

# 大学院教育支援機構（DoGS）海外渡航助成金 報告書

## Outcome report

計画名 Plan	Identifying hidden geothermal system in Indonesia.
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研究科・専攻・学年 Graduate school/Division/Year level	Graduate School of Engineering/D1
渡航国 Country	Indonesia
渡航日程 Travel schedule	2023年6月2日 ~ 2023年7月2日

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### 渡航計画の概要 Outline of the travel plan

The proposed travel plan was designed with two objectives. The initial purpose was to **attend the prestigious ITB International Geothermal Workshop** held in Bandung, Indonesia on the 6th and 7th of June. This event was an unparalleled opportunity to engage with leading professionals in the field, sharing insights, and learning from the global community of geothermal experts. Following the workshop, the travel plan pivoted towards the second objective, which was to conduct a **field survey** in Mt. Endut, Banten, Indonesia. This fieldwork, spanning approximately **20 days from the 8th to the 28th of June**, was fundamental in gathering crucial information and data to support my ongoing doctoral research. During this time, we undertook various scientific procedures, including the measurement of radon concentration, soil CO<sub>2</sub> flux, and water sampling. This blend of participation in an internationally recognized event and the application of practical fieldwork aimed to both deepen our understanding of the geothermal system and bolster the empirical base of my doctoral research.

### 成果 Outcome

This report details the **successful** first agenda in completing the planned travel to Bandung, Indonesia, for the participation in the **ITB International Geothermal Workshop 2023**. The trip took place from **June 6th to June 7th**, 2023. The ITB International Geothermal Workshop is a distinguished platform that hosts eminent professionals, researchers, and experts from around the world to discuss and explore advancements in geothermal systems. Our objective was to present the paper titled "**Preliminary CO<sub>2</sub> Flux Measurement to Explore Hidden Geothermal System**," showcasing our team's innovative research. The presentation incorporated an extensive explanation of the preliminary CO<sub>2</sub> flux measurement technique that we developed to explore hidden geothermal systems. We elaborated on the novel approach of our methodology, its execution, and the prospective impact on the geothermal industry. Our presentation was well-received and appreciated by the audience, which consisted of experts and thought leaders in the field. Many attendees demonstrated a keen interest in our research. We had meaningful discussions, received constructive feedback, and sparked interest for possible future collaborations.

The ITB International Geothermal Workshop presented an excellent networking platform. We engaged with other professionals and researchers in the field, initiating relationships that could lead to future collaborations. These interactions could potentially open

doors for shared research, joint projects, and collective problem-solving in the geothermal sector.

To conclude, the first travel plan was executed successfully. Our participation in the ITB International Geothermal Workshop 2023 added value to our professional growth and contributed significantly to the geothermal community. We look forward to further exploration and discovery in the field and will eagerly prepare for future events that enhance our understanding and offer **opportunities for collaboration**. Here are several photographs of the presentation:



This section report documents the **successful completion** of the second part of our travel plan - a comprehensive **field survey at Mt. Endut, Banten, Indonesia**. Conducted from **June 8th to June 28th, 2023**, this survey was crucial for collecting **vital** data and information to support my ongoing **doctoral research**. We embarked on the field survey immediately after the conclusion of the ITB International Geothermal Workshop. Our team meticulously executed the planned activities, ensuring that every measurement and data collection activity adhered to the highest standards of scientific accuracy.

The survey saw us **complete** an impressive number of measurements and data collections. We conducted **40 radon measurements** and over **100 soil CO<sub>2</sub> flux measurements**. Furthermore, we successfully obtained **30 water samples** from groundwater and dug wells. All these activities were undertaken with meticulous care and precision to ensure the validity and reliability of the data. This accomplishment marks a significant milestone in my doctoral research. The diverse and extensive dataset we collected during the survey will provide an invaluable resource to delve deeper into geothermal systems' complexities. The data will allow us to analyze various factors, like radon concentration and soil CO<sub>2</sub> flux, contributing to the exploration and understanding of geothermal activity.

In conclusion, the second phase of the travel plan, involving the extensive field survey in Mt. Endut, was successfully conducted. This achievement is a crucial steppingstone towards the successful completion of my doctoral research. We are now better equipped with necessary data and are excited about the next steps in our research journey.





### 今後の展望 Prospects for the future

During the workshop, I interacted with a researcher from ETH Zurich who is engaged in a study closely aligned with my own. This synergy led us to explore the possibility of conducting joint research to test the tools I developed. The joint research proposal offers an excellent platform to compare the results of our tools and methodologies. Such a partnership

could not only validate my research but also enrich it by integrating diverse perspectives and methodologies. It would further ensure a robust and comprehensive understanding of the geothermal system being studied.

The second significant prospect that emerged during the workshop is the potential to be involved in the drilling process in my research field at Mt. Endut. It was revealed that the government is planning to commence drilling operations in the near future. My involvement in the drilling process would provide hands-on experience, deepen my understanding of the geothermal system, and enable me to closely observe and analyze the practical implications of my research. This experience would undoubtedly be invaluable in enhancing the quality and relevance of my doctoral research.

In addition to the future prospects gleaned from the ITB International Geothermal Workshop, the extensive data and samples obtained from the field survey at Mt. Endut, Banten, Indonesia, hold immense value for my ongoing doctoral research. Upon my return to Kyoto University, I will conduct an in-depth analysis of this collected data. This will involve assessing the radon measurements, soil CO<sub>2</sub> flux measurements, and the water samples from groundwater and dug wells. The data will undergo rigorous scientific examination to extract valuable insights and findings. The field data and samples represent a tangible link to the geothermal activity occurring at Mt. Endut, thereby forming an invaluable resource for my research. The real-world data will be pivotal in grounding my research in practical observation, enhancing its validity and relevance. Moreover, the data will contribute significantly to my doctoral research by strengthening the empirical base of the study. It will be instrumental in uncovering new aspects of geothermal systems, potentially leading to novel insights and discoveries. In conclusion, the field data and samples collected during the survey are not only precious but also crucial for my doctoral research. The subsequent analysis of this data at Kyoto University will contribute substantially towards the completion of my research and our collective understanding of geothermal systems.