

EXTERNAL EVALUATION - SHORT REPORT

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Strengthening Quality Infrastructure Services for Environmental and Climate Monitoring

Country/Region: Indonesia

Project number: 2019.2114.7
Project term: 03/2022 - 02/2026

Lead executing agency: Badan Standardisasi Nasional (National Standardization Agency of Indonesia) (BSN)
Executing agency: National Metrology Institute (SNSU), National Accreditation Body (KAN), Standards Implementation Unit, Standards Development Unit, Human Resources Development Unit

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This evaluation is an independent assessment. Its contents reflect the evaluator's opinion which is not necessarily equivalent to PTB's view.

List of abbreviations

BMZ	Federal Ministry for Economic Cooperation and Development
BSN	Badan Standardisasi Nasional- National Standardization Agency of Indonesia
CRM	Certified Reference Material
GHG	Greenhouse gas
KAN	National Accreditation Body
OECD-DAC	Organisation for Economic Co-operation and Development-Development Assistance Committee
PT	Proficiency Testing
QI	Quality Infrastructure
SDG	Sustainable Development Goal
SME	Small and Medium Sized Enterprise
SNSU-BSN	Standar Nasional Satuan Ukuran-Badan Standardisasi Nasional as National Metrology Institute of Indonesia

1. Executive summary of the project

The subject of this evaluation was the project “Strengthening Quality Infrastructure Services for Environmental and Climate Monitoring in Indonesia (ECMI)”, which was implemented over a four-year period (03/2022–02/2026) with a budget of EUR 1.5 million and commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ). The project’s political partner was the National Standardization Agency of Indonesia (BSN), which brings together under its umbrella the core Quality Infrastructure (QI) institutions, including the National Metrology Institute of Indonesia (SNSU), the National Accreditation Body (KAN), the Standards Implementation Unit, the Standards Development Unit, and the Human Resources Development Unit. In addition to these implementation partners, the project cooperated with a range of testing and calibration laboratories as well as private-sector companies. The environmental and climate monitoring sector furthermore comprises a variety of additional stakeholders, including line ministries, subordinate regulatory authorities, and specialised public institutions. While this institutional landscape offers considerable potential for cooperation, it remains highly fragmented, with limited systematic exchange between QI service providers and demand-side actors, particularly from industry.

The project objective was formulated as follows: “The availability and use of quality infrastructure services in the areas of environmental protection and climate monitoring, especially in water and air analysis, have increased.” To achieve this objective, the project was structured around four outputs, two focusing on the supply side and two addressing the demand side. On the supply side, the project worked closely with its main partner, SNSU-BSN, as well as with selected laboratories, to strengthen and expand their service portfolios. On the demand side, the project cooperated with companies in the textile sector to promote the effective utilisation of the newly developed QI services and placed particular emphasis on fostering dialogue and cooperation between industry actors and political decision-makers. This dual approach was well suited to addressing both dimensions of the project objective, namely the availability and the effective use of QI services.

2. Evaluation of the project

The evaluation was conducted between August 2025 and February 2026 and covered the implementation period from project inception until November 2025. The evaluation served both accountability and learning purposes. A mixed-methods approach was applied, combining quantitative and qualitative social science methods that were adapted to the specific subject and context of the evaluation.

The six Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) criteria were used as an evaluation basis for this evaluation:

- Relevance: Is the project doing the right things?
- Coherence: How well does the project fit?
- Effectiveness: Is the project achieving its objectives?
- Impact (higher-level development results): What difference does the project make?
- Efficiency: How well are resources being used?
- Sustainability: Will the results last?

The following marking scale was used for the evaluation:

1	2	3	4	5	6
very successful	successful	successful to a limited extent	rather unsuccessful	mainly unsuccessful	entirely unsuccessful

Overall, the project received the mark: 1.9.

Relevance

The intervention was implemented in a dynamic institutional and political environment that required continuous adaptation to changing framework conditions, including institutional restructuring, changes in mandates, staff turnover, and the consolidation or reduction of laboratory structures. In addition, a planned component related to an Environmental Early Warning System could not be realised as originally foreseen and was ultimately discontinued, resulting in the non-disbursement of anticipated funding. Likewise, intended synergies with the Green Infrastructure Initiative of the German Government did not materialise due to limited operational entry points on both sides. Despite these challenges, the project demonstrated a high degree of flexibility by adjusting its activities and maintaining alignment with evolving partner needs. Planned synergies with other initiatives could not be realised, but the project effectively redirected its focus towards feasible entry points within the QI system and used the implementation period to strengthen networks and prepare follow-up cooperation, particularly in emerging areas such as the circular economy.

The relevance of the project for the partner lies primarily in its direct contribution to strengthening Indonesia's national QI system, which is a critical enabling framework for environmental governance, climate monitoring, and economic development. By supporting key institutions and improving capacities for water and air monitoring, the project directly addressed priority areas of Indonesia's development agenda, including environmental quality, emissions reduction, and sustainable resource management. In doing so, it reinforced the partner country's ability to generate reliable data for policy implementation and regulatory enforcement.

Moreover, the project's focus on improving both the supply and use of QI services responded to structural gaps in the Indonesian system, particularly the fragmentation between QI providers and industrial users. This made the intervention highly relevant not only at the institutional level but also for broader development objectives related to sustainable industrialisation and environmental protection.

Overall, the criterion received the mark: 1.8

Coherence

The intervention was implemented as a stand-alone project but achieved strong internal coherence through close links with another PTB activity in Indonesia in the solar and photovoltaic sector. Cooperation enabled synergies through shared staff and joint training activities. In contrast, cooperation with the two PTB-implemented regional projects remained largely marginal and did not result in structured collaboration. The same holds true for cooperation with other German actors such as Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) under the Global Project Quality Infrastructure (GPQI), which remained limited due to differing focus areas (technical implementation versus policy-level QI support).

The project effectively supported both indirect and direct target groups within Indonesia's QI system. An interesting approach was the Young Talents Programme, involving around 160 BSN employees. The programme combined capacity-building workshops financed by the project with a BSN-funded boot camp, in which young professionals worked with small and medium sized enterprises (SME) to identify their standards and testing needs. While the programme broadened understanding of SME-related QI needs and strengthened internal learning processes, this did not yet translate into measurable company-level uptake of QI services.

For the direct target group, particularly laboratories and QI service users, the project provided targeted technical support, including training and mentoring for wastewater testing capacities. Activities in the textile sector on sludge analysis and standard development were closely aligned with existing regulatory frameworks.

Initial plans for cooperation with United Nations Industrial Development Organization (UNIDO) under the Swiss-funded cooperation were not realised, although limited re-engagement has recently taken place in the context of circular economy discussions.

Overall, the criterion received the mark: 1.5

Effectiveness

The intervention contributed substantially to the achievement of the outcome objective on the supply side, while results on the demand side remained more limited. Outputs 1 and 2 were the main drivers of success and made strong contributions to Outcome Indicators 1 and 2. Capacity development for the BSN, SNSU, and associated laboratories significantly strengthened metrological traceability, proficiency testing (PT), and quality assurance systems in water analysis and to a limited extent also in air analysis. Training measures, certified reference material (CRM) related activities, and institutional support enhanced both individual competencies and organisational performance, while also reinforcing cooperation across key institutions of the national quality infrastructure system. As a result, the project achieved substantial progress in water-related services, while progress in the gas sector remained more limited than initially envisaged.

In contrast, Outputs 3 and 4 made only partial contributions to outcome achievement. Pilot activities with industry, particularly in the textile sector, succeeded in raising awareness and initiating engagement with environmental and climate-related QI services. However, this did not translate into sustained or measurable uptake by companies, as required under Outcome Indicator 3. Structural constraints, limited incentives, and the complexity of policy-driven issues—such as sludge management and regulatory standard-setting—restricted the extent to which companies could practically apply the introduced services within the project timeframe. While some initial testing activities and advisory processes were implemented, the causal chain towards systematic private sector use of QI services remained incomplete.

Similarly, Output 4 contributed to improved awareness and dialogue between stakeholders, including BSN, regulators, and industry representatives, through various exchange and information formats. These activities helped increase the visibility of QI services and fostered a more conducive environment for cooperation. However, there is limited evidence that these exchanges led to behavioural change, strengthened institutional coordination, or sustained policy-level follow-up. The contribution of Output 4 therefore remains indirect and difficult to measure in terms of outcome-level effects.

Overall, the criterion received the mark: 2.3

Efficiency

The project had a budget of EUR 1.5 million, of which EUR 1,160,945 had been spent by 20 November 2025, corresponding to an implementation rate of approximately 77%. Overall, financial resources were managed efficiently and the allocation across outputs and cost categories appears coherent and appropriate. Based on the available evidence and stakeholder interviews, the evaluation concludes that the same outputs could not have been achieved with fewer resources, indicating sound production efficiency. Resources were generally used economically, and implementation benefited from identifiable synergies across activities.

With regard to whether higher results could have been achieved with the same resources, some limitations were identified, particularly in Output 3. Engagement with companies, especially on sludge-related issues, generated relevant pilot activities but did not translate into measurable uptake of QI services. It remains unclear whether a stronger focus on more directly QI-oriented interventions would have yielded greater demand-side results. In addition, long-term, policy-driven processes (e.g. standardization in the wastewater/sludge area) limit the extent to which short-term project resources can fully realize potential impacts.

Regarding allocation efficiency, the same level of outcomes could likely not have been achieved with fewer resources. However, an untapped potential in resource allocation was identified. In particular, the limited engagement in the gas sector appears suboptimal given its relevance for greenhouse gas emissions and the potential role of QI in climate policy. Although institutional constraints were cited, evidence from the BSN gas laboratory suggests increasing technical capacity and demand, including CRM development and PT schemes. This indicates that a stronger focus on gas-related QI services could have further enhanced overall effectiveness.

Overall, the criterion received the mark: 2.5

Impact (higher-level development results)

Available evidence suggests that Indonesia has made progress in the project related Sustainable Development Goals (SDG), but challenges remain significant. Water bodies remain heavily polluted, industrial emissions are increasing, and improvements in waste and chemical management are uneven. At the same time, Indonesia has strengthened its climate policy framework, including updated Nationally Determined Contributions (NDCs) and improved integration of climate measures into national planning. Scientific and technical capacities within BSN, have improved, including expanded training and certification systems.

At outcome level, the project is plausibly aligned with these higher-level changes and likely contributes indirectly to their advancement. It strengthened key prerequisites for SDG progress by improving measurement and monitoring capacities. This includes enhanced water quality monitoring through PT, improved detection of heavy metals, and better wastewater analysis. In the climate domain, the project supported greenhouse gas (GHG) measurement capacities through certified reference materials and technical cooperation with relevant institutions. Contributions to sustainable industrialization are reflected in improved industrial testing capacities and support for cleaner production processes, particularly in the textile sector.

Overall, while direct attribution to SDG-level changes cannot be established due to data limitations and the indirect nature of impacts, the intervention is clearly aligned with national development priorities and strengthens essential technical foundations for achieving higher-level development goals.

Overall, the criterion received the mark: 1.5

Sustainability

The sustainability assessment indicates that key partners and target groups generally possess sufficient institutional and human capacities to maintain positive results beyond the project period. Core services within the BSN, including certified reference materials, PT schemes, and assigned values, are embedded in formal mandates and supported by qualified staff and ongoing demand. Demand-oriented practices have been institutionalised through needs-based surveys and integrated planning processes, while internal learning structures such as the Corporate University and the Young Talent Programme strengthen organisational continuity and reduce risks related to staff turnover.

The intervention has made a substantial contribution to strengthening these capacities. At the national level, SNSU's role as a metrology institution was reinforced through technical assistance and strategic advisory support, improving its ability to deliver internationally recognised services. At the same time, selected regional laboratories were strengthened through training and the introduction or expansion of PT schemes and testing services, many of which are already operational. Evidence suggests that acquired skills are being applied in practice, although institutional resilience varies, particularly at regional level where financial constraints and limited cost-recovery mechanisms persist.

The durability of results is generally positive, especially on the supply side, as many services are anchored in regulatory requirements and accreditation systems that generate sustained demand. Some progress is also visible in the gas sector, where strengthened competencies for GHG measurement provide a basis for continued, though still developing, service provision. However, demand-side sustainability remains weaker, as company uptake of QI services is still limited and dependent on longer-term regulatory and standardisation processes.

Overall, while financial and institutional risks remain—particularly for regional actors—the intervention has established a solid foundation for continued results.

Overall, the criterion received the mark: 2.0

3. Learning processes and experiences

A key lesson from the project is the importance of a strong central QI institution as an anchor. Positioning the BSN in this role improved coordination and support to regional laboratories, while also showing that an effective anchor requires clear strategic prioritization in addition to technical capacity.

A demand-driven approach increased relevance and ownership, particularly through needs-based surveys, but requires time and trust-building, especially with private sector actors. Capacity development is more sustainable when embedded in institutional systems such as the Corporate University and the Young Talent Programme, which reduce risks from staff turnover. In the gas sector, early technical investments generated incremental benefits despite slower progress, indicating that less mature QI areas need longer time horizons but can still deliver indirect value. Pilot-based approaches proved useful for testing services and managing complexity in emerging areas such as environmental monitoring and industry engagement.

4. Recommendations

Recommendations to partners;

Identify and utilise available entry points for incremental progress in the gas sector to strengthen gas-related metrology services, including testing, calibration, PTs, CRMs, as well as GHG measurements and automotive emissions.

Further institutionalise collaboration with the Ministry of Environment to ensure systematic follow-up of results from industry consulting and pilot activities within ongoing policy and standardisation processes, thereby strengthening quality infrastructure in the environmental sector.

Recommendations to the project team;

Place stronger emphasis on the selection and engagement of medium-sized companies that are not yet well acquainted with QI concepts and are therefore likely to benefit more from project support than well-established companies.

While continuing to focus on problem-oriented initiatives such as the sludge case, the project team should also maintain close attention to a more systematically encouraging and documenting company-level use of QI-related services, thereby generating measurable evidence of uptake without expanding the project scope.

Support BSN in developing a more structured approach to engaging private companies with a focus on clear communication of the QI value proposition and trust-building.

Continue to provide consultancy support to SNSU-BSN in developing and further operationalizing its long-term strategic master plan to strengthen its role as an anchor institution in the national QI system, recognizing that internal ownership and sustained momentum within BSN are essential prerequisites for its successful implementation.

Assess the implementation of newly acquired knowledge and skills not immediately after training activities, but after a period of three to six months, when opportunities for practical application have materialised.

Recommendations to the International Cooperation Department (Group Q.3);

Review and consolidate best practices for engaging with the private sector across PTB-projects in order to develop a more effective strategy for private-sector engagement and to respond proactively to the BMZ's increasing interest in private sector development (see Objective 3 of BMZ-Reformplan "Zukunft zusammen global gestalten" – BMZ January 2026).

Formulate an output and corresponding indicators that capture improvements in BSN's strategic capacities, in order to better cover the real support of the project to BSN and measure its strategic results.

