

# Basic Development Agenda 2019-2024

Adopted August 30th, 2019

*The methodology as presented in this document is discussed with the active members during the EGU meeting in Vienna April, 9th, 2019. It will be adopted during the Wageningen Soil Conference on August, 30th, 2019, after a commentary round via email with all members.*

## 1. Objective of SOPHIE

SOPHIE supports the realisation of qualified soil hydro-physics (SHP) data, highly needed in EU policy making, coming from EU-wide agreed, preferred, and innovated cost-effective laboratory- and field methods, accomplished through international collaboration.

## 2. Domain of SHP-properties

See Figure 1.

**Hydro-physics properties are THE properties that determine the soil-water interactions**



And with water flow the transport of dissolved compounds (Nitrogen, Phosphates, Pesticides, Antibiotics, Organics, etc)

Nile region Achmim, Egypt (mid east)

**SHP-Properties – some examples**

- soil water retention & (un)saturated conductivity
- shrinkage and swelling
- organic matter
- texture (particle distribution)
- structure (soil aggregation/pore structure)
- density
- capillary rise
- and alike



Dike breakthrough Wilnis, Netherlands, 2003

**SHP properties in societal issues – Outcomes strongly depend on Soil-Water-condition**

- **Food security & Agricultural development** (drought, water damage, precision drainage, irrigation, water logging, compaction, erosion)
- **Salinity and Sodicity** (leaching, evaporation, capillary rise)
- **Soil greenhouse gas emissions** (N<sub>2</sub>O/CO<sub>2</sub>)
- **Water quality** (percolation of nutrients, contaminants, antibiotics)
- **Nature conservation** (wet and dry lands: climate change)
- **Sustainable land use** (Healthy Soils, Function location)
- **Flooding** (dike stability, infiltration, soil water repellency)
- **Damage to buildings & roads** (soil shrinkage)

Fig 1: Use of Soil Hydro-Physics data.

### 3. OGSM

According to the OGSM a basic development agenda is ready in 2019, written in collaboration with active members, and checked with members of the current distribution list (*now*). The basic development agenda will be based upon the goals of SOPHIE, and on conclusions of the Brussel meeting, held in December 2017. The OGSM stimulates focus, clarity, and collaboration. It covers all HIS-topics:

- **H**armonization (accepted preferred methods, and their output parameters)
- **I**nnovation (improvement of current, and development of new cost effective methods)
- **S**tandardization (accepted Work Instructions for the preferred methods).

### 4. Basic Development Agenda - Introduction

The Basic Development agenda serves as a guide to Harmonise, Innovate and Standardise (HIS) laboratory and field methods. The first focus, in the Harmonisation topic, is to set the baseline situation: what methods are used, and what parameters are described among the SOPHIE partners. This is done by gathering the used methodologies. Then, in mutual agreement, determine the preferred methods for field- and laboratory use (Golden, Silver and Bronze standard) yet without changing the contents of the available methods. Hereafter improvements will be implemented where necessary. The Innovation topic can start as soon as bottle necks in quality and/or efficiency are recognized in the Harmonisation part. Standards will be determined or written in the Standardisation topic, as soon as the preferred methods are determined in the Harmonisation part. Updates will take place after improvements.

The next chapter describes the overall and long term Methodology in more detail. As decided during the Brussels meeting (2017), the Short Term Focus will be on 4 parameters in the coming three years (2020-2022). Additionally, a high valued topic was that reference samples need to be developed. This development already has been initiated, and is part of the Innovation topic.

As SOPHIE strives for focus, clarity, and collaboration, (preliminary) results will be shared as much as possible on the websites and/or in other publications, with version number, date, signatures of representatives that underline the choices, bottle necks, and improvement proposals. There where copyright is limiting, only changes will be mentioned.

## 5. Basic Development Agenda - Methodology

### 5.1 Harmonisation

1. Make an inventory of the Standards used and known within the group members.

Baseline situation:

2. Make an overview of the desired output parameters
3. Without adjusting its contents, select from the inventory a Golden, Silver and Bronze standard per desired parameter for
  - lab use --> code LGxx, LSxx, LBxx
  - field use --> code FGxx, FSxx, FBxx
4. Determine bottlenecks, and possible improvements
5. Put the outcome of 2-4 on the SOPHIE website, and in a review paper, with version number, date, signatures of representatives that underline the choices, bottle necks, and improvement proposals.

### 5.2 Innovation

6. Use the inventories of Harmonisation and Standardisation to derive the most urgent Innovation subjects.
7. Create a database with project ideas for Innovation for engineers, students, PhD's, and others. Proposals need to be collaborative and should serve SOPHIE's objective. It also should contain a financial paragraph.
8. Give each proposal a priority number from a SOPHIE's point of view, and put it online.

### 5.3 Standardization

9. Use the inventory of Harmonisation
10. Assign in general agreement the time needed per standard (no costs)
11. Put the standards on the SOPHIE website
12. Discuss the bottlenecks of Harmonisation and improve the contents per Standard
13. Discuss these with Harmonisation

### 5.4 Circular Improvement and Setting Priorities

14. Design a flow chart in which improvements and priorities are determined according to a prefixed procedure.

## 6. Basic Development Agenda – Short term Focus (2020-2022)

The Brussels meeting (Dec 2017) has attributed to a set of focus areas for the coming 3 years that should be incorporated in the general Methodology of the Basic Development Agenda:

1. Focus parameters for HIS considerations:
  - a. Particle distribution (especially finer particle fractions),
  - b. Bulk density (swelling, sampling of scale, macro-porosity),
  - c. Structure (methodologies),
  - d. Infiltration capacity (e.g. scale).
2. Reference samples for inter- and intra-lab comparison of water retention determination procedures, as part of the Innovation topic. A first round of reference samples is currently prepared by Ghent University and WEPAL, and tested by 14 collaborating laboratories in Europe.