

BAGUS Project News

Prof. Sudarto Notosiswoyo's Retirement



Bagus Project's leader on Indonesian side, Professor Sudarto Notosiswoyo, has arrived to his retirement in August 2018. On 4th August 2018 ITB held a ceremony to commemorate Prof. Sudarto's contributions and achievements during his 42 years serving as lecturer and researcher in which JICA coordinator, Mr. Jiro Kamigatauchi, and Mr. Taiki Kubo from Kyoto University and Ms. Riestanti attended.

Despite his retirement, Prof. Sudarto will still be the leader on Indonesian side of BAGUS Project, as he said in previous BAGUS Project meetings, that he will be back as Emeritus Professor and work in ITB especially for the completion of BAGUS Project.



2018 Intensive Training Course on Geothermal Science and Technology

As previously planned, the 2018 Intensive Training Course on Geothermal Science and Technology was conducted from 2nd to 16th September 2018 at Kyoto University's Katsura campus. Similar from the last year's training, the participants experienced classroom lectures, field works and advanced laboratory experiments. A total of fourteen participants from ITB, Center for Mineral, Coal and Geothermal Resources (CMCGR) of Geological Agency, Ministry of Energy and Mineral Resources, Star Energy and Geo Dipa Energi joined the training this year.

Although during the training typhoon Jebi hit Kyoto and left some considerable damage to the city, the training went well according to the plan. Eventually all participants successfully completed the courses delivered and returned home happily with added knowledge and experiences.

Course Schedule

No.	Day	9:30-11:30	13:30-15:30	15:45-17:45
1	2 (Sun)	Arrival at Kyoto and Orientation		
2	3 (Mon)	[1] Dr. Yamada <i>Geothermal Drilling</i>	[2] Dr. Goto <i>Electromagnetic Geophysics</i>	[3] Dr. Kashiwaya <i>Geochemistry</i>
3	4 (Tue)	[4] Prof. Mikada <i>Seismic Geophysics</i>	[5] Prof. Tosha <i>Social Science</i>	[6] Prof. Yoneda <i>Mineralogy</i>
4	5 (Wed)	[7] Prof. Koike <i>Geo-thermics & mathematics</i>	[8] Prof. Koike <i>Remote Sensing</i>	[9] Dr. Tenma <i>Reservoir Engineering</i>
5	6 (Thu)	Self study	[10] Prof. Fujimitsu <i>Volcanology</i>	<i>Collaboration Seminar with Koike Lab.</i>
6	7 (Fri)	[11] Prof. Sakurai <i>Global Leadership</i>	[12] Mitsubishi Materials & Mitsubishi Materials Techno <i>Geothermal Practice</i>	[13] Prof. Ishida <i>Geomechanics</i>
7	8 (Sat)	Self study		
8	9 (Sun)	Trip to a Geothermal Site		[Orientation of field training]
9	10 (Mon)	Field training at a geothermal site (Hatchobaru, Kyushu)		
10	11 (Thu)	Return Trip to Kyoto (including geothermal site-visits in Beppu City)		
11	12 (Wed)	Laboratory experiments		
12	13 (Thu)	Laboratory experiments	Data Analysis	
13	14 (Fri)	Self study	Presentation of Learning Result	
14	15 (Sat)	Feedback of overall training		
15	16 (Sun)	Return to Indonesia		



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GEOHERMAL
DEPT.

The course covered a good balance of breadth and depth in the realm of geothermal. I gained a much greater knowledge about the geothermal science and technology, both theoretical and practical. The sensei on the course were very experienced and knowledgeable. I liked the atmosphere of the course: relaxed, easy to discuss with the *sensei*. I will take the key knowledge gained and put this into practice to contribute to Indonesia's geothermal development.

It was very pleased to join in 2 (two) weeks of the geothermal intensive course. There were many lectures that I got and especially about fieldwork experience at Hatchobaru. They improved my knowledge related to geothermal energy. Thanks to all the lecturers at Kyoto University and ITB who have given me the opportunity to follow this program. I also give thanks to JICA which is the agency of this program. I enjoyed staying in Kyoto, one of the comfort cities in Japan. Hopefully, I can be there again at another time. ありがとうございます

I am so lucky to join this precious program. By joining this program, I got chances to improve my geothermal knowledge through the excellent Sensei at Kyoto University. I also really enjoy Kyoto city with the beautiful view and extraordinary cultures. On this opportunity, I want to say thank you to all of the parties involved in this course who always take care of us while we stayed in Kyoto. I hope we can meet again in the future.
どうもありがとう



Agung Budi
Tri Prasetyo



Grandy Bilhan
Danakusumah



Ayu Gracia
Ade Sumartha



Abdul Hadi
Harahap

Two weeks of the training was very unforgettable moment. Very tight schedule, abundant of knowledge shared by all the sensei respectfully that range from explorations to engineering study of Geothermal followed by memorable field trip to one of the oldest Geothermal field in Japan which is Hatchobaru, including data sampling and analysis, experiencing the city of Kyoto and Beppu, the famous *onsen* and introduced to Japanese culture and very pleasant stay both in Kyoto and Beppu. Two weeks was not enough, the excitement of experiencing the taste of living in Japan with all Jica colleagues was very extraordinary experiences. Thank you JICA, BAGUS SATREP and Kyoto University for making this journey happened. Would like to see all the people involve again in the future.
どうもありがとう.

BAGUS-SATREPS geothermal training course provided by JICA was a robust, comprehensive and compact, yet a very well delivered geothermal course. Its broad coverage ranged from the fundamental of exploration techniques, geothermal best practices, new geothermal frontier to human resource development; extended with geothermal power plant visit, fieldworks and lab analysis, sufficiently making this two weeks training a complete geothermal course.

Trainers in their respective fields and helpful laboratory supervisors were making a series of learning process in Kyoto University comfortable to be followed. Open discussion during the class, fieldworks, laboratory analysis and final presentation created a lively learning environment.

Not to mention the generous and warm hospitalities from all Kyoto Univ.' sensei and doctoral students of Prof. Koike's lab members that we received during our stay in Kyoto were exceeding our expectation, making the two weeks stay in Kyoto a very humbling and unforgettable experience.



Akbar Dwi
Wahyono



Angga Bakti,
(Jr. Lecturer)

This JICA intensive short course for Geothermal did a great job and exceeded my expectations. There are many insight and each every day there is always something new to learn. Thank you for the knowledge and the opportunity. It is really great experiences and I hope can come back to Kyoto.

GEO DIPA ENERGI



Chevy Iskandar,
Geophysicist

It was a big honor and unforgettable moment for me to attend two weeks intensive training from JICA and Kyoto University in Japan. The program is very useful, I can learn many things not only knowledge about geothermal but also very good culture in Japan. Lab experience and field sampling in Hatchobaru was one of my great experience that I have got from this training. Thank you so much and I really appreciated for JICA and Kyoto University especially Koike Sensei. See you in another journey Kyoto, Japan !

CENTER FOR MINERAL, COAL
& GEOTHERMAL RESOURCES

I am very thankful to be given the opportunity to join this two-week intensive course. Being able to experience the study the latest technology developed in Japan, going to Hatchobaru power plant and Jigoku hot springs, also doing lab experiment were such valuable experience for me. Thank you to JICA and BAGUS program for the funding, for all of the *senseis* for all the knowledges shared, and all of the students for making the trip to Japan fun and memorable.



Ratna Dewi,
Geophysicist

THANKS A LOT. I don't have word to describe what I feel. I would like to thanks Institut Teknologi Bandung as well as Kyoto University, their collaboration made my dream come true: to attend the training program during 2 weeks in Kyoto. BAGUS project is an excellent opportunity to enrich knowledge about geothermal. Their awesome team, well organized, made my life wonderful in Japan. All of the teachers were incredible and very formative with concrete examples, they helped me to improve in order to develop my skills. JICA training helps me see life through new perspective. I experienced a geothermal environment for the first time. I gained enormous knowledge and enjoy Japan. I'm so glad that I did and I hope to come back to Kyoto again. I would recommend this training to anyone interested in geothermal field "Dear successor, do not hesitate! It is an opportunity not to miss"

ITB
MINING ENG.
DEPT.



Rindraniaina
Sylvie
Raharisonjanahary



Awwab Hafizh

BAGUS program realizes one of my dreams. Learning about Geothermal in Japan from very smart and humble lecturers is an unforgettable experience. Not only science, but I get very good friends, able to feel Japanese culture directly and use the laboratory equipment that I just recognized. I say Thank You to JICA, ITB, Kyoto University and all parties who participated in the success of this event. Science is an invaluable investment. Hopefully this program will continue and have a great impact on the future of all of us.

Alhamdulillah, All Praises to Allah. This is Amazing Experience Two weeks Intensive Course in Japan. I learned everything about Geothermal Energy in Japan, I learned Japan geological condition, and I also learned Japanese Culture like hard work, discipline and on time. Shinkansen, beppu tour, Kyoto history heritage and typhoon make the journey perfect. An Unforgettable experiences! I hope I can come back to Japan with my family. Arigato Gozaimasu. Terimakasih

ITB
HYDROGEOLOGY
DEPT.



Rendi Ermansyah
Putra



Ichsan Alfian

I really enjoy the two weeks intensive geothermal course in Kyoto University and learn a lot about all about not only geothermal system but also in geothermal exploration and geothermal development. Beside that, I also learn much about Japanese culture, especially in how they manage time and respect each other. I want to say thank you so much to JICA for all supported and all sensei especially Koike sensei and also Kashiwaya sensei, Goto Sensei, Tada san, Kubo san, Mr Yudi, Mrs Rios, Mrs Nurita, and Mr Panggea who have accompanied us very well. I hope someday will be back again to Kyoto University. This course is truly wonderful.

STAR ENERGY

Joining two weeks intensive training held in Kyoto University was a big opportunity for me, as I was only lab technician who have no knowledge about 3G application in geothermal. Thanks to JICA and BAGUS project for the priceless experience and knowledge that I have been get there. The materials that I have learned there can strengthen my knowledge in geothermal geoscience to support Star Energy's expansion projects.



Salsa Muryani
Prehtina,
Lab Technician



Wahyuddin Diningrat,
Geophysicist

The course covered geology, geophysics and geochemistry analysis needed for geothermal exploration and monitoring. Each subject was well prepared and the lecturers possess comprehensive knowledge on its field. Katsura campus of Kyoto University as the venue of this course, has a good environment, quiet and calm, thus very suitable for study and research. But we need to prepare and made our lunch beforehand considering no halal food restaurant open during the course time. The most memorable event was when we went for field study at Hatchobaru Geothermal Field in Kyushu. We experienced & were introduced to the power station and turbine of Hatchobaru Geothermal power plant. Also we observed thermal manifestations i.e. the mud pool, chloride spring, and geyser. The way the site being presented for tourism impressed me; two thumbs up for its tidiness and accessibility not only for researcher but also for all people.



Near-surface Geophysical Exploration at Wayang-Windu

In the Wayang-Windu region, high radon anomalies in soil gas are found at the areas close to the hydrothermally altered zones based on the remote sensing and the junctions of topographical lineaments detected from the digital elevation map. It implies that the geochemical anomalies are related to the fracture zones. For verification of this hypothesis, in July 2018 a research group of the ITB and Kyoto University tried the transient-electromagnetic (TEM) surveys to investigate the sub-surface resistivity structure at Wayang-Windu. The preliminary results indicate that the buried low resistivity zones (<10 Ohm-m), interpreted as clay-rich alteration near a fracture zone, are often found at depth of 30-50m near the high-radon anomalies. We conclude that the geochemical anomaly is possible due to deep and high-temperature gas/water upwelling through the fracture zone, and therefore can be a good indicator of hydrothermal activities. Now, further geophysical surveys are prepared for deeper explorations around the fracture zones.

(Article by: Dr. Tada-nori Goto, Kyoto Univ.)



Research Activity Progress

Mr. Taiki Kubo, a researcher from Kyoto University (KU) returned to Bandung in August 2018 and continued his research activities with ITB counterparts. This time together with the ITB counterparts he measured Mercury and Radon at Wayang Windu (WW) and took gas samples at some monitoring points there. Additionally, to verify the result of spatial estimation of Radon, 15 simplified Radon measurements were conducted in a total of 5 areas of North-east and South-west of WW. Furthermore, he advised on the data acquisition for the verification of results of High Resolution DEM results and its summary. Prof. Koike joined the survey for two days.



Dr. Yohei Tada of KU stayed over in Bandung after the project's Joint Coordinating Committee Meeting in July 2018 and continued his research activities. His purposes this time were to take surface water samples and to analyze stable isotope ratio of dissolved inorganic carbon using Isotope Ratio Mass Spectrometry (IR-MS) to estimate locations of cracks that lead from subsurface Geothermal reservoirs to the surface according to the chemical analysis of surface water samples taken for each catchment area, which he successfully completed during his stay. Also, among the 5-measurement apparatus JICA donated to ITB in 2017, the last one "Water Isotope Analysis System" was finally and successfully installed in July 2018 and handed over to ITB.

Asst. Professor Kashiwaya of KU returned to Bandung in September 2018 for 2 weeks to collect hot-water samples in WW, Patuha, Tankubang Perahu, and Tampomas to be analyzed in Kyoto to obtain information related to Geothermal reservoir layers and the situations of geothermal fluid circulation.

A Joint ITB/JICA/JST SATREPS Project for Technology Development of Steam-spot Detection and Sustainable Resource Use for Large Enhancement of Geothermal Power Generation in Indonesia Beneficial and Advanced Geothermal Use System

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<https://www.jica.go.jp/oda/project/1400739/index.html> (JICA)
<http://bagus-satreps.fttm.itb.ac.id/> (ITB)
http://www.jst.go.jp/global/kadai/h2601_indonesia.html (JST)
<http://www.geoenv.kumst.kyoto-u.ac.jp/bagus1.html> (Kyoto University)