

SOPHIE

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SOPHIE = SOil Program on Hydro-physics, via International Engagement

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

➤ **Effect of soil on water (dynamics):**

flow rate, retention, moisture condition

➤ **Effect of water on soil:** temperature condition, shrinkage, organic matter decline, surface crust

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

Nile region Achmim, Egypt (mid east)



SHP properties essential in variety of societal issues

→ Outcomes strongly depend on Soil-Water-condition

Soil Hydro-Physics (SHP) 3 Main pillars

Water flow rate

Water Retention

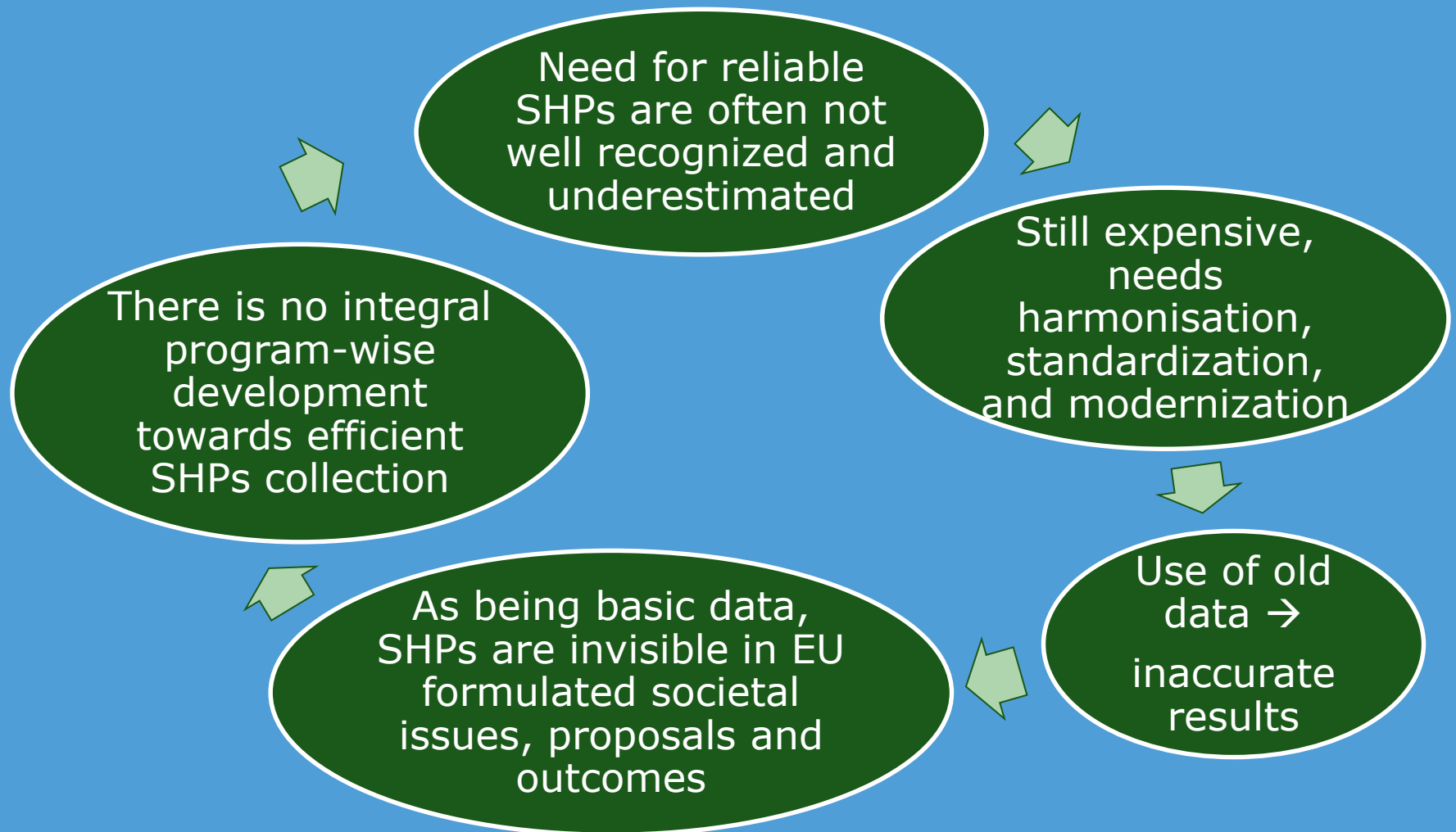
Moisture content



Soil-Water-Interaction directly affects

- Crop water stress vs. food security
- Salinity and Sodidity occurrence
- Flow of Nutrients, Contaminants, Antibiotics
- Waterlogging / ponding
- Soil fauna and Nature development
- Forest fires
- Drainage design
- Drinking water availability
- Greenhouse gas (N₂O/CO₂) emissions
- Compaction
- Erosion
- Weather / Climate
- Dike stability
- Soil shrinkage/cracks vs building/road damage

Challenges for SHP-properties (SHPs)



SOPHIE Ambition

“Without data,
you're just another
person with an
opinion.”
~W. Edwards Deming



Internationally collaborate on modernizing SHP-properties use, determination, and distribution

by

- **Harmonisation** (method and threshold comparison)

International use of same golden, silver and bronze standards; inter-comparison via standard samples; use of comparable threshold values

- **Standardisation** (used methods: golden, silver, bronze)

What parameters are crucial; How must they be determined; How must they be stored in dBase; standardize to general acceptable level

- **Innovation** (efficient equipment, models, dBases)

Stimulate modernization into efficient field-, and laboratory equipment and model development, e.g. combine proximal sensing (PS), remote sensing (RS), field and lab techniques to increase output and reduce costs.

Thank you

