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Name of sector project

Science Education Quality Improvement Project (SEQIP), Indonesia

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Tabular overview

The evaluation mission

Evaluation period	6/2012 – 4/2013
Evaluating institute / consulting firm	KEK-CDC Consultants
Evaluation team	Dieter Zürcher (KEK-CDC Consultants) Rina Arlianti (consultant)

The development measure

Title according to the offer	Science Education Quality Improvement Project, SEQIP
Number	1993.2168.8 (Try-out Phase and Phase 1) 2000.2140.2 (Phase 2) 2006.2042.7 (Phase 3)
Overall term broken down by phases	Try-out Phase: 4/1994 to 9/1996 Phase 1: 10/1996 to 12/2002 Phase 2: 1/2003 to 9/2006 Phase 3: 10/2006 to 9/2008
Total costs	KfW: € 12.3 million concessional loan (Phase 1) € 10.4 million grant (Phase 2) GIZ: € 9.0 million grant (all Phases) MoNE: € 11.5 million (all Phases) Total: € 43.2 million
Overall objective as per the offer, for ongoing development measures also the objective for the current phase	Teaching and learning in science lessons at Indonesian primary schools is improved through the use of the experimental kits.
Lead executing agency	Ministry of National Education (MoNE), Directorate for Kindergarten & Primary Education

Implementing organisations (in the partner country)	Ministry of National Education, 31 provinces and more than 100 District Education Offices, 40 teacher training colleges/institutions, and approximately 35,000 primary schools.
Other participating development organisations	KfW, German and Indonesian manufacturers of science kits.
Target groups as per the offer	All grade 4-6 students of Indonesian primary schools in 31 provinces (this means more than 1 million students per year in each age cohort in all SEQIP schools).

The rating

Overall rating <i>On a scale of 1 (very good, significantly better than expected) to 6 (the project/program is useless, or the situation has deteriorated on balance)</i>	The overall rating for the project is satisfactory (level 3).
Individual rating	Relevance: 3; Effectiveness: 2; Impact: 3; Efficiency: 2; Sustainability: 3

Executive summary

Programme context: Indonesia has now about 241 million inhabitants and is the world's fourth most populated country. It has experienced strong economic expansion since recovering from the 1997 Asian financial crisis, with growth rates between 6-8%. Through years of efforts, Indonesia has achieved 95% of net primary education enrolment. At present, about 26.9 million students are enrolled in national primary schools, with 97 girls for 100 boys, almost reaching equality. Literacy rates of the population aged 15-24 have almost reached 100% in all provinces of Indonesia and it is nearly 95% for the entire Indonesian population over 15 years of age. The main problem of the Indonesian education system consisted in the relatively high drop-out rates, the general poor teaching quality and lack of teaching aids, specifically in science education. Since 1999, and especially after 2003, Indonesia has seen substantial progress in decentralising the educational system. Over time, the autonomy of districts and schools considerably increased.

Project concept: In 1994, GIZ began to develop the concept for the Science Education Quality Improvement Project (SEQIP). The SEQIP package combined German Technical Cooperation (TC) and Financial Cooperation (FC) and was conceived and implemented as a joint cooperation programme between GIZ (TC) and KfW (FC). The FC consisted of supplying science experimental kits for teachers, kits for students and the provision of consultancy services for quality control of kit production and training of teachers in equipment maintenance, etc. The TC included capacity development activities in form of advice to the then Ministry of National Education (MoNE), training of SEQIP consultants, who trained the advisory teachers in core schools, and who in turn, instructed their peer teachers in satellite schools of the same school cluster.

SEQIP focused at modernising the science teaching at primary education levels of grades 4 to 6. Until the end of the project in 2008, 33,161 schools in 5,525 school clusters directly benefitted from SEQIP. A total of 66,000 teachers participated in the SEQIP project, which is equivalent to 5% of all of the 1.2 million primary school teachers in Indonesia in 2008 (GTZ 2009:12).

Technical implementation: The TC was implemented in four phases between 1994 and 2008 and consisted of: 1) Advising the Ministry in teacher education (including the integration of the new didactical approach into the curriculum); 2) Revising and preparing instructional material; and 3) Building the capacity of the primary education systems in order to introduce modern teaching and learning practices. The SEQIP approach included simultaneous capacity development efforts at various levels: a) the MoNE was to include the new science education concept into the curriculum, to secure co-financing and to scale-up to additional

regions; b) at the provincial and district levels, capacity development efforts included the training of various types of key resource persons (consultants and teachers); and c) at the school level, various educational materials were distributed (teacher and student kits, instructional materials, etc.). In addition, a broad range of teachers were trained, and teachers and students were monitored and evaluated to measure the application and outcome of the new SEQIP approach. The project was firmly anchored at the Ministry level. The objectives and indicators of SEQIP were adjusted phase-wise and were in line with the then BMZ sectoral strategy for basic education. The TC component was responsible for the development and implementation of a comprehensive M&E system, which, however, took some time for it to be operational. The SEQIP M&E system provided comprehensive data on various variables, including changes in learning outcomes.

Evaluation mission: On behalf of GIZ, Mrs. Rina Arlianti and Mr. Dieter Zürcher (from KEK-CDC) conducted an ex-post evaluation of SEQIP. The field mission in Indonesia took place between January 13th and February 3rd. 2013. The evaluation design consisted of: 1) Case studies, including visits of SEQIP and non-SEQIP schools in four provinces: DKI Jakarta and South Sulawesi (both were included in Phase 1), Bangka Belitung (Phase 2), and West Java (Phase 3); 2) Interviews with more than 100 staff of Province and District Education Offices, SEQIP consultants, teachers, and one other donor as well as a science kit manufacturer; 3) School visits to 33 schools, of which six were non-SEQIP schools; and 4) Online survey, which broadened the overall information base by receiving the opinion of 36 SEQIP consultants, representing nearly all provinces.

Assessment according to the five DAC criteria

It must be noted that the implementation of the evaluation and its corresponding results and ratings were affected and complicated by two major circumstances. First, the project was conceived in the mid-1990s, nearly 20 years ago. The context changed since then as did the yardstick to rate the project. Secondly, the TC and FC were interlinked during the project's implementation phases and cannot be strictly separated in the outcome, even though GIZ was not responsible for the activities of FC.

Relevance: The project was very relevant at that time. The need for quality improvement of primary education, especially for mathematics and science subjects, remained a high priority in Indonesian education policies over time. The focus on quality improvement was highly relevant at that time (and still is today). Indonesia had already achieved nearly 100% enrolment for boys and girls in the mid-1990s, and quality issues became more important. SEQIP was fully in line with international and Indonesian efforts to improve quality education

at primary levels. The combination of supplying experimental kits and training teachers, as implemented by SEQIP, is still considered “best practice” in thematic respect. Teaching aids supplied to schools without training, as practiced by other organisations, has not occurred by SEQIP. Retrospectively, the supply of more student kits and fewer teacher kits would have improved the relevance. The progressing decentralisation of the education system, the shift to class teachers and the introduction of multi-media tools in recent years for science education have further unfavourably affected the relevance after 2006. The rating for **relevance is satisfactory (level 3)**.

Effectiveness: SEQIP introduced a cascading approach of training advisory teachers and class/science teachers which has allowed the training of 66,000 teachers. The learning outcomes of the students during SEQIP implementation was systematically monitored and compared with non-SEQIP schools. The main targets for the learning outcomes and the use of the kits were achieved while the project was implemented. Until the end of SEQIP, the project was listed as highly successful in the GIZ progress reports, having achieved all objectives (incl. learning outcomes). It even overachieved some targets, including the number of distributed science kits (36,000 teacher kits and 18,000 student kits). Today, in contrast, only one fourth of teacher kits are still used to prepare students for the national examination. On the other hand, around half of the SEQIP student kits are still in regular use, although the range of experiments is slowly diminishing due to broken parts, losses, etc. Other important reasons for not using the science kits are time constraints of teachers and lack of training. Still, between 50-60% of the teachers met during schools visits were trained under SEQIP and the quality of SEQIP trainings were highly rated by these teachers. The Teacher Working Groups are still in place, but they rather serve as general meetings of teachers in a school cluster as before SEQIP. The project increased the problem solving capacities of students, and teachers apply more group-centred teaching methods today. The consultants and advisory teachers (over 5,700 persons), in particular, were innovators and change agents of the project and most are still active at universities and schools. The rating for **effectiveness is good (level 2)**, mainly referring to achievements in SEQIP schools.

Overarching development results (impact): The causal link between supply of kits, training of teachers and improved student learning outcomes, which positively affects poverty and unemployment rates, is long and complex. Assessing this causal link was beyond the analytical scope of this evaluation. At the level of international benchmarking of science skills, however, it is not possible to detect a positive trend in Indonesian primary schools at the country level. Time series data for both, the Trends in International Mathematics and Science Study (TIMSS) as well as the Programme for International Student Assessment

(PISA) indicate that Indonesian students perform poorly in science and that there was no improvement over time. The anticipated spread to non-SEQIP districts and additional provinces in Phase 3 was minimal. 12.6% of today's primary schools received student kits under SEQIP, 1.4% additional schools procured them afterwards and 23.2% received teacher kits under SEQIP. Thus, altogether an estimated 24.6% of primary schools have SEQIP kits. Overall, 5% of today's 0.7 million primary teachers of grades 4 to 6 were trained by the SEQIP.

The relatively high equipment cost is one factor why the project did not achieve national coverage. To achieve national coverage, substantially more resources would have been required. The maintenance of the experimental kits was and remains a challenge and is not conducted as planned. On the other hand, the impact of the project on the education system was highest at the school level with the trained science teachers. Due to the increasing decentralisation, specifically after 2005, the project's influence of central and provincial levels was decreasing because the responsibility for training the teachers and the operations of schools shifted to district and even school levels. The MoNE was convinced that the SEQIP approach was a success and it transferred the approach to the subject of mathematics. However, the Mathematics Education Quality Improvement Project (MEQIP) eventually remained a limited pilot programme. The rating for overarching development results is **satisfactory (level 3)**.

Efficiency: The training component was implemented in an efficient manner and the coordination with other donors took place regularly. The cooperation between GIZ and KfW was good, but the supply of kits (under the FC) was often delayed and required adjustments in the training approach. Given the size of Indonesia, the technical assistance input was relatively small for a sectoral approach: one long-term advisor was supplemented by various short term consultants. Much of the outreach was achieved through the hiring of local consultants from universities and teacher training institutes. The distribution of teacher and student kits (the responsibility of the KfW), however, was erratic. Generally, core schools received more material. The supply of costly science kits for teachers to so many schools cannot be considered optimal because: 1) They do not specifically promote interactive learning because they are more used for demonstrations of science experiments; 2) All schools were also stocked with the similar INPRES kits in parallel; and 3) the teacher kits are often no longer used. The utilisation of student kits was more efficient, although the intended borrowing of experiments within the school cluster did not materialise in general. The rating for efficiency and coordination is **good (level 2)**.

Sustainability: The good quality of the experimental kits and the training of the teachers were commendable and improved the sustainability. Still, between 50-60% of the teachers interviewed in schools were trained under SEQIP. This is a remarkable rate five years after project closure. The sustainability, however, is hampered by various factors: the restocking of damaged spare parts – though this was addressed from the beginning of the project – does not take place for various reasons. The teacher kits were produced in Germany (which was stopped after Phase 1), procurement of supplies for the kits must be approved by the Principal and the parts are not easily available in local markets. Therefore, the range of experiments that can be conducted is eroding. The transfer of the SEQIP approach to new teachers only occurs in individual cases, because the role of the Teaching Working Groups has profoundly changed: they still meet regularly, but they deal with general school issues and no longer with issues related to the use of science kits and concepts only. SEQIP was not sufficiently broad in its outreach strategy: it covered 0.1 % of schools during the try-out or pilot phase and 24.6% as of today. Thus anchoring the SEQIP approach as a general standard for grades 4 to 6 in all Indonesian primary schools could only be partially achieved. The rating for sustainability is **satisfactory (level 3)**.

Overall rating: SEQIP was a relevant measure to improve the science education of grades 4-6 students in Indonesia at that time. It reached around 66,000 teachers in 35,000 schools and this has contributed to enriching and improving science teaching. However, it could not achieve a truly national level implementation which has limited impact and sustainability. German development cooperation supported decentralisation as a cross-cutting theme at the same time and districts and schools received much more autonomy. This has negatively affected the transfer of SEQIP knowledge to new teachers, because teacher training colleges no longer specifically trained teachers on SEQIP kits after the project ceased. Yet, still half of the student kits are utilised in the science teaching, which is seen as a remarkable achievement thanks to the training provided to teachers by SEQIP. It must be noted that SEQIP was a pioneering approach at that time for GIZ influencing other projects. The relevance, impact and sustainability were affected by external factors that were difficult to control by the project. The **overall rating** for the project is **satisfactory (level 3)**.

The major recommendations are:

- Ensure a critical mass (full coverage) and long-term implementation to secure sustainability at national level: SEQIP achieved only partial coverage in all provinces. Therefore, it ended as a hybrid between a pilot project and one with national outreach. If the project truly aspires for national coverage, the necessary means (technical assistance and finances as well as time) should be secured.

- Creating more ownership at local levels: All the SEQIP material was supplied at no cost to the schools. Sustainability likely could be improved if the material would need to be purchased locally. However, this must ensure that poor and remote schools do not drop out. This would also require local production of such kits as much as possible.
- Joint KfW/GIZ projects should have a joint planning and reporting basis: The procedures should be harmonised in order to avoid duplication or differing results frameworks.
- Secure policy coherence between complementary projects outside of the focal areas with those in the focal areas: Complementary projects should have clear and limited pilot character and not be undercut by other programmes of the focal area (e.g. the decentralisation efforts supported by Germany affected SEQIP) or the affected project must undergo a strategic reorientation.
- Secure access to key project documents and M&E data: For knowledge management reasons and for ex-post evaluations access to these documents is critical.
- The new Indonesian primary education curriculum will require a review and re-arrangement of the SEQIP experiments: The pedagogical integration of the various experiments into the new curriculum needs to be done to safeguard the SEQIP investment.

Overarching development goal/indirect result Primary school education is improved and relevant for the labour market (KfW)
Indicators:
1. Youth unemployment in the core Districts of the project, compared to other Districts without the intervention (added by KEK)
Assessment: partly achieved
2. Production of similar exp. kits/teaching materials by Indonesian companies or teacher training units. (added by KEK)
Assessment: partly achieved
3. Outreach of the new pedagogical approach to other subjects achieved (maths). (added by KEK)
Assessment: partly achieved



Project objective /direct result Teaching and learning in science lessons at Indonesian primary schools is improved (GIZ) through the use of the experimental kits. (KfW)
Indicator The marks of SEQIP students in the final primary exams (grade 6) are better than the results of students of the comparison schools by at least 10%. (GIZ/KfW)
Assessment: largely achieved
SEQIP Approach is introduced in all Provinces covered by the project (GIZ)
Assessment: partly achieved
40 pedagogical centres use the SEQIP approach in the training of primary teachers. (GIZ)
Assessment: not achieved



Intermediate outcome / use of outputs Trained teachers are capable to perform the experiments
Indicator Teacher kits are used in each school for approximately 20 experiments each school year. (KfW)
Assessment: partly achieved



Intermediate outcome / use of outputs Students are capable to perform the experiments made possible with the new student kits. (GIZ/KfW)
Indicator Student kits are used in each school for approximately 30 experiments each school year. (GIZ/KfW)
Assessment: largely achieved



Intermediate outcome / use of outputs Students understand rules and law of natural sciences. (GIZ/KfW)
Indicator The students carry out the range of possible experiments with the kits and understand the scientific rules and laws involved. (GIZ) how did you measure this?
Assessment: partly achieved

Note: red marked indicators were defined for this ex-post evaluation

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