



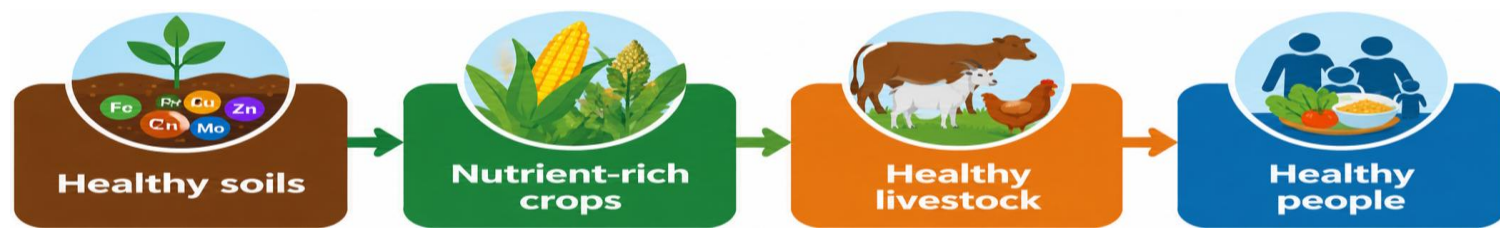
From Soil to Diet: Linking Soil Micronutrients to Hidden Hunger in Northern Ghana

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INTRODUCTION

- ❑ **Micronutrient malnutrition (hidden hunger)** remains a major challenge in many parts of West Africa (FAO, *et al.*, 2023).
- ❑ It involves **inadequate intake** of essential **micronutrients**, including **mineral elements** such as Fe, Mn, Cu and Zn, as well as **vitamins**
 - Resulting in (child) morbidity and/or mortality, **even before diagnosis**.
- ❑ **Soils** may represent an underlying and often overlooked **driver of hidden hunger**, as micronutrient deficiencies can propagate along **the soil–plant–animal–human** continuum
- ❑ Soil management affects nutrition security **directly** and **indirectly**, including through its influence on plant **nutrient uptake** and **vitamin synthesis**.



1 The Role of Soil Micronutrients (Fe, Mn, Cu, Zn, Mo)

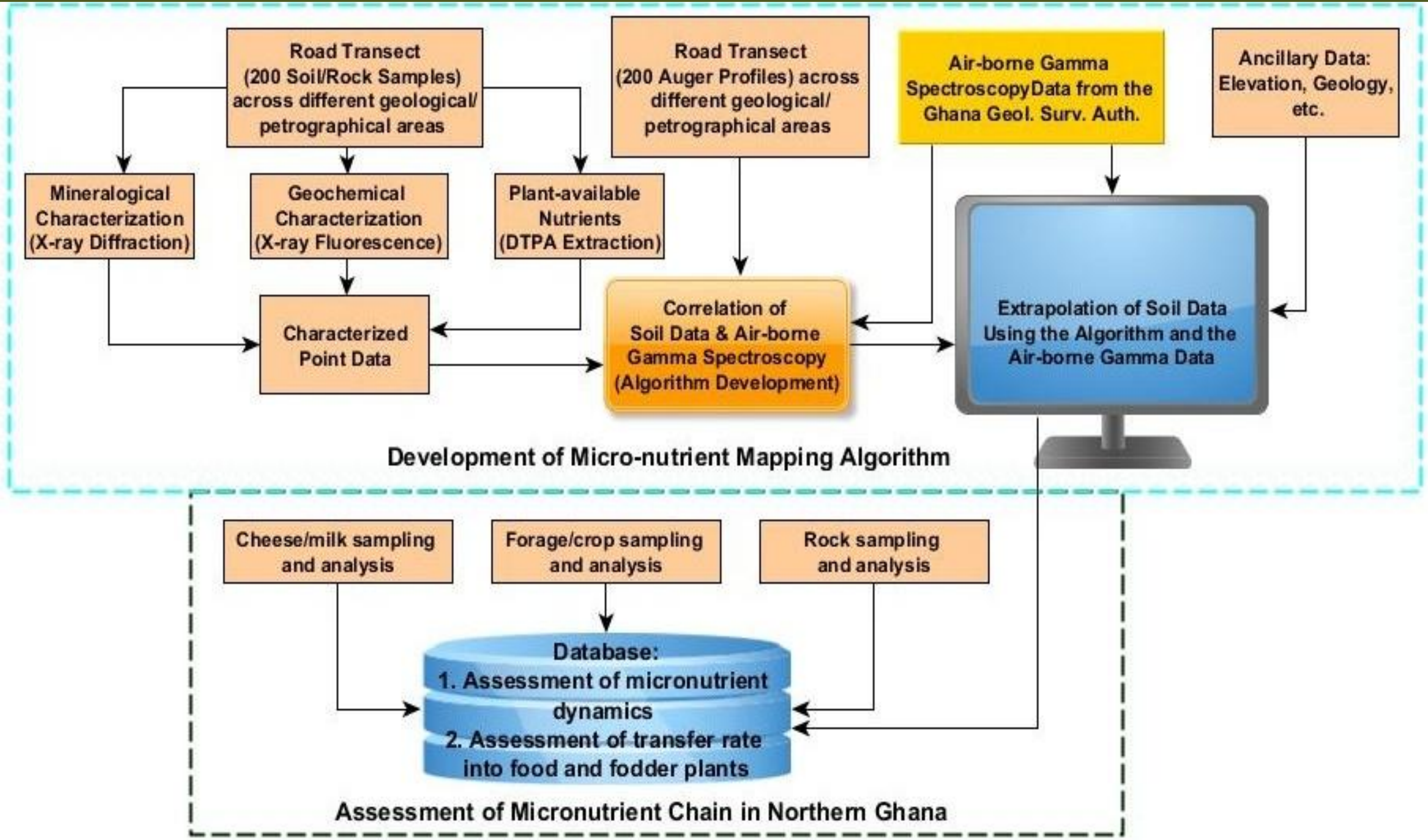


2 The Role of Micronutrients in Plant Synthesis of Vitamins



Legend: = Role in plants | = Role in animals/humans | = Vitamin synthesis (plant)

APPROACH



CONCLUSION

- ❑ **Soil micronutrient** availability is **spatially variable** across Northern Ghana.
- ❑ **Fe** and **Mn** are generally **adequate** and represent relatively **low constraints**.
- ❑ **Cu** and **Zn** show **greater potential for local deficiency** and require **targeted management**.

- ❑ **Mo** is consistently **low/below detection** in soils, indicating a potential regional constraint.
- ❑ **Nutrient-specific, spatially targeted management** can improve soil fertility, crop/forage quality and nutrition security.

REFERENCES

FAO, IFAD, UNICEF, WFP and WHO. 2023. *The State of Food Security and Nutrition in the World 2023. Urbanization, agri-food systems transformation and healthy diets across the rural–urban continuum*. Rome, FAO.

FAO, WFP, 2018. *Home-Grown School Feeding: Resource Framework—Synopsis*. Rome, World Food Programme.

Take-home Message

- ❑ Sustainable **soil management** is critical for **rural communities** that depend heavily on **locally produced food**
- ❑ In Ghana, where the homegrown school feeding program (HGSF) mandates the **sourcing** of up to **80 %** of the **food for students** from the locality (FAO, WFP, 2018) it is even more important.



- ❑ Spatially **targeted micronutrient management** can improve **soil fertility**, **crop and forage quality**, and ultimately contribute to **better nutrition security**.
 - **Fe + Mn** → generally **adequate**
 - **Cu + Zn** → potential **constraints**
 - **Mo** → potentially **widespread deficiency**

OVERVIEW

