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**REPORTS OF REGIONAL INTERGOVERNMENTAL BODIES**

(Item 9 of the provisional agenda)

**REPORT OF THE COORDINATING COMMITTEE FOR GEOSCIENCE  
PROGRAMMES IN EAST AND SOUTHEAST ASIA**

*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.<sup>1</sup>

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**62<sup>nd</sup> SESSION OF ESCAP, 6-12 April 2006, JAKARTA, INDONESIA**

**REPORTS OF REGIONAL INTERGOVERNMENTAL BODIES**

(Item 9 of the provisional agenda)

**REPORT OF THE COORDINATING COMMITTEE FOR GEOSCIENCE  
PROGRAMMES IN EAST AND SOUTHEAST ASIA (CCOP)**

**SUMMARY**

CCOP had successfully carried out most of its planned activities for the year 2005 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 44 activities including seminars, workshops and meetings were organized and attended by 1,684 participants from the member countries. This comprises 28 activities in the geo-resources, 13 in the geo-environment and 3 in the geo-information sector.

In the Energy Programme of Geo-resources sector, the Petroleum Policy and Management Project supported by the Royal Norwegian Government with case studies in Cambodia, China, Indonesia and The Philippines continued. The series of dedicated bilateral PETRAD seminars on specialized topics in the petroleum sector requested by member countries was implemented. The 3-year Danish government-supported Institutional Capacity Building in CCOP Countries Project Phase 1 started on January 2005. The long-term objective of the project is to strengthen the capacity of the public authorities within the CCOP member countries to assess their countries' hydrocarbon potentials. It involves cross-border case studies in Viet Nam-China and Indonesia-Malaysia-Philippines. In the Mineral Programme, the Global Mineral Resources Assessment project supported by the United States Geological Survey was continued. The 3-year Community and Small-scale Mining in Asia (CASM-Asia) Project supported by the World Bank in close cooperation with the Geological Survey of Japan/ National Institute of Advanced Industrial Science and Technology (GSJ/AIST) was launched. The objective of the project is to function as a hub for CASM activities through which cooperation network of those engaged or have interest in artisanal/small scale mining can be built and to bridge the artisanal/small miners with the stake holders, communities, technology and science in the Asia-Pacific region. In the Groundwater Programme, the project on Groundwater Assessment along Great River Basins in East and South-East Asia, which is a 5-year project, continued with the support of GSJ/AIST.

For the Geo-environment sector, the project on development of techniques on landslide hazards assessment supported by the Korea Institute of Geoscience and Mineral Resources, Republic of Korea continued with workshops and experts visits to some member countries. Training of young scientists involved in volcanic hazards mitigation was carried out in a field workshop conducted in Indonesia, supported by the GSJ/AIST. Two coastal zone programmes, the integrated geological assessment of deltas in South-East Asia in conjunction with the IUGS/IGCP Delta Map Scientific Project No 475 of the International Geoscience Programme of the International Union of Geological Sciences (IUGS/IGCP), and the Coastal Environment Management Strategy of the Asian Delta Region, both supported by Japan were continued. The Korea Institute of Geoscience and Mineral Resources (KIGAM) in cooperation with CCOP organized a tri-thematic workshop and training on

current issues in geoscience. The three thematic parallel sessions are Seawater Intrusion Problems in the CCOP Region, Mineral Potential Mapping using GIS and Remote Sensing, and a New Strategy for Marine Aggregates Development and Information Management.

For the Geo-information sector, work on the multilingual thesaurus, an initiative supported by UNESCO and the International Centre for Training and Exchanges in Geosciences (CIFEG) of France to translate 6,000 geoscientific terms to national languages of CCOP Member countries to facilitate exchange and sharing of information is in progress. Development of the Southeast Asian Network for Geoscience (SANGIS) bibliography also supported by UNESCO and CIFEG continued; this bibliography is now available in the web.

Subsequent to the 26-December Asian tsunami disaster, the Department of Mineral Resources of Thailand (DMR) in cooperation with CCOP organized an International Seminar on Tsunami with the theme “How Thailand and the Neighboring Countries will become ready for Tsunami?” in Bangkok on 31 January to 1 February 2005, in response to the role of geoscience in the post tsunami rehabilitation and reconstruction, longer term tsunami mitigation, and early warning and creating public awareness. Following the recommendation of the successful DMR-CCOP International Seminar on Tsunami, a “Project Planning Workshop” was held in Phuket on 28-30 March 2005. The objective of this workshop is to develop a multi-nation project on Tsunami to carry out needed work and analysis addressing both and short and longer term needs of the Tsunami-affected countries. A project document was developed at the end of the workshop, focusing on tsunami hazard as part of a fully integrated collaborative approach to coastal geo-hazards, particularly on three main geoscientific initiatives requiring urgent and concerted action: (1) Risk Assessment For Forward Planning, (2) Risk Mitigation and (3) Coastal Rehabilitation.

The implementation of the Royal Norwegian government supported project on “Tsunami Risk Reduction Measures with Focus on Land Use and Rehabilitation” commenced in June 2005. This project is an 8-month fast track study in consideration of the urgent needs for reconstruction works to commence. The main purpose of this project is to establish practical guidelines for land use and rehabilitation of the devastated areas, considering the risk of future earthquake and tsunami events. The results of the study can also be used in other parts of the tsunami affected regions around the Indian Ocean. The project is conducted by the Norwegian Geotechnical Institute (NGI), the project’s technical executing organization in close cooperation with the Department of Mineral Resources, Thailand and the Technical Secretariat. A Local Advisory Panel gives inputs to the study. The main conclusions regarding future tsunami risk are:

- 1) Within the next 50 to 100 years, the largest credible earthquake to be prepared for is a magnitude 8.5 event. The event could cause a tsunami which at the most gives an inundation level of 1.5 to 2.0 m above sea level. If the tsunami occurs at high tide, the inundation level could be 2.5 to 3.0 m above the mean sea level.
- 2) After about 100 to 200 years, the potential for earthquakes greater than M 8.5 will increase gradually, and so does the potential for generating larger tsunamis than that for the M 8.5 earthquake scenario. This implies that, as time passes by, the tsunami risk will gradually increase from tolerable to highly unacceptable.
- 3) Within the next 50 to 100 years, the potential risk from tsunamis to human life and property in Thailand will be small and can be regarded as tolerable. Therefore, in the short to medium term perspective, no mitigation measures would strictly be required. However, already now steps should be taken to reduce the more long-term risk of human casualties.

To reduce future risk and vulnerability to tsunamis, the following actions are recommended for Thailand:

- 1) Within a few years time implement measures to ensure a lasting long term awareness of the tsunami risk. Such measures may include new requirements to land use, site planning and building codes in potentially affected areas, and construction of some form of “monuments” along the coast that will give a clear warning to future generations about the tsunami risk.

- 2) Within the next 5 to 10 years, implement at least some physical measures to reduce the consequences of future tsunamis and to serve as examples for the future. Physical measures considered most attractive are establishment of safe escape routes and elevated escape hills, and construction of local protection dikes near the waterfront.

For other countries around the Indian Ocean, the tsunami risk and the need for mitigation measures may be significantly greater than for Thailand. These countries are encouraged to undertake similar risk assessment and mitigation studies as presented herein for Thailand. A dissemination seminar is planned to be organized in March 2006 to share the results of the project to the stakeholders, planners, decision-makers as well as the international community. A dissemination seminar is planned to be organized in March 2006 to share the results of the project to the stakeholders, planners, decision-makers as well as the international community.

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 with the purpose of carrying out joint applied geoscience programmes for sustainable development in East and Southeast Asia.

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. A new strategic plan was formulated with the focus on the following:

- ❑ Enhanced coordination of the geoscience programmes of the national geoscientific institutions of the CCOP member countries in order to promote cooperation and to maximize the benefits of programmes of regional significance.
- ❑ Continued human resource development and institutional capacity building in accord with national priorities in order to achieve greater regional self-sufficiency in providing the geoscience inputs to sustainable economic development, sound environmental management and improvement of the welfare of the people of the region.
- ❑ A greater flow of technical information between the member countries, cooperating countries and cooperating organizations of CCOP in order to share such information for their mutual benefit, to learn from each other’s experience and to identify further opportunities for cooperation in capacity building.

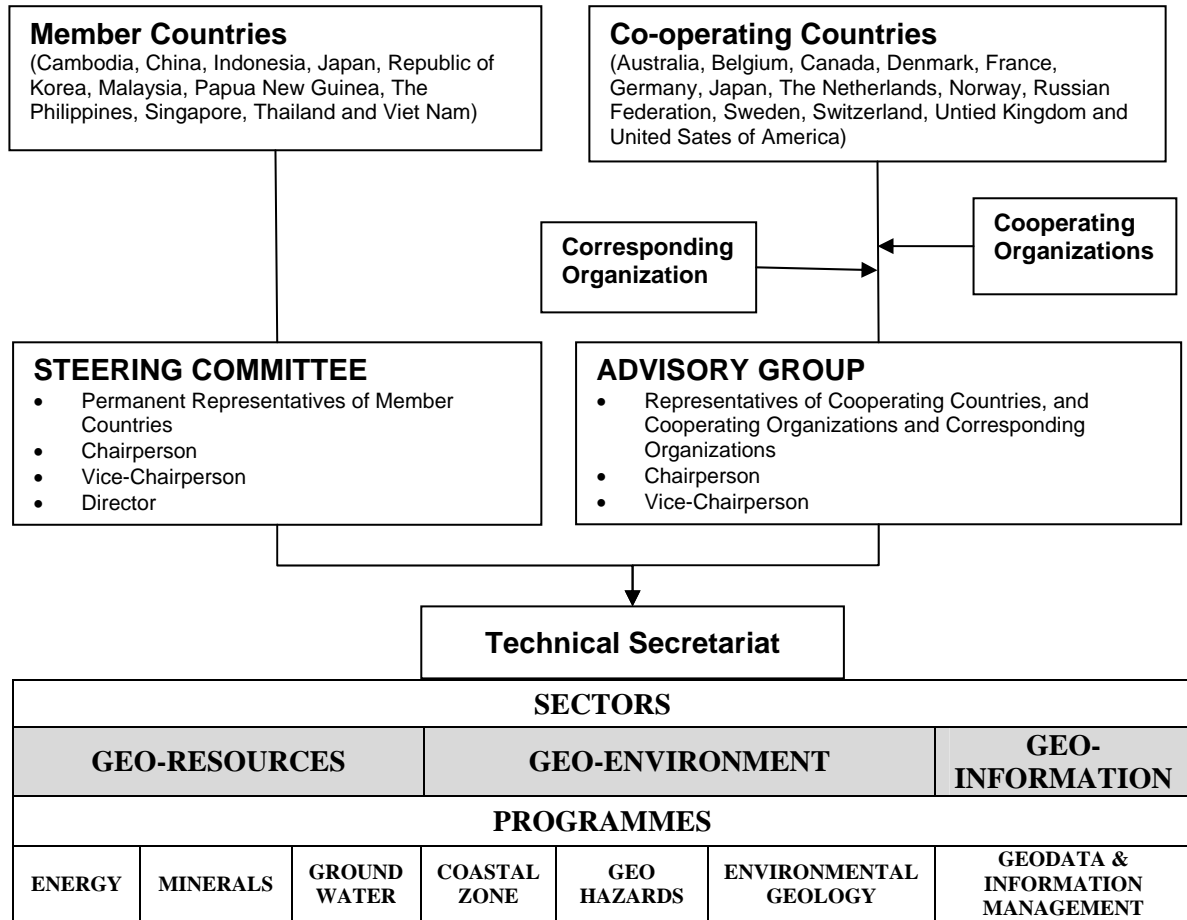
With the new Strategic Plan, CCOP’s technical activities were divided into three sectors and seven programmes that will allow the adoption of clear targets for the achievement of CCOP’s strategic objectives (Figure1).

- the **geo-resources sector**, consisting of the minerals programme, energy programme and groundwater programme;
- the **geo-environment sector**, consisting of coastal zone programme, geohazards programme and environmental geology programme;
- the **geoinformation sector** with the geodata and geoscience information management programme.

CCOP has 11 member countries; Cambodia, China, Indonesia, Japan, Malaysia, Papua New Guinea, The Philippines, Republic of Korea, Singapore, Thailand and Viet Nam. CCOP is being supported by 14 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.

**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 Cooperation and Project Support

Technical support for activities contributing to sustainable geo-resources and environmentally sound development in the CCOP region is being continuously provided by the Cooperating Countries and Organizations as summarized below (*Table 1*). To optimize the benefits of the programme support by the Cooperating Countries and Organizations, the Member Countries also provided in-kind support.

**Table 1. Summary of CCOP technical activities with Cooperating Countries and Organizations**

<b>Cooperating Country/Organization</b>	<b>Activities</b>
<b>Canada</b>	Cooperation and support for an Ocean and Coastal Mapping Workshop to Member countries. Discussion for a workshop in Malaysia
<b>Denmark</b>	Support of the Capacity Building in CCOP Countries Project Phase 1 (ICB-CCOP 1), petroleum sector
<b>France</b>	Support to the SANGIS Training-Bibliographic Phase and Asian Multilingual Thesaurus Programme through CIFEG. A new project on European-Asian thesaurus is also being discussed. Support to technical visits of CIFEG experts to Member countries
<b>Japan</b>	Five projects are being supported for 2005-2006, 4 with GSJ/AIST and 1 with University of Tokyo. Cooperation and support for the CASM-Asia Project. On going discussion on groundwater project for Cambodia with regional component involving CCOP.
<b>Germany</b>	Cooperation / communication through bilateral projects with member countries
<b>The Netherlands</b>	A New Initiative on Indian Ocean Coastal Plan has been proposed by TNO-National Geological Surveys. Assist in seeking funding support also for the CCOP Tsunami Project.
<b>Norway</b>	Support for the Petroleum Policy and Management (PPM) Project Support of the project on Tsunami Risk Reduction Measures With focus on Land use and Rehabilitation Through PETRAD, CCOP organized tailor-made bilateral seminars/workshops for the CCOP member countries Discussion on a proposed new project after completion of PPM on the Practice of Knowledge Management in Petroleum and Other Resources in CCOP Member Countries Discussion on support for delineation of outer limits of the Continental Shelf
<b>United Kingdom</b>	Cooperation with GETECH in the production of aeromagnetic and gravity maps Assistance in seeking funding support for CCOP's tsunami project from DFID, and through EUROGEOSURVEYS from the EU.
<b>United States of America</b>	Through U.S. Geological Survey, cooperation on the implementation of the Global Mineral Resource Assessment Project (GMRAP) Offered seminars on gas-hydrates and coal bed methane for MC on bilateral

<b>Cooperating Country/Organization</b>	<b>Activities</b>
	<p>basis.</p> <p>Initiative on Sea Grant model programme for the region with NOAA Texas A &amp; M University made available Fellowships for the member countries</p> <p>Support for Integrated Ocean Drilling Programme for global climate change study and involvement of CCOP in the programme is under discussion</p> <p>CCOP's interest in USAID supported Indian Ocean Tsunami Warning System Project</p>
<b>Asean Council on Petroleum (ASCOPE)</b>	<p>Close cooperation is maintained through jointly organizing seminars, information exchanges for the benefit of the member countries. Participation in ASCOPE Joint Committees Meeting to discuss current issues on CCOP and ASCOPE energy programmes.</p>
<b>Circum Pacific Council</b>	<p>Cooperation on the WGGC Project</p> <p>CPC named CCOP as the international secretariat for the proposed International Energy Conference 2007.</p> <p>New initiative on Powering the Rim, and discussion on a project to develop new modules of RIMSIM game for different scenarios</p>
<b>Economic and Social Commission for Asia and the Pacific (ESCAP)</b>	<p>Information exchange and discussion, cooperation on technical activities as well as organizing workshops and conferences. CCOP reports to the UN-ESCAP Commission Session and participates in the subcommittee meetings</p>
<b>International Union of Geological Sciences (IUGS)</b>	<p>CCOP is an Associate Partner in the International Year of Planet Earth initiative. IUGS support to CCOP activities. Application for Associate Membership in IUGS. Cooperation in various IUGS/IGCP projects and IUGS Commission activities. Jointly holding CCOP Thematic Session for 2005 Annual Session with IUGS/GEM</p>
<b>United Nations Educational, Scientific &amp; Cultural Organization (UNESCO)</b>	<p>Support to the organization of the SANGIS Training Programme-Bibliographic Phase and SANGIS Asian Multilingual Thesaurus</p> <p>Support for technical visits of CIFEG experts to member countries.</p> <p>Information exchange, discussion and cooperation on CCOP technical activities were continued and new initiatives on groundwater discussed</p>
<b>The World Bank</b>	<p>Support for a New Project, CASM-ASIA coordinated by CCOP for the region</p>

Other Cooperating Countries generally continued their technical support to a number of CCOP work programmes by providing valuable advice and guidance as well as the implementation of bilateral technical assistance to CCOP member countries.

## **II. 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 met most of its planned targets under the three sectors on Geo-resources, Geo-environment and Geo-information. During the reporting period, a total of forty-four (44) activities were carried-out and attended by 1684



participants from the member countries (*Table 2*). Aiming at capacity building and technology transfer, these activities were highly appreciated by the participants.

**Table 2. Summary of CCOP member countries' participation in technical activities**

<b>Sector</b>	<b>No. of activities</b>	<b>No. of participants</b>
Geo-resources	28 (*5)	851 (*408)
Geo-environment	13	809
Geo-information	3	24
<b>TOTAL</b>	<b>44</b>	<b>1684</b>

\*CCOP-PETRAD Seminars

## **1. GEO-RESOURCES SECTOR**

### **1-A. ENERGY PROGRAMME**

#### **1) Petroleum Policy and Management (PPM) Project**

The 4-year Norwegian Government-supported PPM Project is in full implementation of the various activities such as workshops, expert visits, seminar, planning/coordination meetings conducted in 2005. Four workshops were organized to discuss the case studies of the Philippine Sulu Basin, China Sichuan Basin, Indonesia Kutei Basin and Cambodia Khmer Basin. Six expert visits were organized to conduct short course and hands-on training on specialized topics related to the case studies.

The 4<sup>th</sup> PPM Project Seminar was held on 3-7 October 2005, in Hua Hin, Thailand. The seminar was attended by 24 participants from 8 member countries and covered presentations from the case study participating countries on knowledge dissemination and the project's impact and benefits, including some recommendations to improve the project implementation. The country presentations also included a special topic on enhanced oil recovery / improved oil recovery (EOR/IOR) - the government roles. Mr. Gunnar Soiland of the Norwegian Petroleum Directorate and former PPM Co-coordinator attended the meeting and presented the EOR/IOR developments in Norway.

The Project Coordinator also attended several planning meetings including the National Project Coordination Committee meetings in the case study countries. He also represented the CCOP Technical in the ASCOPE meetings, in some PETRAD seminars and in other petroleum-related conferences.

The CCOP-NPD (Norwegian Petroleum Directorate-NPD) and CCOP-MFA (Norwegian Embassy in Bangkok) PPM Annual Meetings for 2005 was held in Bangkok on 14 and 27 June, and 28 June respectively. The meeting with NPD focused on the institution support provided by NPD to the project. Other opportunities for cooperation were also discussed. The progress of the PPM Project was reviewed at the meeting with MFA. The Project's budget and work plan for 2005 were presented and approved by MFA at the meeting and the possible continuation with a new project after the completion of PPM in June 2006 was also discussed.

Details of the PPM Project can be accessed at the website:

<http://www.ccop.or.th/projects/PPM.html>.

#### **2) Institutional Capacity Building in CCOP Countries Project Phase I (ICB-CCOP 1)**

The 3-year Danish government-supported ICB-CCOP 1 Project started on January 2005. The long-term objective of the project is to strengthen the capacity of the public authorities within the CCOP member countries to assess their countries' hydrocarbon potentials. It involves cross-border case studies in Viet Nam-China and Indonesia-Malaysia- Philippines. Geoscientists from all CCOP member countries are invited to participate in regional project workshops and training courses. The

project will also involve a pool of Danish and regional experts, as well as management and coordination support from the Technical Secretariat.

Implementation of the project activities so far have contributed much to attaining the core development objective of the project: to promote regional cooperation through the sharing of information and knowledge in the joint conduct of geoscientific study of cross-border geological basins that contribute to the better understanding of the petroleum systems for the assessment of their hydrocarbon potentials.

Effort to attract the interest and involvement of neighboring countries in joint study of cross border basin with petroleum resources or potential, using strategic and at times sensitive data is challenging at all times and inherently complex. Due to the common effort, there has been significant success in this respect. Neighboring countries are now fully committed to conduct the cross-border case studies of the Yinggehai-Song Hong basin between China and Viet Nam, and the Sulu Sea-East Sabah basin between The Philippines and Malaysia with contributions from Indonesia. We have seen the enthusiasm, the spirit of cooperation, trust and the willingness to exchange and share knowledge and information during the conduct of the workshops. Furthermore, China has agreed to host the Vietnamese scientists for the joint field study in China and vice versa as part of the case study activities.

It is also significant to point out that subsequent to the selection of the Yinggehai-Song Hong Basin case study for the Project, the Yinggehai-Song Hong Basin in the Beibuwan area was identified for bilateral cooperation in an agreement signed between the Governments of China and Viet Nam during the visit of the Chinese President HE Mr Hu Jintao to Viet Nam in November 2005.

Activities undertaken under this project include inception phase meeting, workshops and meetings to discuss the two cross border case studies: Yinggehai-Song Hong basin between China and Viet Nam, and the Sulu Sea-East Sabah basin between The Philippines and Malaysia.

Details of the ICB Project can be accessed at the website:

<http://www.ccop.or.th/techdetail.asp?id=31>

### **3) CCOP/ASCOPE/PETRAD Programmes**

With the technical and financial support of Norway, CCOP/ PETRAD cooperation to undertake activities at the request of CCOP member countries remained active and successful. Continued efforts are being exerted and PETRAD had been particularly resourceful in soliciting support for the seminars requested by the member countries. The Technical Secretariat and PETRAD have been compiling a list of topics provided by the member countries, which will serve as the basis to request for funding support from the Government of Norway.

During the reporting period, five seminars were held with a total of 408 participants.

## **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. A series of workshops and seminars are planned for the CCOP member countries between 2003 and 2007. For the reporting period the 3rd CCOP-USGS-CGS (California Geological Survey) Workshop on Quantitative Mineral Resource Assessment of SE Asia, and Joint Seminar with North-East Asian Region of GMRAP was held.

### **2) Community and Small-Scale Mining in Asia (CASM-Asia) Project**

The CASM-Asia Project has been endorsed by the 44<sup>th</sup> Steering Committee Meeting on 19-20 November 2005 in Tsukuba, Japan. This three-year project, from 1 May 2005 to 31 April 2008, is

supported by the World Bank in close cooperation with the Geological Survey of Japan, AIST. The objective of the project is to function as a hub for CASM activities through which cooperation network of those engaged or have interest in artisanal/small scale mining can be built and to bridge the artisanal/small miners with the stake holders, communities, technology and science in the Asia-Pacific region.

The Project was launched at the Inaugural Meeting held in Bangkok, Thailand on 25-26 July 2005. Following the inaugural meeting, the Goal-Oriented Project Planning (GOPP) workshop was also organized.

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

### **1) CCOP-GSJ/AIST Project on Groundwater Assessment along Great River Basins in East and Southeast Asia**

The CCOP-GSJ/AIST Project on Groundwater Assessment along Great River Basins in East and Southeast Asia is a 5-year project which commenced in April 2004 with the support of the Geological Survey of Japan / AIST. This Project aims to make a volumetric evaluation of groundwater resources by a water balance simulation, and to make a groundwater assessment plan along the great river basin in each country and/or area according to the field situation. It is also the objective of this project to extend the database of the CCOP Compilation of Groundwater and Geothermal Databases in the CCOP region, Phase IV Project by making a qualitative groundwater assessment. During the reporting period, the kick-off meeting of the Project and a training course were organized.

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

### **2-A. GEOHAZARDS PROGRAMME**

#### **1) Development of Techniques on Landslide Hazards Assessment Project**

With the support of the Government of Korea through the Ministry of Science and Technology (MOST), CCOP and KIGAM initiated a 3-year project in 2002 entitled "Development of techniques on landslide hazards assessment". The project aims to develop the techniques for the assessment of landslide hazards in the CCOP member countries with respect to application study of geographic information system (GIS) and remote sensing.

The third phase of the project, 1 August 2004 – 31 July 2005 has been shortened to end of April 2005 due to financial measures taking place at MOST, Korea. The proceedings of the project will be published in March 2006 by KIGAM.

#### **2) Field Workshop for Volcanic Hazards Mitigation**

The CCOP-GSJ/AIST Project on Field Workshop for Volcanic Hazards Mitigation is a 4-year project which commenced in April 2004 with the support of the Geological Survey of Japan / AIST. This Project aims to conduct a comparative study of the volcanic hazards faced by CCOP member countries, the predictive methods for future eruption in middle term based on the eruptive history, hazards mapping from a volcanic eruption case study and scenario analysis on the eruptive sequence (activity duration, the climax of activity, eruption rate, eruption sites, and eruption style). This could be achieved by conducting case studies field visits, workshops and research. Special field excursions and training will be arranged for young volcanologists from the concerned member countries. Scientific papers from the study will be published.

In 2005, the project's second field workshop was organized in Yogyakarta, Indonesia.

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

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

The CCOP-GSJ/AIST Project on Integrated Geological Assessment of Deltas in South-East Asia (DelSEA Project) is a 4-year project which commenced in April 2004 with the support of the

Geological Survey of Japan/AIST. The purpose of the project is to conduct cooperative geoscientific study/research of the major deltaic areas of East and Southeast Asia by member countries of CCOP as part of the IGCP 475 “DeltaMAP” project, and to promote the sharing and dissemination of the study/research results in annual meetings of IGCP 475, the proceedings of which will be published in an international journal.

The Kick-off Meeting of the CCOP DelSEA Project was held in Ho Chi Minh City, Viet Nam from 9 to 16 January 2005 in conjunction with the International Conference on DELTAS and the 2nd Annual Meeting of IGCP-475 DeltaMAP and the Asia-Pacific Network for Global Climate Change Research (APN) MegaDelta.

A seismic survey in Lake Tonle Sap, Cambodia is planned to be jointly carried out by the General Department of Mineral Resources, Cambodia (DGMR), DMR and GSJ/AIST under this project in early 2006. The purpose of this survey is to undertake collaborative study among CCOP member countries and particularly to understand the geology and stratigraphy of coastal lowlands of the Mekong River delta in Cambodia by using seismic equipment.

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

### **1) Research on the Coastal Environment Management Strategy of the Asian Delta Region (Phase I)**

The CCOP-GSJ/AIST Research Project on Coastal Environment Management Strategy of the Asian Delta Region (Phase I) is a 3-year project which was started in April 2004, and is being supported by Tokyo University in close cooperation with the Geological Survey of Japan / AIST. This project aims to describe quantitatively the problems on seashore erosion and eco-system loss and to make the proper management strategy of coastal environment.

A field study, including aerial and ground survey of the Chao Phraya Delta was carried out. It was followed by the Japan-Thailand Joint Seminar on Strategy for Sustainable Development of Coastal Area organized by the Technical Secretariat in Bangkok, in cooperation with the Department of Mineral Resources Thailand (DMR), University of Tokyo, and GSJ/AIST.

### **2) CCOP-KIGAM Workshop and Training on Current Issues in Geoscience**

CCOP and the Korea Institute of Geoscience and Minerals (KIGAM) organized a tri-thematic workshop and training on current issues in geoscience on 26-28 October 2005 in Bangkok. The three thematic parallel sessions are as follows:

- Theme I: Seawater Intrusion Problems in the CCOP Region.
- Theme II: Mineral Potential Mapping using GIS and Remote Sensing.
- Theme III: A New Strategy for Marine Aggregates Development and Information Management.

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

### **1) SANGIS Programme**

*CCOP-CIFEG- UNESCO Asian Multilingual Thesaurus for Geoscience (AMTG)*

The Asian Multilingual Thesaurus is a tool for information retrieval across language barriers. This facilitates multilingual research and information exchange. CCOP member countries participating in this initiative include Cambodia, China, Indonesia, Japan, Korea, Malaysia, Thailand and Viet Nam. Lao PDR was also invited to participate. The Thesaurus shall be integrated in the SANGIS Bibliographic Database, enabling each country to work on its own language.

A printed AMTG is planned to be published in 2006, together with a web-based one at <http://www.ccop.or.th/amtg>.

### *SANGIS Bibliographic Database*

With the compilation of the AMTG, the SANGIS bibliographic database on Microsoft Access application has been enriched, with the AMTG integrated into the system. The Chinese National Coordinator of the SANGIS programme visited CIFEG on 20 to 25 June 2005 to customize the SANGIS Access application for Chinese language. The Chinese version of SANGIS database is now ready for use. A training course on the use of this database for six regional libraries of China Geological Survey was conducted by CIFEG on 5-9 September 2005.

UNESCO through CIFEG provided the CCOP T/S server to host the SANGIS web database, which was successfully transferred to CCOP T/S on November 2005. The SANGIS web database can now be accessed at <http://www.ccop.or.th/sangis>.

### **2) GRIDNET Programme**

The GRIDNET programme (Geoscience Report and Information Dissemination Network) aims to ensure that information, reports and other products from Cooperating Country and Organisation's bilateral and other aid-funded research projects relevant to the CCOP region are made available to organizations in CCOP member countries. The titles available in GRIDNET as well as the web links to the reports/publications of some Cooperating Countries can be seen in the CCOP Homepage,

### **3) CCOP-GSJ/AIST Project on Geoscience Asian Information Network (GAIN)**

The CCOP-GSJ/AIST Project on Geoscience Asian Information Network (GAIN) is a 3-year project which was started in April 2004, and is being supported by the Geological Survey of Japan / AIST. This project aims to establish a clearinghouse of geoscience information of East and Southeast Asia where customers worldwide can get the necessary information on the availability of geoscientific information particularly of CCOP member countries. Data and information will reside in the respective member countries. This will also make use of what has been accomplished in the CCOP Metadata Project, as a starting point to further contribute to the promotion, dissemination and use of geoscientific information. The website for the CCOP Metadata / Clearinghouse is at <http://www.aist.go.jp/RIODB/GeoMetaData/ASIA/>

Under this project, the 3<sup>rd</sup> Working Group Meeting of CCOP Metadata Project was held on 24-25 November 2005 in Bangkok, Thailand.

## **4. FELLOWSHIPS AND GRANTS**

### **1) CCOP Texas A & M University Fellowship Programme**

The CCOP Texas A & M University (TAMU) Fellowship is a cooperative programme between CCOP and the Texas A&M University in the USA. Under this programme TAMU will provide graduate education fellowships to outstanding government and industry personnel from the CCOP member countries. In addition to the educational aspects, the project hopes to develop joint research projects between TAMU faculty and scientists and agencies in the CCOP member countries.

The first recipient of the award is Ms. Corazon Sta. Ana from the Department of Energy of The Philippines. There are two more slots available for the CCOP member countries under this program.

### **2) 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. Under the programme, a grant will be made available for researches in Geoscience and Environment in East and Southeast Asia to candidates from the Member Country hosting the CCOP Annual Session.

For 2005, the recipient of the award was Ms. Pan Xiao-Fie for her research work entitled “*The pressure depth temperature regime (P-T-X) for fluid infiltration and auriferous fluid source of two typical Indonesian gold deposits, the Nanjinshan and the Jinwozi, in the Beishan mountains*”. She is a PhD student at the Institute of Geology and Geophysics Chinese Academy of Science, Beijing, China. Dr. Ric Terman awarded the grant to Ms. Li during the CCOP 42<sup>nd</sup> Annual Session held in Beijing, China on November 2005.

### **III. New Initiatives for Tsunami**

#### **1) International Seminar on Tsunami: “How Thailand and the Neighbouring Countries will become ready for Tsunami?” (31 January – 1 February 2005, Bangkok, Thailand)**

Subsequent to the Asian Tsunami disaster, the Department of Mineral Resources of Thailand (DMR) in cooperation with CCOP organized an international seminar on Tsunami in response to the role of geoscience in the post tsunami rehabilitation and reconstruction, longer term planning, tsunami mitigation, early warning and creating public awareness. The seminar was supported by the DMR, the British Geological Survey (BGS), TNO – National Geological Survey of the Netherlands, and the National Institute for Advanced Industrial Science and Technology/Geological Survey of Japan (GSJ/AIST). The objectives of the seminar are to discuss geoscience actions for post tsunami rehabilitation and reconstruction, tsunami mitigation and early warning system, creating public awareness of tsunami hazards and to discuss how the international communities can assist the affected countries to become ready for future tsunamis.

The seminar officiated by HE Dr. Thaksin Shinawatra, Prime Minister of Thailand, was held in the Grand Miracle Hotel, Bangkok, Thailand on 31 January – 1 February 2005. A total of 679 participated in the seminar, among which 612 are from Thailand and 67 foreign experts from other countries, namely Canada, Finland, Germany, India, Indonesia, Japan, Korea, Malaysia, Netherlands, Norway, Papua New Guinea, Poland, Sri Lanka, United Kingdom and United States of America. A total of 61 agencies/organizations were represented; 25 from Thailand and 36 from other countries.

Prior to the seminar, on 28-30 January 2005, a field trip to the tsunami affected areas in Thailand, Phuket and Phang Nga Provinces, was organized by DMR. A total of 27 foreign scientists from various countries & organizations (Japan, Korea, Myanmar, Norway, UK, USA, CPC, CCOP, JICA), and one Journalist from BBC News participated in the field trip.

#### **2) Project Planning Workshop on Tsunami (28-30 March 2005, Phuket)**

Following the recommendation of the successful DMR-CCOP “International Seminar on Tsunami” held in Bangkok, Thailand on 31 January to 1 February 2005, a “Project Planning Workshop” was held in Phuket on 28-30 March 2005. The objective of this workshop is to develop a multi-national project on Tsunami to carry out needed work and analysis addressing both and short and longer term needs of the Tsunami-affected countries. Representatives of CCOP member countries – Thailand, Malaysia and Japan, and CCOP Cooperating Countries – Canada, Germany, the Netherlands, United Kingdom, and the Chairman of the Advisory Group participated in the Workshop.

A project document was developed at the end of the workshop, focusing on tsunami hazard as part of a fully integrated collaborative approach to coastal geohazards, particularly on three main geoscientific initiatives requiring urgent and concerted action: (1) Risk Assessment For Forward Planning, (2) Risk Mitigation and (3) Coastal Rehabilitation.

#### **3) Project on Tsunami Risk Reduction Measures with Focus on Landuse and Rehabilitation**

Upon the approval of the project by the 45<sup>th</sup> Steering Committee Meeting, 31 March to 2 April 2005 in Phuket, Thailand, implementation of the Royal Norwegian government supported

project on “Tsunami Risk Reduction Measures with Focus on Landuse and Rehabilitation” commenced in June 2005. This project is an 8-month fast track study in consideration of the urgent needs for reconstruction works to commence. The main purpose of this project is to establish practical guidelines for land use and rehabilitation of the devastated areas, considering the risk of future earthquake and tsunami events. The results of the study can also be used in other parts of the tsunami affected regions around the Indian Ocean.

The project is conducted by the Norwegian Geotechnical Institute (NGI), the project’s technical executing organization (TEO) in close cooperation with the Department of Mineral Resources (DMR), Thailand and the CCOP T/S. A Local Advisory Panel gives inputs to the study.

The project study has already been completed, and the final report is already available. It could be freely downloaded at the CCOP website, from the following link:

[http://www.ccop.or.th/download/pub/tsunami\\_final\\_report.pdf](http://www.ccop.or.th/download/pub/tsunami_final_report.pdf)

**The main conclusions from the report regarding future tsunami risk are:**

1. Within the next 50 to 100 years, the largest credible earthquake to be prepared for is a magnitude 8.5 event. The event could cause a tsunami which at the most gives an inundation level of 1.5 to 2.0 m above sea level. If the tsunami occurs at high tide, the inundation level could be 2.5 to 3.0 m above the mean sea level.
2. After about 100 to 200 years, the potential for earthquakes greater than M 8.5 will increase gradually, and so does the potential for generating larger tsunamis than that for the M 8.5 earthquake scenario. This implies that, as time passes by, the tsunami risk will gradually increase from tolerable to highly unacceptable.
3. Within the next 50 to 100 years, the potential risk from tsunamis to human life and property in Thailand will be small and can be regarded as tolerable. Therefore, in the short to medium term perspective, no mitigation measures would strictly be required. However, already now steps should be taken to reduce the more long term risk of human casualties.

**To reduce future risk and vulnerability to tsunamis, the following actions are recommended for Thailand:**

- Within a few years time implement measures to ensure a lasting long term awareness of the tsunami risk. Such measures may include new requirements to land use, site planning and building codes in potentially affected areas, and construction of some form of “monuments” along the coast that will give a clear warning to future generations about the tsunami risk.
- Within the next 5 to 10 years, implement at least some physical measures to reduce the consequences of future tsunamis and to serve as examples for the future. Physical measures considered most attractive are establishment of safe escape routes and elevated escape hills, and construction of local protection dikes near the waterfront.

For other countries around the Indian Ocean, the tsunami risk and the need for mitigation measures may be significantly greater than for Thailand. These countries are encouraged to undertake similar risk assessment and mitigation studies as presented herein for Thailand.

To share the results of the project to the stakeholders, planners, decision-makers as well as the international community, a dissemination seminar is planned to be organized in March 2006.

#### **IV. Publications**

A total of eleven publications (2 Newsletters, 1 Annual Session Proceedings, 3 Steering Committee Meeting reports, 1 PPM Mid-term Review report and 4 PETRAD Seminar reports) were published during the reporting report.

The workshop and seminar reports and proceedings of the Petroleum Policy and Management (PPM) Project are published in the CCOP PPM Website.

## **V. 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. ESCAP official attended the CCOP Annual Session and presented a paper during the Thematic Session held in conjunction with the Annual Session.

ESCAP and CCOP are playing an active role in the post December 26, 2004 disaster rehabilitation and mitigation efforts. Many post-tsunami activities are being discussed and planned both by ESCAP and CCOP. CCOP values the opportunity to work closely together with ESCAP in the design and implementation of these programmes. CCOP has also several other initiatives on geohazards, coastal zone management and groundwater, which provide a basis for further cooperation.

## **VI. 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.