



Theme 1
STATUS AND TRENDS OF GLOBAL SOIL
NUTRIENT BUDGET

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Objectives

- Identify and review the current status of the regional or national nutrient budget
 - ✓ data are of particular importance for regional & national action plans on SDG Target 2.4 (sustainable food production systems, including in the context of climate change)
- Provide the advance technique for study the status of the soil nutrient budget/ soil nutrients
 - ✓ This will help to increase the accuracy and precision of the data sharing
- Identify and review innovative management practices and technologies for the management and remediation of problem soils that are cost-effective and efficient
 - ✓ Information will support recommend a sustainable production system while protecting the soil.
 - ✓ make wise decisions for soil and nutrient management and promote a cost-effective and environmentally friendly crop production system

Topics and key questions to be addressed

The subtopics to be addressed under theme 1 are:

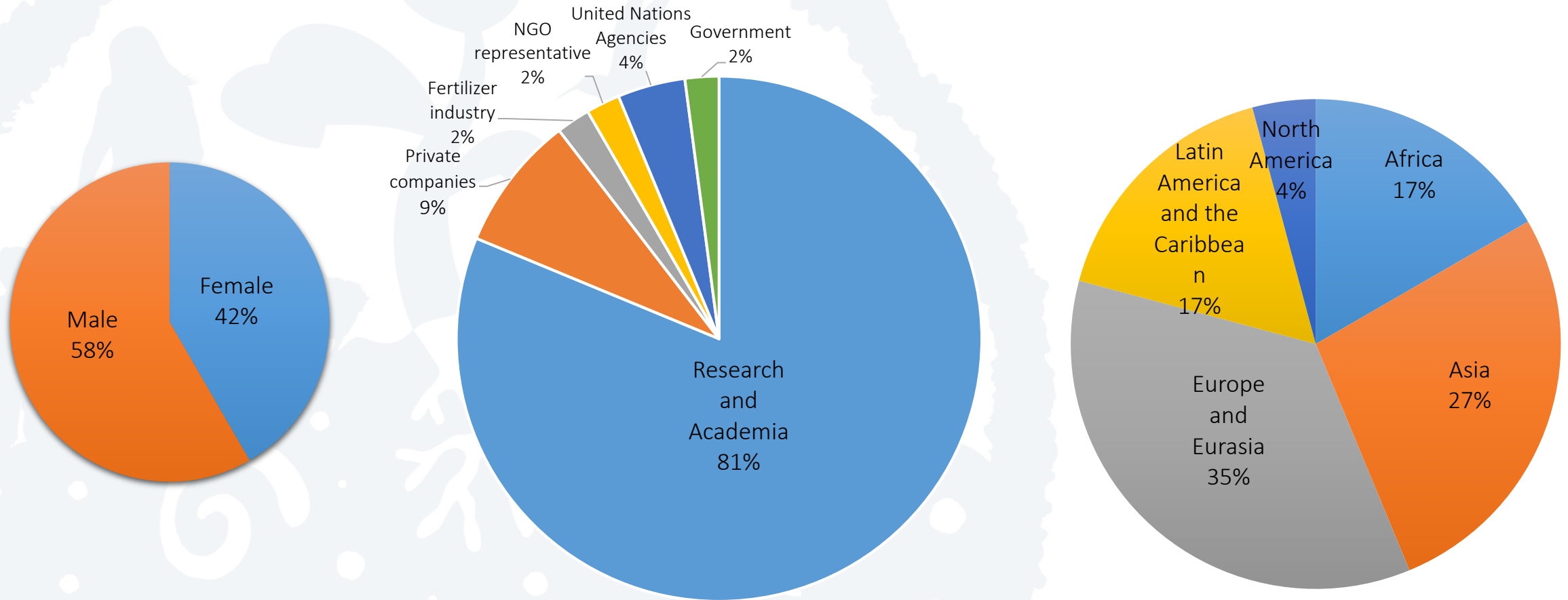
- Assessing, mapping and monitoring soil fertility/soil nutrients (soil nutrient budget)
- Applications of soil fertility data/information for decision making
- State of the art on the availability of soil nutrients/fertilizers (i.e. sources of phosphorous)

- Are we monitoring and mapping soil nutrients in a comprehensive and useful way?
- Is there a real and sound nutrient budget assessment available?
- What are the major factors in physical, chemical, and biological soil fertility driving soil nutrient availability and crop production?
- Can we grow crops sustainably without fertilizers?
- How can soil fertility management contribute to improve crop production?
- What is the contribution of new technologies such as nano fertilizers, slow-release fertilizers, coated fertilizers, and nitrification inhibitors to food security?
- reserves of micronutrients, soil clays, soil organic matter) for identifying and better manage the micronutrient budgets?

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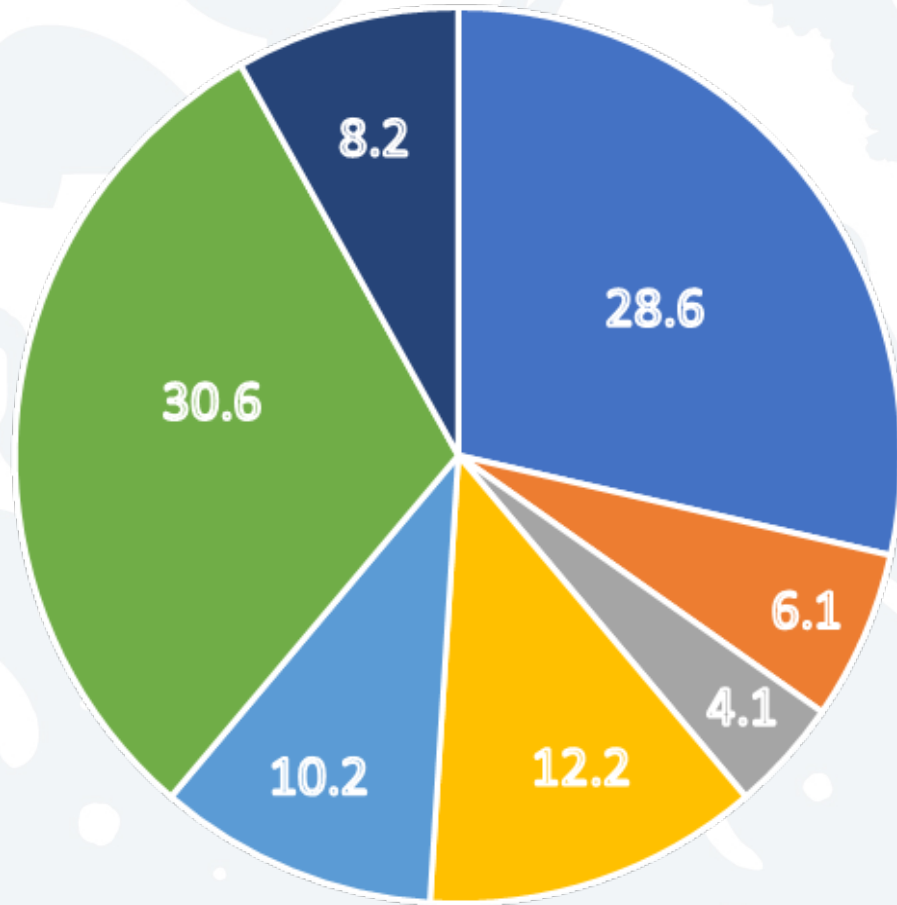
Gender, regional, and stakeholder balance



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Theme 1 : sharing of main topics



Topic sharing (%)

- Integrate nutrient management
- intercropping system
- Conservation system
- micro organism activities
- Bio Circular Ecology
- trend of nutrient budget/national/regional
- miscellaneous

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The main emerging outcome

- Applying the **Biofertilizers** showed a significant positive effect on SOC stocks and leguminous crops showed the biggest increase, the use of single microbial inoculants or different combinations of microbial inoculants showed the large increase in SOC. This study marked an important of the bio-based fertilizers represents as an opportunity to combine sustainable practices, create a positive C budget contributing to soil carbon sequestration.
- New solutions that allow the disposal of recycling and reuse of the waste in a sustainable way were proposed and the soil incorporate with the **waste recycling** either spent coffee ground/the new develop product/biodegradation plastic/biochar stimulated growth of the microbial biomass, increased C mineralization

Main challenge and gap

- **Large uncertainties** due to data scarcity and differences in data sources and estimation methods used
- **The accuracy** of many data layers remains poor in many countries.
- Persisting data gaps are difficult to fill with the current methods and the resources available.
- Collective **ownership, openness and innovation** in creating novel data sourcing pipelines and analytical tools
- Creating a national soil test data base and compare each period is challenge due to **the farmer management practices and digitize of the soil test data** and also the **harmonized of soil testing methods**.

Main challenge and gap

- Lack of awareness, educations, standard tools and infrastructure for nutritionally balanced farming practices
- The association of plant systems should be upscaled to promote sustainable soil fertility based on organic fertilization sources and reduce their environmental impact.
- The complex nature of plant-nutrient dynamics under variable soil composition is poorly understood

Way forward

- Extensive researches and **long term monitoring** are needed at different land situations to determine and optimize the nutrient demands by the crops for attaining sustainable yield and soil fertility.
- Joining effort for the monitoring of the nutrient budget through the launched global programme to better monitor and report on nutrient use, nutrient use efficiency, risks, and emissions from agriculture.



Thank you for your kind attention!

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