South-East Asia Laboratory NETwork

: “implementing basic rules of quality control and procedure harmonization in soil analysis laboratories.”

Background In many countries governments are introducing the rule that orders for environmental and ecological analyses should only be given to laboratories that are accredited for this type of work. For accreditation, ‘Quality Management’ is an essential aspect. However, many laboratories find it very difficult to implement the necessary procedures of quality assurance, laboratories with marginal budgets, or smaller research laboratories that work without much competition. Such ‘small’ laboratories often do not have the necessary resources and incentives to engage in a comprehensive effort as done by larger laboratories seeking accreditation, and proper training and refresher courses may be neglected. Moreover, ‘small laboratories’ have often developed their own analytical methods that can provide results significantly different when compared to standard procedures. Thus there is a need of evaluating the consequences of using ‘adapted’ analytical methods.

Objectives

Our goal is to organise a set of trainings with two main objectives.

The first one is to introduce a number of basic measures of quality control and management in the ‘small’ laboratories of South-East Asia. Such basics measures do not require a high financial input but they necessarily involve a change in attitude and practice of all laboratory personnel. Indeed, quality control is primarily aimed at the prevention of errors. Yet, despite all efforts, it remains inevitable that errors are made; therefore, the control system has procedures to detect and correct them.

A complementary objective is the harmonization of analytical methods between the different laboratories in order to reach standardisation at the regional scale.

Activities during the trainings

1. Review existing practices for field sampling, sample preparation, soil analysis, instruments and chemical checking, use of internal and external soil controls, interpretation and archiving of soil analysis.

2. Agree on specifications and guidelines for harmonized approaches to the determination of the main chemical and physical soil properties.

3. Analyse the results of a ring test made by SEALNET in 2015, in order to train the participants, when errors or mistakes are suspected, for the "Five Ws rule": what error was made? where was it made? when was it made? who made it? why was it made?

4. Suggest improvement for better laboratory management that allows quality control (including tracking of errors and their cause) while (i) stimulating and motivating all personnel, (ii) improving safety and (iii) improving communication possibilities, both internally and externally.

Outputs:

1. Producing a short report that lists the currently used practices for field sampling, sample preparation, soil analysis, instruments and chemical checking, use of internal and external soil controls, interpretation and archiving of soil analysis, etc.

2. Draft documents containing Standard Operating Procedures (SOP) for:

- analytical methods that fit with international standards and that can be used by participating laboratories in South-east Asia;

- methods of investigation that describe a complete testing system to detect mistakes and errors;

- archiving the analytical results in a standard and harmonized way, using international units to express analytical results.

3. Increase the staff capacity, from the technicians to the laboratories leaders, by teaching them a limited number of simple rules and inexpensive measures to obtain better results during routine and research analysis.

Beneficiaries

Thailand: 1 central laboratory and 12 regional laboratories from Land Development Department (LDD). **Lao PDR**: the soil analysis laboratories from the Department of Agricultural Land Management (DALaM) and from the National University of Laos (NUOL).

Indonesia: : Indonesian Soil Research Institute (ISRI)

Expected impacts for the laboratories and the users:

After this training, the laboratories try to get proficient certificates from ASPAC (Australasian Soil and Plant Analysis Council), an independent international organisation that operates a soil Inter-Laboratory Proficiency Programme (see ;http://www.aspac-australasia.com). This official quality certification will be a first step to get later on official governmental accreditation and to pass ISO certifications. On the other hand, users (companies, farmers, researchers, etc.) will be sure that their results are accurate and precise, and that results coming from different laboratories are comparable.

Project leaders and managers

1. Mrs Nopmanee Suvannang (Thailand):

   Director of the Technical Service Division, Land Development Department (LDD, Bangkok). In charge of analytical methods.

2. Dr Phai Duy Do (Vietnam):
   Head of Central Analytical Laboratory, Soils and Fertilizers Research Institute (SFRI, Hanoi). In charge of laboratory management.

3. Dr Phil Moody (Australia):
   Soil scientist, Department of Science, Information Technology and Innovation (Brisbane), contact person with ASPAC. In charge of soil analysis interpretation and recommendations to farmers.

4. Dr Christian Hartmann (France, Lao PDR):
   Soil scientist at the 'Institut de Recherche pour le Développement' (IRD), currently based at the Department of Agricultural Management (DALaM, Vientiane). In charge of soil physics.

SEALNET's Second Worshop:
Presentation of the ring test results
December 21-23, 2015,
Office of Science for Land Development,
Land Development Department
Bangkok, Thailand

Monday, 21 Dec 2015	
9h00 - 9h30	Registration
9h30 - 9h40	Welcoming speech by DG LDD and FAO representative
9h40 - 10h00	Presentation of SEALNET and the ring test
10h00 - 10h50	Review existing practices for field sampling, sample preparation, soil analysis, instruments and chemical checking, use of internal and external soil controls, interpretation and archiving of soil analysis in each lab (10 min by laboratory)
10h50 - 11h00	Coffees break
11h00 - 12h00	Global presentation of the ring test results
12h00-13h30	Lunch
13h30 - 14h00	Presentation of soil pH analyses by standard method (ISO 10390:2005)
13h30 - 15h00	Presentation of soil pH analyses of the ring test and discussion to identify the problem in the results provide by the laboratories
15h00 -15h15	Coffee break
15h15 - 15h45	Presentation of soil organic matter analyses by standard method
15h45 - 17h00	Presentation of soil organic matter analyses of the ring test and discussion to identify the problem in the results provide by the laboratories

Tuesday, 22 Dec 2015	
9h00 - 9h30	Presentation of soil available P analyses by standard method
9h30 - 10h45	Presentation of soil available P analyses of the ring test and discussion to identify the problem in the results provide by the laboratories
10h45 - 11h00	Coffees break
11h00 - 11h30	Presentation of soil available K analyses by standard method
11h30 - 13h00	Lunch
13h00 - 14h15	Presentation of soil available K analyses of the ring test and discussion to identify the problem in the results provide by the laboratories
14h15 - 14h45	Presentation of soil total N analyses by standard methods
14h45 - 16h00	Presentation of soil total N analyses of the ring test and discussion to identify the problem in the results provide by the laboratories
16h00-16h10	Coffees break
16h10 - 16h30	Conclusion of the first ring test organized

Wednesday, 23 Dec 2015	
9h00 - 12h00	Suggestion for improvement for better laboratory management that allows quality control in each labs (including tracking of errors and their cause) (i) stimulating and motivating all staffs involve in the lab (ii) improving safety (iii) improving communication possibilities, both internally and externally
12h00 - 13h30	Lunch
13h30 - 15h00	Discussion to agree on specifications and guidelines for harmonized approaches to the determination of the main chemical and physical soil properties
15h00-15h10	Coffees break
15h10 - 16h30	Discussion on the future plan activities and training for sustainable the soil quality lab system in regional aspacts and provide the first draft proposal to the pillar 5 of Asian soil Partnership programme

Budget

	Thai Baht	USD	ratio
Travelling cost	132,000	3,677	32%
Accomodation	102,144	2,845	24%
Per diem	102,144	2,845	24%
Organization budget	81,056	2,258	19%
Total	**417,344**	**11,625**	**100%**

	Thai Baht	USD	ratio
LDD	115,840	3,227	28%
IRD	93,200	2,596	22%
FAO	208,304	5,802	50%
Total	**417,344**	**11,625**	**100%**

Traveling cost = includes the cost of coming to Bangkok and also the daily taxi expenses to come to LDD

Organisation budget covers the laboratory expenses (chemical, etc…) and coffee breaks, room facilities, etc…