John Arumba’s** presence, love and kindness will forever be with us.

Rest in Peace.

HIGHLIGHTS FOR THE YEAR 2019

72nd CCOP Steering Committee Meeting

The 72nd CCOP Steering Committee (SC) Meeting was held at Novotel Samui Resort Chaweng Beach Kandaburi, Samui Island, Surat Thani Province, Thailand on 4-7 March 2019. The Meeting was attended by delegates of the following Member Countries (MC): CAMBODIA, CHINA, INDONESIA, JAPAN, REPUBLIC OF KOREA, LAO PDR, MALAYSIA, MONGOLIA, MYANMAR, PAPAUA NEW GUINEA, SINGAPORE, THAILAND and VIETNAM. BRUNEI DARUSSALAM attended as Observer. Also present were **Dato' Yunus Abdul Razak**, Vice-Chairperson of the CCOP Advisory Group, and the Director and staff of the CCOPTS.



Group photo of Vice-Governor of Surat Thani Province, the Chairperson of the CCOP Steering Committee and Permanent Representative of CCOP Member Countries

Mr Theera Anantaseriwidhya, Vice-Governor of Surat Thani Province, Thailand, and **Dr Sommai Techawan**, Permanent Representative of Thailand to CCOP, Director-General, Department of Mineral Resources (DMR), Thailand, 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 72nd CCOP Steering Committee Meeting.

The CCOPTS Director tabled the CCOP Progress Report covering the period 1 January to 31 December 2018 with update on technical activities from 1 January to 28 February 2019. The Report covered administration and personnel, finance, technical cooperation and project support, technical activities, fellowships and grants, publications and documentations.

Japan Delegation announced that from 2019 Japan will raise their annual cash contribution from USD 50,000 to USD 60,000. The Meeting expressed thanks to the Government of Japan for this increased contribution, and to the Geological Survey of Japan for its efforts in expediting this increased contribution.

The Meeting endorsed the Revised CCOP Action Plan 2019-2020 presented by the CCOPTS Director. The Indonesia Delegation informed the Meeting that APGN 2019 will be held in UNESCO Global Geopark Rinjani, Lombok Island, West Nusa Tenggara, Indonesia. Indonesia Delegation proposed involvement of CCOP in this activity under APGN and CCOPTS cooperation. Indonesia Delegation added that Indonesia need to establish/improve the large-scale multi-hazard mapping and mitigation (for volcanoes, earthquakes, tsunamis and landslide geohazards). Indonesia Delegation proposed that MCs such as China, Japan and Republic of Korea or Cooperating Countries and

Organizations consider formulating a project or activity on this topic. The Republic of Korea Delegation expressed their support to the proposal of Indonesia, regarding a CCOP initiative on large scale multi-hazard mapping and mitigation. The representative of PNG expressed willingness cooperating in geohazard activities of CCOP. PNG can assist in areas of monitoring, assessment and reporting on various geological hazards. He further added that PNG would like to cooperate on issues relating to small-scale mining, particularly for gold. PNG has a small-scale mining training center that was established as part of a World Bank Project and the experience gained through this development is worth sharing. The Thailand Delegation recorded their appreciation to Malaysia, Japan, China and Republic of Korea for their advice and contribution to the success of Satun Global Geopark. Thailand is setting a target of having 4 national geoparks and one more UNESCO Global Geopark by 2022 and is pleased to cooperate with CCOP Member Countries in knowledge and experience sharing in geopark development. Thailand's Head of Delegation further mentioned that he had an opportunity to discuss with the Governor of Ubon Ratchathani Province where Phachan-Samphanbok is located at the Thailand-Lao PDR border. He was given a suggestion of developing transboundary geopark and Thailand is willing to work with Lao PDR on this proposal. Laos Delegation expressed their support to Thailand in developing the transboundary geopark.

Dato' Yunus Abdul Razak presented the findings and recommendations of the 21st Select Finance Committee (SFC) meeting. The Meeting endorsed the recommendations of the SFC, and expressed appreciation to **Dato' Yunus Abdul Razak** for the effective facilitation of the meeting.

The CCOPTS Director presented the revised CCOP budget for 2019 which the Meeting endorsed as recommended by the 21st SFC Meeting with the following comments. The Representative of PNG informed the Meeting that efforts have already been initiated in following-up on PNG's arrears of annual cash contribution to CCOP. They will update the CCOPTS on the progress, and will request documentation if needed. Thailand Delegation informed the meeting that efforts are being made to increase Thailand's annual cash contribution to USD 50,000 from 2021. Thailand Delegation will report to the CCOPTS once their Government gives the approval. The CCOPTS Director informed the Meeting that during his term as Director from 2013, Japan Delegation has been attending the March/April SC meetings on their organization's cost. The Meeting acknowledged this as an in-kind contribution and expressed its appreciation to Japan.



The 21st SFC meeting

Next Steering Committee Meeting and Annual Sessions

Thailand Delegation announced that the 55th CCOP Annual Session (55AS) and the 73rd CCOP Steering Committee Meeting (73SC) will be held on 3-7 November 2019 and 8-9 November 2019 respectively, in Kantary Hills Hotel, Chiangmai, Thailand. The topic of the thematic session is “Geoscience for Sustainable Development”. For the 74th CCOP Steering Committee Meeting (74SC) in March 2020, Cambodia Delegation is willing to host, however, they need time to get the approval from their Government. They will report to the 73 SC Meeting in Chiangmai, Thailand on the final decision. The Malaysia Delegation offered to host the 74SC in the event that Cambodia cannot host it. For the 56th CCOP Annual Session and the 75th CCOP Steering Committee Meeting, Indonesia Delegation informed the Meeting that they are considering either Yogyakarta or Lombok Island as the venue. The actual date will be announced at the 55AS in Chiangmai, Thailand.

The Meeting endorsed the CCOPTS proposal to revive the EAGER Award Project with the guideline and priority list of Member Country recipients as shown in ANNEX VIII. For 2019, the call for applications from P1 list (Cambodia, Lao PDR, Mongolia, Myanmar, Papua New Guinea, Singapore & Timor-Leste) will be issued in March 2019 and award will be made at the 55 AS in Chiangmai, Thailand.

The Meeting accepted Young Earth Scientist (YES) Network as a CCOP Cooperating Organization.

The Meeting endorsed the following initiatives, and tasked the CCOPTS to work closely with the respective proponents in the implementation.

- a) Establishment of Geoscience Data Repository (GDR) system of CCOP Member Countries by KIGAM
- b) Cooperation of CCOP and China-ASEAN Geosciences Cooperation Center
- c) Introduction of the Seminar on Geohazard Prevention and Mitigation by CGS
- d) Working Group in Southeast Asia on IUGS Deep-time Digital Earth (DDE) Big Science Program

Malaysia Delegation shared information on the following meetings:

- Asia Petroleum Geoscience Conference & Exhibition (APGCE) 2019 “Fresh Ideas, New Frontiers” hosted by PETRONAS will be held on 29-30 October 2019 in Kuala Lumpur Convention Center, Malaysia
- National Conference on Groundwater – “Making the Invisible Visible” in July 2019 in Kuala Lumpur, Malaysia.



Excursion of Delegation of the 72nd CCOP Steering Committee Meeting

55th CCOP Annual Session, 3–7 November 2019, Chiang Mai, Thailand

The 55th CCOP Annual Session was held at the Kantary Hills Hotel, Chiang Mai, Thailand on 3 – 7 November 2019. It was organized by the Royal Thai Department of Mineral Resources (DMR), Ministry of Natural Resources and Environment, jointly with the Department of Groundwater Resources, the Department of Marine and Coastal Resources, the Department of Primary Industries and Mines, and the CCOPTS.



Opening Session of the 55th CCOP Annual Session

The Session was attended by representatives of the following Member Countries: CAMBODIA, CHINA, INDONESIA, JAPAN, REPUBLIC OF KOREA, LAO PDR, MALAYSIA, MONGOLIA, MYANMAR, THAILAND and VIETNAM. BRUNEI DARUSSALAM attended as an observer. From the Cooperating Countries, CANADA, DENMARK, FINLAND, RUSSIAN FEDERATION, and UNITED KINGDOM were in attendance. From the Cooperating Organizations, IUGS, PETRAD, Universiti Kebangsaan Malaysia (UKM) and YES Network attended the session. International Environmental Research Institute (IERI), Trilateral Cooperation Secretariat (TCS), and Korea Gas Hydrate R&D Organization (GHDO) attended as observers. Also present at the Meeting were the Honorary Advisers of CCOP. The staff of the CCOPTS were also in attendance.



The Honorary Advisers of CCOP and CCOPTS staff at the Advisory Group Meeting

The Opening Session started with welcome addresses delivered by **Mr Komsan Suwanampa**, Vice Governor of Chiang Mai Province, and **Dr Sommai Techawan**, Director-General of the Department of Mineral Resources and Permanent Representative of Thailand to CCOP. Special messages were delivered by **Mr Ioannis Abatzis**, Chairperson of the CCOP Advisory Group and Representative of Denmark to CCOP; and **Datuk Shahar Effendi Abdullah Azizi**, Chairperson of the CCOP Steering Committee, Permanent Representative of Malaysia to CCOP and Director General of the Department of Minerals and Geoscience Malaysia. **Mr Pongboon Pongtong**, Deputy Permanent Secretary, Ministry of Natural Resources and Environment, Thailand officially opened the 55th CCOP Annual Session. **H.E. Mr Vorawut Silpa-archa**, Minister of Natural Resources and Environment of Thailand delivered a special video opening message to the Session since he could not be present due to the ongoing ASEAN Summit in Bangkok.



The MoU Signing between the Royal Thai Department of Mineral Resources (DMR) and the Korea Institute of Geoscience and Mineral Resources (KIGAM)

The MoU signing between the Royal Thai Department of Mineral Resources (DMR) and the Korea Institute of Geoscience and Mineral Resources (KIGAM) was held. The purpose of this MoU is to set a framework for cooperation between DMR and KIGAM in the areas of mutual interest relating to geosciences such as: Geology and Geo-information; Mineral Resources; Geohazards; Geoscience Training Centre and Geological Museum and Geopark Development. **Dr Sommai Techawan**, DMR Director-General and **Dr Bok Chul Kim**, KIGAM President signed the MoU. Witnesses were **Dr Seong-Pil Kim**, Director of Global Cooperation, KIGAM and **Mr Montri Luengingkasoot**, Deputy Director-General, DMR.

Dr Young Joo Lee, CCOPTS Director summarized the Progress Report of CCOP including organizational changes (personnel), the current financial situation, technical activities and cooperation and support from Cooperating Countries and Organizations during the year 2018-2019 with update on the progress from January to June 2019. The Session recorded CCOP's appreciation to the contribution of the late John Arumba, former Permanent Representative of Papua New Guinea to CCOP. The Session congratulated **Mr Chen Shick Pei** (CCOP Honorary Adviser) and **Dr Martin Smith** (Representative of United Kingdom to CCOP) as newly elected CCOP Editor-in-Chief and Vice Editor-in-Chief respectively.

Written reports and presentation files of Member Countries, Cooperating Countries and Cooperating Organizations are available from the CCOP website, <http://ccop.asia/activity/445>.

On behalf of the Geological Society of America (GSA), **Mr Ioannis Abatzis**, Chairperson of the CCOP Advisory Group, together with **Datuk Shahar Effendi Abdullah Azizi**, Chairperson of the CCOP Steering Committee and **Dr Young Joo Lee**, CCOPTS Director presented the East Asian Geoscience and Environmental Research (EAGER) / Ric Terman ward (EAGER) in the form of USD 5,000 cheque and Certificates from GSA and CCOP to **Mrs Sodnom Oyungerel**, for her research proposal "The geological, geochemical and ore genesis studies of an ore field at the Tavt gold deposit in Northern Mongolia". **Mrs Sodnom Oyungerel** is a Ph.D. candidate from Mongolia currently studying in Seoul National University, Republic of Korea.



Presenting the EAGER Award for 2019

A thematic session with poster session on the theme “Geoscience for Sustainable Development” was held in conjunction with the Annual Session . There were 3 technical sub-topics; (1) Geo-Resources for the Society, (2) Geo-Environment for the Society, and (3) Geo-Education for the Society.



The 73rd CCOP Steering, Committee Meeting, 8-9 November 2019, Chiangmai, Thailand

The 73rd CCOP Steering Committee Meeting was held at Kantary Hills Hotel, Chiangmai, Thailand on 8-9 November 2019. The Meeting was attended by delegates of the following Member Countries : CAMBODIA, CHINA, INDONESIA, JAPAN, REPUBLIC OF KOREA, LAO PDR, MALAYSIA, MONGOLIA, MYANMAR, THAILAND and VIETNAM. Also present were **Mr Ioannis Abatzis**, Chairperson of the CCOP Advisory Group , and the Director and staff of the CCOPTS. BRUNEI DARUSSALAM also attended as Observer.

The Opening Ceremony started with the welcoming remarks of **Mr Montri Luengingkasoot**, Deputy Permanent Representative of Thailand to CCOP and Deputy Director-General of the Royal Thai Department of Mineral Resources (DMR), on behalf of the Permanent Representative of Thailand to CCOP. **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson of the CCOP Steering Committee, Permanent Representative of Malaysia to CCOP and Director-General of the Department of Mineral and Geoscience Malaysia, officially opened the 73rd CCOP Steering Committee Meeting.



Heads of Delegation at the 73rd CCOP Steering Committee Meeting

The CCOPTS Director presented the CCOP Progress Report covering the period 1 January to 30 June 2019. The report covered administration and personnel, finance, technical cooperation and project support, technical activities, fellowships and grants, publications and documentations. The China Delegation stated that China will do its utmost in facilitating cooperation between China Geological Survey (CGS) and CCOP Member Countries on marine geology, coastal geology, geo-hazard, etc. The Indonesia Delegation appreciated CCOPTS efforts in promoting CCOP activities to other countries and organizations and proposed a pilot project on urban geology of Member Countries' cities. The Meeting agreed to formulate a good proposal together and CCOPTS will approach UN-ESCAP for support. The Korea Delegation informed that KIGAM will host a project planning workshop on urban geology with the participation of China, Japan, Korea, Geological Survey of Finland (GTK) and the British Geological Survey (BGS) in December 2019.

The Meeting endorsed the proposed CCOP Workplan 2020 presented by the CCOPTS Director with the following comments. China Delegation informed that China Geological Survey (CGS) would seek opportunity to sign MoU with YES Network, in order to expand the possibility of nourishing young geoscientists, especially under the framework of CCOP-ASEAN-China Geoscience Cooperation Centre. The Meeting endorsed Indonesia Delegation's proposal of including in the CCOP Workplan 2020 an initiative for climate change directly or indirectly instigated by geological conditions. The Representative from Myanmar requested to include activities for surface and groundwater resources in Myanmar, especially on contamination of groundwater and pollution of aquifer. in Ayeyarwady River and its catchments and deltaic areas due to the mining and anthropogenic activities. Ayeyarwady River is a major source of water in Myanmar and studies on groundwater and surface water pollution and contamination including monitoring and management of these water resources are vital for Myanmar. The Myanmar Representative encouraged cooperation with CCOP and requested for relevant projects with Member Countries such as those of CCOP-KIGAM Groundwater Project; Greater Mekong Transboundary Aquifer and CCOP-GSJ Groundwater Project: Database of Groundwater Resources.

The Meeting endorsed the recommendations of the 22nd SFC Meeting, and expressed appreciation to **Mr Ioannis Abatzis** for the effective facilitation of the meeting. China Delegation expressed apologies for having been absent at the 22nd SFC Meeting due to the hectic transitional period of CGS International Cooperation Division, and moving forward would be more active in communication with CCOPTS.

The CCOPTS Director presented the proposed CCOP budget for 2020 which the Meeting endorsed, as recommended by the 22nd SFC Meeting, with the following comments: The Lao PDR delegation requested CCOPTS to send an official letter again for the Member Country's cash contribution. The China Delegation expressed support to the 22nd SFC Meeting's recommendation for CCOPTS to issue official letter to Member Countries' relevant Government agencies regarding the decision on the increase of Member Countries' Annual Cash Contribution. Regarding Malaysia Delegation's proposal in waiving the arrears of the annual cash contribution of Papua New Guinea and Timor-Leste, the Meeting acknowledged the importance of both countries' active participation in CCOP and unanimously expressed the willingness to consider this proposal on a case by case basis. With reference to the previous Steering Committee Meeting, the Thailand Delegation informed the Meeting that Thailand's effort so far to seek approval for the increase of annual cash contribution from USD 40,000 to USD 50,000 in 2021 was unsuccessful. The Thailand Delegation will inform the progress in the next Steering Committee Meeting.

Cambodia informed the Meeting that it is pleased to host the 74th CCOP Steering Committee Meeting, planned to be held on March 2020 at Sokha Angkor Resort, in Siem Reap, Cambodia back to back with a CCOP Strategic Planning Workshop.

The Indonesian Delegation informed the Meeting that the 56th CCOP Annual Session and 75th CCOP Steering Committee Meeting will be held on 1-7 November 2020, Sheraton Senggigi Beach Resort, in Lombok Island, West Nusa Tenggara, Indonesia.

The Vietnam Delegation reiterated its offer of hosting the 57th CCOP Annual Session and the 77th CCOP Steering Committee Meeting in October/November 2021, and requested an official letter from the CCOPTS regarding this. Originally, Vietnam was given the honour to host the 55th CCOP Annual Session and 73rd CCOP Steering Committee Meeting in 2019, however due to unforeseen circumstances Vietnam was unable to host these meetings. Thailand came forward and offered hosting of the meetings.

The following Countries offered the hosting of future Annual Sessions & Steering Committee Meeting.

- March 2021, 76SC – Malaysia
- March 2022, 78SC – Mongolia
- November 2022, 58AS & 79SC – Malaysia
- November 2023, 59AS & 81SC – Lao PDR

The Meeting accepted the International Environmental Research Institute (IERI) as a CCOP Cooperating Organization with the following comments. The Korea Delegation expressed support for IERI to be a CCOP Cooperating Organization and recommended CCOPTS to suggest to IERI to share any relevant information through and with KIGAM being the office of the Permanent Representative of Korea to CCOP. The Meeting tasked the CCOPTS to prepare the MoU between CCOP and IERI for signing at the 74th CCOP Steering Committee Meeting scheduled in March 2020 in Siem Reap, Cambodia.

The Meeting endorsed the CCOPTS Director's proposal of extending the service of **Dr Dhiti Tulyatid**, Regional Expert for another two-year term, from 1 May 2020 to 30 April 2022.

As nominated and seconded by Japan and Korea Delegations respectively, the Meeting elected the Permanent Representative of Malaysia **Datuk Shahar Effendi bin Abdullah Azizi** to continue his service as Chairperson of the CCOP Steering Committee for another two-year term, 2020-2021, and the Permanent Representative of Thailand, **Dr Sommai Techawan**, as the Vice-Chairperson. As **Datuk Shahar Effendi bin Abdullah Azizi** is the incumbent Chairperson, the CCOPTS Director was given the authority to chair the election process. **Datuk Shahar Effendi bin Abdullah Azizi** accepted with appreciation to continue his term as Chairperson of the CCOP Steering Committee. Likewise, on behalf of **Dr Sommai Techawan**, the Thailand Delegation accepted with thanks to serve as the Vice-Chairperson of the CCOP Steering Committee.

TECHNICAL PROGRAMMES AND ACTIVITIES

In 2019, a total of 48 training/workshop activities were carried out and attended by 880 participants from the CCOP Member Countries. With strategic focus on capacity building, knowledge sharing and technology transfer; the workshops, training courses, symposia, 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

Strategic Goal	No. of activities	No. of participants
Outreach	1	23
Cooperation & Partnership	30	419
Knowledge Enhancement & Sharing	12	312
Data & Information	5	126
TOTAL	48	880

OUTREACH

In 2019, the outreach initiatives carried out include attending technical meetings, giving lectures, discussions and telephone conferences. The activities are reported in the 2019 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 – 2019, aims to develop new geoinformation integration and sharing system using international standards and free and open-source software for CCOP Member Countries.

The 4th CCOP GSi International Workshop was co-funded by the Geological Survey of Japan, AIST and hosted by the Department of Geology, General Department of Mineral Resources (GDMR), Ministry of Mines and Energy (MME) of Cambodia. The Workshop was held on 1-3 October 2019 at Hotel Somadevi Angkor Resort & Spa, Siem Reap, Cambodia. Twenty-three (23) participants from the Member Countries (Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Mongolia, Papua New Guinea, Philippines, Thailand and Vietnam) including two observers from Brunei Darussalam, and the staff of the CCOPTS attended the workshop.

Dr Kong Sitha, Director of the Department of Geology, GDMR, MME, welcomed all the participants to the Workshop. **Dr Young Joo Lee**, CCOPTS Director delivered the opening remarks. **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, more than 15 portal sites are accessible from the GSi system main site, <https://ccop-gsi.org/main>, with more than 60 map catalogs and 770 datasets.

Mongolia, a newcomer to the GSi Project presented on the current situation of geological survey investment environment and opportunities in Mongolia.. Publicly available data from MRPAM's investors guide web page, <http://invest.mrpam.gov.mn/>, and others are welcome to be uploaded to the GSi System.

Brunei Darussalam, another newcomer to the GSi Project made a presentation on the country's geoinformation developments. Brunei's Survey Department under the Ministry of Development shares geoinformation data for the public use via its geoportal http://www.survey.gov.bn/web/survey_department/. These and other publicly available data are also welcome to be shared via the GSi system.

Dr Bandibas led the GSi information system training on the new features, data upload, map services formulation, portal site generation, map layer customization, and on GSi mobile web application using GSi database.

The agreements on the GSi Project were reiterated and updated as follows.

- Data uploader should be the authorized person representing the agency in the respective member country that publishes the related data, so that the metadata information will be accurate.
- Even in the training, the participants of training should bring their own country data, not other country's data.
- The system could support viewing WMS data outside of the GSi System. If anyone does not want the public to view their data, they have to set the permission level of the data to below 4.
- Each member country is encouraged to setup their own WMS Server to serve their own data to GSi Portal.
- Capacity building for app/portal maintenance and future innovations will be organized upon request and subject to availability of funding.
- Active involvement in the development of dynamic portals where end-users may simulate various earthquake- & volcanic- related hazards, upon request.
- Versioning of GSi system is already added. Current version is v3.1.
- CCOP data compiled through its projects will be uploaded to the GSi system.
- Include in the manual the naming convention for data provider.
- All datasets uploaded to the GS system must use the agreed naming convention (Annex) metadata and keywords. Customize pop-up information of each data layer. Data legend must follow the published printed map.



Participants at the 4th CCOP GSi International Workshop in Siem Reap

PUBLICATIONS

Proceedings of the 54th CCOP Annual Session “Geoscience for Future Earth: Beyond History Toward Mystery”

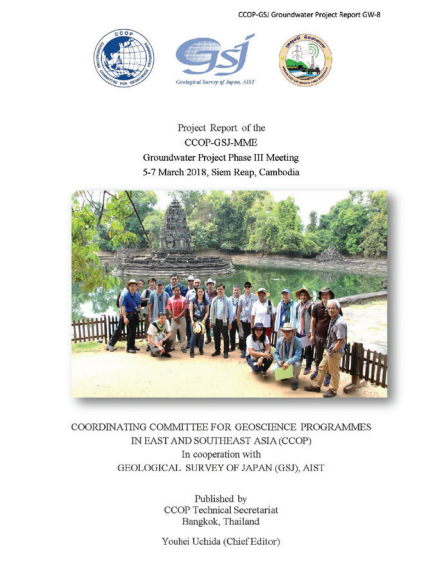
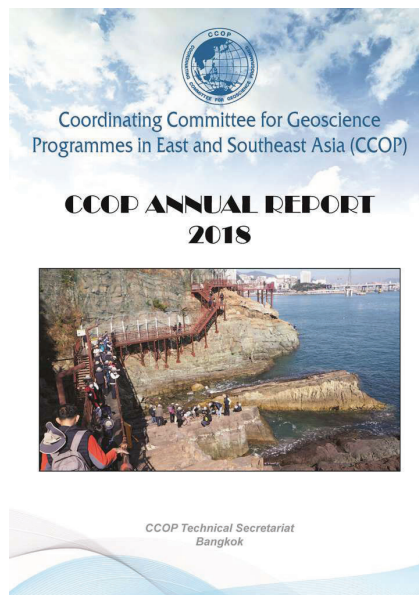
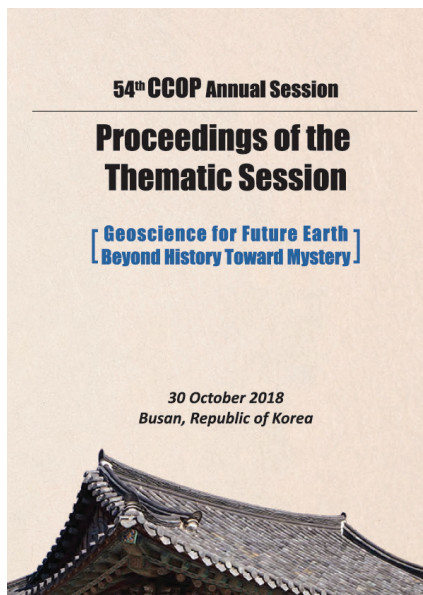
This is the proceedings of the Thematic Session, “Geoscience for Future Earth: Beyond History Toward Mystery” held at the 54th CCOP Annual Session on 30 October 2018, Busan, Republic of Korea. The proceedings contain 30 full papers presented at the session, from Member and Cooperating Countries of CCOP. The 256-page publication is available both electronically and in printed book. Its 14.5 MB PDF file can be downloaded from this link, <http://ccop.asia/publication-details/94>.

CCOP Annual Report 2018

The CCOP Annual Report for 2018 is now available both in printed and digital formats. The 60-page report summarizes the projects and activities carried out during the year 2018, the financial statement and more. Its 4.5 MB digital file can be downloaded from this link, <http://www.ccop.asia/download/CCOP-AR2018.pdf>

Report of the CCOP-GSJ-MME Groundwater Project Phase III (GW8) Meeting, 5-7 March 2018, Siem Reap, Cambodia has been published.

This publication is the compilation of country reports presented at the CCOP-GSJ-MME Groundwater Phase III Meeting. The Member Countries will produce a technical report on CCOP Groundwater Project Phase III (GW-9) by the end of the project in 2019. The reports of GW-8 will be the backbone for the technical report documenting the outcome of the GW Phase III Project. This may contribute some solutions not only on groundwater management but also energy problem in the CCOP Member Countries. The 90-page report is available in printed and digital formats. Its 4 MB pdf file can be downloaded from this link, <http://ccop.asia/pdf/publication/GW-8.pdf>.



COOPERATION AND PARTNERSHIP

In the year 2019, CCOP continued to collaborate with its MCs, CCs and COs to implement the planned activities and adopted activities in new areas of concern. Outreach activities have continuously been developed, thanks to the generous support by funding agencies and in-kind contribution by Member Countries. The table below summarizes the cooperation and activities of the Member Countries, Cooperating Countries and Cooperating Organizations.

Summary of CCOP Technical Activities with Member Countries, Cooperating Countries & Cooperating Organizations in 2019

COUNTRY	CCOP TECHNICAL ACTIVITIES
1) Member Countries	
Cambodia	The Department of Geology, General Department of Mineral Resources , Ministry of Mines and Energy of Cambodia hosted the 4th International Workshop of the GSi Project on 1-3 October 2019 in Siem Reap.
China	<p>China Geological Survey provided financial and technical supports for the following activities:</p> <ul style="list-style-type: none"> i. CCOP-CGS Seminar on Geohazard Prevention and Mitigation, 21 - 25 June 2019, Lanzhou, China ii. IGDP Phase II: Jointly held with the China-ASEAN Marine Geoscience Aoshan Forum, the 3rd Workshop of the CCOP/ASEAN Integrated Geoscience Data Processing and Geophysical Compilation (IGDP-II) Program was held on 19-21 July 2019, Qingdao, China. CGS supported for printing 300 copies of the CCOP Coffee Table Book, “Best Practices on Mine Rehabilitation and Decommissioning Plan in CCOP Region” <p>China organised the following activities:</p> <ul style="list-style-type: none"> i. Energy China Forum 2019: 9th Asia-Pacific Shale Gas & Oil Summit, Jianguo Hotel Shanghai, China, 25-27 September 2019 ii. 2019- 10th Anniversary China-ASEAN Mining Cooperation Forum & Exhibition
Indonesia	<p>China Geological Survey and Geological Agency of Indonesia provided financial and technical supports for the China-ASEAN Mining Cooperation Forum and Exhibition: the 9th Liaison Officials’ Meeting, Jakarta, Indonesia on 12 July 2019..</p> <p>The Geological Agency of Indonesia hosted the CCOP-GSJ Groundwater Project Phase IV Kick-off Meeting on 2-4 December 2019 in Bali Island.</p>
Japan	<p>Geological Survey of Japan (GSJ) provided financial and technical supports for the following activities:</p> <ul style="list-style-type: none"> i. CCOP-GSJ Groundwater Sub-project: Studies on Ground-Source Heat Pump Systems ii. Publication of GW-8: Report of the CCOP-GSJ-MME Groundwater Project Phase III Meeting, 5-7 March 2018, Siem Reap, Cambodia iii. CCOP-GSJ-Department of Groundwater Resources (Thailand) Groundwater Project Phase III Meeting, 13-15 Feb in Chiang Mai, Thailand iv. GSJ International Training Course on Practical Geological Survey Techniques 2019 - Application to Geological Disaster Mitigation, 4 - 21 June 2019, Tsukuba, Japan v. Geoinformation Sharing Infrastructure for East and Southeast Asia (GSI) Project vi. CCOP-GSJ Groundwater Project Phase IV-GSJ and Daiichi Institute of Technology provided resource persons for the CCOP Workshop on The Future of ASM and Local Communities, 4 March, Samui Island, Thailand.

COUNTRY	CCOP TECHNICAL ACTIVITIES
Republic of Korea	<p>Korea Institute of Geoscience And Minerals Resources (KIGAM) provided financial and technical supports for the following projects:</p> <ol style="list-style-type: none"> i. Unconventional Oil & Gas Resources Project Phase II (UnCon Project Phase II): Assessment of shale energy resources in Asia. The following meetings were organized: (a) UnCon13, 23-25 April, Hanoi, Vietnam (b) UnCon 14, 16-18 September 2019, Ulaanbaatar, Mongolia ii. Groundwater-surface water interaction and comparative study of groundwater dependent ecosystems in the Mekong Basin: application to transboundary aquifer management (Phase III) iii. Establishment of Geoscience Data Repository system of CCOP Member Countries <p>KIGAM and IS-Geo continued to support and organize training courses and the following were held:</p> <ol style="list-style-type: none"> i. Regular Training Course on "Oil and Gas Development, Groundwater and Geologic Hazard Assessment", April 8-19 , 2019.IS-Geo of KIGAM, Daejeon, Republic of Korea ii. Regular Training Course on Exploration, Development and Processing of Mineral Resources, 9 – 29 April 2018, Daejeon, Republic of Korea iii. Regular Training Course on Geological Mapping and Mineral Exploration, 30 September through 18 October 2019, IS-Geo of KIGAM, Daejeon, Republic of Korea
Lao-PDR	<p>Lao PDR through the Department of Geology and Minerals (DGM) , and Department of Mining (DOM) organized the CCOP-DGM-DOM-ASOMM Workshop for ASEAN Mineral Resource Evaluation, 11-14 March 2019, Vientiane.</p>
Malaysia	<p>Malaysia through the Department of Minerals and Geoscience Malaysia (JMG) hosted and organized the CCOP-JMG-British Geological Survey (BGS) Workshop on Urban Geology on 26-27 February in Putrajaya.</p>
Mongolia	<p>Mongolia through the Mineral Resources and Petroleum Authority of Mongolia hosted and co-organized the CCOP – KIGAM Unconventional Oil and Gas Resources Project: Assessment of Shale Energy Resources in Asia (UnCon Project Phase II) National Coordinators' Meeting and Workshop (UnCon 14) on 16-18 September 2019 in Ulaanbaatar.</p>
Thailand	<p>The Royal Thai Department of Mineral Resources (DMR) hosted the following activities:</p> <ol style="list-style-type: none"> i. The 72nd CCOP Steering Committee Meeting, 3-5 March 2019, Samui Island. ii. Kick-off Meeting of the Geoscience Data Repository Project, 29-31 October 2019, Bangkok, Thailand iii. CCOP 55th Annual Session and 73rd Steering Committee Meeting, 3-9 November, 2019, Chiangmai, Thailand <p>DMR continues to support the siting of the Permanent Office Building for CCOPTS in DMR Complex, Bangkok, Thailand.</p>
Vietnam	<p>Vietnam through the Vietnam Petroleum Institute (VPI) hosted and co-organized UnCon13, 23-25 April, Hanoi. VPI also provides resource persons for UnCon13.</p> <p>Vietnam through NAWAPI invited CCOP to the Vietnam International Water Week-VACI2019, 22-25 March, Hanoi, Vietnam</p>

2) Cooperating Countries

United Kingdom	<p>U.K. through the British Geological Survey co-sponsored and provided resource persons for the CCOP-JMG-BGS Workshop on Urban Geology held on 26-27 February in Putrajaya, Malaysia.</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 in accordance with the decision of the 72nd CCOP Steering Committee Meeting in March 2019, Samui Island, Thailand.</p>

COUNTRY	CCOP TECHNICAL ACTIVITIES
3) Cooperating Organizations	
EuroGeoSurveys	The Geological Surveys of Europe (EuroGeoSurveys) initiated the participation of CCOP in the European Commission “International Network of Raw Materials Training Centres” (INTERMIN) Project at the INTERMIN Meeting, 30-31 January, Madrid, Spain
ESCAP	75 th Session of the Economic and Social Commission for Asia and the Pacific was held on 27-31 May, Bangkok, Thailand.
IUGS	IUGS invited CCOP to the 73 rd IUGS Executive Committee Meeting, 25-28 February in Beijing, China.
UNESCO	UNESCO invited CCOP to update and revise a groundwater project proposal for application to the UNESCO Mekong Groundwater Adaptation Fund, 21 March, Hanoi, Vietnam.
World Bank	Financially supported the CCOP Workshop on The Future of ASM and Local Communities, 4 March, Samui Island, Thailand.

INTERMIN Meeting 2019:

The INTERMIN meeting 2019 was held on 30-31 January 2019 at IGME Headquarters, Eadquarters,, Madrid, Spain.

Participants from various offices and organizations around the world: Australia (1), Austria (1), Belgium (6), China (1), Czech Republic (1), France (2), Germany (2), Greece (1), Hungary (1), Italy (1), Poland (1), Portugal (2), Spain (10), Thailand (1), UK (1), Uruguay (1), and USA (1) attended the meeting.

Dr Manuel Regueiro (IGME) opened the session & welcomed participants to the meeting. **Dr Dhiti Tulyatid**, Regional Expert, represented CCOPTS and gave a presentation on Current Status of Technical Activities and Training offered for raw materials professionals in geology and mining engineering in East and Southeast Asia. The meeting updated the work progress and achievements of INTERMIN. **Dr David Ovardia** facilitated the face-to-face Session on Focus Group on raw materials professional requirements (Employer’s needs). Some of the issues addressed include: the next 15 years, what are the necessary shifts in training and education for overcoming the skills mismatch? What is going to change (and what is going to remain the same? How training itself is going to look like and which of these skills wouldn’t be taught at training centres? Other speakers include: **Anne-Lise Gautier** (BRGM) & **Veronique Lamblin** (Futuribles); **Isabel Pino & Laurence Lamm** introduced the educational component at the EIT RM; **Andrzej Biessikirski** gave a presentation on “MIREU Project – skills & requirements and SLO”; **Krishnan Subramani**, EGS, gave a presentation on WP5: Communication and dissemination. **Vitor Correia** (EFG) talked about “Towards enhanced training programs (Response); **Peter Muller** (BDG) talked about Creating synergies between Guide and Intermin; **Francisco Jaview Elorza** (UPMa) gave a presentation on WP4: Developing international network of Raw Materials Training Centres.

Dr Manuel Regueiro moderated the session on Future Pathways: 1. He asked participants to Inform INTERMIN future meetings that INTERMIN can be visible; 2. Next INTERMIN Meeting will be in South America in October 2019, probably in Chile. Participants will visit one of the mines; possibly organizing a workshop on mining; 3. WP1 & WP2 are alright; WP3 is two months behind schedule; WP2 WP3 & WP4 should work to get some outputs for INTERMIN.



Opened the session & welcomed INTERMIN participants Dr Dhiti Tulyatid gave a presentation to the meeting

The 73rd IUGS Executive Committee Meeting.

CCOPTS Director was invited to attend the 73rd IUGS Executive Committee Meeting held on 25-28 February in Beijing, China. The meeting was chaired by **Prof. Dr Qiuming Cheng**, President of IUGS. A total of 81 participants comprising IUGS executive members, representatives of IUGS members, IUGS Task Groups, Initiatives, Joint Programs, and Adhering and Affiliated Organizations.. Each representative was tasked to report the 2018 activities and to provide the action plan of 2019. The International Geological Congress in 2020, to be held in New Delhi, India, and in 2024, to be held in Busan, Korea, were also discussed. Many activities for the Congresses were proposed by IUGS representatives. The meeting tasked each representative to combine the related activities from different organizations in order to have a bigger impact on the geoscience community. These activities should also link to UN SDGs.

Workshop on Mineral Exploration and Mineral Resources Evaluation:

The Workshop was held on 11-14 March 2019 in Vientiane, Lao PDR Mr **Chansone Senbouttalath**, Vice Minister of MEM, Lao PDR, delivered a Welcoming Address. **Dr Adichat Surinkum**, Director CCOPTS delivered the Opening Speech.

A series of presentations on mineral resources of Lao PDR and Thailand were given by resource persons. Mineral resource evaluation, estimation and classification were among the topics of interest for the meeting. The following is a listing of some of the presentations:

- (i) **Dr Abhisit Salam**, Lecturer of Chulalongkorn University on SE Asia Mineral Deposit Geology;
- (ii) **Mr Paul Barel**, Savan Resources Sole Co.,ltd on Mineral Exploration Programmes, Typical Methods, Stage and Decision Points;
- (iii) **Mr Khoun Phetsengsy**, DDG of DGM, Lao PDR on Geology of Lao PDR and International Cooperation
- (iv) **Mr Somchanh Keomanivong**, Fomer Superintendent Geologist (Sepon Project): Hydrothermal System related to Au-Cu deposit;
- (v) **Mr Nuchit Siritongkham**, Geologist of DMR on Potash deposit in Khorat Group;
- (vi) **Mr Shaun Versace**, Principal Resource Geologist of PanAust Ltd., on a JORC Code Mineral Resources Estimation in Phubia Mines.

Dr Dhiti Tulyatid, Regional Expert, CCOPTS gave a presentation on “the Introduction of UNFC on mineral resources evaluation; **Dr Adichat Surinkum**, Director, CCOPTS gave a talk on the Case Study on the Application of UNFC to Thailand Potash Deposits. Participants visited the PhuBia/ Huaysai gold mines on the third day of the workshop.

Dr Simone Phichith Director General of RIEM, Lao PDR, gave the closing remark.

There were several participants including **Mr Shaun Versace**, Principal Resource Geologist of PanAust, **Mr Mark Walker** and **Mr Sheppard**, Mining Inspection Advisors, Australian volunteers to the Ministry of Energy and Mines, Department of Mines, Lao PDR, that expressed their interest in using the UNFC system to evaluate the mineral deposits they are working on.

A total of 60 participants from both private sectors and government agencies, also expressed their interest on the establishment of a body/system for resource evaluation and classification in the East and Southeast Asia Region and for the body/system to have the “Competent Persons” for the resource classification without having to import such person from other parts of the world. It is the CCOP’s intention to support and facilitate the use of UNFC for resource classification on mineral (and petroleum) deposits in East and Southeast Asia region.

16th ASOMM Working Group Meeting and 2019 IGF Workshop and Training Towards Sustainable Practices.

Department of Primary Industries and Mines of Thailand organized the 16th ASOOM Working Group Meeting on 18-21 March at Kantary Hotel in Chiang Mai, Thailand. CCOPTS Director was invited to make three (3) presentations on the CCOP activities related to the ASOMM action plan and the future cooperation between ASEAN Member States and CCOP. There was a discussion on more joint programs on Small Scale Mining, Capacity Building and Geoinformation Integration and Sharing System. CCOPTS Director informed that all delegations of ASEAN Member States may participate in all CCOP activities and he requested for greater collaboration in these said subjects through the CCOP Permanent representative of each Member States.



A group photograph of Delegates of the 16th ASOMM Working Group Meeting and 2019 IGF Workshop and Training Towards Sustainable Practices

The 2019 IGF Workshop and Training “Towards Sustainable Practices” was organized on 20 March at the same venue. All delegations from ASOMM participated and shared their own experiences and best practices on mining. They formulated groups of discussion focused on sharing good practices and addressing gaps in ASEAN and then shared comments with the representative of Intergovernmental Forum on Mining, Metals and Sustainable Development (IGF). They also agreed to organize one more workshop in July 2019.

The UNESCO Mekong Groundwater Adaptation Fund Proposal

UNESCO (Jakarta) organized the validation workshop on 21 March in the UN Vietnam Headquarters, Hanoi, Vietnam. Participants from Vietnam, Cambodia, Lao PDR, Myanmar, Thailand and CCOPTS attended the one-day workshop to validate the final draft of the “Groundwater Resources in the Greater Mekong Subregion: Collaborative Management to Increase Resilience” proposal for the Mekong Groundwater Adaptation Fund. The workshop discussed the major potential risks, screening procedures and mitigation measures for the four pilot areas. During the final discussion, each Member Country was tasked to share views on screening of environmental and social principles. Finally, all

agreed to support this proposal through the Permanent Representative to the Mekong Groundwater Adaptation Fund by the end of May 2019.

Vietnam International Water Week-VACI2019

Vietnam Ministry of Natural Resources and Environment organized the VAC 2019, Vietnam International Water Week on 22-23 March at the Almaz Conventional Center to celebrate the World Water Day. The UN World Water Development Report was launched on 22 March together with keynotes from representatives of International Organizations and Minister of MONRE, Vietnam. More than 400 participants from international and local agencies attended this event. There were 7 (seven) topics of discussion during the event, including all subjects related to water and environment. CCOPTS Director was invited to give a keynote and chaired the session on mine water and environment.

JMG-DMR Working Group Meeting

CCOPTS Director was invited to attend the Malaysia-Thailand Border Joint Geological Survey (1/2019) held on 25-28 March in Krabi province of Thailand. There were 22 geoscientists from Mineral and Geoscience Department, Malaysia, Universiti Kebangsaan Malaysia, Department of Mineral Resources of Thailand and CCOPTS. The meeting focused on the progress of the programs held during 2018, many of them were co-organized by CCOP. The Meeting also discussed the revised action plan for 2019-2022 because both sides were tasked to work on more specific geoscience activities, especially on outreach and geohazard mitigation. Several geosite visits were made after the meeting in order to have greater appreciation of the stratigraphic correlation and geopark promotion. CCOPTS Director provided more information on CCOP sharing mechanism and suggested to the meeting to find easy and low cost ways to share geoscience information with the public using simple graphic via social network.

The Official Kick-off Meeting of JICA Project on GSHP

The Energy-saving cooling system using Groundwater Heat Source Project is funded by the Japan International Cooperation Agency (JICA). The official kick-off meeting of the project was held on 5 April 2019 at the Royal Thai Department of Mineral Resources, Bangkok, Thailand. The meeting was chaired by Dr Sommai Techawan, Permanent Representative of Thailand to CCOP and Director General of DMR. The meeting was attended by **Dr Young Joo LEE**, Director of CCOP TS, **Dr Dhiti Tulyatid**, Regional Expert, **Marivic Pulvera Uzarraga**, Project Manager, **Dr Youhei Uchida**, Leader of the Shallow Geothermal and Hydrogeology, as well as representatives of Misawa Environmental Team of Japan. The pilot project is carried out at the DMR's Jubilee Geological Museum in Pathumthani Province.



The Expert Group on Resource Management (EGRM) Tenth Session

The UNECE Resource Management Week was held in Geneva during 29 April – 3 May 2019. The meeting was organized by the Committee on Sustainable Energy, Economic Commission for Europe, Economic and Social Council. **Dr Dhiti Tulyatid**, Regional Expert, represented CCOP in the Meeting. The meeting elected **Dr Young Joo LEE**, Director of CCOPTS to be the member of the Bureau. **Dr Dhiti Tulyatid** was among the panelist on the Panel Discussion on International Centres of Excellence and Extrabudgetary Project. It was suggested that CCOP should facilitate and support the International Centres of Excellence and to represent its Member Countries in the region. **Dr Dhiti Tulyatid** also gave a report on CCOP activities related to UNFC. CCOP reiterated its intention to facilitate related activities on the use and application of UNFC on resource classification in support of the UNSD Goals.



Dr Dhiti Tulyatid, CCOPTS, gave a report on CCOP activities related to UNFC

The International Workshop on Heritage Values of Ly Son – Sa Huynh Geopark:



Field Excursion at Hang Cau Cliff and the island

During 18 – 19 June 2019, **Dr Dhiti Tulyatid**, Regional Expert, CCOPTS; a Member of Thailand National Geopark Committee and a Field Evaluator for Thailand National Geopark, participated in the International Workshop on Heritage Values of Ly Son – Sa Huynh Aspiring Geopark, at the Central Hotel, Quang Ngai, Vietnam. Ly Son – Sa Huynh Geopark is located along the 130 km long central coast of Vietnam in Quang Ngai province. The Ly Son – Sa Huynh Geopark covers an area of 2,016 km² with a population of about 900,000 in nine districts of Ly Son, Binh Son, Tra Bong, Tay Tra, Quang Ngai city and coastal communes of Tu Nghia, Mo Duc and Duc Pho. In addition, the geopark also covers 2,617 km² of wetland including internal water as defined by the United Nations Convention on the Laws of the Sea 1982. The event is an opportunity to strengthen scientific and geological relevance to cultural heritage and to further supplement findings from scholars, researchers and policy-makers that help finalize the application dossier to be submitted to UNESCO by the end of 2019 for the recognition of Ly Son-Sa Huynh as a UNESCO Global Geopark. The event also provided information for the conservation, management and development of the aspiring Ly Son – Sa Huynh UNESCO Global Geopark, as well as to commemorate the 110th anniversary of unearthing Sa Huynh Culture.

Third Trilateral GeoSummit

The Third Trilateral GeoSummit was held in Sapporo, Japan on July 30, 2019. The meeting was attended by delegates of the following institutions: China Geological Survey (CGS), Korea Institute of Geoscience and Mineral Resources (KIGAM), and the Geological Survey of Japan (GSJ).

Dr Yusaku YANO, Director General of GSJ, officially opened the Third Trilateral GeoSummit by delivering the welcome address. In response, **Dr ZHANG Hongtao**, Counselor of State Council of the People's Republic of China, presented his special message. **Dr Bok Chui KIM**, President of KIGAM also presented his special message.

Ms HAN Mei, Deputy Secretary-General of the Trilateral Cooperation Secretariat (TCS) delivered her keynote speech to commemorate the Third Trilateral GeoSummit with the theme "CJK Trilateral Cooperation: 20 Years Past, A New Journey Ahead." **Dr Young Joo LEE**, the Director of CCOPTS, presented his keynote speech entitled "CCOP: The Premier Geoscience Community in Asia beyond History and Borders."

Dr SHU Siqi, Director of International Cooperation Division of CGS, introduced the current status of CGS. Secondly, **Mr Hee Soo KIM**, Head of International Cooperation Department of KIGAM gave a presentation on the current status of KIGAM and **Dr Shinsuke NAKAO**, Deputy Director General of GSJ, introduced the current status of GSJ. **Dr Yuichiro TANAKA**, **Dr Koji MASUDA**, **Dr Yuji MITSUHATA**, and **Dr Takayuki SAWAKI** also introduced the current status of their respective research institute of GSJ.

The themes of the technical sessions for the Third Trilateral GeoSummit are: (i) Active Fault, (ii) GIS, (iii) 3D Geological Modeling and (iv) Coastal Geology.

Dr Toshihiro UCHIDA, Leader of the International Coordination Group of GSJ, reported on the result of the Third Trilateral GeoSummit, highlighting consensus and action items.

The Minutes of the Third Trilateral GeoSummit were reviewed by CGS, KIGAM and GSJ. The representatives from the three institutions have agreed to sign the Minutes on the plenary session and the technical sessions .

THE 6TH ASIA PACIFIC GEOPARKS NETWORK SYMPOSIUM:

The Asian Pacific Geoparks Network Symposium (APGN) with the theme "UNESCO Global Geopark contributing to sustaining local communities and reducing geohazard risks" was held in Rinjani-Lombok UNESCO Global Geopark in Lombok, Indonesia from 31 August to 6 September, 2019. **Dr Dhiti Tulyatid**, Regional Expert, CCOPTS, participated in the Symposium from 3-6 September 2019. The first APGN symposium was held in Langkawi Geopark, Malaysia (2007) followed by Dong Van Geopark, Vietnam; (2011) Jeju Island, South Korea (2013) ; San'in Kaigan Geopark, Japan (2015) ; Zhijindong Cave UGGp, China and Rinjani-Lombok UGGp, Indonesia (2019). The next symposium will be held in Satun UGGp, Thailand in 2021.

A total of **600 people** who currently work on UNESCO Global Geoparks as well as National Geoparks from Asia-Pacific countries participated in the event. The symposium focused on "UNESCO Global Geoparks Contributing to Sustaining Local Communities and Reducing Geohazard Risk" The symposium included **five sub-themes**: (1) Empowering local socio-economic sustainable development; (2) Engaging Communities, geohazard risk and recovery; (3) Popularizing scientific knowledge for public education; (4) Promoting aspiring global geoparks; and (5) Networking volcanic landscape global geoparks. The venue provided a good platform for participants of various backgrounds who work on geoparks to get together and share their knowledge on the natural heritage and mitigation of

geohazard through creative and active engagement. The meeting also brought together key persons on UGGps development including **Mr Miguel Clusener-godt**, UNESCO; **Prof Nikolas Zouros**, GGN President; **Dr Guy Nartini**, Chair of UGG Council; etc.

Three Mid-symposium excursions were organized to (1) Rinjani Cultural Landscape (Mataram - Kemaliq Pura Lingsar - Waterfall in Aik Berik – Narmada Park); (2) Local Wisdom for Disaster Resilience (Mataram – Gumantar – Senaru – Narmada); and (3) Trace of Ancient Volcano in Sembalun Valley (Mataram – Sembalun – Narmada). Dr Dhiti joined the excursion to the Ancient Volcano in Sembalun Valley which is one of the most important geosites in Rinjani-Lombok Geopark. It is a remnant volcano caldera. The age of the volcano is about 0.45 Ma. Participants also have the opportunity to visit the Narmada Park, which is a geosite and cultural site of Rinjani-Lombok Geopark.

Satun UGGp will be the next host for the 7th APGN Symposium in Satun, Thailand.



Result of the Meeting:

The APGN committee accepted Satun UGGp's offer to host the 7th APGN Symposium in Thailand in 2021. The meeting also look forward to the 9th International Conference on UNESCO Global Geopark to be held in 17-20 September 2020 in Jeju UGGp, Republic of Korea. The meeting also agreed on "The Rinjani-Lombok Declaration on Sustaining Local Communities and Reducing Geohazard Risk"

Observations and Discussions:

1. The networking activity is very important among participants based on the UGGps of various countries.
2. The venue provided a platform for participants of various backgrounds to meet, discuss and share their experiences. More than half of the participants come from various background other than geoscience or geoscience-related background. This can be seen from both the oral and poster presentations given during the symposium. Geology is used as the foundation of the UGGps which in turn serves the communication and interpretation in Geotourism, management and sustainable development.
3. **Dr Dhiti** commented on the presentation of **Prof Ibrahim Komoo** (Malaysia), Vice President of GGN, that he also include CCOP, in the process of development and capacity building for the establishment of the UGGps in the East and Southeast Asia region.
4. **Dr Dhiti** informed **Ms Kana Furusawa** (Japan) a member of the APGN Advisory Committee that CCOP has involved in the establishment of UGGp in Member Countries for many years. As the organization goal, CCOP would like to continue the cooperation particularly in working towards having a UGGp centre-of-excellence as well as supporting the Member Countries in their endeavor on the setting up of their UGGps. **Ms Kana Furusawa** voiced this comment to the committee and was supported by **Dr Mahito Watanabe** (Japan), another committee member. **Dr Watanabe** is happy to cooperate but indicate that there is no funding from Japan.
5. **Dr Dhiti** discussed with the next host Thailand about the possibility to co-hosting the 7th APGN in Satun and the offer was agreed by all.
6. Khorat National Geopark will be hosting another capacity building workshop at its geopark in December 2019 with the assistance of Japanese Geopark Network and it invites CCOP to participate in the event.

Recommendation and Way Forward:

1. UGGps may not be a platform for technical geoscientists but a matter of finding the geological features of international significance of the area and the interpretation for geotourism (education) purpose. The platform is still very important for the application of geoscience knowledge for sustainable development. The goal of “Geopark” is very much in line with CCOP’s strategy in support of the UN sustainable development goals.
2. CCOP should take part in co-hosting and participating in activities related to UGGps of its Member Countries. It is recommended that CCOP cohost the 9th International Conference on UNESCO Global Geopark during 17-20 September 2020 in Jeju UGGp, Republic of Korea and the 7th APGN Symposium to be held at Satun UGGp in 2021. CCOP should also participate in other related UGGps activities of its MCs such as the Khorat Geopark in December 2019.
3. CCOP should make use of these events to work out the future steps toward the capacity building and the technical support for the establishment of the UNGps in all Member Countries, especially those that have not had any UNGps.

Energy China Forum 2019:

The 9th Asia-Pacific Shale Gas and Oil Summit was held in Jianquo Hotel Shanghai 25-27 September 2019. **Dr Young Joo Lee**, Director of CCOPTS, and **Dr Dhiti Tulyatid**, Regional Expert, CCOPTS, attended the meeting. The summit was organized by the Shanghai United Institute for Unconventional Resources and Shanghai Energy Economy Committee of SEA. Co-organizers include China Petroleum Enterprises Association and CCOP. The summit was also supported by the Shanghai Federation of Social Sciences Association and Shanghai Association for Science & Technology.



A group photograph of participants at the 9th Asia-Pacific Shale Gas and Oil Summit

Ms Shaw Zhang, Executive President, ECF, opened the ECF2019. She thanked CCOP for co-organizing the Summit. The presentation of the morning session covered the energy reform and policy for unconventional oil & gas; environmental policy and regulations in Onshore oil & gas development; Implications of International Tight-shale oil & gas development (**Erik Darner**, MD, HIS Energy Consulting Asia Pacific); China is still on the “pilot” project stage on shale oil & gas compared to the USA. China focuses on gas while USA is on oil. The presentations including “Exploration Prospect for Permian Marine-continental Shale Oil & Gas by **Zhai Gangyi**, Chief Scientist, Energy Innovation Project of CGS show that China’s shale gas has been focused around the southern part of the country. A panel discussion on “Development and Geology Exploration of Unconventional Oil and Gas” was held **Dr Young Joo Lee**, Director of CCOPTS was among the panelists.

Dr Young Joo Lee and **Dr Dhiti Tulyatid** also joined the Networking Reception & Award Ceremony: ECF2019 Forth Oil & Gas Tech Innovation Award and Excellent Paper”. **Dr Young Joo Lee** delivered a speech to congratulate the award recipients and presented the award to one of the recipients. He also presented tokens of appreciation to **Ms Xiaolai Zhou**, President; and **Ms Shaw Zhang**, Executive President, ECF. Among the VIPs include **Ms Li Hongming** – Chairwoman of Shanghai Association for Science & Technology, and **Mr Zhai Gangyi** – Chief Scientist of Energy Innovation Project for China Geological Survey. **Dr Young Joo Lee** also accepted to be the ECF Institution Expert.

The summit continued in the second day with a number of presentations on new technology and innovations on shale gas – shale oil exploration and productions. A Panel Discussion on the Engineering, Technology & Equipment of Shale Oil & Gas and the Award Reports of ECF2019 4th Oil & Gas Tech Innovation Award Winners and the Excellent Paper Reports were also held.

Participants had a chance to visit Shanghai Shenkai Petroleum Science & Technology Co., Ltd during the third day of the meeting. The company is a subsidiary of Shanghai Shenkai Petroleum and Chemical Equipment Corporation Ltd., which specializes in R&D manufacturing, selling mud logging unit, drilling instrumentation and providing technical engineering service for oil industry.



A group photo at the end of the 4th Oil & Gas Tech Innovation Award and Excellent Paper Ceremony



Director CCOPTS, was a panelist in a discussion on the Development and Geology Exploration of Unconventional Oil and Gas at ECF2019, Shanghai.

In summary, CCOP has continued its strong network and collaboration with the ECF. **Dr Young Joo Lee**, Director of CCOPTS has joined as one of the ECF’s experts. He participated as a panelist in the panel discussion and delivered a congratulatory message to the award recipients. ECF supported economy return air ticket (one ticket), accommodation and meeting package. CCOP facilitated the meeting through the invitation to PRs of Member Countries. The Tenth Celebration for ECF in 2020 will be possibly in one of the hotels in Shanghai.

10th International Forum on Energy for Sustainable Development

The event took place during 7-8 October 2019 under the theme “Translating Targets into Actions” at the United Nations Conference Centre in Bangkok, Thailand. The forum was organized by the five United Nations Regional Commissions and the Ministry of Energy of the Kingdom of Thailand. **Ms Armida Salsiah Alisjahbana**, Under-Secretary-General of the United Nations and Executive Secretary of ESCAP delivered a welcome address. She stressed on UN SDG7 and emission reduction. **H.E. Mr Sontirat Sontijirawong**, Minister of Energy, the Royal Government of Thailand introduced the “Energy for All” policy which is designed for all stakeholders to take part in sustainable energy development. This would increase their income and save energy. **Mr Bambang Brodjonegoro**, Minister of National Development Planning (BAPPENAS), Republic of Indonesia, delivered a welcome address. **Dr Dhiti Tulyatid**, Regional Expert, CCOPTS, attended the forum. Further information can be found at: <https://www.unescap.org/events/10th-international-forum-energy-sustainable-development>.

The forum provided a good networking with representatives from other UN Member States that led to the visit of **Mr Scott Foster**, Director of Sustainable Energy Division, United Nations Economic Commission for Europe (UNECE), to CCOPTS office on 8 October 2019. **Mr Foster** supports CCOP on the promotion of the application of UNFC and the setting up of the International Centre of Excellence at CCOP.



The meeting was held on 6 November 2019 at Kantary Hills Hotel, Chiang Mai, Thailand. There were a total of 17 participants attending the meeting: Cambodia (2), China (2), Indonesia (1), Malaysia (2), Mongolia (1), Korea (1), Thailand (2), UKM, Malaysia (1), DMR Thailand (1), Chiang Mai University, Thailand (1), CCOPTS (2) (**Dr Y.J. Lee**) and **Dr Dhiti** (CCOPTS, regional expert) and Other (1) (former CCOPTS director **Dr Adichat Surinkum**), **Dr Young Joo Lee** delivered the opening remarks, and **Mr Meng Wang**, President of YES network introduced the meeting agenda.

Meeting agenda

1) International level

Dr Wang (President of YES network) introduced YES Network comprising members from 50 countries.

Dr Wang requested CCOPTS to support hosting the national YES Chapter for the non-member countries. **Dr Lee** asked for a list of non-membership countries in Asia. (Currently, only Philippines, China, and possibly Indonesia are members). **Dr Lee** (CCOPTS) suggested to YES to contact the organization network, rather than personal network for hosting the national chapter.

CCOPTS and YES agreed that CCOP will promote the membership for all CCOP Member Countries for hosting the national chapter. **Dr Wang** asked for active contribution from Republic of Korea for the chapter where the next IGC will be hosted. Participants agreed that they would need young people from Asia to actively participate in YES network for contributing to next IGC and young organizations in Asia will collaborate with all levels of geological organizations (international, national, regional) while maintaining independence of each organization's activity.

2) National Level

Dr Wang confirmed that participants during the meeting will be the national contact person. For the establishment of national chapter and registration, participants agreed that every country will work to support new association (YES network chapter). YES network and CCOP will support to develop their functions. YES network will closely work with other Asia organizations (e.g. GEOSEA) to support sending young researchers and promoting memberships. With regards to the MOU between YES and CCOP, it is ready to be launched as the regional chapters for YES Asia. The Office will be based in Thailand.

Participants were concerned that there are 11 years left for attaining SGDs 2030, and agreed that young scientists in Asia should work closely and collaborate to develop collaborative geoscience projects, in order to face the challenges from Asia including urban geology, Geohazards, Geo-Resources, and other topics related to SGDs 2030.

2019 (the 10th Anniversary) China-ASEAN Mining Cooperation Forum & Exhibition

The China-ASEAN Mining Cooperation Forum and Exhibition (Mining Forum) is an international mining conference co-sponsored by the Ministry of Natural Resources of China and the People's Government of Guangxi Zhuang Autonomous Region. It is also an important activity within the framework of the China-ASEAN Expo and the China-ASEAN Business and Investment Summit. 2019 is the 10th anniversary of the start of the Mining Forum with a theme "Deepening Mutually Beneficial Mining Cooperation, Accelerating Economic win-win Development". Relying on this platform, the consensus on mining cooperation between China, ASEAN, and the countries along the Belt and Road has been continuously strengthened. The areas of cooperation have been continuously expanded and the cooperation mechanism has been continuously improved, thus effectively promoting exchange and cooperation both in mining and other fields.



Dr Young Joo Lee, Director of CCOPTS, along with **Dr Dhiti Tulyatid**, Regional Expert and **Ms Thanitnunth Invakul**, Assistant, represented CCOPTS in the meeting with full support from the organizer.

Dr Young Joo Lee, Director of CCOPTS was among VIPs present at the welcoming banquet including head of delegations from ASEAN Member States (**H.E. Meng Saktheara**, **H.E. Peng Navuth**, **H.E. Nhek Someth**, **H.E. Yem Kannika**, **H.E. Chansavath Boupha**, **H.E.**, **Dr Ye Myint Swe**, **H.E. Nonita S Caguioa**, **H.E. Assefa Kumssa Afeta**, **Datuk Haji Shahar Effendi Bin Abdullah Azizi**, **Dr Sommai Techawan**, **Tran Van Thao**, and **Ben Yachou Moulay Yuosef**).

The Opening Ceremony was held at the Chinese Hibiscus Hall, NICEC. VIPs who delivered the opening speeches include **H.E. Meng Saktheara**, **H.E. Chansavath Boupha**, **H.E. Dr Ye Myint Swe**, **H.E. Nonita S. Caguioa**, and **H.E. Assefa Kumssa Afeta**.

A series of seminars were held during the two-day forum including:

1. Seminar on China-ASEAN Geosciences Cooperation: 15 November 2019.

The session was sponsored by China Geological Survey. The session was chaired by **Tang Shanmao**, Director General, China-ASEAN Geosciences Cooperation Center (Nanning), and Director General, Guangxi Bureau of Geology & Mineral Prospecting & Exploration. **Dr Young Joo Lee**, Director of CCOPTS gave a presentation on CCOP's roles on "Regional Geoscience Community, towards Sustainable Earth".

2. Seminar on China-ASEAN Geosciences Cooperation of Colleges and Universities: 15 November 2019.

The seminar was sponsored by Nanning Normal University, The Department of Natural Resources of Guangxi Zhuang Autonomous Region. The seminar was co-organized by Peking University, Guilin University of Technology, Guilin University of Electronic Technology, Guangxi

Association for Artificial Intelligence. The seminar focused on the Frontier of Geosciences and Participation in ASEAN Cooperation. **Dr Young Joo Lee**, Director CCOPTS, gave a presentation entitled “CCOP Towards Premier International & Intergovernmental Organization”.

3. Seminar on Geology and Mining Information Services for China – ASEAN Countries: 15 November 2019.

The Seminar was sponsored by China Geological Survey through the organizer, Development Research Center, CGS. In this seminar, **Zhang Minghua**, from the Development Research Center, CGS, gave a presentation on “Introduction to International Geoscience Data Sharing Standards”. In his presentation, he mentioned about CCOP-ASEAN Geoinformation Metadata Standard for Data Sharing. **Mr Viwat Totirakul**, DPIM, also gave a Country Report 2019 for Thailand.

Guangxi Institute of Natural Resources Survey and Monitoring through **Dr Zhang** arranged a special dinner for the Thai Delegation. The Venue provided a good opportunity for CCOPTS Director to meet and discuss with leaders from government agencies and organizations of ASEAN Member States and the other parts of the world who are involved in mining and exploration. CCOP could promote its work and activities through a number of seminars for international cooperation and education for young earth scientists.

The Institute also provided updated information on current status and activities on mining and exploration of China and other ASEAN Member States and It is recommended that CCOP continues to cooperate with this forum for updated information and networking among CCOP Member Countries.

80th Anniversary of Professor Dr Prinya Nutalaya Meeting

The meeting was held on 29 November 2019 at the Department of Geological Sciences, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand. The Department of Geological Sciences, Faculty of Science at Chiang Mai University hosted the event to celebrate the 80th anniversary of Professor **Dr Prinya Nutalaya**. The meeting aimed to promote students’ attributes and broadening their visions and attitudes toward geology through the experienced geologist alumni. **Prof Dr Prinya** is among one of the founders of the Department of Geology (now Geological Science), Chiang Mai University. The Department of Geological Sciences invited **Dr Dhiti Tulyatid**, Regional Expert, CCOPTS to participate in the meeting and as a chairperson for one of the technical sessions.

Dr Sommai Techawan, PR of Thailand to CCOP and Director General of DMR also gave presentations.; **Dr Adichat Surinkum**, former Director of CCOPTS, **Mr Kanok Intharawijitr**, Executive Vice President, Geosciences, Subsurface and Exploration Group, PTTEP, and other Thai geologists also attended the meeting. Their participation helped to promote the network of CCOP to local geological groups and organization and the work of senior and young geoscientists both internationally and domestically.

Joint Workshop on Capacity Development focusing on Geoparks Development and Evaluation in Thailand and Surrounding Countries.

The workshop was held during 6-8 December 2019 at See Sea Hotel, Satun UNESCO Global Geopark, Satun, Thailand. The workshop was co-hosted by DMR, Satun Global Geopark, Khorat Geopark and Japan Geopark Network. The workshop aimed at sharing knowledge and experience focusing on geopark development and evaluation.

Dr Dhiti Tulyatid, Regional Expert, CCOPTS, represented CCOP in this meeting. **Mr Surachai** Director of Bureau of Geology, DMR, facilitated the meeting. **Mr Sumrit Rieng** Chief Executive Director of Satun Global Geopark, gave a welcoming remark to participants. **Dr Tawsaporn Nuchanong**, former DG, DMR, raised the point on the up-coming re-evaluation of Satun Global Geopark, two years after achieving the Global Geopark status.I. He also reminded the participants about the upcoming APGN Meeting to be held in September 2020 in Satun.

Ms Kana Furusawa Vice-Secretary General of JGN greeted the meeting and introduced the JGN member. **Prof Dr Nakada** President JGN and Vice-coordinator of APGN; **Dr Kazuhiro Nobe**, Head of Oki Island UGGp / Leader of International Collaboration WG of JGN; **Mr Kouichi Ueta**, International Section Manager, San'in Kaigan UGGp; **Mr Kazunori Noguchi**, Staff, Nanki Kumano Geopark; **Mr Tristan Gray**, Staff, Mine Akiyoshidai Karst Plateau Geopark; and **Ms Chikako Tamari**, Staff, Sakurajima Kinkowan Geopark.

The Japanese team shared their experiences. **Kouichi Ueta** from San'in Kaigan UGGp shared his experience on hosting of APGN2015. **Mr Narongrit** gave a presentation about Satun Global Geopark. **Dr Nakada** discussed about the eight points which Satun Geopark needs to improve for the preparation of their re-evaluation next year. The team and other participants had a chance to visit a number of sites related to those eight points mentioned. The team also went to inspect the proposed venue for 2021 APGN meeting in Satun. These sites include: Ban Tha Oi community; Tambon Na Thon, Khao Nui and the economic development of the Panya Batique Community. Overall, the JGN team was satisfied with the latest development and the preparation of the communities in Satun UNESCO Global Geopark. It was suggested that CCOP in cooperation with DMR and JGN organize a workshop on Global Geopark Development in Thailand during early 2021 on the share resource basis.

19th ASOMM, 11-13 December 2019, Bangkok, Thailand

Dr Young Joo Lee, CCOPTS Director and **Ms Marivic Pulvera Uzarraga**, CCOPTS Project Operation/Information Manager attended the 19th ASOMM and associated meetings on 11-13 December 2019 in Pullman Bangkok King Power Hotel, Bangkok, Thailand. **Dr Lee** delivered a presentation at the 19th ASOMM entitled, "Geoscience toward sustainable Earth" including CCOP activities under the mineral sector.

At the meeting, Brunei Darussalam's head of delegation officially announced their intention to become a CCOP Member Country from year 2020 and handed to the CCOPTS Director the official letter of intent.

At the 7th Private Sector Forum on Cooperation in Minerals in ASEAN held in the afternoon of 12th December, **Dr Lee** presented "CCOP's Role promoting Sustainable Mining for better Earth". Discussion was held regarding a planned ASOMM+3 workshop on green mining initiated by Brunei Darussalam and the Philippines in cooperation with KIGAM and CCOP. This workshop is planned to be held between end of July to November 2020 once the funding is confirmed.



Delegates at the 19th ASOMM



Brunei Darussalam Head of Delegation officially announced their intention to become a CCOP Member Country from year 2020

CCOPTS Courtesy Visits and Visitors

2 April. **Ioannis Abatzis**, Chair of CCOP Advisory Group and Representative of Denmark to CCOP paid a courtesy visit at CCOPTS to welcome its new Director, **Dr Young Joo Lee**.

3 April. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Regional Expert **Dr Dhiti Tulyatid** and Project Manager **Marivic Pulvera Uzarraga** paid a courtesy visit to the Director-General of the Department of Mineral Resources, & Permanent Representative of Thailand to CCOP, **Dr Sommai Techawan**.

10 April. CCOPTS Director, **Dr Young Joo LEE** and former Director, **Dr Adichat Surinkum** attended a Signing Ceremony (MoU) between **Dr Wang Meng** of Young Earth Scientists (YES) Network and **Datuk Shahar Effendi bin Abdullah Azizi**, Chairperson, CCOP Steering Committee on YES becoming a member of Cooperating Organization to CCOP at the Malaysian Petroleum Club, Twin Tower, Kuala Lumpur, Malaysia.

22 April. CCOPTS Director, **Dr Young Joo LEE**, Regional Expert, **Dr Dhiti Tulyatid** and Project Operation and Information, **Mrs Marivic Pulvera Uzarraga** paid a courtesy visit to **Dr Nguyen Van Nguyen**, and staff at the Deputy Director General, GDGMV (the General Department of Geology and Minerals of Vietnam), Hanoi, Vietnam.

24 April. CCOPTS Director, **Dr Young Joo LEE**, Regional Expert, **Dr Dhiti Tulyatid**, paid a courtesy visit to **Dr Tran Tan Van**, Director General; **Dr Trinh Hai Son** and staff, the Vietnam Institute of Geoscience and Mineral Resources, Hanoi, Vietnam.

24 April. CCOPTS Director, **Dr Young Joo LEE**, Regional Expert, **Dr Dhiti Tulyatid**, and **Prof Dr Azra N Tutuncu**, UnCon Resource Person from Colorado School of Mines, USA, paid a courtesy visit to **Dr Nguyen Anh Duc**, General Director, and staff, the Vietnam Petroleum Institute, Hanoi, Vietnam.

3 May. CCOPTS Director **Dr Young Joo Lee** paid a courtesy visit to the Embassy of the Republic of Korea in Bangkok and met the Honorable Ambassador **Mr Lee Wook-Heon**.

22 May. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Regional Expert **Dr Dhiti Tulyatid** and Project Manager **Marivic Pulvera Uzarraga** paid a courtesy visit to the Royal Thai Department of Mineral Fuels (DMF), headed by **Director-General Premrutai Vinaiphath**. Together with her are **Dr Phumee Srisuwon**, DMF's Deputy Director-General and Deputy Permanent Representative of Thailand to CCOP; as well as the Thai team members for the CCOP-KIGAM Unconventional Oil and Gas Project.

24 May. **Dr Kyoung-Woong Kim**, Director of the International Environmental Research Institute (IERI) and Professor of the School of Earth Sciences and Environmental Engineering, Gwangju Institute of Science and Technology (GIST), Republic of Korea, visited the CCOPTS and introduced IERI and GIST. IERI was founded in 2001 with the purpose of establishing a research institute for the United Nations University (UNU) at GIST. Since then IERI has been contributing to the improvement of the international environment both domestically and overseas, by educating researchers and supporting technologies in developing countries, as well as R&D to cope with climate change through joint activities on international environmental research.

27 May. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Project Manager **Marivic Pulvera Uzarraga** paid a courtesy visit at the Finland Embassy of Bangkok, and was met by **Mr Heikki Karhu**, Deputy Head of Mission.

28 May, CCOPTS Director, **Dr Young Joo LEE** and Regional Expert, **Dr Dhiti Tulyatid** attended the 10th Anniversary Celebration of Sirindhorn Museum and Technical Seminar on “Four decades of the paleontological research in Asia: Implication for earth evolutions”, Kalasin, Thailand.

30 May. **Dr Oystein Berg**, CCOP Honorary Adviser from Norway visited CCOPTS to congratulate **Dr Young Joo Lee** for having been appointed as the CCOPTS Director. He gave helpful suggestions and recommendations on the way forward for CCOP.

7 June. **Dr Youhei Uchida** of the Geological Survey of Japan (GSJ), Project Leader of the CCOP-GSJ Groundwater Project visited the CCOP Technical Secretariat to discuss about 1) Workshop on the Ground-Source Heat Pump studies, 5 November 2019 in parallel with the 55th CCOP Annual Session, Chiangmai, Thailand; 2) Kick-off Meeting of the CCOP-GSJ Groundwater Project Phase IV; and 3) GW-9 Final Report of the CCOP-GSJ Groundwater Project Phase III. On behalf of the CCOP Member Countries, **Dr Young Joo Lee**, CCOPTS Director expressed thanks to **Dr Youhei Uchida** for the efforts in leading the CCOP-GSJ Groundwater Project and to GSJ for the extension of the project to Phase IV and Japan's strong support and cooperation to CCOP.

14 June. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Regional Expert **Dr Dhiti Tulyatid** and Project Manager **Marivic Pulvera Uzarraga** paid a courtesy visit to the Royal Thai Department of Groundwater Resources (DGR) , and were met by **Ms Jongjit Niranathmateekul**, DGR's Director-General, together with her staff. On behalf of the CCOP Member Countries, CCOPTS Director **Dr Young Joo Lee** conveyed thanks to DG Jongjit for DGR's strong support and cooperation in CCOP's activities on groundwater.

17 June. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Project Manager **Marivic Pulvera Uzarraga** paid a courtesy visit to the Embassy of Germany in Bangkok and was met by the Honorable Ambassador himself, **Mr Georg Schmidt**. **Dr Lee** introduced CCOP to His Excellency, and conveyed thanks to Germany through the Federal Institute for Geosciences and Natural Resources (BGR) for funding several activities for CCOP inr the past years. The Honorable Ambassador offered to connect CCOP to the German Academic Exchange Service (DAAD) Information Center in Bangkok, as well as to the Science Attache assigned to this region who is based in Singapore, for new collaboration opportunities with Germany.

18 June. Director, **Dr Young Joo LEE** paid a courtesy visit to **Atty Wilfredo G. Moncano**, Vice-Chairperson, CCOP Steering Committee, Permanent Representative of Philippines to CCOP, Acting Director, Mines & Geosciences Bureau (MGB), Manila, Philippines.

5 July. As part of the kick-off activity of the JICA-funded Project on Ground Source Heat Pump (GSHP) in Thailand, delegates from Misawa Environmental Technology Co. Ltd. of Japan led by its President **Mr Kazuma Moriyama**, together with **Dr Youhei Uchida** from the Geological Survey of Japan visited the CCOP Technical Secretariat. The project's workplan was discussed in the meeting. A workshop

on GSHP is planned to be held on 2 November 2019, in parallel with CCOP's 55th Annual Session in Chiangmai, Thailand. Tentatively planned in January 2020, is the educational visit at GSHP installation sites and Thermal Response Test (TRT) sites in Japan, for Thailand partners as well as some selected CCOP Member Countries.

7 July. **Dr Young Joo Lee**, Director of CCOPTS, together with **Dr Dhiti Tulyatid**, Regional Expert, paid a courtesy visit to **Mr Rudy Suhendar**, Permanent Representative of Indonesia to CCOP, Head of the Geological Agency, Ministry of Energy and Mineral Resources (MEMR), at his office in Jakarta, Indonesia. **Dr Rudy Suhendar** and his staff, including **Dr Eko Budi Lelono** (Head of Center for Geological Survey); **Andiani** (Head of Groundwater and Environmental Geology); **Kasbani** (Head of Volcanology and Geological Hazard Mitigation); **Iman Sinulingga** (Head of Mineral Resources, Coal and Geothermal); **Ratdomo Purbo** (Secretary of Geological Agency); **Dadan Kusnida** (Head of R&D Agency); and **Setyorini** (Head of LEMIGAS); **Moehamad Awaludin** (Head of Mineral Exploration); and **Dr S.S Rita Susilawati** (Head of Coal Division) welcomed **Dr Young Joo Lee** and **Dr Dhiti Tulyatid**. **Dr Young Joo Lee** gave a presentation on CCOP and expressed his appreciation to Indonesia for the increase of the country's Annual Cash Contribution from USD 50,000 to USD 55,000. He also thanked Indonesia for the hosting of the 2020's CCOP Steering Committee Meeting, which will be held either in Lombok or Jogjakarta. **Dr Lee** encouraged all MCs to set up their CCOP National Committees to work on CCOP related matters. He also would like to see more participation from MCs, CCs and COs.

19 July. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Project Manager **Ms Marivic Pulvera Uzarraga** paid a courtesy visit to the Malaysian Embassy in Bangkok, and met **Ms Suzilah Binti Mohd Sidek**, Deputy Chief of Mission, and **Mr Johan Ikram Ahmad Rusli**, First Secretary. **Dr Lee** introduced CCOP, and informed that Malaysia currently holds the chairmanship of the CCOP Steering Committee. Discussion on possibilities of Malaysia to fund projects on geohazards, groundwater, etc., for the CCOP Member Countries was held. Invitation to the upcoming CCOP Annual Session in Chiangmai was also extended to the Embassy of Malaysia.

23 July. CCOPTS Director, **Dr Young Joo Lee** gave a presentation on Activities of CCOP on Mining & Rehabilitation Sector at the Workshop and Training towards Sustainable Mining Practices among ASEAN+3 Countries and the Inter-government Forum on Mining, Minerals, Metals and Sustainable Development (IGF), hosted by the Royal Thai Department of Primary Industries and Mines (DPIM) at The Palazzo Hotel, Bangkok, Thailand.

5 August. CCOPTS Director, **Dr Young Joo Lee**, Regional Expert, **Dr Dhiti Tulyatid** and Project Operation and Information, **Ms Marivic Pulvera Uzarraga** paid a courtesy visit to the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP), Bangkok, Thailand. They were met by **Ms Armida Salsiah Alisjahbana** ESCAP Executive Secretary, and Mr Stefanos Fotiou, Director of the Environment and Development Division, ESCAP. **Dr Y.J. Lee** informed Ms Amida about his recent position as Director of CCOPTS. He then introduced CCOP and discussed on possible cooperation between CCOP and ESCAP. **Ms Amida** mentioned about ESCAP's recent activities that possibly be related to CCOP's work on topics like environmental, climate change, carbon capture and storage. **Mr Stefanos Fotiou** suggested that one of the topics ESCAP would like to have is about "Coal Mining": How to stop coal mining without sacrificing the economy. Both sides agree that a start could be made by participation and attending to the current events and activities of the two organizations' activities to start the re-bridging between the two organizations and then work out from there.

19 August. As recommended by the Honorable Ambassador of the German Embassy in Bangkok, CCOPTS led by **Dr Young Joo Lee** visited DAAD (German Academic Exchange Service) Information Centre Bangkok. He met **Dr Georg Verweyen**, Director of DAAD Information Centre Bangkok, and **Knut Zuchan**, Counsellor and Head of Science and Technology Department, German Embassy Bangkok.

Dr Verwyen informed the visitors of the many opportunities that DAAD have been offering globally, as well as in CCOP region. These include scholarships in German universities as well as universities in Thailand, provision of German experts and lecturers to universities, internships, etc.

One of DAAD's most attractive scholarship programmes for both the German and the Thai sides is DAAD's support for PhD candidates at German universities, ranging from 4 months to 4 years. The candidate will need an excellent research proposal and a first contact with a potential German supervisor. Especially the option of bi-nationally supervised PhDs can build a solid foundation for future university and research cooperation. DAAD is currently looking for qualified applicants before 15th October 2019. For those interested they can visit <http://daad.or.th/funding>

21 August. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Regional Expert **Dr Dhiti Tulyatid** and Project Manager **Marivic Pulvera Uzarraga** paid a courtesy visit to the Embassy of Canada in Bangkok, and were met by the **Honorable Ambassador Donica Pottie**. Her Excellency informed that Canada's current development fund relevant with geoscience is for geohazard, and climate change (coastal geology, ocean, maritime).

23 August. The ASEAN Federation of Mining Associations (AFMA) led by its President **Dato' Seri Mohd Ajib Anuar** visited the CCOPTS office to brief CCOP on AFMA's various activities and discussed potential joint collaborative programmes with CCOP. **Dato' Seri** was accompanied by AFMA's Secretary General, **Mr Muhamad Nor Mohamad** and AFMA's Secretariat Officer, **Mr Lutfi Hamidee Abd Latif**.

27 August: **Dr Young Joo Lee**, Director of CCOPTS, visited the Ministry of Unification in Republic of Korea. The Director spoke with **Ms Hyeonjeong Lim**, Director of the Development Cooperation Division of the Inter-Korean Exchange & Cooperation Bureau. The Deputy Directors from the same division, **Mr Dong-Ki Han** and **Ms Gowoon Lee**, have also attended. The Ministry of Unification confirmed to support North Korea's participation in the 55th CCOP Annual Session. CCOP is to contact North Korea immediately and directly through the Embassy in Thailand.

On the same day, the Director also visited Seoul National University to participate in the Advanced Marine Policy Conference. He was able to meet **Mr Seong-Hyeok Moon** (Minister of Ministry of Oceans and Fisheries), **Ms Yeon-Seung Lee** (President of Korea Maritime Transportation Safety Authority), and **Mr Tae Young Kim** (President of the Marine Industry Research institute for East sea rim). Possible collaborations with CCOP on Marine Geosciences were discussed.

28 August: The meeting with the National CCS Research Center in Korea Institute of Geoscience and Mineral Resources (KIGAM) & Kongju University was led by **Dr Se Won Chang** and **Dr Young Jae Shin**. High possibility of a new project between CCS and CCOP together with the likelihood to renew the CCS-M project in 2020. **Dr Lee** also made a visit to the Ministry of Science and Technology. **Mr Won Ki Min**, the Deputy Minister of the Ministry, showed strong support to CCOP and Siam-KIGAM Cooperation.

29-31 August: **Dr Young Joo Lee** met with **Mr Bok Chul Kim**, President of KIGAM, and the staff of the International Cooperation Division. Establishment of the National Committee is noteworthy. In terms of the Geosummit Projects, Coastal Geology is covered by China Geological Survey (CGS), Geological Survey of Japan (GSJ) and KIGAM. Urban Geology is under the responsibility of British Geological Survey (BGS), Geological Survey of Finland (GTK), CGS and KIGAM.



CCOPTS Director met with **Dr Bok Chul Kim**, President of KIGAM & staff on International Cooperation

Mr Saro Lee (Director of Geological Platform Division) confirmed to support CCOP through the Geoscience Data Repository (GDR) Project. Additionally, he confirmed on an increase in budget to 100,000USD in 2020. **Mr Saro Lee** mentioned specific interests in Sampling & DB of Non Metallic Minerals (Clay Minerals). Lastly, the Directors agreed on the organization of special trainings of GIS in the early 2020s and continuing with the IS Geo Training. **Mr Se-Joon Kim** (Director of Petroleum and Marine Division) invited CCOP's participation as a partner in the "Shallow Gas" project, a KETEP project starting from 2021. In addition, possible CCOP project on Gas Hydrate with CGS (QIMG) and Petronas, VPI was discussed. **Dr Daegee Huh** (Director of Gas Hydrate Organization) and **Mr Ju Young Lee** (Project Manager of GH Project) brought up the possibility of starting a CCOP project on gas hydrate. **Mr Jinho Kim** (Director of Shipbuilding Organization) confirmed the promotion exhibition of Tamhae 3.

1-3 September: **Professor Gyeong Woong Kim**, Director of International Environmental Research Institute (IERI) promised continuous support for CCOP scholarships. CCOP initiated MOUs with IERI and GIST.

4 September. **Dr Young Joo Lee** visited the Ministry of Trade, Industry & Energy. A close discussion with **Mr Seung Chul Oh** (Director of Resources Security Policy Division) and **Ms Seunghei Jeong** (Team Leader) was held. They requested a higher contribution of CCOP; this includes a 10-year plan on the Oversea Energy and Mineral Development of Korea (2020-2029). During the visit to the National Council for Science & Technology (NST), areas of collaboration with CCOP were examined, including but not limited to North Korea issues.

5 September. **Dr Young Joo Lee** was invited as a VIP guest to participate in the Korea Carbon Forum 2019, held in Pyeong Chang, ROK. Many individual meetings were held and these were concluded with hopes for stronger connections with CCOP.



CCOPTS Director was invited to Korea Carbon Forum 2019

During a meeting with **Mr Moonsoon Choi** (Governor of Gangwon Province) and **Mr Jin Seoub Choi** (Director of Strategic Industry Division), they shared special interests in the Saraburi Province, and a possible collaboration in low carbon society and new southern policy. **Mr Sang Hyun Kim**, President of Korea Research Institute on Climate Change (KRIC) expressed the organization's interests in participating in the 55th CCOP Annual Session. and KRIC desires for collaborative work with CCOP on low carbon technology for climate change. **Dr Kyung-Nam Shin**, Director General of Green Technology Center (GTC), assured continuous and extended support on the CCUS (Carbon Capture Utilization and Storage) activities. **Dr Young Joo Lee** had a meeting with the Green Climate Fund (GCF). Dr Kilaparti Ramakrishna, Head of Strategy & Planning, sought for potential collaboration opportunities with CCOP on climate change issues.

6 September. **Dr Young Joo Lee** visited the Korea International Cooperation Agency (KOICA). Many meaningful discussions were held with **Ms Mikyung Lee** (President of KOICA), **Mr Byeong Eun Kim** (Director of SDG Quality Assurance Team), **Mr Jongjun Won** (Manager of Southeast Asia Department), and **Mr Donghyun Lee** (Chief of Staff). **Dr Young Joo Lee** asked for possible support from KOICA in on-going projects, and KOICA expressed interests with but not limited to the Mekong River issues and the Master Plan for Mineral Development. KOICA suggested Global Training Programs on Mineral and Rehabilitation, and to be conducted in Korea. These programs are opened to possible partnerships with KIGAM and MIRECO. At the Ministry of Foreign Affairs, possible collaboration with the CCOP-SCG-KIGAM CCUS project was discussed with **Mr Yeonchul Yoo** (Ambassador for Climate Change). **Mr Se Joong Kwon** (Director General of International Energy Security Division), **Mr Sheok Hong Shin** (Director), and **Ms Ha Yeon Yang** (Second Secretary) support CCOP, which includes in form of internships.

11 September. CCOPTS Director, **Dr Young Joo Lee**, accompanied by Regional Expert **Dr Dhiti Tulyatid** and Project Manager **Ms Marivic Pulvera Uzarraga** paid a courtesy visit to the Embassy of the Philippines in Bangkok, Thailand. They were met by the Honorable Ambassador herself, Her Excellency **Mary Jo A. Bernardo-Aragon** together with Third Secretary and Vice Consul, **Juan Carlos C. Borromeo**.

13 September. **Dr Young Joo Lee**, Director CCOPTS, **Dr Dhiti Tulyatid**, Regional Expert and **Ms Marivic Pulvera Uzarraga**, Project Manager, CCOPTS paid a courtesy visit to the Royal Danish Embassy in Bangkok, Thailand. They met Ambassador **Uffe Wolffhechel**.

21 September. **Dr Young Joo Lee**, Director CCOPTS, **Dr Dhiti Tulyatid**, Regional Expert, and **Ms Marivic Pulvera Uzarraga**, Project Manager, CCOPTS, visited and attended the meeting with **Dr Nengyou Wu**, Director General, QIMG, and his staff (**Prof Yin Ping**; **Minghua Zhang**; **Yinye Wu**; **Jiayu Yang**; and **Fei Xiao**). **Dr Young Joo Lee** expressed his thanks to the warm hospitality that QIMG welcomed and showed him and his staff the Institute's laboratories. He also informed that several CCOP Member Countries are interested in cooperating with the QIMG. **Dr Nengyou Wu** indicated that QIMG appreciated and supported the activities through CCOP including knowledge sharing, capacity building and data distribution. **Prof Yin Ping** proposed to have three activities: 1. Marine Sand: Cooperation on Marine Sand Survey, Exploration and Environment Impact Assessment; 2. Coastal Erosion: Cooperation on Asia Countries Coastal Erosion Monitoring Under super El Nino Climate Events; and 3. GEO-DE: Global Observation on Delta and Estuary.

6-9 October 2019, **Dr Young Joo Lee** attended the 2019 International Forum on Climate Adaptation (IFOCA) Jeju Island, Republic of Korea.

8 October 2019, **Mr Scott Foster**, Director of sustainable Energy Division, United Nations Economic Commission for Europe (UNECE), Geneva, Switzerland, visited the CCOPTS Office in Bangkok, Thailand.

28-30 November 2019, **Dr Dhiti Tulyatid** attended the 80th Anniversary of **Professor Dr Prinya Nutalaya** Meeting, Chiang Mai, Thailand.

6-9 December 2019, **Dr Dhiti Tulyatid** attended the Joint Workshop on Capacity Development Focusing on Geopark Development and Evaluation, Satun, Thailand.

17 December 2019, **Datuk Shahar Effendi bin Abdulla Azizi**, Chairperson of CCOP Steering Committee, Permanent Representative of Malaysia to CCOP, Director-General of Mineral and Geosciences Department Malaysia accompanied by **Dr Sommai Techawan**, Permanent Representative of Thailand to CCOP, Director-General of the Department of Mineral Resources and **Dr Young Joo Lee**, CCOPTS Director paid courtesy visit to **H.E. Mr Varawut Silpa-archa**, Minister of Natural Resources and Environment. They thanked Thailand for hosting the 55th CCOP Annual Meeting and the 73rd CCOP Steering Committee Meeting between 3-9 November 2019 in Chiang Mai which was successfully completed. **Dr Young Joo Lee**, CCOPTS Director, introduced about CCOP activities with a plan for the year 2020 that focus on the preparation of geological data for community planning in urban geology.

On this occasion, **H.E. Mr Warawut Silpa-archa**, Minister of Natural Resources and Environment has informed that the present mission of the Ministry is to solve environmental problems related to pollution, and is very pleased if the CCOP will support the underground geological mapping and the management of groundwater systems activities in the future.



Chairperson of The CCOP Steering Committee, CCOPTS Director and Permanent Representative of Thailand to CCOP, Director-General of the Department of Mineral Resources paid a courtesy visit to the Minister of Natural Resources and Environment



Courtesy Visits & Visitors



KNOWLEDGE ENHANCEMENT AND SHARING (KES)

Geo-Hazards Prediction and Mitigation

CCOP-JMG-BGS Workshop on Urban Geology, 26 February 2019. Mesmera 1, the Everly Putrajaya, Malaysia.

The Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP) along with the Department of Mineral and Geoscience Malaysia (JMG) and the British Geological Survey (BGS) co-organized the workshop to introduce participants to the concept of urban geology as one of the emerging new disciplines in geoscience.

The objectives of the project include: To introduce participants to the concept of urban geology as a discipline; To provide an opportunity to share experience by examining case studies; & To provide the opportunity to take part in a field excursion to visit certain place in Kuala Lumpur.

The workshop included sessions on data field and laboratory techniques used in an urban environment with a focus on planning an urban geological study. The second day focused on the development of the 3D urban geology models, applied urban ground models (engineering, hydrogeology), with UK case studies and thematic mapping and data delivery.

The Opening chaired by **Datuk Shahar Effendi Abdullah Azizi**, Director General of the Department of Mineral and Geoscience Malaysia, Chairperson of the CCOP Steering Committee and a Permanent Representative of Malaysia to CCOP; **Dr Dhiti Tulyatid**, Regional Expert of CCOP Technical Secretariat Office, presented on behalf of Director of CCOPTS; **Mr Andrew McKenzie**, Head of Delegations for the British Geological Survey; Mr Kamal bin Daril, Deputy Director General (Cooperates and Economic Mineral), Department of Mineral and Geoscience Malaysia; **Mr Muhammad Rosli Muhamad Jaafar**, Under Secretary of Mineral and Geoscience Malaysia Division of Ministry of Water, Land and Natural Resources; **Mr Hisamuddin Termidi**, Chairman of the Organizing Committee, CCOP-JMG-BGS Workshop on Urban Geology.



Dr Dhiti Tulyatid delivered a welcoming speech. **Datuk Shahar Effendi bin Abdullah Azizi**, Director General of JMG, gave an Opening speech of the workshop. **Mr Jontih Enggihon**, Director of JMG Selangor gave a talk on the Keynote Paper titled "Urban geology and its application to development of cities – the Malaysia Perspective".

During the first day, the workshop covered the introduction, desk-based and remote sensing techniques for urban geology. A practical session on “Local challenges and opportunities for future urban development: participants share their experiences. The lectures also covered field techniques for mapping and lab techniques for characterization of urban deposits (soils and rocks) with the practical activity on designing and urban field campaign. In the evening of day one, CCOP hosted the Welcoming Party at the Everly Putrajaya Hotel.

Day two: the resource persons gave a technical talk on Hanoi Urban Geology: constructing geological database and developing smart technology management for underground spatial of Hanoi Urban. The lecture covered the development of 3D urban geology models; introduction to Anthropogenic process and impacts; thematic mapping using urban geology, data, applications and delivery; Urban Ground Models: A case study from the city of Glasgow, Scotland; the application of geology information for urban planning; case studies; Practical activity on: Thematic maps and models; & policy and partners for effective implementation.

On the last day, participants had a chance to join a study visit in KL (Taman Bukit Permai, Jalan Kuari, Batu Caves, and MRT Information Centre).

GSJ International Training Course on Practical Geological Survey Techniques 2019 – Application to Geological Disaster Mitigation

The Geological Survey of Japan (GSJ) conducted the international training course on “Practical Geological Survey Techniques 2019 – Application to Geological Disaster Mitigation”, to be conducted on 4 – 21 June 2019 in Tsukuba, Japan. The course objectives are buildup of practical capability on geological mapping based on field survey and laboratory work; human networking not only among the trainees but also with GSJ researchers; and promotion of collaborative geoscience research activities in the future.

There were 9 participants from the CCOP Member Countries – Cambodia, Indonesia, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Thailand and Vietnam. The course consisted of three sections: 1) Practical geological survey techniques for accretionary geology; 2) Exploration and analysis techniques; and 3) Application to geological disaster mitigation.

CCOP-CGS Seminar on Geohazard Prevention and Mitigation, 22-24 June 2019, Lanzhou, China

The CCOP-CGS Seminar on Geohazard Prevention and Mitigation was organized on 22-24 June 2019 in Lanzhou, China with the theme “Sciences and technology – the solution to the improved response capacity to geohazard”. There were 60 participants at the seminar including experts from 7 CCOP Member and Cooperating countries; China, Malaysia, Mongolia, Thailand, Canada, France and Germany.

At the opening session, **Mr Ke Song**, Deputy Mayor of the People’s Government of Lanzhou Municipality; **Mr Wenkui Zhou**, Deputy Director-General of Gansu Department of Natural Resources; **Ms Marivic Pulvera Uzarraga** on behalf of **Dr Young Joo Lee**, CCOPTS Director delivered the welcoming remarks. **Mr Yan Wang**, Deputy Secretary of party leading group, Vice-President of China Geological Survey officially opened the seminar.

There were 15 presentations on new theory, technology, solution of geohazard prevention and mitigation, successful examples and experiences of geohazard risk reduction, research direction of efficient response for geohazard risk reduction during the two days seminar. Among these numerous famous experts in China introduced the failure mechanisms of the high-speed long-distance landslides, development of theory and technology of geohazard monitoring and early warning, application of fiber optical technology in geohazard monitoring, and geohazard prevention and control at the county level in China.

Discussion on the way forward included opportunities of knowledge dissemination bilateral/national geohazard projects and multi-lateral collaboration opportunities.

All participants went to the Gansu Geological Museum and visited the achievements of geohazard prevention and mitigation in Gansu province. The participants also visited the Fulongping community in Lanzhou, and Huaining county which have remarkable achievements on geohazard mass prevention system construction and comprehensive geohazard treatment respectively.



Group photos of participants at CCOP-CGS Seminar on Geohazard Prevention and Mitigation



Press Release (in Chinese): CCOP-CGS Seminar on Geohazard Prevention and Mitigation

Environmental Geology

Geosite Evaluation in NE of Lao PDR

CCOPTS Director was invited to be a resource person on Geosite Evaluation for LaoPDR geoscientists during 20-24 January. The program started with the discussion on the list of Geosites proposed by Lao PDR considering as potential sites for Lao PDG aspiring geopark. The evaluation team decided to investigate proposed sites in the northeastern part because those linked to the activities on Lao PDR independent. The Team, one CCOPTS and 2 Lao PDR geoscientists, also identified many geological sites related to the tectonic evolution of the area, for example, deep sea marine deposit and thrust faults. More detail correlation study with Northwest of Vietnam and Southern China will be proposed for Transboundary Geoscience Project by Lao PDR this coming 72nd SC Meeting.

CCOP Workshop on the Future of ASM and Local Communities, Monday 4 March 2019, Kanda Ballroom, Novotel Samui Resort Chaweng Beach Kandaburi, Koh Samui, Surat Thani, Thailand.

Artisanal and small-scale mining (ASM) has many dimensions including science, technology, national/local economy, social & community development and human security. However, some important subjects still remain untouched. The workshop was intended to review the progress of CASM-Asia and discuss new technological challenges such as landscape rehabilitation as well as new commercial instruments which enable the local communities to achieve the endogenous development.

A total of 22 participants from Member Countries, Cambodia (1); China (4); Republic of Korea (2); Lao PDR (2); Mongolia (2); Papua New Guinea (1); Thailand (1); and CCOPTS (6) participated in the workshop. Resource persons: **Dr Satoshi Murao**, National Institute of Advanced Industrial Science & Technology, Japan; **Dr Honda Yasuhiro**, Lecturer of Daiichi Institute of Technology, Japan; and **Mr Ruay Limsuwan**, Managing Director, World Gemstone Exploration & Mining Consultant Co., Ltd.

The one-day workshop included the country paper presentations that focus on two themes: how local community can manage the landscape around ASM; and how the ASM subsector can be linked to the social business like “responsible jewellery”. Presentations included those from China, Lao PDR, Mongolia, Papua New Guinea, and Japan. **Dr Satoshi Murao** talked about ASM Asia and the CCOP Capacity Building programme. **Mr Ruay Limsuwan** presented an interesting topic on ASN of gemstones and diamond in SE Asia and Africa.



Group photo of participants at CCOP Workshop on the Future of ASM and Local Communities

IS-Geo Training Course on Geological Mapping and Mineral Exploration

During a series of regular training courses provided by the KIGAM/IS-Geo in collaboration with the CCOP for member countries, the KIGAM/IS-Geo training course on Geological Mapping and Mineral Exploration was held in the International School for Geoscience Resources of KIGAM, Daejeon, Korea, from 30 September to 18 October 2019 with a total of 20 trainees from nine (9) CCOP member countries and 2 African countries.

This course was designed to foster professionals from all over the world in the fields of geological mapping and mineral exploration as well as to enhance the competence of the cooperating countries/organizations with Korea/KIGAM and to meet the high interest regarding “Geological Mapping” and “Mineral Exploration”. This 3-week training course provided participants an interdisciplinary approach to explore the academic knowledge and practical skills on the expertise of Geological mapping or Mineral exploration. The contents of this course comprised a general overview on principles and genetic concepts of geological mapping technique and geophysical methods into mineral exploration. Total 14 of Korean/Foreign instructors were involved in the course. The course also included a briefing session on the National Geological surveys on Oct. 18th. Participants presented on their own countries’ current geological mapping and/or mineral exploration status. Each of the participants delivered in-depth SWOT and Gap analysis. They also suggested solutions and estimated expected outcomes in terms of economy, technology and society and environment. They actively shared their own opinions one another. They worked on future roadmap for implementing the CCOP member countries and Africa Mining Vision in the future.

On the first three days of the first week, **Dr Chwae** gave lectures on how to utilize mapping tech. Trainees were able to develop map-reading ability based on the satellite images provided by Google Earth. A two-day field excursion was provided on the Friday and Saturday of the first week of the training course from 4 - 5 October. Participants headed for Seosan which is located in the central-western coastal part of Korea. Seosan is known for its geology and trainees were allowed to conduct the research on geologic structures and receive training in how to interpret deformation history and recognize geological boundaries on the outcrop. Through this field practice, they learned how to take structural measurements using a compass clinometer and apply what they learned in the class on the field. Therefore, they were able to learn how to utilize and apply geometrical techniques in geological map making under the guidance of the international expert.

On 12 October, participants spent time appreciating the Korean landscape by visiting Hanok village in Jeonju and participating in Jeonju Bibimbap Festival. This culture trip spiced up the training, providing integrated and meaningful knowledge of Korean history and culture.

The training course successfully delivered the intended goals and benefited all the attended participants. It has raised the level of skills of geologists in CCOP member countries and Africa working in the field of geological mapping in order to capture high-quality data for geological map production. In addition, this cooperation could be a foundation for sharing the enhanced use of geological information to manage long-term productive outcomes in CCOP member countries and Africa and Korea. The international network of mineral resources should be maintained and developed for further collaborative activities. Advanced courses regarding hands-on activity are recommended for consideration of improving future plans.



Water Resources Integrated Management

CCOP-KIGAM-DGR Workshop on Transboundary Aquifer Monitoring and Management in Mekong Basin – Efforts for Climate Resilient Groundwater Management and Restoration, 8-9 July 2019, Chatrium Hotel Riverside, Bangkok Thailand.



Dr Kriangsak Pirarai, Director of the Groundwater Resource Information Center, Department of Groundwater Resources, and **Dr Yongcheol Kim**, Head / Principal Researcher, Groundwater Research Center, Geological Environment Division, KIGAM, delivered a welcome address. Both looked forward to closed cooperation on Groundwater development in the Greater Mekong Subregion. **Dr Young Joo Lee**, Director of CCOPTS delivered an opening address. All participants had a group photo taken and introduced themselves in the meeting.

Dr Dhiti Tulyatid, Regional Expert, CCOPTS, gave a presentation on “CCOP’s Roles in Promoting Groundwater and other related geoscience activities in East and Southeast Asia.

Dr Eunhee Lee gave a talk about the CCOP-KIGAM Groundwater Project. She presented some results from Cambodia and Lao PDR on the monitoring wells located next to the Mekong River. She informed the meeting on the objectives of the workshop are to promote and sharing of information and best practices among GMS on transboundary aquifer management. **Dr Yongcheol Kim** gave a presentation on “Managed Aquifer Recharge (MAR) for groundwater restoration in S Korea”. In his opinion, for the GMS, the area needs a lot of recharge water to increase the groundwater level, e.g., sources: river water, reclaimed water to inject (need to be treated before injection), and rain water; Methods: rainwater harvesting, borehole injection ASR. **Dr Kriengsak Srisuk**, gave a presentation on the potential impacts of climate change on groundwater resources and salinity distribution in central Huai Luang Basin, Udon Thani, NE Thailand.

Dr Kong Sitha presented a Cambodia country report. Cambodia has some As, Mn & Fe contaminations in groundwater. There was also a drawdown making withdrawal of groundwater become more difficult. **Dr Wu Aimin** gave a presentation on Transboundary Aquifer Research in Lancang-Mekong Basin and over-exploited Aquifer Management in North China Plain. **Mr Ounakone Xayviliya** gave a country report for Lao PDR He also presented the well monitoring results achieved form 5 wells. **Ms Phuengchat Chantawongso** gave a Thailand country report on “Transboundary

Aquifer Monitoring and Management in Mekong Basin – Effort for Climate Resilient Groundwater Management and Restoration of Thailand”. **Mr Hoang Van Hoan** gave a talk on “Groundwater resources and impact assessment of climate change to the groundwater resources in the Mekong River Delta, Vietnam”.

After the country report, there was a discussion on way forward. **Dr Yongcheol Kim** led the discussion. He asked the participants what they want. He mentioned that all presentations were more or less concerning domestic water supply. **Dr Kriengsak Srisuk** suggested that all countries should specify or select working areas that all could linked, thus a clear objective can be determined. The meeting was aware of the opportunity for exchange of technology and experiences and it was suggested that a clear topic should be defined for working together, i.e., saline soil in Thailand & Lao and that the same national coordinators should be involved throughout the project. It is also encouraged that participating countries share their groundwater data in order to have better understanding of transboundary aquifer systems and areas most at risk. This should be carried out in small selected areas from the outset (NB. KIGAM cannot support a countrywide work). **Dr Wu** mentioned that China could help organize a workshop within China or the Chinese experts could be invited as resource persons to the workshop held e.g. in Cambodia or other countries. KIGAM would like to focus on TBA and could offer a workshop with participants from Thailand, Lao, Cambodia & Vietnam. Most importantly, the project should initially focus on key area e.g., the triangle area .

On 9 July 2019, all participants had a chance to visit the Royal Initiative Project, “Chang Hua Man” in Phetchaburi Province.

CCOP-KIGAM Consultative/Expert Meeting for Groundwater Sustainability Prediction in TBA system of GMS

Dr Dhiti Tulyatid, Regional Expert, and **Ms Marivic Pulvera Uzarraga**, Programme Manager, CCOPTS, represented CCOP in this meeting. The meeting was also attended by **Dr May Raksmeay**, Senior Lecturer, Universiti Teknologi MARA (UiTM), Cambodia; **Dr Hoang Van Hoan**, Senior Hydrogeologist, National Center for Water Resources Planning and Investigation (NAWAPI), Vietnam; **Ms Pham Thi Thuong**, Manager of Surface Water Investigation, NAWAPI, Vietnam; **Dr Yongcheol Kim**, Leader, Groundwater Research Center, KIGAM; **Dr Eunhee Lee**, Senior Researcher, Groundwater Research Center, KIGAM; and **Dr Dongkyu Park**, Senior Researcher, Groundwater Research Center, KIGAM.

Dr Eunhee Lee welcomed and opened the meeting and followed with an introductory presentation on project activity and suggestions for future collaboration. **Dr May Raksmeay** then presented an Overview of groundwater sustainability analysis modeling work of Cambodia and **Dr Hoang Van Hoan** gave a presentation on the groundwater database of Vietnam and an overview of groundwater sustainability analysis modeling work.

The group discussed on the current situation and possible ways forward and the establishment of the Action Plan for the project. The group based their discussion around a list of “required data for hydrogeological data harmonization in Mekong Delta for sustainable transboundary groundwater resources development”.

The meeting noted that:

1. There are still more data needed on the Cambodia side, most of the data from Vietnam are OK. **Dr Raksmeay** needs to cooperate with **Dr Kong Sita** for further data collection. If needed, KIGAM can support some funding for getting hold to data. **Dr Raksmeay** also indicated that the Ministry of Rural Development Cambodia may have related data.
2. The meeting also found that we need data over the area located to the east side of the Mekong River in Cambodia, as well as the area extended into Vietnam.

3. The group agreed to share the data. The summary report of Cambodia and Vietnam will be done by the end of October and **Dr Eunhee Lee** will summarize the meeting report.
4. **Dr Eunhee Lee** also indicated that the two countries find candidates to apply for a Master Degree candidate to work on the project with **Dr Eunhee Lee**.
5. CCOPTS will facilitate the communication among the related parties and other organization for further cooperation, including the Mekong River Commission.
6. Way Forward: the project will be continued into 2020 – 2022. The Group may work on communication among related people during the CCOP Annual Session in Chiang Mai, early November 2019. **Dr Eunhee Lee** has planned to visit the MRC early 2020.



CCOP-KIGAM Consultative/Expert participants visit the KIGAM's Geological Museum and the Groundwater Laboratory Facility.

CCOP-DMR-MISAWA-GSJ Workshop for Application of Groundwater Heat Source

The CCOP-DMR-MISAWA-GSJ Workshop for Application of Groundwater Heat Source is a side meeting during the 55th CCOP Annual Session in Chiangmai, Thailand. This took place on 5 November 2019.

The first presentation was from **Dr Youhei Uchida**, about the CCOP-GSJ Groundwater & GSHP Project. During the Q&A, a delegate from UK questioned the presenter's understanding of the geological model. He added on that maybe the presented model is too simple, as rivers will have migrated through time and a good geological model is necessary, especially if the ground source heat is to be licensed. **Uchida** answered that he is very well aware of this point. He referred to the Department of Mineral Resources in Thailand holding much more of a specific hydrological data. To a question asking about the possibility of private sectors' revenue out of this, **Uchida** mentioned that this model is only a hypothesis and a test. As it is not at a commercial state, the whole process is costly because all equipment are imported from Japan. However, if supplies can be provided within Thailand, cost reduction can be expected within 10 years.

The second presentation was about the Experimental Investigation of Ground Source Heat Pump System in Thailand, presented by **Sorranat Ratchawang**. The following presenter was **Mr Tran Trong Thang**, talking about the Initial Assessment of Potential for Ground Source Heat Pump Installation in Red River Delta in Vietnam. No further questions were asked for these presentations.

Thermal Response Test in Thailand was presented by **Hikari Fujii**. A delegate from Japan asked the presenter to elaborate more about the economic point of view. He added whether it is always necessary to conduct a measurement before the pump construction because most of as most of the GHP have their own TRT system, but it is overly expensive. Fujii responded that the test should take place when there are at least 10 wells. He added on that for an individual household, only 1 or at most 2 GHP exists.

The fifth presentation dealt with the Environmental and Economical Aspect of GSHP in Thailand by **Yutaro Shimada**. A delegate of Thailand questioned the value of the rated cooling COP being 4.5 and whether this number is based on experiment. Shimada answered that the actual measurement is much lower than the value. Both results of GSHP and ASHP turned out to be very high. A delegation of UK asked a question about the 50-year lifespan viable. The presenter replied that he will consider this comment for his future work.

The last presentation by **Masato Tanaka** outlined the JICA Project for Cooling System using Groundwater Heat Source. A delegate of Thailand questioned if he ever thought about the dual system of cooling and heating. For example, if one keeps using the cooling mode, the heat might accumulate in the ground. Injecting the heat into the ground, over a long period of time, might decrease the efficiency of cooling. **Tanaka** replied by giving the case of Japan, where there is a system in Japan holding only cooling mode. He added that there is no trouble in running the system. However, he also did mention that response test and calculation be very important.



Participants of CCOP-DMR-MISAWA-GSJ Workshop for Application of Groundwater Heat Source

Energy and Mineral Resources Sustainable Development

KIGAM/IS-Geo Regular Training Course on “Oil and Gas Development, Groundwater and Geologic Hazard Assessment”, 8 – 19 April 2019, IS-Geo of KIGAM, Daejeon, Republic of Korea

Under the series of regular training courses provided by KIGAM/IS-Geo in collaboration with CCOP for Member Countries, the KIGAM/IS-Geo training course on “Oil and Gas Development, Groundwater and Geologic Hazard Assessment” was conducted from 8 to 19 April 2019 in the International School for Geoscience Resources of KIGAM, Daejeon, Korea, with total 19 participants from CCOP Member Countries, including 1 participant from CCOPTS.

Aiming to foster professionals from all over the world in the fields of Oil and Gas Development, Groundwater and Geologic Hazard Assessment as well as to enhance the capabilities of the cooperating countries/organizations with Korea/KIGAM, this 2-weeks training course provided participants Oil and Gas Development Technology, Groundwater and Geologic Hazard Assessment includes Gas Hydrate/Lab Tour, lab tour to research facilities in groundwater research center and Field Excursion to Gyeongju & Pohang. The contents of this course comprised of 2 modules: 1) Oil & Gas Development Technology 2) Groundwater & Geologic Hazard Assessment. On the last day of Module 2, briefing with action plan workshop was carried out. Participants gave presentation of their own action plans was conducted on 19 April 2019.

During the entire course schedule, Korean Language & Cultural class was held in the afternoon for an hour, in which all the trainees attended and learned how to read and write Korean language, play Korean traditional game and sing a traditional Korean song.

In overall evaluation, the training course has been successfully organized. It reached the targets and benefited all the attended participants. It would be a good base for future cooperation possibilities among CCOP Member Countries and KIGAM/IS-Geo. The network of Oil and Gas Development, Groundwater and Geologic Hazard Assessment should be maintained and developed for further collaborative activities within the region. Advanced courses regarding contents, activities such as field survey and case study & discussion for the network are recommended for consideration of future plans.



Oil & Gas Development, Groundwater and Geologic Hazard Assessment Course

CCOP – KIGAM Unconventional Oil and Gas Resources Project Phase II: Assessment of Shale Energy resources in Asia (UnCon Project Phase II) National Coordinators Meeting & Workshop (UnCon13)

The UnCon13 was conducted at the VPI Tower, Hanoi, Vietnam, on 23-25 April 2019. Twenty-seven participants from twelve 12 CCOP member countries, represented by Cambodia, China, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Mongolia, Myanmar, Papua New Guinea, Thailand, Vietnam, and CCOPTS staff attended the meeting. At the Opening Ceremony, **Dr Young Joo Lee**, Director of CCOPTS, delivered the welcome remark, along with other two VIPs including **Dr Se-Joon Kim**, Director of the Petroleum Division, KIGAM; and **Dr Nguyen Hong Minh**, Deputy Director of Vietnam Petroleum Institute (VPI). **Dr Quach Duc Tin**, Director of the Department of International Cooperation, General Department of Geology and Minerals of Vietnam, on behalf of the Permanent Representative of Vietnam to CCOP, delivered the Opening Remark.

Dr Byeong-Kook Son of KIGAM presented his talk on the Introduction and background to the Meeting/Workshop. **Mr Tin Myint Aung** (Myanmar) asked about the availability of the seismic data and **Prof Dr Azra N. Tutuncu** also commented about how the work in the US were done through the small area that then expanded to cover the bigger area or the whole basin.

Mr Nguyen Quang Tuan, Chief of Petroleum Geology, EPC-VPI, gave a talk on the Depositional Environment and characteristics of shales in the Anchau area. He indicated that the potential target for UnCon HC include D1, L Dev Shale; T1 Lang Son Fm & T3 Van Lang Fm. The basin has a complex development history. The work covered geological sampling and analyses. Methodology: 3D Geo Model; Thermal & Maturity Model; source rock model and gas shale properties; & Generation and expulsion model. With the outcome: regional gas shale remaining OGIP volumes per area; and thermal and maturity evolution of the basin. The paleo-environmental study included: regional data; outcrop data and well data. These data are analyzed to give gross depositional map of interested intervals.

Mr Do Manh Toan, Chief of Geochemistry, EPC-VPI, gave a talk on “Potential of CBM and shale gas in Hanoi trough in the North of Vietnam”. Oligocene unit is the shale gas potential. The Miocene formation is the CBM potential. The unconventional target within the (Oligocene) Dinh Cao – Phu Tien Fm Paleogene with kerogene type III, 20-110 m thick & 0.5-1.6 TOC from W to E. the majority of areas are in late maturity window with peaks of over maturity in the deepest depocenters (>3400-3500m).

Prof. Dr Azra N. Tutuncu, Colorado School of Mines, USA gave a talk on “Unconventional Oil and Gas Reservoir Developments in the US”.

Each country representative presented the updates on the shale volumes and gas/oil amounts that were already calculated and estimated last year.

The meeting agreed to revise the submitted written reports, describing in more detail the process of calculation and assessment. It was recommended to refer to BGS's reports to for an enhanced written country report. It was noted that UnCon Project activities are the initial steps for the Asian Unconventional Resources Assessment, and, therefore, the estimated values have a lot of "uncertainty." The uncertainty can be compensated not only by detailed descriptions on how respective parameters are defined but also by Monte Carlo simulation. As a result, the uncertainty needs to be described in the written report in detail; thereby, justifying the estimates and giving meaning to UnCon project.



Participants of UnCon13

CCOP – KIGAM Unconventional Oil and Gas Resources Project: Assessment of Shale Energy Resources in Asia (UnCon Project Phase II) National Coordinators Meeting and Workshop (UnCon 14), 16-18 September 2019, Ulaanbaatar, Mongolia

The CCOP-KIGAM project for the shale gas energy assessment (UnCon Project Phase II) was launched at UnCon 10 in 2018 in Bangkok, Thailand, followed by UnCon 11 in Chongqing, China; UnCon 12 in Kota Kinabalu, Malaysia; and UnCon 13 in Hanoi, Vietnam. The objective of the meeting is to make updates on the shale volumes and gas/oil amounts that have been calculated and estimated since last year.

Dr Young Joo Lee, Director, CCOPTS and **Dr Hyun Suk Lee**, Head of Oil and Gas Research Center, KIGAM, welcomed all participants to the meeting. **Mr Kherlen Kh.**, PR of Mongolia to CCOP, Chairman, Mineral Resources and Petroleum Authority of Mongolia (MRPAM) delivered an Opening Remark. At the end of the session, all participants attended a group photograph.

Dr Byeong-Kook Son, KIGAM, gave a talk on the introduction and background of the meeting. **Mr Munkhbileg**, N., Head of Mineral Resources Information Technology Center, MRPAM, gave an updated information on the Geological Survey and mineral resources of Mongolia. **Dr Jargalan**, S., Mongolian University of Science and Technology, presented on "Rare Earth Minerals (REE) Mineralization and Metallogenic Characteristics, Mongolia. Certain studies have been done but the development of the REE mining is still underway. **Mr Lkhgva-Ochir S.**, Mining Operations Manager, Energy Resources LLC,

talked about “Coal Deposit and Distribution in Mongolia”. **Mr Tuvshinjargal, A.**, Officer, Geology and Exploration Division, MRPAM, presented on “Oil Shale Exploration Activities of Mongolia”. **Dr Buyan-Aravjikh, D.**, Chief Geologist of Petromatad, LLC, gave a presentation on “Petroleum Geology of Mongolia: Short Summary of source rock quality”. **Dr Sungil Lee**, Senior Researcher, Oil and Gas Research Center, Petroleum & Marine Research Division, KIGAM gave a presentation

Coordinators present their country report to the meeting. **Dr Kook** gave a summary of the meeting and proposed the future. The meeting agreed to have final report submitted to CCOPTS by 10 October 2019.



Participants of UnCon 14



CCOPTS and Head of Oil and Gas Research Center, KIGAM, and PR of Mongolia to CCOP, Chairman, Mineral Resources and Petroleum Authority of Mongolia (MRPAM)



While in Ulaanbaatar, Mongolia for UnCon14, CCOPTS Director **Dr Young Joo Lee** was interviewed live on Bloomberg TV Mongolia

Workshop on the Application of UNFC for Resource Classification and Management

PETRAD, together with the UNECE, CCOP, the PTT Exploration and Production Public Company Limited (PTTEP), and the Siam Cement Group Company Limited (SCG) co-organize this workshop through this course on resource management and the application of UNFC. UNFC has direct justification links to Sustainable Development Goal No. 7 on access to clean and affordable energy. UNFC is used in many countries for effective management of national resource endowments and socio-economically efficient development of the energy resource contributing to sustainable development. It allows a direct comparison of projects that extract primary energy fuels, such as oil, gas, coal and uranium with renewable energy projects.

At the workshop, there were 29 participants from CCOP Member and Cooperating Countries / Organizations: Australia (1); Cambodia (3); China (1); Malaysia (3); Mongolia (4); Thailand (17: DMR-3, DGR-2, DPIM-1, PSU-1, DED-2, SCG-2, PTTEP-3, EGAT-2, & KKU-1); and CCOPTS (4). Resource Persons: **Mr Per Blystad & Mr Sigurd Heiberg**.

Opening: **Dr Dhiti Tulyatid** and **Ms Thanitnan Invakul**, Assistant, and **Nicha**, Secretary, CCOPTS facilitated the organizing as well as participated in the workshop. **Dr Dhiti** facilitated the opening session, which started with the welcome address video presentation of **Mr Scott Foster**, Director of the Sustainable Energy Division, United Nations Economic Commission for Europe (UNECE).

Dr Kasana Soonthornsaratul, Vice-president, Subsurface Technical Review Department, PTTEP, kindly delivered the Welcome Address; **Dr Young Joo Lee**, Director of CCOP Technical Secretariat, delivered the Opening Address.

During the two-day workshop, **Mr Per Blystad** and **Mr Sigurd Heiberg** introduced the UNFC and its application and relationship with other classifications. UNFC can be applied to various types of resources including petroleum, solid mineral, renewable energy, geothermal energy, CCS, anthropogenic resources, groundwater, etc.

At the end of the workshop, successful participants received the certificate of participation.



DATA AND INFORMATION

CCOP-GSJ-DGR Groundwater Phase III Final Meeting: 13-15 February 2019, Grand View Hotel, Chiang Mai, Thailand.

The meeting was attended by 19 participants from Member Countries (Cambodia(1); China (1); Indonesia (1); Japan (2+1 observer); Korea (2); Lao PDR (3); Malaysia (1); Myanmar (1); Mongolia (1); Philippines (1); Thailand (2+1observer); and Vietnam (1)) and CCOPTS staff. The Opening session co-chaired by **Dr Adichat Surinkum**, Director of CCOPTS and **Dr Youhei Uchida**, CCOP-GSJ Groundwater Project Leader. **Dr Adichat Surinkum**, Director of CCOPTS, delivered a welcoming remark. **Dr Youhei Uchida** delivered a welcoming address stressing how important the groundwater project is to this region and expressed his appreciation to CCOP for the support on this GW project.

The participants updated the progress of the project on Groundwater Monitoring and related Database system of their countries. **Dr Uchida** informed the meeting that he has revised the Groundwater 8 Project Proposal. The sub-group meeting on Day 2 could be summarized that several countries need to share experience among CCOP MCs and request the on-site trainings for groundwater monitoring and analysis, as well as how to upload the data. It is also suggested that cooperation needed to carry out through the national compiler. However, some data need to be checked and clarified and will need to communicate with GSJ expert. On Day 3, the participants had a chance to visit Mae Moh Mine in Lampang Province to learn more on groundwater management and mine pit drainage.



Group photos of Participants in CCOP-GSJ-DGR Groundwater Phase III Final Meeting

Joint workshop of CCOP IGDP-II project and China-ASEAN Marine Geoscience Aoshan Forum

Jointly held with the China-ASEAN Marine Geoscience Aoshan Forum, the 3rd Workshop of the CCOP/ASEAN Integrated Geoscience Data Processing and Geophysical Compilation (IGDP-II) Program was held on 19-21 July 2019, Qingdao, China. This was funded by China Geological Survey, and hosted by the Qingdao Institute of Marine Geology at the Laboratory for Marine Mineral Resources, Pilot National Laboratory for Marine Science and Technology (Qingdao). There were 25 participants from Cambodia, China, Indonesia, Japan, Republic of Korea, Malaysia, Myanmar, Mongolia, Papua New Guinea, Thailand, Vietnam and from CCOPTS.

Country reports on national geophysical works, geoscience database and the use of RGIS-IGDP software, were presented. Chinese experts from the Development and Research Center (DRC), CGS, led the training on the usage of RGIS-IGDP software on, 1) Introduction of geophysical data processing methods and RGIS-IGDP software, 2) IGDP Databases with RGIS, 3) Gravity/Magnetic joint inversion, 4) 2.5D Gravity/Magnetic joint inversion, and 5) 3D Gravity/Magnetic inversion and visualization.

Mr Ren Wei from DRC, CGS delivered a presentation on the use of AI technology in geological feature recognition. **Dr Takemi Ishihara**, GSJ, presented a status report of the CCOP magnetic compilation under the MAMEA Project in close cooperation with the IGDP project. Required data are digital flight line data (total intensity or anomaly data with sampling interval of 1km or smaller); digital grid data (Grid interval of 2'x2' (3km) or smaller; and analog data if no digital data available (Contour maps with flight lines at scales of 1:1,000,000 or larger. **Dr Qiao Jihua**, DRC/CGS updated the status of CCOP gravity data compilation. More gravity and magnetic data are required to complete the compilation, which are summarized in Table 1, with detailed information at presentations of **Dr Ishihara** and **Dr Qiao**.

CCOPTS will issue an official letter to the Permanent Representative of Member Countries right after this workshop, to request the required data needed in completing the compilation of magnetic and gravity data of CCOP. The Meeting agreed that data required will be submitted to CCOPTS within year 2019, with consideration to Mongolia who is a newcomer in this project. IGDP Project Phase II will be concluded by year 2019 according to the Project's workplan. However, the compilation of the magnetic and gravity map will still have to be completed. **Dr Zhang Minghua**, IGDP Project Leader proposes setting up a training base/center at CCOPTS starting 2020 for the following tasks:

1. Continue and complete the compilation of CCOP Magnetic/Gravity Maps. Updating CCOP maps from 2002 to 2020.
2. Advanced Technology Training on
 - a. Digital Field Mapping techniques for CCOP Member Countries from CGS in cooperation with Thailand's Department of Mineral Resources (DMR).
 - b. RGIS-IGDP software use and application in practice with DMR, Thailand.
 - c. Artificial Intelligence (AI) cooperation
 - d. Online RGIS-IGDP
 - e. High technologies from CCOP Member Countries (KIGAM, GSJ, etc.)
 - f. IUGS-CGI/OGC standards for data and information sharing



Joint workshop of CCOP IGDP-II project and China-ASEAN Marine Geoscience Aoshan Forum

Kick-off Meeting of the CCOP-KIGAM Project on Geological Data Repository System

The GDR Project Kick-off Meeting/Meeting was held on 29-31 October 2019, at Holiday Inn Sukhumvit Hotel, Bangkok, Thailand with the objectives of knowing the data management systems being used in CCOP Member Countries in managing and storing geoscientific samples and find commonalities for the establishment of a web-accessible CCOP geoscience data repository management system. Twenty-three (23) participants from the member countries (Cambodia, China, Japan, Republic of Korea, Lao PDR, Malaysia, Myanmar, Mongolia, Papua New Guinea, Philippines, Thailand and Vietnam) including the staff of the CCOP Technical Secretariat (CCOPTS) attended the meeting.

Dr Saro Lee, the GDR Project Leader and Director, Geoscience Platform Research Division, Geoscience Data Center, Korea Institute of Geoscience and Mineral Resources (KIGAM) welcomed all the participants to the workshop. **Dr Young Joo Lee**, CCOPTS Director delivered the opening remarks.

Dr Saro Lee presented the introduction of the GDR Project, as well as the meeting/workshop agenda. **Dr Jong Gyu Han** introduced the GDR System Prototype which is temporarily accessible from this link, <http://49.247.211.54:58080/index.do>.



Country reports on the existing system (electronic/manual) for managing samples in the respective organization were presented, following the questionnaire circulated before the meeting. Among the countries represented at the meeting, only Japan, Mongolia, Philippines' Department of Energy and Thailand have existing geoscience sample data management system.

Dr Jong Gyu Han led the hands-on exercises using the CCOP GDR System prototype for all the participants to beta test the system. There were discussions by group for the improvement of the system. Recommendations presented by each group were noted for consideration of the finalization of the GDR. The following were agreed during the discussion.

- Validation – 1 validator for each organization/country
- IGSN – KIGAM will check if can issue for each country. Membership fee – USD100/year
- Next workshop – guideline, standard and manual will be provided
- What type of rock sample we should start? To be informed before the next workshop.
- First Workshop will be on 21-23 April 2020 in Phuket, Thailand. All the GDR working group

members will be required to bring data to upload the system, as well as a typical sample from their country to display at the CCOP Technical Secretariat office in Bangkok, Thailand.

- Future workshop venues: Danang (Vietnam), Johu Baru (Malaysia), Subic (Philippines)

All the participants had the opportunity to visit the Royal Thai Department of Mineral Resources (DMR) Reference Geologic Samples Collection Warehouse in Rayong Province on the last day of the meeting.

GSJ GW Project Phase IV Kick-off Meeting

The CCOP-GSJ-GAI Groundwater Project Phase IV Meeting was held on 2-4 December 2019 in Bali, Indonesia. It was attended by 28 participants from Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Papua New Guinea, Thailand, Vietnam and the CCOP Technical Secretariat (CCOPTS).

The Opening Ceremony started with the Welcome Remarks delivered by **Dr Young Joo Lee**, CCOPTS Director, and **Dr Youhei Uchida**, CCOP-GSJ Groundwater Project Leader, Geological Survey of Japan (GSJ), AIST. The meeting was officially opened by **Mr Rudy Suhendar**, Head of the Geological Agency of Indonesia and Permanent Representative of Indonesia to CCOP.

Dr Youhei Uchida presented the outcome of the CCOP-GSJ Groundwater Project Phase III which included publication of technical report (GW-9) consisting the following:

1. Report titled “Hydrogeological map –Present status and future plan-”
2. Explanation documents for the country’s capital city or representative area in DB1& DB2
3. Public policy for Groundwater observation system in Public Policy Group

GW-9 Report was distributed at the 55th CCOP Annual Session in November 2019 in Chiangmai, Thailand as well as at this kick-off meeting of the phase IV. The electronic version of GW-9 will be made available for download at CCOP and GSJ websites. Under the same phase, a sub-project on “Development of Renewable Energy for Ground-Source Heat Pump System in CCOP Regions” was also carried out. During this phase three GSHP systems were installed in Thailand, one in Vietnam and a heat exchanger in Indonesia.

Dr Uchida also presented the plans for the CCOP-GSJ Groundwater Project Phase IV as follows.

- Database advancement. Data upload by each MCs.
- Addition of data related to pollution problems in MCs of Public Policy Group
- Field survey and discussion on solving groundwater problems in MCs of PP Group. What kind of GW problems exists should be prepared before the field survey and discussion.
- To continue Ground Source Heat Pump sub-Project

To date the following data are available from the GSi Groundwater Portal, <https://ccop-gsi.org/gsi/groundwater/index.php>

Country	No. of GW Wells	Location
China	0	
Indonesia	292	Java Island, Sumatra Island
Japan	519	Kanto, Yamagata, Ishikari, Kumamoto, Nobi Plain, Sendai
Korea, RO	221	Whole Korea
Malaysia	21	Langat Basin, Sabah (<i>Coordinates to be corrected</i>)
Philippines	1,256	Luzon Island, Bohol, Camarines Norte, Pampanga, Pangasinan, Quezon, Zambales
Thailand	2,027	Chaophraya, Khonkean Province
Vietnam	147	Thanh Hoa, Ha Tinh, Quang Nam, Quang Ngai Provinces, Red River Delta
Total	4,483	

Country reports on the “Issues and improvement ideas for the Phase III Groundwater Database” (DB1& DB2) and “Present hydrogeological data and problem for making Groundwater Database” (Public Policy Group) were presented. It was agreed that Dr Gaurav Shrestha from GSJ will be the Project Leader for the CCOP-GSJ Groundwater Phase IV. **Dr Shrestha** led the discussion on the data compilation planned for Phase IV, and the following were agreed.

- There will only be 2 groups for Phase IV,
 1. DB1 (China, Indonesia, Japan, Korea, Malaysia, Philippines, Thailand and Vietnam)
 2. DB2 (Cambodia, Lao PDR, Mongolia, Myanmar and Papua New Guinea).
- Additional data items to be collected which could be useful for studies on land subsidence caused by over abstraction of groundwater and groundwater pollution problems
 1. Survey date
 2. GW level (static)
 3. GW level (dynamic)
 4. Aquifer name (stratigraphy)
 5. Aquifer type (lithology)
 6. Well-type (monitoring or production)
 7. Pumping rate (production well only)
 8. Number of screens (production well only)
 9. Screen depth (from/topmost)
 10. Screen depth (to/lowest)
 11. Land subsidence in the area
 12. Region/province (well location)
 13. Total dissolved solid
 14. Total arsenic
 15. Ecoli
 16. Total coliforms
- Well-ID should start with the country’s 2-letters code
- The next meeting is targeted to be in Naypyitaw, Myanmar in early 2021. Two alternative dates were identified as follows.
- 25-28 January 2021
- 22-25 February 2021

From next meeting, an additional day will be allocated for technical field survey in the DB2 countries for discussion on solving the country’s related groundwater problems
Deliverables until the next meeting in Naypyitaw were agreed as follows.

- Update DB1 countries data to include the additional data items and bring the updated excel file in the next meeting in Naypyitaw for upload to the GSi Groundwater Portal, <https://ccop-gsi.org/gsi/groundwater/index.php> with the guidance of the GSi Project Coordinator who will be invited to the next meeting.
- Vietnam will provide additional groundwater data from South Vietnam in the next meeting.
- China will discuss with China Geological Survey (CGS) which published data on groundwater that can be shared to this project and communicate with the CCOP Technical Secretariat for update before the next meeting in Naypyitaw.
- DB2 countries will collect groundwater data on their existing monitoring wells and bring the excel file to the next meeting in Naypyitaw for upload to the GSi GW Portal.
- Mongolia will discuss with Mineral Resources and Petroleum Authority of Mongolia (MRPAM) on the groundwater data that they can provide, and will feedback to the CCOPTS before the next meeting in Naypyitaw.
- All countries will bring respective country hydrogeological map (if available) in shapefile format to Naypyitaw for upload to the GSi Groundwater Portal.
- Submission deadline of full paper of GW-10 country reports is end of February 2020.
- **Dr Mawiti Infantri Yekti**, lecturer from Udayana University Bali, gave a talk entitled “Water Allocation of Subak Irrigation Schemes in Yeh Ho River Basin”. She guided the field trip on the last day at PT. Coca Cola, Ulun Danu Temple, Beratan Lake, Bedugul and Jatiluwih Rice Terraces.

FINANCIAL HIGHLIGHTS

From January 1 to December 31, 2019, Member Countries' total cash contributions amounted to **USD 425,000.00**, consisting of Cambodia (USD 10,000), China (USD 50,000), 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 Myanmar cash contribution for 2018 (2nd installment, 2/2) (USD 5,000) was received in 2019.

The expected cash contribution to receive from Lao PDR for 2019 (USD 10,000.00), Papua New Guinea for 2019 (USD 25,000.00) and Timor-Leste for 2019 (USD 10,000.00) (Table 1).

Table 1: Cash Contributions of Member Countries for 2018-2019
(Ending 31 December 2019)

Member Countries	2017 Contribution Received in 2018	2018 Contribution Received in 2018	2019 Contribution Received in 2019	Arrears Contribution Expected to Receive
Cambodia	-	10,000.00	10,000.00	-
China	-	50,000.00	50,000.00	-
Indonesia	-	40,000.00	55,000.00	-
Japan	-	50,000.00	60,000.00	-
Republic of Korea	-	60,389.80	60,000.00	-
Lao PDR	10,000.00*	10,000.00	-	10,000 (Y2019)
Malaysia	-	50,000.00	50,000.00	-
Mongolia	-	-	10,000.00**	-
Myanmar	-	5,000.00 (1/2) (Y2018)	10,000.00 5,000.00(2/2) (Y2018)	-
Papua New Guinea	-	-	-	25,000 (Y2019)
Philippines	-	40,000.00	40,000.00	-
Singapore	-	10,000.00	10,000.00	-
Thailand	-	40,000.00	40,000.00	-
Timor-Leste	-	-	-	10,000 (Y2019)
Vietnam	-	25,000.00	25,000.00	-
Total	10,000.00	390,389.80	425,000.00	45,000.00

*Lao PDR cash contribution for 2017 was received in 2018 (USD 10,000)

** Mongolia cash contribution contributed in 2019 (USD 10,000). (A signing ceremony to officially welcome Mongolia as new Member Country of CCOP was held at the 71st SC Meeting, 2-3 November 2018, Busan, Republic of Korea)

In addition to Member Countries' contributions, the amount of **USD 36,590.63** earned from the management of projects during January - December 2019 period which from "CCOP-KIGAM-KNOC Unconventional Oil and Gas Project: Assessment of Shale Energy Resources in Asia Phase II", 2nd Installment 2018 (2/2) (USD 2,234.14), "CCOP-GSJ-DGR Groundwater Project Phase III Meeting" (USD 4,957.00), "CCOP-KIGAM Groundwater-Surface Water Interaction and Comparative Study of Groundwater Dependent Ecosystems in the Mekong Basin to Transboundary Aquifer Management (Phase III)" 1st Installment 2019 (1/2) (USD 2,582.74) and 2nd Installment 2019 (2/2) (USD 2,454.96), "CCOP Workshop on the Future of ASM and Local Communities" (USD 1,445.21), "CCOP-KIGAM Unconventional Oil and Gas Project: Assessment of Shale Energy Resources in Asia (Phase II)" 1st Installment 2019 (1/2) (USD 3,041.22) and 2nd Installment 2019 (2/2) (USD 2,954.53), "CCOP-KIGAM Project Establishment of a Basic Plan for GDR System Development of CCOP Member Countries" 1st Installment 2019 (1/2) (USD 3,143.55) and 2nd Installment 2019 (2/2) (USD 3,116.04), "Research Project on GTC-CCOP Collaborative Research Agreement" (USD 1,877.24), "4th International Workshop on CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project" (USD 3,757.00), "Promotional Booth at the 55th CCOP Annual Session" (USD 750.00), and CCOP-GSJ-GAI Groundwater Project Phase IV Kick-Off Meeting" (USD 4,277.00) are shown in (Table 2).

Other incomes during the period amounted to USD 6,907.05 from interest earned (USD 1,380.67), processed from sale of publications (USD 1,590.84), gain on exchange rate (USD 88.26), miscellaneous incomes (USD 998.71) and unrealized gain on exchange rate (USD 2,848.57). The total income during the period was USD 468,497.68. The expenditure of USD 454,623.29 was incurred from operation and administrative support. The Cash at Bank as of December 31, 2019 amounted to USD 907,642.64.

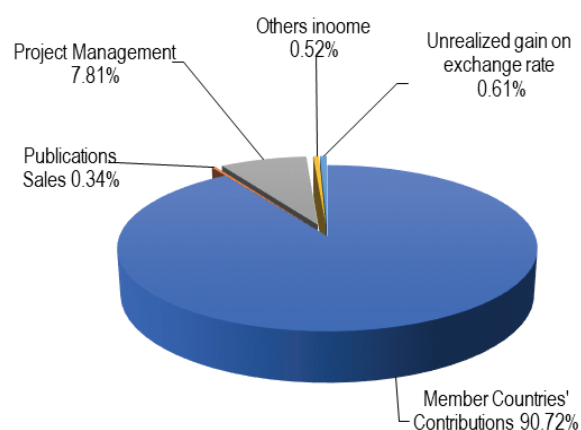
Other Fund (outstanding balanced) (USD 67,524.82) that consists "BGR-CCOP International Training Course on Risk- Sensitive Spatial Planning for CCOP Member Countries" (BGR), Germany (USD 32,856.31), "CCOP- KIGAM Unconventional Oil and Gas Project: Assessment of Shale Energy Resources in Asia, (Phase II)" (USD 1,199.46), "CCOP-KIGAM Groundwater-Surface Water Interaction and Comparative Study of Groundwater Dependent Ecosystems in the Mekong Basin to Transboundary Aquifer Management (Phase III)" (USD 28,401.08), "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 439.53).

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, 2019)

Funding Source	Activities	Country	Period	Amount (USD)
KNOC	CCOP-KIGAM-KNOC Unconventional Oil and Gas Project: Assessment of Shale Energy Resources in Asia (Phase II)	2 nd Installment 2018 (2/2)	1 March 2018	2,234.14
GSJ/AIST	CCOP-GSJ-DGR Groundwater Project Phase III Meeting	Chiang Mai, Thailand	13-15 February 2019	4,957.00
KIGAM	CCOP-KIGAM Groundwater-Surface Water Interaction and Comparative Study of Groundwater Dependent Ecosystems in the Mekong Basin to Transboundary Aquifer Management (Phase III)	1 st Installment 2019 (1/2)	1 March 2019	2,582.74
		2 nd Installment 2019 (2/2)	1 March 2019	2,454.96
CASM	CCOP Workshop on the Future of ASM and Local Communities	Koh Samui, Thailand	4 March 2019	1,445.21
KIGAM	CCOP-KIGAM Unconventional Oil and Gas Project: Assessment of Shale Energy Resources in Asia (Phase II)	1 st Installment 2019 (1/2)	1 April 2019	3,041.22
		2 nd Installment 2019 (2/2)	1 April 2019	2,954.53
KIGAM	CCOP-KIGAM Project Establishment of a Basic Plan for GDR System Development of CCOP Member Countries	1 st Installment 2019 (1/2)	1 May 2019	3,143.55
		2 nd Installment 2019 (2/2)	1 May 2019	3,116.04
KIGAM	Research Project on GTC-CCOP Collaborative Research Agreement	Bangkok, Thailand	30 August – 17 September 2019	1,877.24
GSJ/AIST	4 th International Workshop on CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project	Siem Reap, Cambodia	1-3 October 2019	3,757.00
KIGAM	Promotional Booth at the 55 th CCOP Annual Session	Chiang Mai, Thailand	4-6 November 2019	750.00
GSJ/AIST	CCOP-GSJ-GAI Groundwater Project Phase IV Kick-Off Meeting	Bali, Indonesia	2-4 December 2019	4,277.00
Total Project Management Income				36,590.63

CCOP Income 2019



CCOP Expenditure 2019

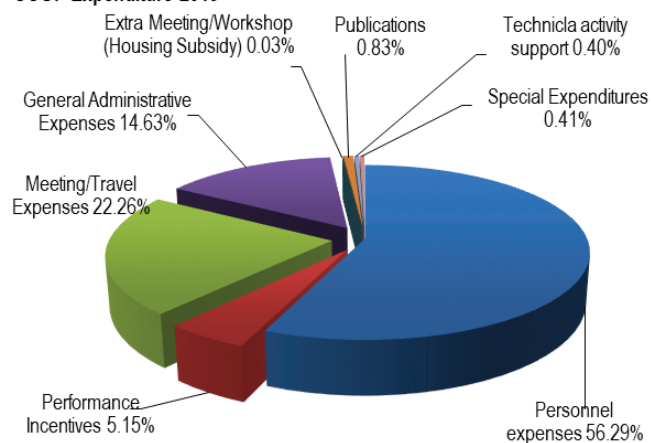


Table 3: CCOP Year-end Financial Statement as of 31 December 2019

DESCRIPTION	2018		2019	
	USD	USD %	USD	USD %
Fund Balance	805,179.92		836,900.24	
Income:				
<i>Member Countries' Contributions</i>	400,389.80	91.46	425,000.00	90.72
<i>Publications sales</i>	-	-	1,590.84	0.34
<i>Project management</i>	37,778.33	8.36	36,590.63	7.81
<i>Others income (Interest, miscellaneous income and gain on exchange)</i>	(415.18)	(0.09)	2,467.64	0.52
<i>Unrealized gain on Exchange rate</i>			2,848.57	0.61
Total Income	437,752.95	100.00	468,497.68	100.00
Expenditures:				
<i>Personnel expenses</i>	228,451.24	56.07	255,924.02	56.29
<i>Performance Incentives</i>	23,531.31	5.78	23,412.89	5.15
<i>Meeting/Travel Expenses</i>	88,247.27	21.66	101,190.14	22.26
<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.	18,847.53	4.62	5,150.40 *5,000.00	0.03
<i>General Administrative Expenses</i>	38,798.17	9.52	66,513.21	14.63
<i>Publications</i>	3,319.56	0.81	3,759.78	0.83
<i>Technical activity support</i>	3,531.48	0.87	1,815.18	0.40
<i>Special expenditures</i>	2,731.78	0.67	1,857.67	0.41
Total Expenditure	407,458.34	100.00	454,623.29	100.00
<i>Unrealized gain/(loss) on exchange rate for Retained Earning</i>	1,429.71		1,251.86	
<i>Income over/(under) expenses</i>	31,724.32		15,126.25	
<i>Tax payable</i>	-		-	
Year-end Balance	836,900.24		852,026.49	
<i>Adjustment to reflect actual cash inflow/outflow):</i>				
<i>Account payable</i>	-		(485.67)	
<i>Other Fund (outstanding balanced)</i> BGR Project (USD 32,856.31) KIGAM Unconventional Oil & Gas Project, Phase II (USD 1,199.46) KIGAM Groundwater Project, Phase II (USD 28,401.08) INTERMIN Project (USD 4,628.44) Promotional Booth at the 55 th CCOP Annual Session (USD 439.53)	66,561.80		67,524.82	
<i>Office equipment (net)</i>	(4,812.93)		(6,017.39)	
<i>Advance</i>	(13,273.45)		(5,877.07)	
<i>Account Receivable</i>	(19.18)		(20.71)	
<i>Tax deductible</i>	1,553.05		492.17	
CCOP CASH AT BANK	886,909.53		907,642.64	

LIST OF CONTACTS

CCOP STEERING COMMITTEE

MEMBER COUNTRIES PERMANENT REPRESENTATIVES (15)

The Steering Committee is a policy making body of CCOP, which shall establish policies and principles for CCOP activities, approve work plan, budget, accounts for each year, new programme proposals, establish subsidiary bodies, appoint the Director, receive and consider the reports of Director on the functions delegated to him.

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H.E. Mr. Cheap Sour

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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

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

ECF – Energy China Forum, China

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

GDR - Geoscience Data Repository Project

GDMR – General Department of Mineral Resources, Cambodia

GEOSEA – Regional Congress on Geology, Minerals and Energy Resources of Southeast Asia

GETECH – Geophysical Exploration Technology

GEUS – Geological Survey of Denmark and Greenland

GIS – Geographic Information System

GSC – Geological Survey of Canada

GSHP – Ground Source Heat Pump

GSi – Geoinformation Sharing Infrastructure

ABBREVIATIONS

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

GSJ – Geological Survey of Japan
GTK – Geological Survey of Finland
IAEA – International Atomic Energy Agency
IGDP – Integrated Geophysical and Geochemical Data Processing
Intermin – International Network of Raw Materials Training Centres
IOC – Intergovernmental Oceanographic Commission
IOMAC – Indian Ocean Marine Affairs Cooperation
ISGeo – International School for Geoscience Resources, Republic of Korea
IUGS – International Union of Geological Sciences
JICA – Japan International Cooperation Agency
JMG – Department of Mineral and Geoscience Malaysia
JPDC – Jeju Province Development Cooperation
KES – Knowledge Enhancement and Sharing
KIGAM – Republic of Korea Institute of Geoscience and Mineral Resources
KNOC – Korean National Oil Company
MAMEA – Magnetic Anomaly Map of East Asia
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
NAWAPI – National Center for Water Resources Planning and Investigation, Vietnam
PETRAD – Petroleum Management and Administration, Norway
PTTEP – PTT Exploration and Production Public Company Limited
SC – Steering Committee
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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
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