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Organization of the  
United Nations

# GSNmap



# Global Soil Nutrient and Nutrient Budget Maps

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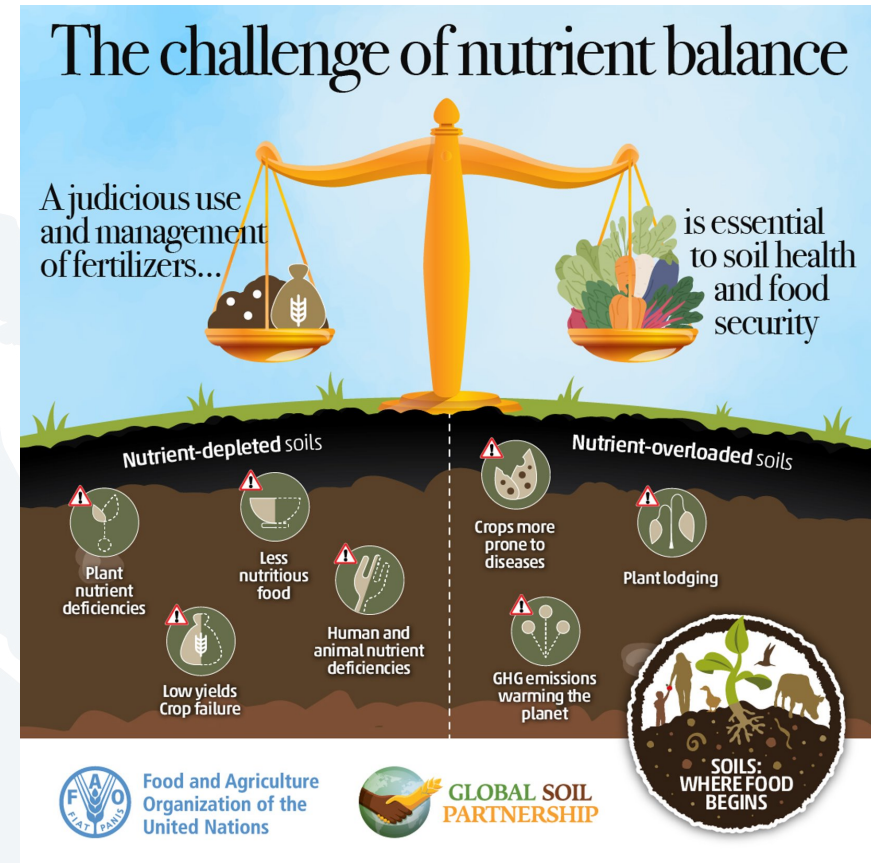
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# Introduction

- GSNmap is a new initiative of the Global Soil Partnership with the intent of developing current state maps of nutrients (NPK) and their balances.
- Based on country-driven approach
- GSNmap and Global Soil Erosion Map (GSERmap) will be developed simultaneously



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# Goals of GSNmap



## Phase I

Map the current state of macro and micronutrients, as well as soil attributes related to fertility (CEC, pH, SOC, texture, bulk density)



## Phase II

Produce Nutrient Budget maps for NPK

# Nutrient maps 2018 - 2022 baseline – Phase I

01

## GSNmap WG

INSII – GLOSOLAN  
networks

02

## Nutrient data

Nutrient data  
from 2018 to 2022

03

## Soil fertility data

SOC, CEC, pH, Bulk  
density, Texture

04

## Data harmonization

Sample depth and lab  
methods

05

## Modelling and mapping

Random Forests models  
along with uncertainty  
estimation of the maps

06

## Publication

First version by  
5 December 2022

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# Nutrient Budget maps – Phase II

## ● Cropping data

Distribution, area, yield

## ● Fertilizer use

Type, dose, nutrient proportions

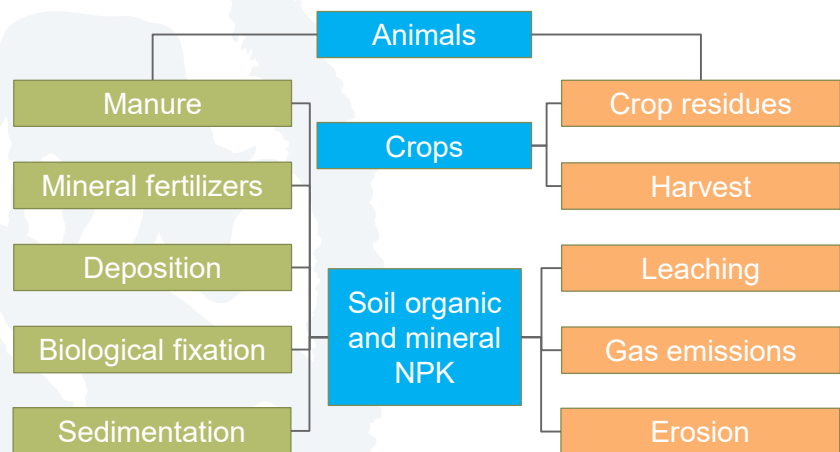
## ● Long-term field trial

At point location

## ● GSERmap

Soil Erosion map

$$SNB = \sum_{i=1}^n IN_i - \sum_{j=1}^m OUT_j$$



Stoorvogel and Smaling, 1990

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Country guidelines and technical specifications



# Nutrient Budget Maps – Challenges

- Many factors to be estimated (unknown uncertainty)
- Limited available data
- Most data is at national scale
- Including more stakeholders

# GSNmap Working Group. Join now!



## Main tasks

- Improve methodologies for mapping Nutrient Budgets
- Contribute to the publication of technical guidelines
- Publication of main findings in high impact journals
- Networking



## Global Soil Nutrient Map

### Working Group (WG)

The WG will have the following objectives:

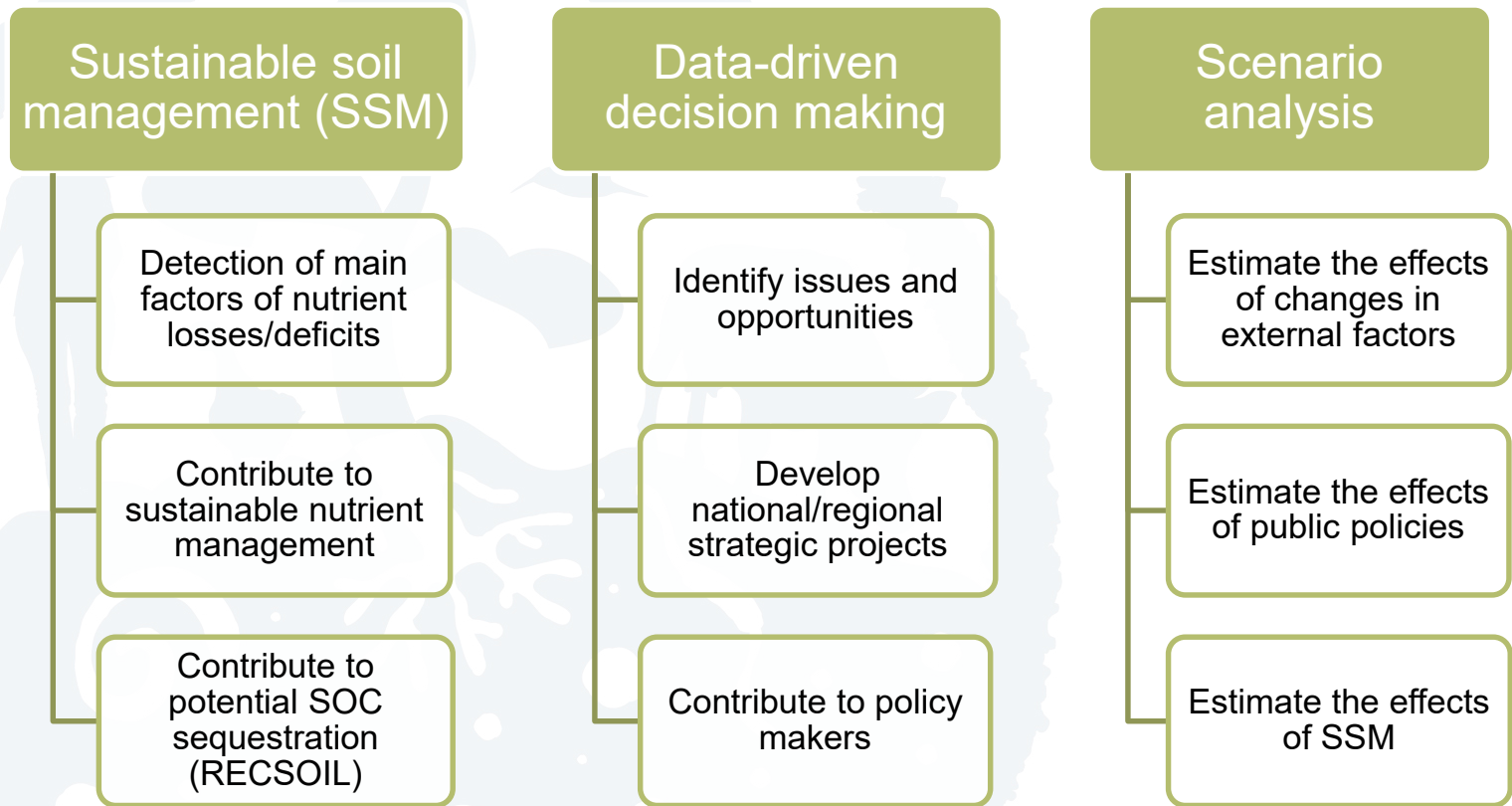
- support the identification of a suitable methodology to map soil nutrient budgets at the national scale
- contribute to the publication of supporting training material
- contribute to the publication of key documents

<https://forms.gle/j7c5e6xodWju5AUN9>

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# Outcomes



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# The GSP and the country - driven approach

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# Country - driven Global Data Products

*Of the countries, by the countries, for the countries!*



**GSOCmap**

V1.0 (2017) >> V1.5 (2019) >> V.1.5 (2020) >> V1.6 (2022)

Global Soil Organic Carbon Map



**GSOCseq**

V1.0 (2021) >> v1.1 (2022)

Global Soil Organic Carbon Sequestration Potential Map



**GSASmap**

V1.0 (October 2021)

Global Salt Affected Soils Map



**GBSmap**

V1.0 (May 2022 by INBS)

Global Black Soil Distribution Map



**GSErmap**

Global Soil Erosion Map

PHASE I



PHASE II



**GSNmap**

Global Soil Nutrient Map

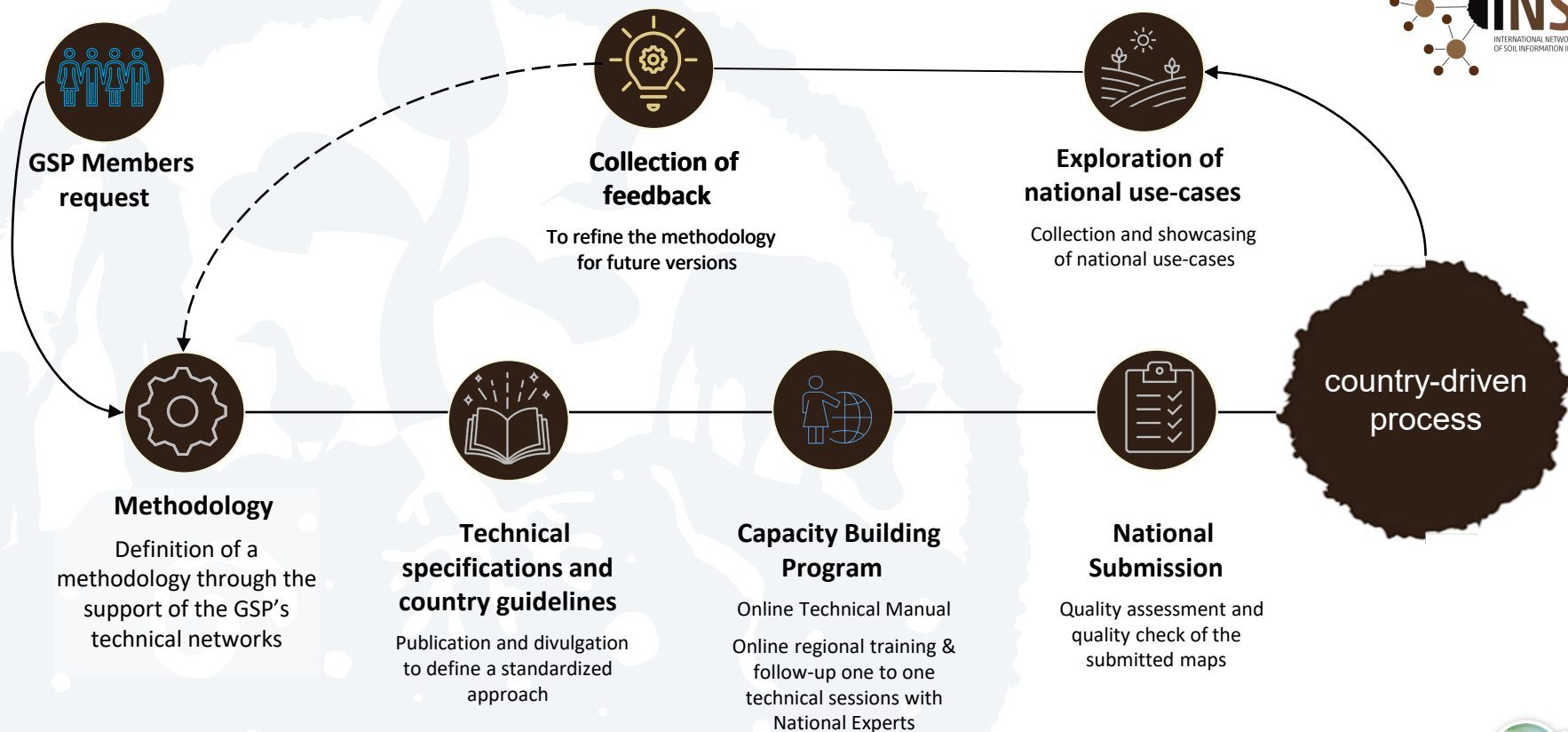
PHASE I



PHASE II



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# Capacity Development



## Capacity Development

1200+



National Experts

60+



Training Workshops



140+ Countries

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# Join GSNmap initiative!

Soil Information  
and Data Team  
FAO/GSP



Yusuf



Moritz



Christian



Yi



Isabel



Marcos

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