

Discussion Paper  
 USAID Director's Project Review  
 December 12, 1974

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Retrospective Review/Evaluation  
 Geological Survey Assistance  
 USAID Proj. 497-11-210-193  
 FY 1970 - mid FY 75

Introduction

In 1969, the USG and the GOI agreed to enlist the services of the US Geological Survey (USGS) to provide assistance to the Geological Survey of Indonesia (GSI). This project was to continue and supplement earlier assistance provided by the USGS and the US Department of Mines to Indonesia between 1956 and 1965. The new project was planned to continue for five years and was to consist of a resident USGS staff of three to four people assisted by TDY personnel. The project was also to provide various geologic equipment and commodities, and to provide training, both in-country and overseas/US Participant training. During the life of the project, US inputs have totalled \$1,751,300 which have provided for 188.5 man/months of field and advisory services, 87.1 man/months of TDY services, \$220,000 worth of equipment and commodities, 315 man/months of in-country training provided to a total of 132 GSI staff members and associates, and 102 man/months of US training provided to 12 GSI senior staff members. GOI direct contribution inputs during the life-of-project exceeded Rp.1.138 billion (\$2,742 million) and the GOI Trust Fund inputs exceeded Rp.34.9 million (approx. \$841,000).

I. Project Objectives

Original documentation described the basic objective/purpose of the project to be "Improve the capacity of the Geological Survey of Indonesia (GSI) to survey, map, and appraise the geology of natural resources in Indonesia, to intensify and accelerate the training of geologists, geophysicists, and mapping specialists within the GSI and other agencies of the Department of Mining, and to accelerate the completion of maps and interpretative reports which service to identify promising natural resource targets for investment and development to the benefit of the national economy".

Specific target objectives included:

- (a) Formal in-country training providing (1) mapping techniques and photo-geology to at least 30 GSI staff members and (2) geophysical techniques and interpretation to at least 20 senior staff;
- (b) Overseas participant training (US) provided to two to five GSI staff members during each of the five years of the project;
- (c) Increase maps and publications by (1) publishing a new 1:1,000,000 Base Map for plotting Indonesian geologic and resource data, (2) publish new geologic and tectonic maps of Indonesia at scale of 1:5,000,000, (3) publish Geologic Quadrangle Maps at scale of 1:100,000 on Java and 1:250,000 off Java, and (4) publish and distribute geologic reports and resource bulletins; and
- (d) Upgrade the technical equipment and facilities at GSI for field mapping investigation, laboratory support, drafting facilities, and publication.

In FY 1972, project revisions made the overall Goal and Project Purpose more specific and established a series of quantifiable output targets. The Goal was listed as follows: "Facilitate orderly long-range development of Indonesia's mineral resources and systematic land-use planning". Likewise, the Purpose revised as follows: "Develop an improved capacity on the part of the Geological Survey of Indonesia (GSI) to map, identify and appraise mineral and other geological resources of the country, emphasizing mineral target identification through coordinated geologic mapping, geochemical surveying and geophysical investigation".

## II. Status of Targets and Objectives

a. The GSI capabilities for mapping, identifying and appraising mineral and other geological resources can be demonstrated by the strength of its staff and the publication of maps during the project. The following table provides some indication of these capabilities:

<u>Qualitative Indicators for Major 5-year Outputs</u>	<u>Original FY 1970 plan</u>	<u>FY 1972 Revision</u>	<u>FY 1974 Revision</u>	<u>Actual Achievement</u>	<u>Target Capabil.</u>
A. Systematic Geological Maps Published	17	14	10	7 *	7 annually
B. Regional Geological Maps Published	4	3	1	0 *	2 annually
C. Qualified GSI Mapping Division Staff: Geologists/Asst. Geol.	24/20	-	22/30	20/39	-
D. Qualified GSI staff: Cartographers/Photo- graphers (Others: Chemists, Geochemists, Librarians, etc.)	20/7	-	29/10	25/13	-

\* In addition, 1 reconnaissance map has been published. Other maps in various developmental stages include: 2 systematic, 1 regional, and 1 reconnaissance map in color proof; 6 systematic maps in cartography; 3 of 4 parts of Indonesia tectonic map have been printed (by USGS). Finally, the GSI is currently completing the first issuance of a Geologic Technical Bulletin.

b. Twelve Participants were trained in the United States during the course of the project (one remote sensing Participant was funded from General Participant Training Project). Three of the 12 received academic/university training, while the others received on-the-job training with USGS counterparts. This total of overseas participants is fewer than the maximum originally planned (primarily due to inadequate English language capabilities); however, the training provided was effective, and all participants have returned and have been assigned to the positions for which they were trained. Ten separate courses/training sessions were conducted in-country during the project. A total of 122 attendees studied for a combined 315 man/months in the USGS-conducted courses in photogeology, geophysics, remote sensing, geologic structure, mapping techniques, and cartographic procedures.

c. Commodity procurement over the five years totalled \$219,000 which includes laboratory and library reference materials in addition to survey and analytical equipment. Generally good and efficient use has been made of the commodities.

d. The follow-up work in GSI conducted by the USGS TDY specialists in such areas as analytical techniques and fission-track age dating has ensured that all learned techniques and project equipment are being efficiently applied and utilized.

## III. Special Problems requiring Continued Attention

During the course of the project, several problems continued to exist which, to some degree limited the overall effectiveness of the project, and which require some continued attention:

- The planning and implementation of upgrading action in English language capabilities remains critical. This was a continuing problem in participant training selection and will continue to prove a hindrance in international work of the GSI. In order for the GSI to increase publication of reports, surveys and maps, and indeed, to focus on the long-range institutional development of the GSI, capabilities in English language must continue to be improved.
- Although significant measures were undertaken last year, the problem of GSI staff remuneration and the lack of professional incentives and recognition will continue to remain somewhat of an obstacle to

the GSI in recruiting and maintaining high quality geologists, assistant geologists, and cartographers. This problem exists on a macro-scale between the public and private sectors, but its ultimate solution remains critical in the area of long-range mineral and natural resource development and systematic land-use planning.

- c. The GSI procurement supply system, and its shortcomings, have caused critical shortages of certain foreign purchased items, e.g. printing paper. The printing operations have been kept going by stop-gap measures which result in reduced production and lower map quality. The logistical flow of requisite materials and equipment needed by GSI on both continuing and specialized requirements should be seriously reviewed.
- d. Basic in-house training in geology and geologic appraisal and mapping methods of new GSI employees has been somewhat erratic. The GSI may have to organize and conduct a series of its own periodic training and upgrading programs for incoming geologists.

#### IV. Special Recommendations of USAID/USGS

- a. Continued high level efforts in the GSI publication of research and book-type reports and bulletins.
- b. Appointment by GSI of an Editor for the publication of reports and special quality maps. It is recommended that this editor, when appointed, be sent for specialized training *to a country with a Geological Survey*.
- c. Appointment of an Assistant to the Chief of the Cartographic Unit who can devote full time to the technical activities. He should also receive specialized training following an initial period of time on the job.
- d. A map information and sales office should be established by the GSI in Jakarta. In addition to serving the public by displaying and selling GOI mineral and natural resource publications, it would publicize the overall work of the GSI.
- e. If desired by the GSI and GOI, the USGS would be pleased to continue their relationship with GSI through frequent TDY visits and specialized assistance, plus additional participant training through the General Participant Training Project.

#### V. Summary/Conclusions

Despite the inability of the five year Geological Survey assistance Project to successfully meet all the specific output targets in the cumulative publication of maps, and the uncertainties of annual target capabilities in the immediate future, there can be no doubt that this project has realistically accomplished its intended objectives of assisting Indonesia through the GSI to improve its capacity to map, identify, and appraise mineral and other geological resources. The combined technical expertise and strength of the GSI as a scientific and public-service institution has certainly expanded and grown during the past five years. The contributions of the GSI and of the staff in the facilitation of orderly long-range development of the national mineral resources and in systematic land-use planning during Repelita I, Repelita II, and all future Indonesian development cannot be minimized. The requirements and needs of national development in relation to the potential contributions of GSI are unlimited. In this sense, the project comes to a very successful conclusion on December 31, 1974. USAID believes that the contribution of the project to Indonesia's overall development has and will continue to demonstrate its value.