SEALNET-V/21/Report

Report of the fifth meeting of the Asian Soil Laboratory Network (SEALNET)

Virtual Meeting, 20 October 2021

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2021

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1. Introduction

Based on the decision made at the fourth GLOSOLAN meeting in November 2020, all meetings of the Regional Soil Laboratory Networks (RESOLANs) will be focused on decision making only. In this regard, all trainings are being implemented in the form of webinars throughout the year.

The fifth meeting of the Asian Soil Laboratory Network (SEALNET) took place on 20 October 2021 on the online platform Zoom (see the meeting agenda in Annex I). The meeting was attended by 153 participants from 18 countries (see list of participants in Annex II). Ms. Gina Nilo, SEALNET Chair and Ms. Nopmanee Suvannang, GLOSOLAN Chair opened the meeting by reiterating the importance of soil laboratories for decision making, for fighting climate change and for eradicating hunger worldwide. A note was made on the importance of national reference laboratories in establishing National Soil Laboratory Networks (NASOLANs) and trigger actions at the national level.

2. GLOSOLAN updates

Ms. Lucrezia Caon, GLOSOLAN Coordinator, introduced GLOSOLAN objectives and areas of work to new SEALNET members, recalling that GLOSOLAN operates through regional and national soil laboratory networks. Thereafter, Ms. Caon informed participants that on October 12, the network counted on 117 members from the Asian region. This and other information, including GLOSOLAN publications, are available on the GLOSOLAN webpage in English, Spanish, French, Arabic, Russian and Chinese. Ms. Caon also reminded participants that the GLOSOLAN webpage and its subpages contain frequently asked questions that GLOSOLAN members can consult before contacting the GLOSOLAN Coordinator by email.

Ms. Caon concluded by thanking all those members of SEALNET that volunteered to translate GLOSOLAN documents, record training videos and act as trainers in webinars. In this regard, she made a call for more experts to support these activities.

Update on the harmonization on the writing of Standard Operating Procedures (SOPs): the working groups are intensively working to harmonize information provided by GLOSOLAN members. Regional harmonization has already been achieved, whereas the global harmonization of information for most of the methods is ongoing. Overall, GLOSOLAN faced major delays on the preparation of the matrixes on soil biological parameters because of the presence of few experts on these methods in the working groups, and the few inputs submitted by GLOSOLAN members.

Update on the GLOSOLAN PT2021: 280 set of soil samples are available. Each set contains 10 self-seal bags of 10g homogenized soil material labeled with a unique sample code: GLO-01, GLO-02, GLO-03, GLO-04, GLO-05, GLO-06, GLO-07, GLO-08, GLO-09 and GLO-10. 249 laboratories replied to the survey distributed by the GLOSOLAN Coordinator on their wish to participate to this global exercise. Overall, only 8 laboratories did not wish to participate in the PT2021. Laboratories that will participate in the GLOSOLAN PT2021 will be selected based on:

- geographical balance: we will involve at least 1 laboratory per country
- number of parameters (in the list provided below) that interested laboratories can measure
- method of analysis (in the list below) that the interested laboratories can perform
- first come, first serve basis

A decision on the laboratories that will participate in the PT will be made by the end of October 2021. The shipment of the soil samples will start in November 2021. Participants will receive clear instructions on the analysis to perform on the samples, which should focus on organic carbon, available phosphorus and total nitrogen. PT results should be submitted through an online platform accessible through the GLOSOLAN website.

3. SEALNET updates

Mr. Filippo Benedetti, GLOSOLAN alternate coordinator briefly spoke about the status of the regional network, by reporting the number of laboratories from Asia that registered in GLOSOLAN in 2021 (57 new members of SEALNET, from 12 different countries). Mr. Benedetti highlighted that the GLOSOLAN coordinators will work to liaise with the GSP Focal Points and FAO Offices in those countries where a National Reference Laboratory had not been nominated yet and where no laboratory is registered in the network. Mr. Benedetti recalled the importance of National Soil Laboratory Networks (NASOLANs) in (i) improving the efficacy and outcomes of GLOSOLAN activities, (ii) developing ad-hoc programs to better face global and local challenges, and (iii) in reaching a larger number of laboratories. The role played by National Reference Laboratories in leading the establishment of NASOLANs was stressed as well. After providing a general overview of the status of NASOLANs in the region, Mr. Benedetti kindly asked participants to inform GLOSOLAN coordinators about any initiative in this regard, in order to keep the country profile in the NASOLAN database updated.

4. Projects of regional interest

Participants were informed on activities with a link to soil analysis and soil laboratories ongoing in the region:

- **Global Soil Doctors Programme**
  Ms. Carolina Olivera, GSP Secretariat, introduced the Global Soil Doctors Programme to participants: a farmer-to-farmer training programme to promote the practice of sustainable soil management, and to support the work or cover the lack of national extension services. Ms. Olivera reported that many Asian countries expressed an interest in the programme by completing an online survey. Since the programme counts on the use of a soil testing kit, SEALNET members could contribute to the implementation of the programme by preparing and supplying reagents for the soil testing kit.

- **GSP mapping activities**
  Mr. Yusuf Yigini (GSP Secretariat) introduced the International Network of Soil Information Institutions (INSII) to participants; the GSP network in charge of preparing global maps, databases and information systems through a country-driven approach. Since, INSII faces several constrains in terms of data availability, data quality and harmonized data, it would be good if INSII and GLOSOLAN could collaborate. INSII can provide GLOSOLAN with the infrastructure for storing, serving and exchanging soil lab information/spectral services (in relation to the Global Soil Information Systems - GloSIS). It can also implement the harmonization of laboratory data, and build the capacity of laboratories in data processing, storing, mapping and modeling. Otherwise, GLOSOLAN can support INSII by providing fresh measured data, harmonized data, and good quality data. Mr. Yigini made some proposals on how the INSII-GLOSOLAN collaboration could be

implemented. A possibility would be to establish a joint working group to implement specific activities, and to connect GLOSOLAN and INSII members from a same country.

4.1 How to apply for a Technical Cooperation Programme (TCP) project

GLOSOLAN is a self-financed initiative that receives no financial support from the FAO. Financial resources come from projects granted to the Global Soil Partnership (GSP). As a result, the budget is mostly allocated to the implementation of global activities since the GSP has very few regional and national projects. GLOSOLAN members are kindly invited to make an effort to mobilize financial resources for the implementation of national and regional activities. The GLOSOLAN coordinator can help countries and laboratories in preparing the concept notes to submit to donors.

There is the possibility for countries to approach FAO as donor by submitting requests for Technical Cooperation Programme (TCP) projects. General information:

- TCP projects are assigned by FAO every 2 years. All proposals should be submitted within specific deadlines;
- TCP projects provide maximum US$ 500 000;
- TCP projects should be implemented on average in one – one and a half years' time;
- TCP projects can be used to kick off activities, assess needs and write a second phase project proposal.

Application steps:

1. Know what you want in terms of activities and final objective. The GLOSOLAN coordinator can support the country with the project formulation if needed.
2. Ask your government (e.g. Ministry of Agriculture) to send an official letter requesting a TCP project to your country FAO office (for national TCPs) or to the regional FAO office (for regional TCPs). The letter should mention: the problem/challenge faced by your country, the request for a TCP project with a note on how the TCP will help to tackle the problem/challenge. Please copy the GLOSOLAN coordinator on your email for an internal follow up on the request.
3. Prepare the project document. Please note that there is a ready template for this so countries cannot prepare it on their own. The GLOSOLAN coordinator and the TCP officer at the FAO country or regional office should be involved in the preparation of the project document.
4. Submission of the project document, waiting for approval and an eventual start of its implementation.

5. SEALNET main needs

Mr. Filippo Benedetti showed the results of an online survey that was launched before the meeting, to collect preliminary information on the SEALNET main needs. These are:

- provision of regular training on SOPs, implementation of internal and external QC procedures, laboratory management, laboratory health and safety, soil spectroscopy, and equipment use and maintenance;

- harmonization of Standard Operating Procedures (SOPs);
- adoption of more modern methods (e.g. soil spectroscopy), as well as more sustainable (reduced risk for the human health, reduced risk for the environment) methods for soil analysis;
- adoption of quality control (QC) procedures;
- adoption of health and safety measures in the laboratory;
- better waste management policies;
- support for accreditation to international organizations.

Survey results were used as a base to open the discussion among meeting participants and to develop an ad-hoc regional work plan, especially in regards to the organization of webinars.

Participants were also asked to express their opinion on the level of awareness among national governments on soil laboratories' activities. Fifty-three percent of participants stated that governments are somewhat aware of what is going on in laboratories but should be more informed. Otherwise, 34 percent of attendees reported that governments are not aware on soil laboratories activities at all. Only 10 percent of meeting participants affirmed that their governments are fully aware of soil laboratories activities, while 3 percent was not sure about that and thus preferred not to answer to this question. Therefore, the strong majority of meeting participants asked GLOSOLAN to work on the preparation of awareness raising material which may result in a larger technical, financial and political support to soil laboratories operating in the region.

Mr. Christian Hartmann (IRD France) shared with participants a comprehensive presentation on the importance of joining proficiency tests (PTs). Mr. Hartmann stressed the need of identifying PT sample providers and PT organizers on a regional scale, in order to allow each RESOLAN to implement regional (and national) PTs. Mr. Hartmann provided step-by-step guidelines on how to prepare samples for a PT, giving details on the equipment and the know-how needed. A call was launched among SEALNET member laboratories to identify volunteers to provide and prepare samples for the implementation of a SEALNET PT.

6. Position of SEALNET in GLOSOLAN

SEALNET members were asked to express an opinion on the main topics for discussion at the upcoming 5th GLOSOLAN meeting:

- **Standard Operating Procedures (SOPs):** Ms. Caon informed participants that so far GLOSOLAN gave priority to the harmonization of soil chemical parameters; the parameters that are most important to soil fertility, and the most used methods in the world. However, in 2020, GLOSOLAN started to work also on soil physical and soil biological parameters (see table 1).

Table 1. SOPs harmonized by GLOSOLAN since 2018

2018	2019	2020 (ongoing)
• Sample pre-treatment • Inorganic carbon (CaCO3 eq.) • OC Walkley and Black	Bray I Bray II Olsen P Mehlich I	• Particle size-distribution by pipette method and hydrometer • Bulk density • Moisture content by gravimetric method

• Total carbon (Dumas – dry combustion)	Mehlich III (postponed to 2020) pH in water pH in KCl pH in CaCl2 EC saturated paste EC in water N Dumas N Kjeldahl Mineral N (still under writing) Tyurin	• Particulate organic carbon by physical fractionation • Quasi-total elements by digestion using aqua regia and EPA. This includes total heavy metals • Exchangeable bases and CEC by ammonium acetate • Available micronutrients (Fe Zn Cu Mn Mo Ni Cd) – extraction using DTPA • Boron by hot water extraction • Mehlich III for macro and micronutrients (including S and B) • Microbial biomass C and N by chloroform fumigation-extraction • Microbial enzyme activities • Soil respiration rate

A reflection was made on the fact that five years after the establishment of GLOSOLAN, the network might be ready to make a step forward and start working on those methods that are less frequently used but have lower risks for the human health and the environment. This might help the transition towards the use of more sustainable methods.

After recalling how SOPs are harmonized in GLOSOLAN and the role that regional leaders play in it, Ms. Caon opened the discussion on the SOPs SEALNET would suggest GLOSOLAN to harmonize in 2022. These are:

Chemical parameters

- Total carbon by loss of ignition. Regional leaders: Renuka Silva (Sri Lanka), Rabindra Adhikari (Nepal);
- Exchangeable acidity by KCl. Regional leader: Chilamkurthi Sreenivas (India);
- Exchangeable acidity by BaCl2 method. Regional leader: Gina Nilo (Philippines);
- Exchangeable ammonium and nitrate by KCl. Regional leaders: Sanjay Srivastava (India) and Abhay Shirale (India).

Physical parameters:

- Water retention (pF). Regional leader: Linca Anggria (Indonesia).

Biological parameters:

- Microbial population identification. Regional leader: Gina Nilo (Philippines).

SEALNET was informed that in 2021, GLOSOLAN struggled to harmonize some SOPs, because of the few inputs received from soil laboratories (completion of the harmonization matrix) and the few experts in the working group. SEALNET members suggested to work on the most common methods in the region and to support countries by providing them with equipment for conducting the analysis. Attention should also be paid to conversion factors that should be included in the GLOSOLAN SOPs, as was done for the SOP on the Tyurin method. In order to overcome the lack of experts in the working groups, SEALNET suggested to spread the voice on GLOSOLAN at the national level and ask laboratories performing different type of analysis to join the network. The harmonization of some SOPs could also be commissioned to group of experts that can potentially

be paid by a TCP project. Still, GLOSOLAN should involve top experts in the harmonization of some methods.

- **Range and reference values.** The Global Soil Partnership asked GLOSOLAN to work on range and reference values to facilitate the provision of recommendations to farmers and other stakeholders. **Range values** indicate the range of validity of the method. E.g. Method X is reliable for SOC content from xx to xx. This information should be included in the GLOSOLAN SOPs. **Reference values** provide an indication on the status of soil.

  Participants to the meeting expressed the following opinion on the topic:

  - *Range values*: SEALNET agrees on the idea to include range values in the SOPs

  - *Reference values*: SEALNET agrees on the idea to include reference values in the SOPs

7. SEALNET Governance

The governance of SEALNET was defined at the first SEALNET meeting in 2017. At present, the SEALNET counts on the support of a Chair and one or two vice-Chairs. The mandate for these positions is two years after election.

Building on the extraordinary experience of the Latin American Soil Laboratory Network (LATSOLAN), SEALNET agreed to establish a Steering Committee to support the Chair and Vice-Chairs in triggering and implementing national and regional actions. Thus, the SEALNET governance was revised as following:

- 1 SEALNET Chair
- 1 or 2 SEALNET Vice-Chairs
- 1 Steering Committee composed by a few (maybe 5?) active members of the network

The GLOSOLAN coordinator will draft the Terms of Reference for the Steering Committee and send them to SEALNET members for review by email.

In order to strengthen the position of the Chair and Vice-Chairs of SEALNET, and allow them to do real follow ups in each country and in the overall region. GLOSOLAN proposed SEALNET to review the Terms of Reference (TORs) for the position of Chair and Vice-Chairs and to have TORs common to all RESOLANs. The proposal was endorsed. The GLOSOLAN coordinator will draft the revised Terms of Reference for the position of RESOLAN Chair and Vice-Chair and send them to SEALNET members for review by email.

Ms. Caon closed this session by thanking Dr. Gina Nilo from the Philippines (SEALNET Chair), Ms. Su Su Win from Myanmar and Mr. Sanjay Srivastava from India (SEALNET Vice-Chairs) for supporting the network from 2019 to 2021. Ultimately, the network elected their new representatives for the years 2021-2023. Dr. Gina Nilo from the Philippines was re-elected SEALNET Chair and Mr. Muhammad Abbas Aziz from Pakistan was elected SEALNET vice-Chair.

8. Venue and time of the next meeting

The third SEALNET meeting will take place online between September and October 2022.

Annex I. Agenda

Wednesday, **20 October 2021**	
7:00 – 7:10 AM	**Opening, endorsement of the agenda and group picture** *Ms. Gina Nilo, SEALNET Chair* *Ms. Nopmanee Suvannang, GLOSOLAN Chair* *Lucrezia Caon, GLOSOLAN Coordinator, GSP/FAO*
7:10 – 7:30 AM	**Item 1. Global Soil Laboratory Network updates** - Network growth - GLOSOLAN proficiency test (PT) 2021 - Online trainings - Standard Operating Procedures (SOPs) under harmonization - Publications and translation of GLOSOLAN material - Procurement of soil laboratory equipment - GLOSOLAN website - 5th GLOSOLAN meeting *Ms. Lucrezia Caon, GLOSOLAN Coordinator, GSP/FAO*
7:30 – 8:10 AM	**Item 2. SEALNET updates followed by an open discussion** - SEALNET growth: trends on the registration of new laboratories - National Soil Laboratory Networks (NASOLANs): establishment and activities *Mr. Filippo Benedetti, GLOSOLAN Alternate Coordinator, GSP/FAO* - Presentation of the projects implemented/under implementation in the region (both by GSP and other organizations)

	○ **Global Soil Doctors Programme**: eventual provision of reagents to the soil testing kits and preparation of a poster on the interpretation of laboratory results ○ **GSP mapping activities**: provision of good quality data from GLOSOLAN laboratories - Discussion on country-specific project proposals *Ms. Su Su Win, SEALNET Vice-Chair* *Panelists from the Global Soil Partnership Secretariat, FAO: Ms. Carolina Olivera, Mr. Yusuf Yigini, Ms. Lucrezia Caon*
8:10 – 8:40 AM	**Item 3. SEALNET main needs** - Presentation of the results of the online survey - Discussion of the regional work plan - Organization of a SEALNET PT *Panelists and moderators: Mr. Filippo Benedetti, GLOSOLAN Alternate Coordinator, GSP/FAO, and Mr. Christian Hartmann, IRD France*
8:40 AM – 9:15 AM	**Item 4. Position of SEALNET in GLOSOLAN** - Proposals on the SOPs to harmonize in 2022 - Requests on specific topics for GLOSOLAN online trainings (presentation of the survey results) - Definition of range values and reference values in GLOSOLAN SOPs - Other requests Moderators: *Lucrezia Caon, GSP Secretariat and Mr. Sunjay Srivastava, SEALNET Vice-Chair*
9:15 – 9:50 AM	**Item 5. SEALNET governance** - Review the Terms of Reference for the position of the Chair and Vice-Chair(s). Proposal to give more coordination, technical support and monitoring control to these positions in the region.

	- Proposal to establish a Steering Committee to support the work of the Chair and Vice-Chair(s) - Presentation of candidates for the role of SEALNET Chair - Presentation of candidates for the role of SEALNET Vice-Chairs - Election of the new Chairs and Vice-Chairs (online poll) *Moderators: Filippo Benedetti, GSP Secretariat and Ms. Lucrezia Caon, GSP Secretariat*
9:50 – 10:00 AM	**Closing remarks by the former and new Chair and Vice-Chairs**
10:00 AM	**Closure of the meeting**

Annex II: List of participants

Ms. Lucrezia Caon, Global Soil Partnership Secretariat, FAO HQ

Mr. Filippo Benedetti, Global Soil Partnership Secretariat, FAO HQ

Ms. Carolina Olivera, Global Soil Partnership Secretariat, FAO HQ

Mr. Yusuf Yigini, Global Soil Partnership Secretariat, FAO HQ

Mr. Christian Hartmann, IRD France

Ms. Nopmanee Suvannang, GLOSOLAN Chair

Mr. Rob de Hayr, GLOSOLAN Vice-Chair

Country	Name of laboratory	First Name	Last Name
Afghanistan	SRD soil laboratory	Hameedullah	Ahmadzai
Afghanistan	Soil Research Laboratory, MAIL	Baz Muhammad	Waseem
Afghanistan	Soil Research Directory	Bismillah	Sofezadh
Afghanistan	Parwan province soil laboratory	Mohammad Rafi	Salihzada
Afghanistan	Nangarhar research soil laboratory	Sayedazmar	Sadat
Bangladesh	Soil and Organic Waste Management Laboratory	Shamim Al	Mamun
Bangladesh	Central Laboratory, Soil Resource Development Institute	Dr. Zainal	Abedin
Bangladesh	Regional Soils Laboratory 12	Elly Paul	Tomas
Bhutan	Soiland Plant Analytical Laboratory	Jamyang	Jamyang
Cambodia	Soil Science Laboratory	Sambo	Pheap
China	China National Center for Quality Supervision and Test of Chemical Fertilizers(Beijing)	Qi	Jin

China	Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences	Hong	Wang
India	Charles Renard Analytical Laboratory	Pushpajeet	Choudhari
India	ICAR-Indian Institute of Soil Science, Bhopal, India	Pramod	Jha
India	CRAL, ICRISAT, Hyderabad	Chetna	Nimje
India	ICAR-Indian Institute of Soil Science, Bhopal	Abhay Omprakash	Shirale
India	ICRISAT	Chenna	Vijaya Ranganatha
India	CRAL Icrisat	Pulletikurthi	Venkata Satish
India	ICAR Indian Institute of Soil Science	Sanjay	Srivastava
India	ICAR-IISS Bhopal	Ashis K	Biswas
India	India	Hariom	Mishra
India	RARS, Maruteru	Sreenivas	Ch
India	Soil-Plant-Manure-Water Analysis Laboratory,ANGRAU,RARS,Tirupati (Soil Science Lab)	Kandula	Naga Madhuri
India	PDS soil, plant & water Analytical Laboratory	Thomas	Jacob
Indonesia	ISRI	Linca	Anggria
Indonesia	ISRI	Lenita	Herawaty
Indonesia	ISRI	Hesti Eka_Isri	
Indonesia	ISRI	Siti Marisya	Kurniasari
Indonesia	BALITTANAH/ISRI	Reny Tri	Anggraini
Indonesia	Balittanah / ISRI	Ambar Fitri	Rochyati
Indonesia	ISRI / BALITTANAH	Fajar	Achmad
Indonesia	Balai Penelitian Tanah	Firnas	Muldiansyah
Indonesia	ISRI	Dwiky	Rahmadhan
Indonesia	ISRI Soil Laboratory	Diah	Setyorini
Indonesia	ISRI	Hesti	Eka Tantika
Japan	Institute for Agro-Environmental Sciences, NARO	Yuta	ISE
Japan	Soil Inventory and Management Group	Yuji	Maejima
Lao PDR	Center of Excellence in Environment	Santi	Kongmany
Lao PDR	Soils, Plants and Fertilizer Analysis Center	Xaysatith	Souliyavongsa
Mongolia	Laboratory of Soil Science and Education	Nyamdavaa	Batsaikhan
Mongolia	Soil and agrochemstry	Ariuntsetseg	Dugar
Mongolia	ganbat battsetseg	Ganbat	Battsetseg
Myanmar	Land Use Laboratory	Cho	Htwe
Myanmar	Soil and Plant Analysis Laboratory	Myanmar_Su Su Win	

Myanmar	Plant and Soil Analysis Laboratory, Myanmar	Ni Ni Tint_Myanmar	
Myanmar	Soil and Plant Analysis Laboratory	Khin	Thant
Myanmar	Soil and plant analysis laboratory	Phyoe	Win
Myanmar	Water Quality Analysis Laboratory	Aung Kyaw	Thu
Nepal	Agricultural Technology Centre	Santosh	Shrestha
Nepal	Laboratory of soil science and Geology (IOF/TU)	Rabindra	Adhikari
Nepal	National Soil Science Research Centre	Dinesh	Khadka
Nepal	Laboratory of Soil Science and Geology, IOFPC	Rabindra	Adhikari
Pakistan		Muhammad Abbas	Aziz
Pakistan	FFC Soil & Water Testing Labs	Muhammad	Humza
Pakistan	SPNP, LRRI	Raza	Khan
Pakistan	Soil and plant analysis laboratory, department Agronomy Sindh Agriculture University Subcampus Umerkot Pakistan	Muhammad	Saleem
Pakistan	FFC	Muhammad	Irshad
Pakistan	FFC Laboratory, Sheikhupura	Abdul	Jabbar
Philippines	Metro Manila	Marjorie Jean	Tao
Philippines	Metro Manila	Gina	Nilo
Philippines	Regional Soils Laboratory	Ray Alvin	Mariscal
Philippines	Palawan Soils Laboratory	Lucia	Martinez
Philippines	Bureau of Soils and Water Management - Laboratory Services Division	Bergil	Bernaldo
Philippines	Bureau of Soils and Water Management	Sheila Mae	Bautista
Philippines	Department of Agriculture RFO XI-Regional Soils Laboratory	Mary	
Philippines	PhilRice-Agronomy Soils and Plant Physiology Laboratory	Annie	Espiritu
Philippines	Bureau of Soils and Water Management	Chino Manuel	Antonio
Philippines	Bureau of Soils and Water Management - Laboratory Services Division	Lyra	Espectacion
Philippines	Regional Soils Laboratory - Department of Agriculture RFO III	Rosalie	Laxamana
Philippines	Regional Soils Laboratory	Emma	Tayad
Philippines	ASTS	Ma Aussielita	Lit
Philippines	Provincial Soils and Water Laboratory	Nouri Ariadni	Mamalo

Philippines	Palawan Soils Laboratory	Lucia	Martinez
Philippines	Bureau of Soils & Water Management	Gloria	Urriza
Philippines	DA-Philippine Rice Research Institute	Rosaly	Manaois
Philippines	Palawan Soils Laboratory	Rosemarie	Oliva
Philippines	Bureau of Soils and Water Management	Ina Mae	Leoro
Philippines	Laboratory Services Division-Bureau of Soils and Water Management	Jamie Ann	Tumolva
Philippines	Laboratory Services Division	Beatriz	Magno
Philippines	Regional Soils Laboratory XI	Adrienne	Zabate
Philippines	BSWM-Lab Services	Madonna	Go Lim Tai
Philippines	Department of Agriculture RFO-XI, Regional soils labooratory	Reymond	Tamodra
Philippines	PhilRice-Agronomy, Soils and Plant Physiology Division	Cristel Andrea	Gardoce
Philippines	Laboratory Services Division-Bureau of Soils and Water Management	Mary Claire Alyssa	Pras
Philippines	MEL CHRISEL A. SALES	Mel Chrisel	Sales
Philippines	Bureau of Soils and Water Management	Vince Albert	Ching
Philippines	Department of Agriculture RFO-3 regional Soils laboratory	Philippines/DA-RFO3-John Lee Gonzales	
Philippines	Bureau of Soils and Water Management	John Adrian	Pascua
Philippines	BSWM-Laboratory Services Division	Madonna	Go Lim Tai
Philippines	NSWRRDC LUPEZ	Maribel	Jalalon
Philippines	Regional Soils Laboratory-DA-RFO CAR	Maribel	Mananguit
Philippines	Bureao of Soils&H20 Mngt/Lab.services Division	Agnes	Morada
Philippines	CRL Environmental Corporation	Maria Carmela	Capule
Philippines	Laboratory services division, bureau of soil and water mgt, phils	Aurora	Manalang
Philippines	Philippines	Marife	Rebalde
Philippines	Environment and Bioprocess Engineering Lab	Veronica	Migo
Philippines	Department of soil Science Soil and Plant tissue laboratory	Purisima	Juico
Philippines	Laboratory Services Division-Bureau of Soils and Water Management	Aurora	Manalang
Philippines	Bureau of Soils and Water Management - Laboratory Services Division	Joshua Mikhel	Reyes
Philippines	Regional Soils Laboratory DARFO3	Justine	Estabillo

Philippines	Bureau of Soils and Water Management	Shirley	Buduan
Philippines	Agro-based Laboratory	Nelsie Grace	Gela
Philippines	Laboratory Services Division	Florfina	Sanchez
Philippines	Bureau of Soils and Water Management	Ma. Joerdette	Jimenez
Philippines	Regional Soils Laboratory MIMAROPA	Michael Raymond	De Jesus
Philippines	DA RSL8	Philippines Da Rsl 8 Villarin	
Philippines	USMARDC - Central Laboratory	Usm_Carlito Basay	
Philippines	Department of Agriculture RFO 7 - Regional Soils Laboratory	Gerame	Calapre
Philippines	Department of Agriculture RFO 02 - Regional Soil Laboratory	Fevie Rica	Ancheta
Philippines	Agro-Based Laboratory	Nelsie Grace	Gela
Philippines	Regional Soils Laboratory	Kristelle Cassandra	Dela Cruz
Philippines	Department of Agriculture RFO 7 - Regional Soils Laboratory	Carleen	Calimpon
Philippines	Regional Soils Laboratory-ILD DARFO 10	Johanna	Pichay
Philippines	DA-ILAGAN SOIL LABORATORY	Sarah	Aquino
Philippines	Palawan Soils Laboratory	Lucia	Martinez
Philippines	Regional Soils Laboratory, Department of Agriculture RFO III	Lean Mae	Cawili
Philippines	Regional Soils Laboratory-DA-RFO 1	Aileene	Millare
Philippines	Department of Agriculture-Regional Field Office 1	Eunice	Aquino
Philippines	Regional Soils Laboratory - Department of Agriculture RFO 13	Rhodielyn	Bacsarpa
Sri Lanka	Central Soil and Fertilizer testing Laboratory, Department of Agriculture, Sri Lanka	Renuka	Silva
Thailand	Office of Science for Land Development	Rattanachart	Chuaybudda
Thailand	Soil, Fertilizer and Plant Analysis Laboratory (SFP Lab)	Khanok-On	Amprayn
Thailand	Land Development Department	Theeraphop	Thoopboochagorn
Thailand	Soil analysis group, Land Development Regional Office3	Piyawan/Thailand	
Thailand	Office of Science for Land Development	Ldd-Kamarin Nimnualrat	
Thailand	Soil-Fertilizer-Environment Scientific Development Project, Kasetsart University	Worachart	Wisawapipat
Thailand	Laboratory of soil science, KMITL	Sukunya	Yampracha

Thailand	Faculty of Environment and Resource Studies, Mahidol University	Wanwisa	Pansak
Thailand	Maejo soil and plant analysis laboratory	Pathipan	Sutigoolabud
Thailand	Soil Chemistry and Fertility Laboratory	Aunthicha Phommuangkhuk	
Thailand	Office of Science for Land Development	Onanong	Chomsiri
Thailand	Land Development Department	Tipanun	Upanisakorn
Thailand	LDD No.6	Sornchai	Kumsook
Thailand	Office of Science for Land Development, Land Development Department	Hathairat	Pichainarong
Thailand	Laboratory of Land Development Department (Region 6)	Varangkana	Sanguanpong
Thailand	Department of agriculture	Charirat	Kusonwiriyawong
Thailand	The Center for Scientific and Technological Equipment, Walailak University	Thanet	Khomphet
Thailand	Land Development Department	Nopmanee	Suvannang
Thailand	Soil Science Laboratory, King Mongkut's Institute of Technology Ladkrabang	Jawanchanok	Preesong
Thailand	Soil analysis technical service group	Juthamard	Kaiphoem
Thailand	Office of Science for Land Development	Sumitra	Watana
Thailand	Soil analysis group, Land development office 3	Monthatip	Sanguanrak
Thailand	Office of science for developmentland	Jutharat	Yimchaluay
Thailand	office of science for land development, Land Development Department	Chanida	Charanworapan
Thailand	Ldd6	Watcharaporn	Jindaluang
Thailand	Office of Science for Land Development	Surachet	Narabhat
Thailand	Office of Agricultural Research and Development Region 1 (OARD 1) DOA	Siriphon	Magiao
Thailand	Office of Agricultural Reserch and Development Region 1(OARD1) DOA	Thanwarat	Robkham