Physikalisch Technische Bundesanstalt
Braunschweig und Berlin

Indonesia

Quality Assurance in the Environmental and Food Analysis

Summary of the Evaluation Report

Project Data

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PTB Working Group:	Q5.2
Project Coordinator:	Andrea Ulbrich
Evaluators:	Bernward Causemann, lead evaluator Dr. Kenji Kato, technical evaluator

This report was elaborated by independent evaluators for the PTB. It reflects exclusively the evaluators' opinions and conclusions.

Project Description

Since September 2010, PTB, the German National Metrology Institute, has implemented a project in Indonesia funded by the German Ministry of Economic Cooperation and Development (BMZ). The project aims to strengthen the structural framework of Metrology in Chemistry (MiC) in Indonesia in order to develop strategies for action in the fields of environmental protection and food safety on the basis of a reliable and internationally integrated quality infrastructure. The project is scheduled for 4 years. It was extended without cost to May 2015. A follow-up project is envisaged and is expected to be planned in 2015.
The project was subject to an independent evaluation. The field phase took place in December 2014. Evaluators were Bernward Causemann (lead) and Kenji Kato (technical evaluator). This is a summary of the evaluation report.

Project objective:
“The efficiency of the Indonesian environmental and food analysis has considerably improved thanks to the activities of the institute responsible for MiC and its partners.”

Indicators:

1. A strategy has been drawn up for the field of MiC.
2. The competencies in the field of MiC are clearly distributed. The designated institutes have concluded cooperation agreements with LIPI.
3. The traceability chain in the field of water and food safety has been realised via certified reference materials or international interlaboratory comparisons for 4 parameters.
4. The external quality system for testing laboratories has been strengthened.

Target groups are, firstly, the direct users of metrological services (authorities; industrial companies which require food and environmental testing to manufacture better products); secondly, the consumers who benefit from MiC whether they are aware of it or not; thirdly, the whole Indonesian population who will benefit from the effects of an efficient MiC.

Project partners:
Political partner of the project is LIPI, the Indonesian Institute of Sciences. Implementing partner is RCChem-LIPI (Research Center for Chemistry in LIPI). Other partners are the Research Centre Metrology which is the National Metrological Institute of Indonesia, Reference laboratories active in the food and environmental sectors and the National Accreditation Committee (KAN).

Components of support

- Strengthening the basic MiC infrastructure;
- Raising awareness for the importance of a quality infrastructure, with a special focus on the field of MiC;
- Metrological traceability

Assessment of the project

Results:
The project has achieved a substantial number of results, and had progress on all indicators. Some were overachieved.

- A strategy was drawn up for the field of MiC by the relevant institutions which is now being implemented. Following that, major developments tool place: The Indonesian Standards and Conformity Assessment Law was revised, it was decided that MiC will be integrated into the LIPI Research Centre for Metrology. The MiC section in RCChem has a new laboratory building financed entirely from Indonesian funds, with new equipment. At the time of visit, a few technical issues still needed to be resolved.
- No institutes outside LIPI were designated in the area of MiC during the project. Responsibility for MiC is still fully with RCChem except that the responsibilities for water has been divided. But a MiC network has been created with the main players that facilitates cooperation and is appreciated for information exchange. Through it, the PTB project can reach crucial institutions for capacity building.
- From 2010 until August 2013, Indonesia participated in 12 international intercomparisons, including two CCQM pilot studies, one APMP key comparison and one APMP supplemental comparison. The frequency of Proficiency Tests (PT) increased compared to the time before 2010.
- On Certified Reference Materials (CRM), there has been progress. At RCChem, the capacity for certification of Reference Materials (RM) is under preparation for five parameters. Additionally, CRMs have been imported by some reference laboratories (an expensive and time-consuming process that causes long delays) and were used for PTs amongst Indonesian laboratories, although for many PTs, industrial RMs were imported. RCChem is now formally designated by the Research Centre Metrology as Designated Institute (DI) at BIPM.
- Regarding strengthening the external quality system for testing laboratories, there has been significant progress. As noted, the number of PTs has increased, testing laboratories have gained competence. More parameters were added to PTs. A PT software has been introduced and is being applied.

Overall, the Government of Indonesia has shown increased commitment and understanding for MiC. The structure of metrology in Indonesia is now more in line with what is considered international good practice. For such a small project, this is considered substantive impact. There is also commitment by staff and the Research Centre Metrology. This bodes well for the **sustainability** of the achieved results, and a continuous process of development.

Status of the change process:
Currently, the process of integration of MiC into the Research Centre Metrology is under way. It would be important that as many experienced staff as possible move to the LIPI - Research Center for Metrology, and work there fully motivated. As is typical for such organisational changes, concerns and a certain feeling of insecurity developed among MiC staff. These need to be attended to if the capacity in MiC is to be retained. Regarding MiC in Indonesia overall, the chances for sustainability are also considered high because over recent

years, the quality and services of laboratories have increased continuously. This can further be promoted.

Causes and success factors for the observed results and change processes:
Regarding **relevance**, it can be stated that the PTB project is in line with priorities of the Indonesian government. Providing access to international standards through the metrological system has an effect beyond the immediate services. It contributes to an improved sense of quality in the whole laboratory sector. Government reference testing laboratories showed a sense that international traceability would be of value, even if they did not invest in it heavily as it is not a primary concern, but the PTB project addresses an existing interest. The relevance of investing in international accreditation and traceability comes more from future growth prospects than from current needs of the export industry.
Regarding **strategy, t**he initial objective and indicators did not fully reflect the complexity of required intervention levels. It had an emphasis on building technical capacity. At the start of the project it became clear that technical capacity could be built, but for sustainability, a number of issues in the sector, including legal aspects and organisational structures, needed to be clarified. The strategy was therefore adapted to facilitate system reform, which is considered very adequate by the evaluators. The evaluation also notes positively that a great variety of activities focused on the priorities of stakeholders.
Regarding **cooperation**, the project team had intensive consultations with partners and stakeholders throughout the duration of the project. Based on this, the project adjusted plans to the needs of the sector and of its partners. It showed a high level of flexibility.
The **steering** of the PTB project was done entirely by PTB staff and consultants based on frequent consultations with the stakeholders in Indonesia. There is no formal steering committee and no structured formal feedback mechanism with partners, except for an annual meeting with the political partner. This approach helped the project to stay flexible and respond quickly to changing needs. But there was no formal opportunity for stakeholders to hear and discuss their experiences with PTB and get information about what happened in other sections of the project that the specific partner was not involved in. Informally this happened in the MiC Network and during training sessions and PTs.

Learning processes and learning experience
The PTB project learned early on that it needed to put more emphasis on the overall framework for MiC in addition to institution building and technical capacity building. The adaptation of strategy was successful, and the project is considered overall successful.
The MiC structures in Indonesia are not yet able to provide comprehensive services to laboratories and industry, although some reference laboratories reach many other labs through the PTs they offer on a limited number of parameters. The focus on building up technical competence particularly in the LIPI Research Center for Metrology needs to be complemented with building capacity to provide services for customers to impact on industry and on consumer and environmental protection.
The cooperation between MiC Network members needs to intensify if metrological services in chemistry are to be strengthened. The LIPI-RCM can hardly develop the capacity to provide services in all the chemical fields that are of importance in Indonesia, and other laboratories can build relevant capacity, either as reference laboratories or as DI for specific parameters or areas of chemistry.

Government promotes increased capacity in MiC, and the linking into the international system, but has not given some laboratories the mandate to pursue this (e.g. to ensure international traceability of measurements). Existing regulations also do not necessarily prescribe the use of traceable methods. Changing mandates in this manner and requiring greater traceability of measurements could give a big push to the development of MiC in Indonesia.

Recommendations

Amongst others, the following recommendations were made:

- To PTB – the project has brought good results, there is potential for more, and a need for further external assistance of the kind that PTB can provide. PTB should therefore continue the cooperation in a follow-up project.
- The project should consider to introduce an advisory committee, consisting of leadership of stakeholders, possibly including relevant laboratories or other MiC Network members.
- Laboratories and industry should get better and faster access to Certified Reference Materials. In order to achieve that, a number of steps are recommended, like importing and certifying RMs so that the market is prepared for a commercial RM importer.
- The MiC Network should discuss systematic services for reference and field labs, and intensify exchange how they could cooperate to develop their capacities.
- Synergy between physical metrology and MiC should be developed. The evaluation particularly recommends a joint physics-chemistry project with industry.
- Government should consider including the use of traceable material as mandatory in regulations.

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