



COORDINATING COMMITTEE FOR GEOSCIENCE PROGRAMMES

IN EAST AND SOUTHEAST ASIA (CCOP)

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Member Country Report of MYANMAR

1 July 2018 – 30 June 2019

Dr. Thet Tin Nyunt

Deputy Director General

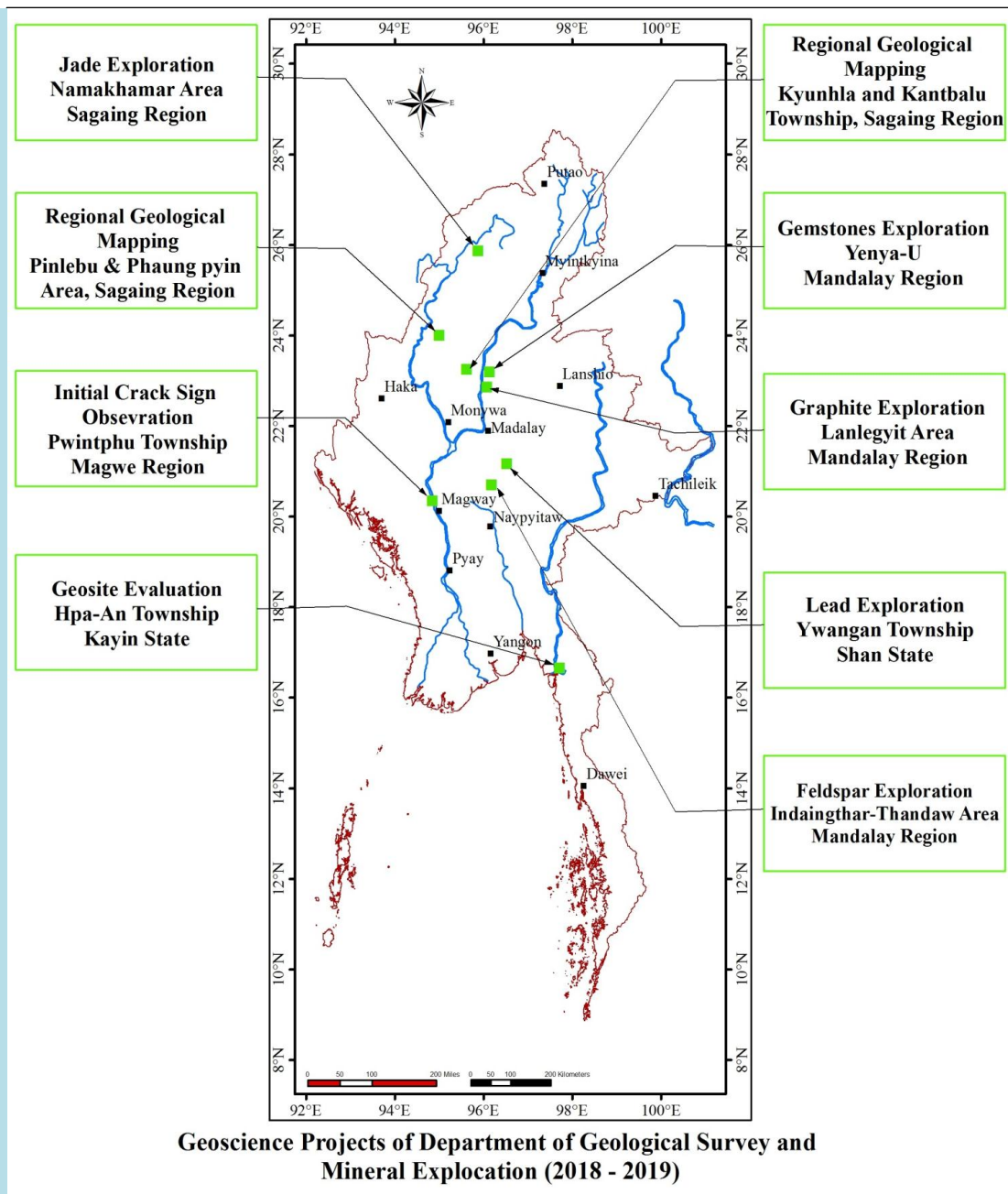
**Department of Geological Survey and Mineral Exploration
Ministry of Natural Resources and Environmental Conservation**

November, 2019

MINERAL PROGRAMME

Every year, DGSE has planned for specific field works in regional geological mapping, mineral exploration ,updating mineral database and joint survey with foreign and local companies.

- *Geological Mapping of(1: 50000) scale covering 680 Km² in Kyunhla and Kantbalu Townships, 1698 Km² in Pinlebu and Phaungpyin Townships in Sagaing Region have been completed..*
- *Mineral Exploration programs were carried out in Sagaing Region, Mandalay Region, Magwe Region and Shan State for **Lead, Feldspar, Graphite, Lateritic Bauxite, Jadeite and Gemstones potential areas.** The program consists of detailed geological mapping, topographic survey, test pitting, trenching, sampling and drilling in some prospects.*



- Total **(0.23 million) metric ton** of graphite probable ore reserve was estimated in the Lanlegyt area, north of Mandalay.



- The jade exploration was carried out in Namkhamar (Chaungthar) area, Hkamti Township, Sagaing Region. The Jadeite bearing conglomerate intercalated in sandstone has already found at Nankhamar/Chaungthar area which situated at the Tertiary Basin of Khanti Jade Mines. Jadeite bearing conglomerate beds was recorded **in length of 5 km and width in 0.3 km** around this study area.



The DGSE and KIGAM

- ❑ (DGSE) and Korea Institute of Geosciences and Mineral Resources (KIGAM) have signed the Research Agreement for the study of chromite mineralization and resources estimation at Bophivum area, Chin State on 28th March 2013. The signed RA tends to carry out the Chromite resource estimation at Bophi Vum area, from 2013 to 2015. The signed RA was finished in 2015 and to be extended four more years up to March 2020.
- ❑ The Chromite mineralization at the Bophi Vum area is associated with dunite of the incomplete ophiolite suite of the Chin Hills and formed as the podiform Chromite in lenses, pockets, irregular and disseminated. The ore reserve was estimated as 9790 tonnes (Measured reserve) and 12080 tonnes (Indicated reserve) with Cr-11.8% and Ni-0.34%..



Disseminated ore



Leopard ore



Nodular ore

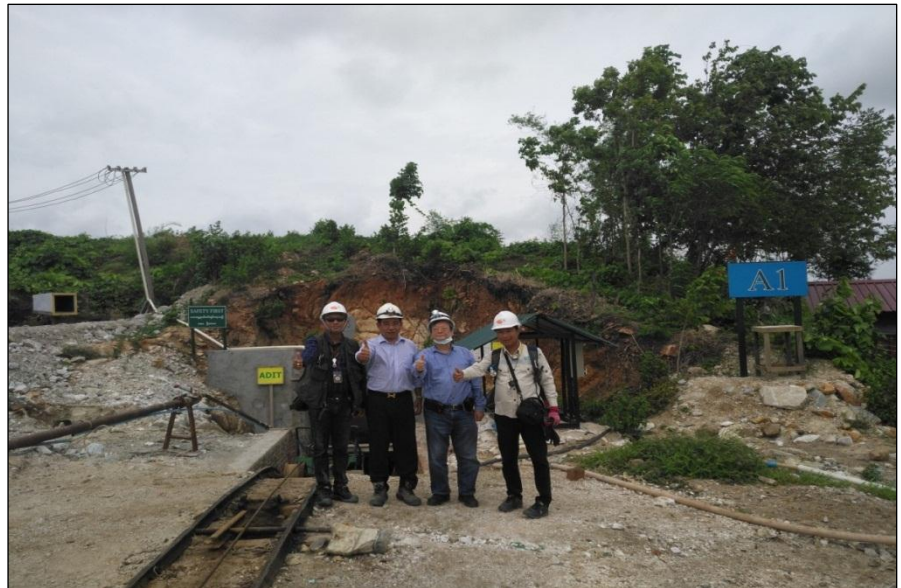


Massive ore

❑ Chengdu Centre of China Geological Survey (**CC-CGS**) and (**DGSE**) has carried out an joint geological field work from 14th July to 31st July 2018, in Myanmar.

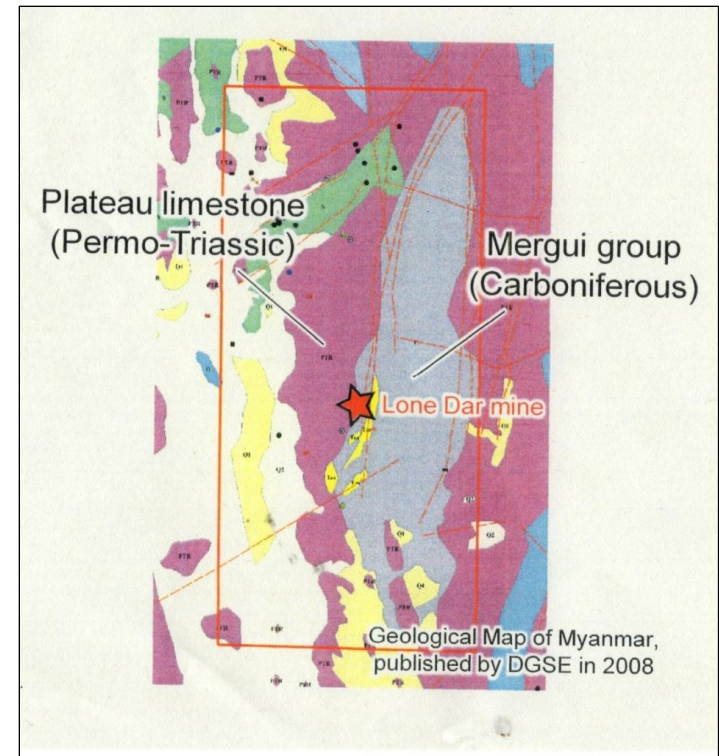


❑ Joint survey team of **DGSE –JICA** mineral affair senior advisor has visited Tabeikkyin – Singu Gold mining area from 11st June 2019 to 17th June 2019. Joint survey team studied gold Mineralization and current mining activities at Minban Taung and Leikkya underground primary gold worksite. Moreover, JICA senior adviser gave lecture about Japan Mining Sector history and good practice and interviewed with KIZUNA scholarship program alumnus students from MONREC



❑ **DGSE** and **JOGMEC** have conducted mineralization of Zn-Pb around Lone Dar Mine in Taunggyi, Hopong area, within 22.1.2019 to 5.2.2019. The main ore minerals are sphalerite (ZnS) and galena (PbS), and siderite is observed as gangue mineral. Small amount of chalcopyrite in quartz vein and silver minerals (argentite and native silver) are also found.

❑ The field party of **DGSE-DMR-Kasetsart University** team have visited Mandalay, Singu, Thabeikkyin and Mogok areas from 16.3.2019 to 3.4.2019. The joint survey team carried out the preliminary investigation of gemstone mine site in Mogok, Kyat Pyin, Ye Nyar U and Kyaukpon areas.



❑ Joint survey team of DGSE, Geological Survey of Japan (GSJ), Irrigation and Water Utilization Management Department (IWUMD) and Akita University, has visited to Kalaw, Nyaung Shwe, Inlay Lake in Southern Shan State from 6th to 8th March 2019.

❑ It is one of a workshop for Geology, Hydrology and Energy in Asia for GSJ.



CLMTV cross - border collaboration, The CLMTV collaboration among the five parties (Cambodia-Lao PDR-Myanmar- Thailand-Vietnam) aims to collect and updated geological information, between boundaries of the five countries and share among the members.

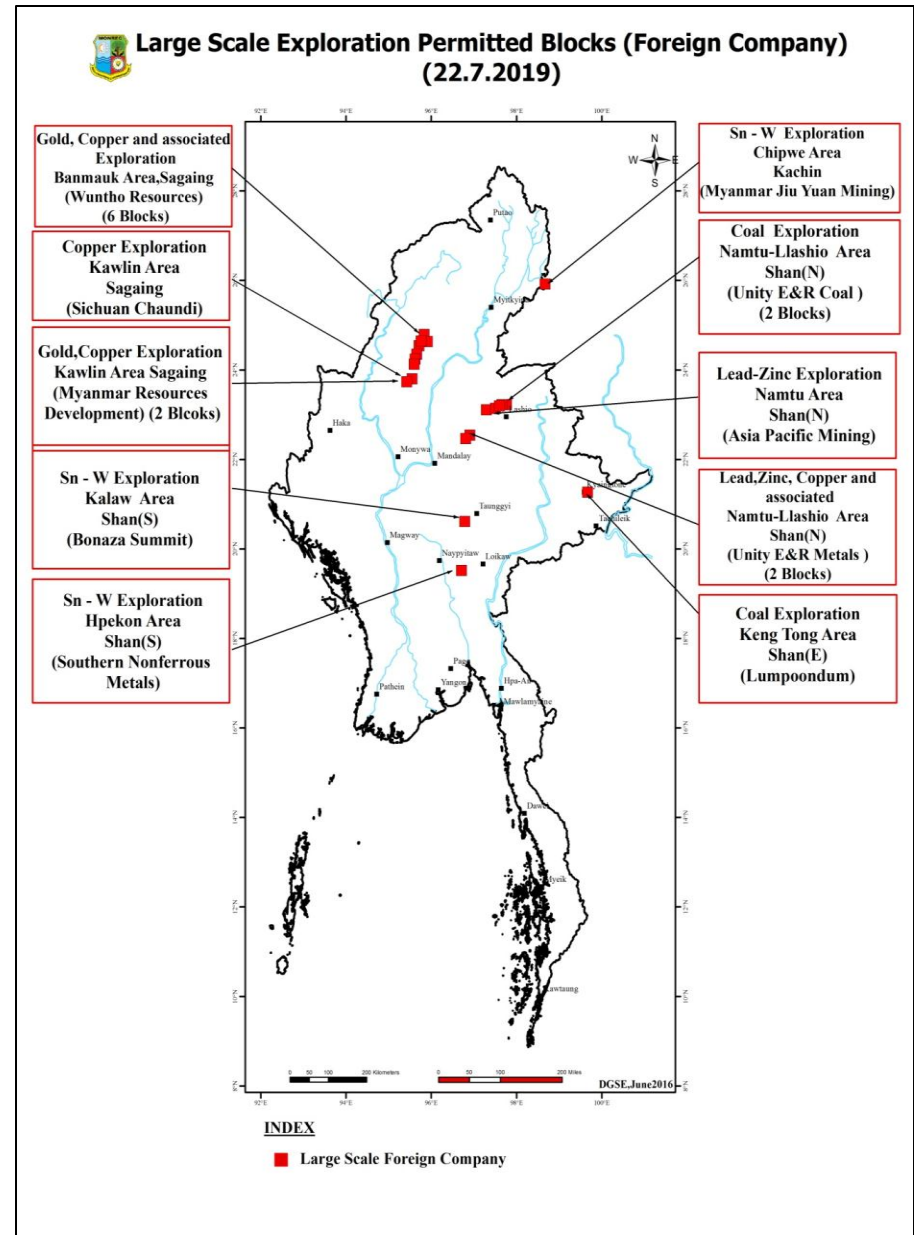
DGSE-DMR joint survey team carried out the preliminary investigation of gemstone mine site in Mogok, Kyat Pyin, Ye Nyar U and Kyaukpon areas. Joint survey team not only surveyed gem mineralization style but also studied gemstone market, quality and design in Mogok and Mandalay gem markets and plazas. It is one of the activities of collaboration in Geosciences among “Comparative Study on Mineralization of Gemstones in CLMTV Region” from 2016 to 2019.

Joint survey team also has done geosites evaluation in Mogok and Monywa area. The effective database of cooperation can be achieved between DGSE and DMR joint field works based on "Comparative Study on Mineral Potential and Geotourism sites".



Joint venture mineral exploration with Foreign Companies.

The foreign companies have applied for mineral exploration rights in Myanmar for Gold, Copper, Lead, Zinc, Tin-Tungsten, and Coal. Currently Ten foreign companies have been granted mineral exploration permits in Myanmar and exploration works are being undertaken with DGSE.



GEO-RESOURCES	ENERGY	GROUND WATER	GEO-HAZARD	GEO-INFORMATION
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Proposed Future Activity

DGSE has planned to proceed with KIGAM for the study of chromite mineralization and resources estimation. The mineralization of corundum and geo-hazards related to active fault and landslides have been studied with DMR from 2016 to 2021. Seamless geological survey along the cross border with CLMTV is also proposed for future activities.

Assistance Required from CCOP in Support of Future Activities

Technical assistances and financial supporting for joint studies are also required.

Assistance Offered to CCOP/Other Member Countries in Support of Future Activities

DGSE can share the technical reports and information, conference papers to CCOP and other member countries.

Other Comments

DGSE would like to propose to improve strengthen bilateral cooperation and research works in the field of geosciences with CCOP member countries

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ENERGY PROGRAMME

During the period of (1.7.2018 to 30.6.2019), Ministry of Electricity and Energy continued enhancing onshore and offshore oil and gas exploration and exploitation, and studied the LNG supply for future domestic requirement.

Oil and Gas Exploration and Production Activities

- The M.O.G.E, in cooperation with International Oil Companies, is carrying out oil and gas exploration and production operations in Myanma onshore blocks through the respective contracts. M.O.G.E is itself carrying out E & P operations in 10 onshore blocks. Oil production is being carried out in the fields of Kyaukkwet, Letpando, Thargyitaung, Htaukshabin and Kanni in Salin Basin and Pyay and Myanaung in Pyay Embayment. Gas production is being carried out in the fields of Kyaukkwet, Thargyitaung, Ayadaw and Mann in Salin Basin and Apyauk, Nyaungdon and Maubin in Ayeyarwady Delta.

Offshore Oil and Gas Exploration and Production Activities

In Myanmar Offshore, there are 28 Oil and Gas Exploration blocks are operated by 17 international oil companies. 11 blocks are exploration stages and 17 blocks are study period. PTTEPI drilled one exploration well in Block M-11. MPRL E&P also drilled one exploration target and appraisal well.

LNG Project

- Yetagun Project is located in Moattama Offshore Blocks M-12, M-13 and M-14 operated by PETRONAS Carigali Myanmar Ltd (PCML).
- Shwe Project is operated by POSCO International Corporation which is located in Block A-1 and A-3 of Rakhine Offshore.
- Zawtika Project located in Block M-9 of Moattama Offshore. The operator is PTTEP International. Its current daily production is about 362.53 MMCFD of gas.
- Yadana Gas Project is located in Moattama Offshore Blocks M-5 and M-6 operated by Total Exploration and Production Myanmar (TEPM)

Proposed Future Activity

Joint study

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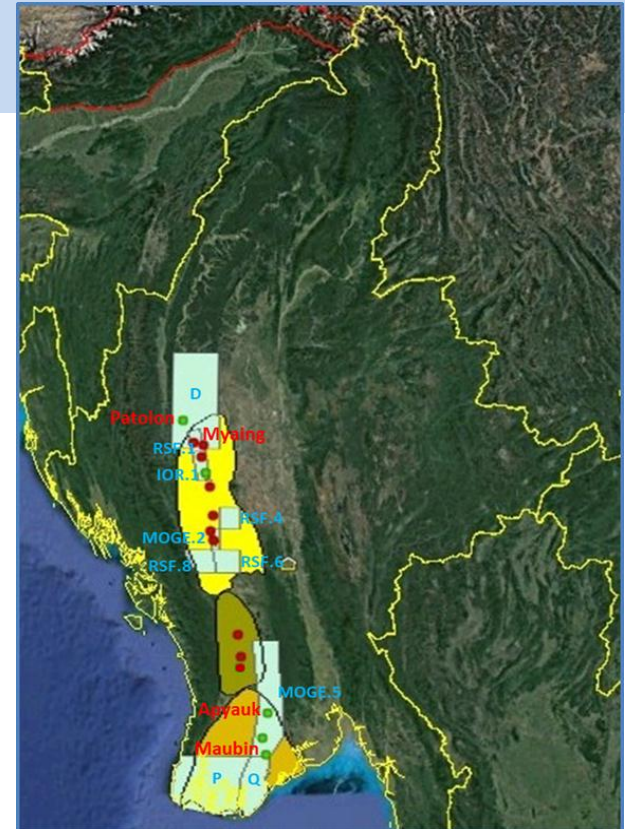
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GROUNDWATER PROGRAMME

Irrigation and Water Utilization Management Department (IWUMD) is the key department which was established under the Ministry of Agriculture, Livestock and Irrigation (MoALI). In briefly, *the water well drilling for agriculture and drinking purposes, groundwater monitoring, artesian aquifer management activities, coastal aquifer management and cooperative groundwater research works with international organizations were done during the July 2018 to June 2019.*

Annual Review of Individual Technical Activities

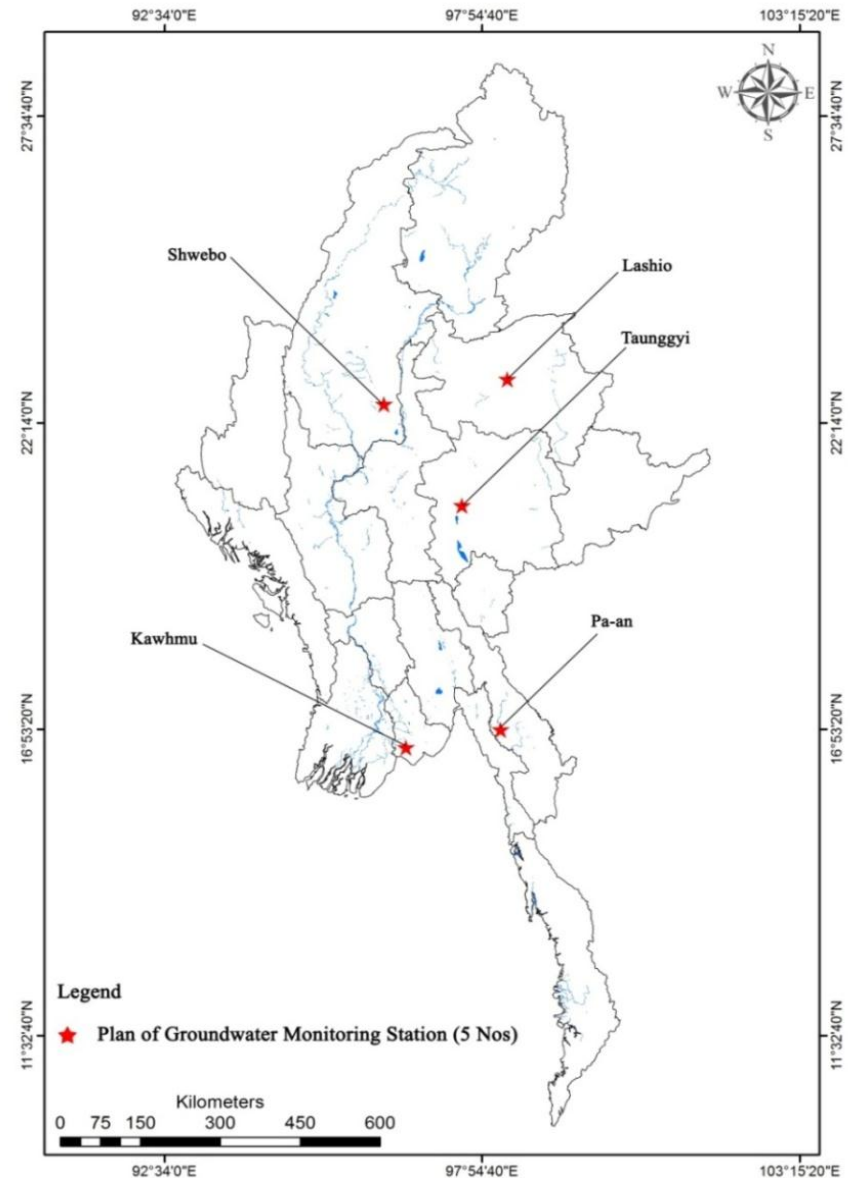
The total of (308) irrigation tubewells and (168) drinking water tubewells were sunk by department within the period of July 2018 to June 2019. The majority of diameter of the tubewells size is \varnothing 4" inches.



IWUMD’s Achievement of Water Well Drilling

Sr.no	State/Region	No. of Irrigation tubewell	No. of Drinking water tubewell	Total number of Tubewells
1	Union Territory (Nay Pyi Taw)	2	13	15
2	Kachin	40	-	40
3	Kayah	-	15	15
4	Kayin	-	17	17
5	Sagaing	32	16	48
6	Rakhine		2	2
7	Bago	77	7	84
8	Magway	-	7	7
9	Mandalay	-	5	5
10	Mon	-	13	13
11	Yangon		2	2
12	Shan	4	33	37
13	Ayeyarwaddy	153	38	191
	Union Total	308	168	476

The total of 5 groundwater monitoring wells were drilled and installed the groundwater monitoring devices with remote data sending and receiving systems in each monitoring wells. The monitoring sensors will record groundwater level fluctuation, Electrical Conductivity (EC) and groundwater temperature.



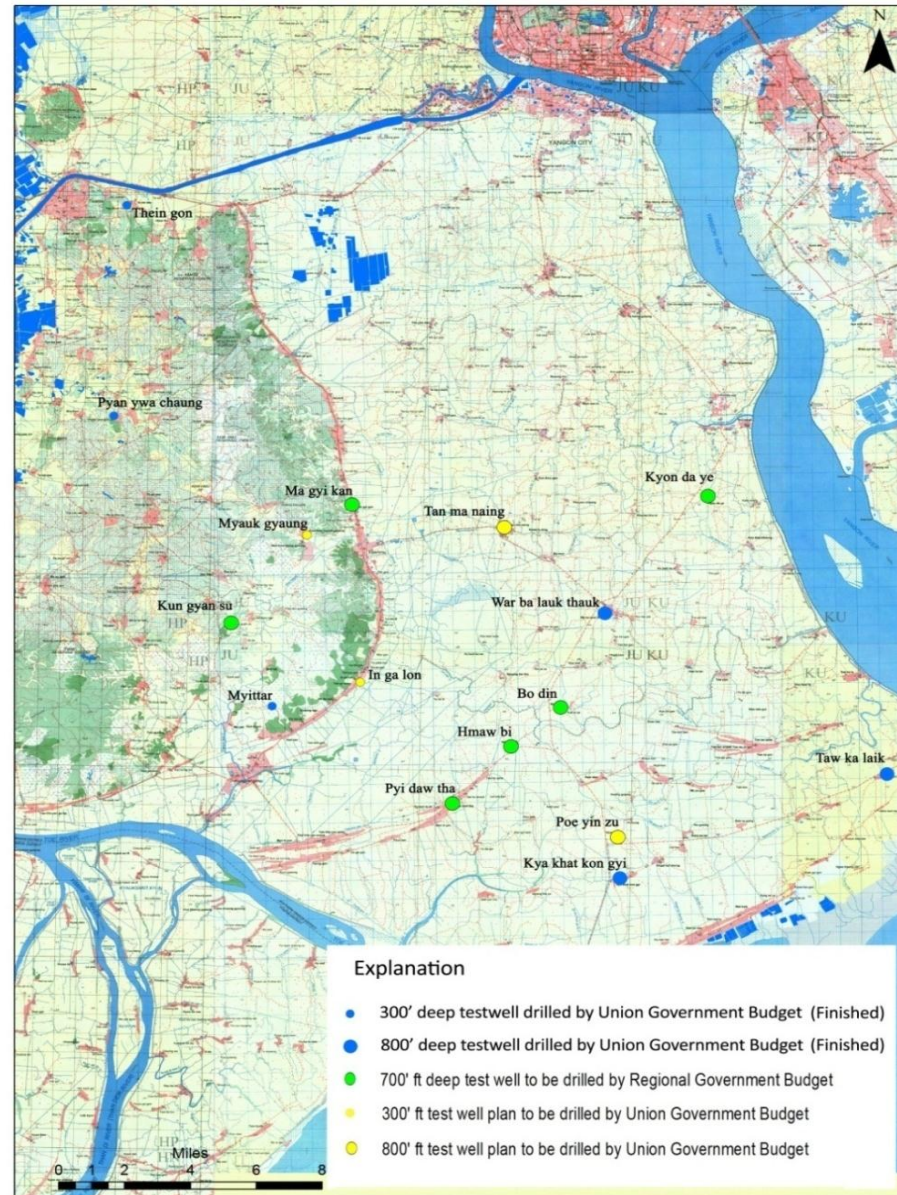
Artesian aquifer management

- Yinmarbin artesian zone is situated within Yinmarbin District, Sagaing Region of Myanmar. It is also laying the western edge of central dry zone of Myanmar. The potential artesian aquifer which composed of Tertiary coarse sand and gravel aquifer is favorable for getting over flowing tubewells with high yield and good water quality.
- The IWUMD is implementing the necessary measures to recover the previous over flowing condition in the artesian zone by means of piezometric level pipe installation in all artesian tubewells and public awareness including groundwater education trainings to local people.



Groundwater investigation in coastal aquifer

IWUMD continues groundwater research work on the coastal aquifer investigation in Yangon Region. The investigation includes surface and sub-surface geophysical surveying, test well drilling and water quality assessment. The total of (10) test wells are drilling and resistivity survey and groundwater sampling and analysis are taking place in necessary areas. Finally, the groundwater assessment report will establish for research areas.



International collaborations in groundwater research

- Feasibility survey for “*Solar-powered Irrigation Improvement Project*” cooperation between IWUMD and Korea Rural Community Cooperation (KRC) in Central Dry Zone – Myanmar.
- Preparing the project concept note on the “*Building of Agricultural Groundwater Monitoring Systems for Rearrangement of Tube-wells in Myanmar*”.
- *Myanmar language translation and official book launching of previously published Hydrogeology of Central Dry Zone – Myanmar by English language* which supported by Australian Water Partnership (AWP).
- *Developing Capacities in Water Accounting and Groundwater Management training program in cooperation with FAO.*

Proposed Future Activities

- Solar-powered Irrigation Improvement Project in Central Dry Zone collaboration with Korea Rural Community Cooperation.
- “Building of Agricultural Groundwater Monitoring Systems for Rearrangement of Tube-wells in Myanmar” with Korea Rural Community Cooperation.
- Artesian aquifer management pilot study of the Yinmarbin-pale sub-basin with Australian Water Partnership.
- Hydrogeological Mapping in Eastern Highland including Shan State with Australian Water Partnership.

Assistance Required from CCOP/Other Member Countries in Support of Future Activities

- ☐ Capacity building for groundwater related subjects under the program of CCOP.
- ☐ Attending the groundwater seminars and workshops and knowledge sharing programme under the arrangement of CCOP.

Assistance offered to CCOP/Other Member Countries in Support of Future Activities

- ☐ Trans boundary aquifer study in Greater Mekong Basin.
- ☐ Knowledge sharing and capacity building program with member countries.

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GEO-HAZARD PROGRAMME

DGSE has carried out the CLMTV Technical Cooperation on Geohazard study activities covering the period of 2016-2018. The Geohazard Pilot Project site of Taungoo-Loikaw-Naypyitaw has been choose during the period of 2019 to 2021. Moreover, DGSE shall be participated geological investigation of potential landslide with ASEAN member countries within the year of 2018-2020 project timeline.

Annual Review of Individual Technical Activities

DGSE and International Organizations including DMR and EOS have carried out geological investigation of potential seismic areas and also recommended to Regional Government Organizations and local communities for future prevention and mitigation of geo-hazard events.

Paleoclimate Investigation with International Organizations in Myanmar

Department of Geological Survey and Mineral Exploration (DGSE), Myanmar Earthquake Committee (MEC), Geology Departments of Myanmar Universities , Department of Hydrology and Meteorology (DMH), Earth Observatory Singapore (EOS), Nanyang Technological University (NTU) participated in joint survey for Paleoclimate Investigation in Myanmar during 16th to 28th March 2019. The survey team has observed around the area of Rakhine Coastal Region, Hinthada Township and Gaw yan gyi Beach in Ayeyawaddy Division. The team intended to develop the meteorological estimations based on geological data in Myanmar.

GEO-HAZARD PROGRAMME

Japan ASEAN Cooperation - ASEAN Landslide Risk Management Field Survey and Workshop

ASEAN Landslide Risk Management Field Survey and Workshop organized by Institute of Global Environmental Strategies (IGES) and sponsored by Japan ASEAN Cooperation was held at Taunggyi, Shan State, Myanmar. In this workshop, knowledge sharing landslide risk management field and QGIS application for landslide susceptibility mapping were discussed within 11.6.2019 to 17.6.2019.



Proposed Future Activities

Proposed future activities are cooperation study not only on seismic hazard investigation and mitigation but also on an active Sagaing Fault effected areas.

Assistance Required from CCOP in Support of Future Activities

- Workshop or training course related to seismotectonic studies in CCOP member countries.
- Exchange of information in the field of geo-hazards management and international cooperation network on geo-hazards prevention and mitigation.

Assistance Offered to CCOP/ Other Member Countries in Support of Future Activities

DGSE can share some kinds of data for geo-hazard effected areas in Myanmar to compare with that of other CCOP member countries.

The GIS laboratory of DGSE has carried out digitizing 1:50000 scale geological map sheets and mineral database. In addition, ASEAN Web-based mineral resources database training program led by GSJ including workshop at Tsukuba and Cambodia field trip investigation has been carried out with the aid of JICA.

Annual Review of Individual Technical Activities

- One of a DGSE delegate participated in the 3rd International Workshop on CCOP Geoscience Sharing Infrastructure for East and Southeast Asia (GSi) Project held on 18th – 20th September 2018 in Langkawi, Malaysia.
- DGSE delegate will be participated in the 4th International Workshop on CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia (GSi) Project, 1st -3rd October 2019. Siem Reap, Cambodia.
- Under the ASEAN Mineral Database Programme, a new database system is being discussed before uploading data/information into a Web GIS system.

Proposed Future Activities

DGSE and CLMTV working group experts have planned to proceed for field works at Hpa-An area, Kayin State in 2020.

Assistance Required from CCOP in Support of Future Activities

More training on Web-GIS are requested to JICA for better understanding of practical application.

Assistance Offered to CCOP/Other Member Countries in Support of Future Activities

DGSE can share the ASEAN Web-based on mineral database, geoscience and geological information to CCOP Member Countries.



CCOP Member Country Delegates Study at the Langkawi Geopark in Malaysia

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The End

Thank for your Attention

We hope there'll be more
cooperation between
Myanmar and CCOP!

2018/03/08