



Distr.: For participants only  
27 April 2011

English only

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## **Economic and Social Commission for Asia and the Pacific**

### **Sixty-seventh session**

Bangkok, 19-25 May 2011

Item 3 (d) of the provisional agenda

**Review of issues pertinent to the subsidiary structure of  
the Commission, including the work of the ESCAP  
regional institutions: Environment and development**

## **Report of the Coordinating Committee for Geoscience Programmes in East and Southeast Asia<sup>1</sup>**

### **Note by the secretariat**

The secretariat transmits to the Commission the report submitted by the Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP) for information.

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<sup>1</sup> The report is reproduced in its original language, which is English. Any queries concerning the report should be directed to the CCOP secretariat.

## Summary

CCOP had successfully carried out most of its planned activities for the year 2010 focused on enhancing coordination of the geoscience programmes of the national geoscientific institutions of member countries, continued human resource development and institutional capacity building, greater flow of technical information between the member countries, cooperating countries and organizations of CCOP. Cooperating countries and organizations continued to provide technical support for activities contributing to sustainable geo-resources and environmentally sound development in the CCOP region. Member countries also provided in-kind support to CCOP work programmes to optimize the benefits of the support provided by the cooperating countries and organizations.

During the year, a total of 17 activities including seminars, workshops and meetings were organized and attended by 569 participants from the member countries. This comprises 14 activities in the geo-resources sector, 2 in the geo-environment sector and 1 in the geo-information sector.

In the Energy Programme of Geo-resources sector, the Cooperation Program for Enhancing Public Petroleum Management of the CCOP Member Countries (EPPM) supported by the Royal Norwegian Government was continued. This program incorporates 3 projects: (1) Petroleum Resource Management with a focus on Natural Gas; (2) Natural Gas Field Development and Environmental Issues (P2); and (3) Metadata on Natural Gas Resources of the CCOP Region (P3). The series of dedicated bilateral PETRAD seminars on specialized topics in the petroleum sector requested by CCOP Member Countries was implemented. In the Mineral Programme, the final workshop of the CCOP-USGS Global Mineral Resource Assessment Project (GMRAP) was conducted on 15-17 March 2010 in Busan, Republic of Korea with 12 participants from 10 Member Countries (except China and Singapore) and 3 resource persons from United States Geological Survey (USGS). In the Groundwater Programme, the Geological Survey of Japan, AIST (GSJ/AIST) generously continues its support for CCOP-GSJ/AIST Project on Groundwater, Phase II with two meetings held on 2-3 March 2010, Bangkok, Thailand and on 2-3 September 2010 in Xi'An, China.

For the Geo-environment sector, the Integrated Geological Assessment of Deltas in Southeast Asia (DeISEA) project phase II continued with the support of GSJ/AIST. The latest activity was organized in Haiphong, Vietnam during 24-29 November 2010 with field excursions. With the support and cooperation of the Geological Survey of China, CCOP organized a symposium on Muddy Coastal Geo-environment and Climate Changes in Tianjin, China on 13-16 September 2010 with field excursions, and attended by 25 participants from Member Countries of CCOP; China, Indonesia, Japan, Vietnam, the Philippines, Thailand and Malaysia. The Environmental Analysis Support Programme in the CCOP and other region project continued, providing in-kind services on environmental specimens, which are analysed by PIXE method.

For the Geo-information sector, CCOP continues to support the international project, OneGeology, <http://www.onegeology.org>. Geological maps of Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Philippines and Thailand have been registered to the project's portal, <http://portal.onegeology.org/>. CCOP continues to represent Asia in the OneGeology Steering Group, and participated in its meeting on 15-16 April 2010 in Wellington, New Zealand, as well as the project's Operational Management Group Meeting held in Berlin on 23 August 2010. The CCOP Metadata project phase II continued and had its final workshop on 20-22 July 2010 in Shanghai, China. Its product, the web-based CCOP Geoinformation Metadata System (CCOP-GIMS) installed at the CCOP TS server, has been made accessible from this link: <http://www.ccop.or.th/metadata>. The East Asia Geoscience and Environmental Research (EAGER) Project continued, providing a grant for researches in Geoscience and Environment in East and Southeast Asia to candidates from the Member Country hosting the CCOP Annual Session.

ESCAP and CCOP continued to maintain frequent consultations and close cooperation through conducting technical activities, mutual participation in major annual meetings, networking and exchange of publications. ESCAP and CCOP are playing an active role and should strengthen cooperation in the post tsunami risk assessment, disaster rehabilitation and mitigation efforts.

## Introduction

The Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP) is an intergovernmental organization whose mission is 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 through outreach, cooperation and partnership, knowledge enhancement and training, and data information.

The CCOP “Coordinating Committee for Offshore Prospecting in Asia” was first established in 1966 by China, Japan, Republic of Korea and The Philippines under the auspices of ESCAP and the United Nations. CCOP became an independent intergovernmental organization in 1987 based on the common understanding of its Member Countries and the aspirations of the United Nations. The name was changed in 1994 to Coordinating Committee for Coastal and Offshore Geoscience Programmes in East and Southeast Asia. During this period, CCOP devoted itself to the coordination of, and cooperation in, scientific activities related to coastal and offshore areas with respect to geological/geophysical surveys, regional map compilations, database development, development of human resources and transfer of state of the art technology. In 2001, CCOP has reviewed and redefined its programmes and activities accompanied by a name-change to Coordinating Committee for Geoscience Programmes in East and Southeast Asia. In 2010, a new strategic plan has been formulated with the focus on the following:

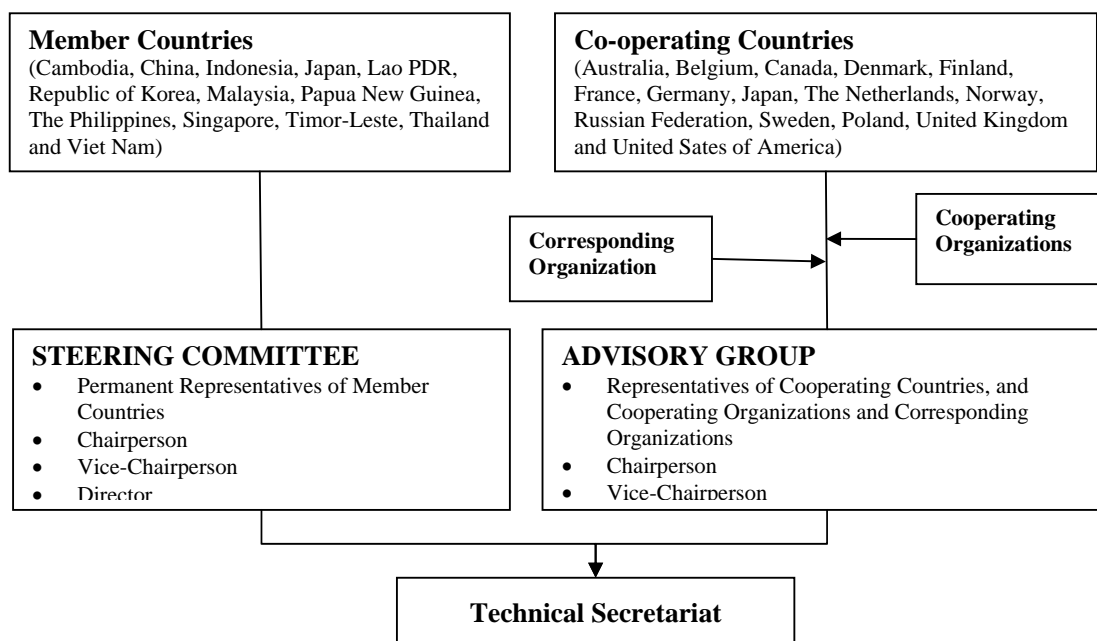
- ❑ **Outreach** - to enhance influence with decision makers, investors and the public through the provision of relevant Earth science information and to develop appropriate skills for communicating effectively with CCOP stakeholders.
- ❑ **Cooperation and Partnership** - to enhance the internal and 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.

With these focus, CCOP’s action plan are targeted under the following programmes for the achievement of CCOP’s strategic objectives:

1. Extractive Industries Development of East and Southeast Asia.
2. Water Resources Management in East and Southeast Asia.
3. New Energy Resources Development of East and Southeast Asia.
4. Geological Sensitive Areas in S & SE Asia
5. Coastal Environment Management Strategy of the Asia Region
6. Geoscience Information system in Asia
7. Geo-Conservation
8. Strengthening the Role and Function of CCOP

CCOP has 13 member countries; Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Papua New Guinea, The Philippines, Republic of Korea, Singapore, Timor-Leste, Thailand and Viet Nam. CCOP is being supported by 15 cooperating countries and 13 international organizations. The CCOP Technical Secretariat is responsible for the coordination of all activities carried out by CCOP. The Secretariat is headed by a Director, who reports to the CCOP Steering Committee consisting of one permanent representative from each member country. The Headquarters of the CCOP Technical Secretariat is located in Bangkok, Thailand. CCOP's operational organization chart is illustrated in figure 1.

**Figure 1. Operational Organization Chart of CCOP**



CCOP's achievements have proven that it is a successful organization with following advantages in regional cooperation.

- Data exchange and sharing of institutional and administrative experiences
- Regional data compilation and regional resource mapping
- Training and human resource development
- Standardization of resource classification and nomenclature
- Harmonization of regulatory environment
- Joint investment promotion

CCOP's financial source includes the cash contributions made by the member countries, project management cost received from major projects and other incomes. Funds for most technical activities are provided under project support to activity by concerned cooperating countries, member countries and organizations.

## I. Technical Activities

A number of workshops, seminars, training courses, working group meetings and expert visits were conducted during the reporting period. The Technical Secretariat has exceeded most of its planned targets under the three sectors on Geo-resources, Geo-environment and Geo-information, 7 programmes. During the reporting period 1 January to 31 December 2010, a total of 17 activities were carried out and attended by 569 participants from the Member Countries (**Table 1**). Aiming at capacity building, knowledge sharing and technology transfer, these activities were highly appreciated by the participants.

**Table 1. Summary of CCOP Member Countries' Participation in Technical Activities**

Sector	No. of activities	No. of participants
Geo-resources	14 (*3)	481(*201)
Geo-environment	2	58
Geo-information	1	30
<b>TOTAL</b>	<b>17</b>	<b>569</b>

\*CCOP-PETRAD Seminars

### 1. GEO-RESOURCES SECTOR

#### 1-A. ENERGY PROGRAMME

##### 1) CCOP-Norway Cooperation Program for Enhancing Public Petroleum Management of the CCOP Member Countries (EPPM)

The CCOP TS continues the implementation of the 4-year EPPM Program that is funded by the Royal Norwegian Government in the amount NOK15 Million. The program incorporates three (3) Projects:

- Petroleum Resource Management with a focus on Natural Gas (P1);
- Natural Gas Field Development and Environmental Issues (P2); and
- Metadata on Natural Gas Resources of the CCOP Region (P3),

During the reporting period, a total of six (6) capacity-building workshops supported by technical fieldworks and two (2) Meetings of **P1** case study countries and another on **P3** country data managers, and one (1) annual Seminar (**S3**) were conducted. The titles of these activities are indicated below:

1. **EPPM P1M1:** Meeting of Case Study Host Countries (Indonesia, Malaysia and Thailand) – Data Integration, LEMIGAS, Jakarta, Indonesia, 23-24 February 2010.

2. **EPPM P3W3:** Metadata system users training & workshop, 24-26 March 2010, Pattaya, Thailand.

3. **EPPM P1W2:** Workshop on North Sumatra – Mergui Basin Case Study: Basin Analysis & Technical Fieldwork, Medan & Parapat, Indonesia, 27-30 April 2010.

4. **EPPM P2W4:** Regulatory Framework for Carbon Capture & Storage (CCS): with focus on storage into geological formations, HSE, CDM and Flaring, 29 June-1 July 2010, Phuket, Thailand.
5. **EPPM P3W4:** Workshop on GIMS in cooperation with China Geological Survey, Shanghai, China, 20-22 July 2010.
6. **EPPM P1W3:** North Sumatra - Mergui Basin Case Study: Basin Modeling, Map Integration and Fractured Basement, Langkawi, Malaysia, 2-5 August 2010.
7. **EPPM P2W5:** Workshop on Mapping of CCS Potential Reservoir and Selection Criteria, Bali, Indonesia, 28 Sep - 1 Oct 2010.
8. **EPPM Seminar 3 (S3),** Bangkok, Thailand, 11-12 Nov 2010.
9. **EPPM P3M1:** Meeting of Country Data Managers - Establishing Guidelines for metadata data management, 16-17 November 2010, Bangkok, Thailand.

All the activities achieved their respective objectives, among others, of creating awareness on the current issues related to natural gas development, cooperation and exchange of technical knowledge in a cross border study, effective data management, and CCS into a geological reservoir - as one possible solution to green house gas emission problems. The presentations and discussions during each activity supports on-going activities in many Member Countries, particularly in the areas of research and policy development. The documents from the workshops were distributed to all the participants and posted in the EPPM Program website <http://www.ccop.or.th/eppm> and will provide free and useful references for the MC.

For the Year 2010, a total of 303 participants attended in the EPPM Program activities, mostly management representatives of regulatory and research organizations dealing on upstream oil and gas, as well as representatives from environmental agencies, academes and national oil companies. This brings the total number of 667 participants since the start of EPPM Program. The female participants represent ~30% of the total number of participants – among the highest in all CCOP activities. The EPPM Program continues to encourage the Member Countries to give equal priority to female geoscientists & other specialists that will benefit from the Program's technical activities.

## 2) CCOP/ASCOPE/PETRAD Programmes

With the technical and financial support of Royal Norwegian Government, CCOP/PETRAD cooperation to undertake activities at the request of CCOP Member Countries remained active and successful. The following seminars were held during the reporting period:

- CCOP-PETRAD-PETRONAS-INSTOK Workshop on Outline Corrosion Management, January 26-27, Kuala Lumpur, Malaysia completed with 81 participants, 18 papers were presented and discussed by 9 Guest Speakers from outside Malaysia, 9 Local Guest Speakers from Service Providers.
- MLR-CGS-PETRAD-CCOP Seminar on Petroleum Policy and Management, 1-3 June, Guangzhou, China, completed with 55 participants and 5 Guest Lecturers with high experiences from the Petroleum Industry.

- ASCOPE-CCOP-PETRAD Meeting to Develop a Project Concept for a (4-year) Regional Program on CO<sub>2</sub>-CCS Challenges CO<sub>2</sub>-CCS Challenges, 1 October completed with 11 participants from CCOP Member Countries and ASCOPE and 4 Guest speakers (Norway -3 and Faroe Islands).

- CNPC-MLR-CGS-PETRAD-CCOP Seminar on the Global Depositional Evolution and Petroleum System Events of Main Foreland Basins, Wuyishan, Fujian Province, China 23-26 November completed with 65 participants from Government Agencies, Institutional, Universities, Oil Companies in China and 4 overseas invited Guest Lecturers with high experiences from the Petroleum Industry, R&D and Geosciences, and 2 local invited Guest Lecturers from CNPC.

A PETRAD 8-week courses in Stavanger, Norway was opened for CCOP and ASCOPE members to apply every year on “Upstream Petroleum Policy and Management” and “Upstream Management of Petroleum Development and Operations”.

## **1-B. MINERALS PROGRAMME**

### **1) CCOP-USGS Global Mineral Resource Assessment Project**

The CCOP-USGS Global Mineral Resource Assessment Project (GMRAP) is part of a 5-year initiative to assess the identified and undiscovered non-fuel mineral resource of the world. Since 2003, three workshops had been conducted for the CCOP Member Countries, in 2003, 2004 and 2005. To date assessment for porphyry and sediment hosted copper have been completed and the draft final report was sent to national coordinators for inputs and comments. The final workshop planned to be held in 2008, in conjunction with 45th Annual Session and 52nd Steering Committee Meeting had been postponed to 2010, in conjunction with 55th Steering Committee Meeting in Busan, Republic of Korea. The final workshop took place from 15-17 March 2010 with 12 participants from 10 Member Countries (except China and Singapore) and 3 resource persons from USGS. The final outcome of CCOP-USGS cooperation in GMRAP will be released as an online USGS Scientific Investigations Report (SIR).

## **1-C. GROUNDWATER PROGRAMME**

### **CCOP-GSJ/AIST Project on Groundwater Assessment and Control in the CCOP Region**

GSJ/AIST generously continues its support for CCOP-GSJ/AIST Project on Groundwater, Phase II. During report period 1 July 2009 to 30 June 2010, the project had held two meetings with 20 participants from MC and CC:

The Meeting of CCOP-GSJ/AIST Hydrological Mapping under CCOP Groundwater Project was held on 2-3 March 2010, Bangkok, Thailand with 8 participants from Cambodia, Japan, Thailand and Vietnam. The project will start working at Chao-Phraya basin in Thailand and Red River delta in Vietnam. From the period 2010 to 2013, the hydrological maps of Chao-Phraya basin and Red River Delta with the scale of 1:200.000 will be done for publication in hard copy and CD-Room. The Procedure of the hydrological mapping is as follows:

1. Preparing base map and hydrological data (~Mar. 2011)
2. Compiling hydrological data on the base map (Apr. 2011 ~ Mar. 2012)
3. Considering description of hydrological data (Apr. 2012 ~ Mar. 2013)

The second meeting of CCOP-GSJ/AIST Groundwater Project was held in Xi'An, China on 2-3 September 2010 with 26 participants and the third meeting is planned to be held in Vietnam on September 2011.

## **2. GEO-ENVIRONMENT SECTOR**

### **1-B. COASTAL ZONE PROGRAMME**

#### **1) CCOP-GSJ/AIST Project on Integrated Geological Assessment of Deltas in Southeast Asia Phase 2 (DelSEA II Project)**

CCOP had on-going activities with AIST/GSJ, Japan in 2008. DelSEA II Project (Integrated Geological Assessment for Deltas in Southeast and East Asia Phase 2 Project), has been conducted jointly with IGCP-475 DeltaMAP project for annual meetings and seminars. The main proposes are to foster exchange of modern knowledge on deltas, Quaternary geology, sequence stratigraphy, and geological coastal management and to enhance joint study for better understanding of deltaic coasts and geological assessment for coastal management.

The latest activity was organized in Haiphong, Vietnam during 24-29 November 2010 in conjunction with field excursions was attended by 33 participants from 11 Member Countries of CCOP; Cambodia, China, Indonesia, Japan, Republic of Korea, Vietnam, the Philippines, Papua New Guinea, Timor Leste, Thailand and Malaysia plus Germany.

During the seminar, the detail studies on sedimentary processes and coastal change of Yellow River Delta, Red River Delta, Mekong River Delta, South Yellow Sea, East China Sea and Pleistocene-Holocene sea level fluctuation in Japan were presented. Participants from CCOP Member Countries were also presented the status of coastal erosion problem focusing on hazard assessment, monitoring and counter measures for the future climatic change. The participants intensively discussed, shared and exchanged their knowledge and some future cooperation research or networking was also discussed.

#### **2) CCOP-CGS Symposium on Muddy Coastal Geo-environment and Climate Changes**

CCOP (Coordinating Committee for Geoscience Programmes in East and Southeast Asia) has new activity with China Geological Survey in 2010, which is a Geo-Environment programs, the symposium on Muddy Coastal Geo-environment and Climate Changes.

The activity was organized in Tianjin, China on 13-16 September 2010 in conjunction with field excursions was attended by 25 participants from Member Countries of CCOP; China, Indonesia, Japan, Vietnam, the Philippines, Thailand and Malaysia.



During the symposium, special studies on muddy coastal environments in East and Southeast Asia were presented by 6 invited experts. Participants from CCOP Member Countries were also presented the status of coastal research focusing on coastal processes and natural hazard monitoring and counter measures for the future sea-level rise. The presentation session was followed by two days field excursion along the coast of the Bohai Bay. The excursions showed significant geomorphological features of the muddy coast and preservation of geological landscape. The native landscape and series of Chenier were highlight on the area of Houtangpu and Yucenzi. Oyster reef plain and ancient lagoonal wetland demonstrated the evolution of the Bohai coastal area through time.

## **2-C. ENVIRONMENTAL GEOLOGY PROGRAMME**

### **1) Environmental Analysis Support Programme in the CCOP and Other Regions**

The 48<sup>th</sup> CCOP Steering Committees Meeting in Daejeon, Republic of Korea endorsed the Environmental Analysis Support Programme in the CCOP and Other Regions proposed by AIST/GSJ under the auspices of Japan Radioisotope Association and Iwate Medical University. This programme will provide in-kind services on environmental specimens, which are analysed by PIXE method.

Currently, 32 specimens from BIOTEC, Thailand were analysed from small-scale salt mining in NE Thailand. The result clearly indicated that some trace elements of salt products affect the color. The service is still open up to the maximum number of 500 samples per year and it will continue through this year.

## **3. GEO-INFORMATION SECTOR**

### **1) OneGeology-CCOP**

The 49<sup>th</sup> CCOP Steering Committee Meeting endorsed the OneGeology Project, an international initiative of the geological surveys of the world led by the British Geological Survey (BGS) and a flagship project of the 'International Year of Planet Earth'. Its aim is to create dynamic geological map data of the world available via the web.

To date, CCOP's 1:2M Geologic Map of East and Southeast Asia and the 1:1M Geologic Maps of Indonesia, Japan, Republic of Korea, Malaysia, Philippines and Thailand have been made available and accessible through the portal, <http://portal.onegeology.org/>.

The OneGeology-Global established a 1G Steering Group, comprising of 7 members, of which the CCOP TS Director is one, representing Asia. The First Steering Group Meeting was held on 23-24 April 2009, in Paris, France, and the Second Steering Group Meeting was held on 15-16 April 2010 in Wellington, New Zealand. The Director-General of the Geological Survey of Japan, AIST was participated these physical meetings, on behalf of the CCOP TS Director who unfortunately could not attend the meeting. The Geo-Information Sector Coordinator attended the OneGeology Operational Management Group Meeting held in Berlin on 23 August 2010. Several issues were discussed at the meeting, and the highlight of it is the incorporation of OneGeology for project sustainability, which will be further discussed and

considered at the next Steering Group Meeting scheduled in April 2011, Tokyo, Japan.

CCOP acknowledges the Geological Survey of Japan, AIST for hosting the WMS server for CCOP's 1:2M Geological Map of East and Southeast Asia and the 1:1M Geological Maps of Indonesia, Malaysia and Philippines including their own. Appreciation also goes to Republic of Korea and Thailand for preparing their own WMS server for their own geological maps, and to be accessible through the OneGeology Portal. Geological map of Mongolia is now ready for registration to the OneGeology Portal, while the geological maps of Papua New Guinea and Vietnam still need further processing before registration. The CCOP Technical Secretariat continues to encourage the rest of the Member Countries to have their 1:1M Geological Maps be available through the OneGeology Portal.

## **2) CCOP Metadata Phase II**

The CCOP Metadata Project Phase II approved by the 48<sup>th</sup> CCOP Steering Committee Meeting held in Daejeon, Republic of Korea on November 2006, with the financial support of China Geological Survey (CGS). It is the objective of this phase to develop a comprehensive CCOP Metadata Standard for Geoscience in conformity with ISO19115 International Metadata Standard. CGS will not only provide financial support, but also resource persons for the project and is more than happy to share their vast experience in metadata development with the CCOP Member Countries.

After having the web-based CCOP Geoinformation Metadata System (CCOP-GIMS) installed at the CCOP TS server, <http://www.ccop.or.th/metadata>, the project held a workshop and training for the CCOP Metadata Working Group as well as for the EPPM Metadata Group, on the usage of the system including data entry and metadata management, on 20-22 July 2010 in Shanghai, China. There were thirty-seven participants at the meeting, including from the Member Countries, CCOP Technical Secretariat as well as participants from Lao PDR and Myanmar. Aside from being introduced to the system's features and capabilities, the Workshop also made revisions to the published CCOP Standard for Geo-information Metadata, producing the CCOP SO1 Edition 2.

CGS continues offering its support for GIMS training for Member Countries when required.

## **1) FELLOWSHIPS AND GRANTS**

### **1) East Asia Geoscience and Environmental Research (EAGER) Project**

The EAGER Project is a trust fund set up in the Geological Society of America with personal contribution of Dr. Maurice "Ric" Terman, CCOP Honorary Advisor, to be used for funding research in geoscience in the region. The grant will be made available for research on Geoscience and Environment in East and Southeast Asia to candidates from the Member Country hosting the CCOP Annual Session since 2003.

The EAGER grant for 2010 was awarded to Mr. Johannes Hutabarat (Indonesia) at the 47<sup>th</sup> CCOP Annual Session held in Manado, Indonesia. The title of his research proposal is "Petrology and Geochemistry Characteristics of

Volcanic Jatibarang in Northwest Java Basin and the Implication of Paleogene Volcanism System.”

## II. New Initiatives

### 1) **Assessments of Coastal Erosion and Mitigation Measures along the East and Southeast Asia Coasts**

Climatic Change is the Global issues for the consequence of sea level rise and season change. Over the course of this century, climate change is expected to have significant impacts in the East Asia and Pacific region, according to the IPCC. World Bank 2007 report postulated that tropical Asia will be strongly influenced by the monsoon system that could in turn be significantly impacted by climatic change. This study also reviews new data on rates of deglaciation in Greenland and Antarctica and projects sea level rise at two to five times higher than IPCC estimates. If these more extreme scenarios were to come about, low lying countries such as Thailand, Vietnam or Indonesia may be very significantly impacted.

### 2) **Outreach Workshop of CGI Asian Regional Working Group - *International Workshop on CGI global standard for Asian Geoinformation Web Service in CCOP region.***

The Geo-Information Sector of CCOP has been organizing various activities on geoinformation in East and Southeast Asian countries, such as digital geology mapping, metadata, and multilingual thesaurus. However, standardization of digital geoinformation is not well known in these countries except for ISO standard on metadata. Dissemination of recent CGI activities can contribute to the standardization of the digital geoinformation of these countries. Utilization of GeoSciML and Asian Multilingual Thesaurus will open up a way to distribute the Asian geoinformation to all over the world through CGI standard web service.

The objectives of this workshop are to disseminate activities of IUGS Commission for the Management and Application of Geoscience Information (CGI) to Asian geoscience communities, to increase awareness of the importance of geoinformation standards for the business of Asian geological surveys, to show the results of OneGeology-Europe for future model of Asian Geoinformation management, to make a trigger to establish a new project on one stop web service of Asian geoinformation in CCOP.

### 3) **Best Practice in Mineral Resources Utilization and Development in the CCOP Region**

Minerals have played an important role in maintaining today's modern life. Mineral wealth as a natural asset can stimulate or enhance economic growth potential and social progress. Especially, minerals become more important in some developing countries. It is expected that mining as an industry will continue to expand over the next two or three decades to satisfy a continuously increasing demand from industrial production, agriculture, high-tech sectors, and merchandise producers.

#### ***Objectives***

a) To enhance the effectiveness of legal and institutional tools and information on mining activities.

b) To enhance the capability and capacity of the MC in the assessment and management of the environment and social equity in the mining activities.

**4) Post- EPPM Program on Climate Change & Energy Security**

The objective of this initiative is to conduct capacity building projects to support the roles of geosciences in the development of unconventional oil and gas resources and in the development of the legal framework for CCS. The following are the target outputs:

- a) Atlas of CCS potential reservoir in East & SE Asia
- b) Atlas of tertiary basins in East & SE Asia – updating the previous Atlas of CCOP – Norway Oil & Gas Resource Management Project (OGRM) of 1995
- c) Series of capacity building workshops & case studies related to high CO<sub>2</sub> gas fields development, Gas hydrates as potential new energy resource & potential for CCS, Oil and gas shale and other unconventional resources.

**5) Comprehensive countermeasure against land subsidence in delta region Project**

This project aims to construct a countermeasure against subsidence problem by integrating the following three research topics:

- a) Construction of a combined monitoring system that can measure the amount of ground change widely, continuously and precisely using InSAR, GPS, leveling, airborne laser scanning and tilt meter;
- b) Construction of a numerical simulation model that can evaluate the relationship between ground water flow and land subsidence accurately;
- c) Evaluation and prediction of impact of land subsidence on environment.

**6) Seminar on Landslide Risk Assessment and Mitigation Measures for CCOP Region**

The CCOP Member Countries have been working closely with the national and international organizations on Natural Disaster Risk Assessment to support their societies in better assessment and management of risks. As a result of the collaboration, Mitigation measures for Landslide Risk have been developed in various ways of implementation. Responding to the need of the CCOP Member Countries to build capacities to undertake assessment of risks due to natural disasters, CCOP TS plan to organized series of seminars on Landslide Risk Assessment and Mitigation.

The seminar will be conducted during 2011-2012 and will aim at briefing policy and decision-makers of the key steps required in the entire process of undertaking risk assessment and its direct impact on achievement of development goals. The seminar will also aim at providing hands-on experience to participants on the assessment of hazards, vulnerabilities, capacities and risks and in developing better understanding of risk management.

### **7) Integrated Geophysical and Geochemical Data Processing and Interpretation - IGDPI**

To keep CCOP Member Countries continuously benefit from modern information technology in geoscientific study and mineral exploration technology in the member country and around the world, China Geological Survey would support a project on software training for regional geophysical and geochemical data processing and mapping in mineral resource assessment and exploration.

#### ***Main courses:***

- a) Regional geophysical data processing and interpretation methodology and software training.
- b) Regional geochemical data processing and mapping software training.
- c) Application case study: geophysical and geochemical interpretation for minerals and oil & gas.

### **III. Publications**

Twelve newsletters, proceedings and reports were published during the reporting period. The workshop and seminar reports and proceedings of the CCOP-Norway Cooperation Program for Enhancing Public Petroleum Management of the CCOP Member Countries (EPPM Program) were published on the CCOP website.

### **IV. Cooperation with ESCAP**

ESCAP and CCOP continued to maintain frequent consultations and close cooperation through conducting technical activities, networking and exchange of publications. CCOP reports to the ESCAP Commission Sessions, takes part in the related technical meetings and participates in the Sub-Committee Meeting on Environment and Sustainable Development and ICT Committee Session.

ESCAP and CCOP are playing an active role in addressing regional energy security issues, disaster rehabilitation and mitigation efforts. CCOP values the opportunity to work together with ESCAP in the design and implementation of all of its programmes. CCOP has also several other initiatives on geohazards, coastal zone environment and groundwater, which provide a basis for further cooperation.

#### **Acknowledgements**

CCOP would like to thank all the member countries, cooperating countries and organizations for their support. The generosity of the Royal Thai Government, through the Department of Mineral Resources, in providing the office premise for the CCOP Technical Secretariat, and facilitating its smooth and efficient operation is gratefully acknowledged.