

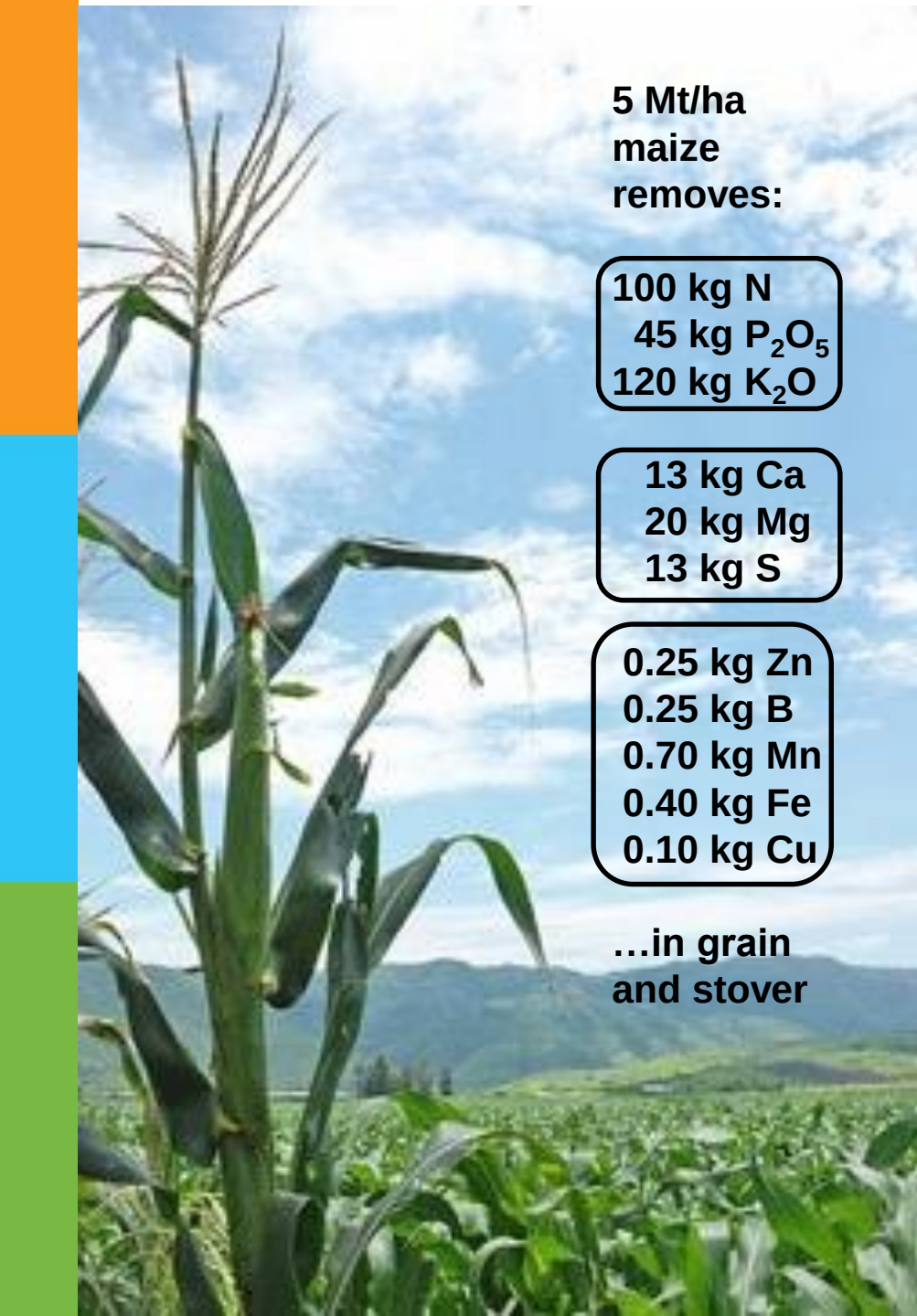
The SMaRT Approach: Delivering Balanced Fertilizers to Smallholders

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5 Mt/ha
maize
removes:

100 kg N
45 kg P₂O₅
120 kg K₂O

13 kg Ca
20 kg Mg
13 kg S

0.25 kg Zn
0.25 kg B
0.70 kg Mn
0.40 kg Fe
0.10 kg Cu

...in grain
and stover

Why are balanced fertilizers important?

- Fertilizers replace nutrients removed in harvested products, and therefore sustain high productivity.
- Most fertilizers supplied to farmers supply only NPK
- Small amounts of secondary and micronutrients can greatly improve yields, but are rarely available to farmers.

Commercial farmers

Soil/plant analyses



Professional recommendation



Custom Fertilizer
(requires large volume to manufacture economically)



The smallholder farmer reality

Full analyses often costly, not accessible

Crop-specific interpretations often not available for multiple crops

Small soil and crop-specific volumes cannot be economically produced



The challenge



**Bring better fertilizers to
smallholder farmers, most of
whom**

- cannot afford or access analytical services
- are purchasing in small volume
- are growing a variety of crops under different soil conditions



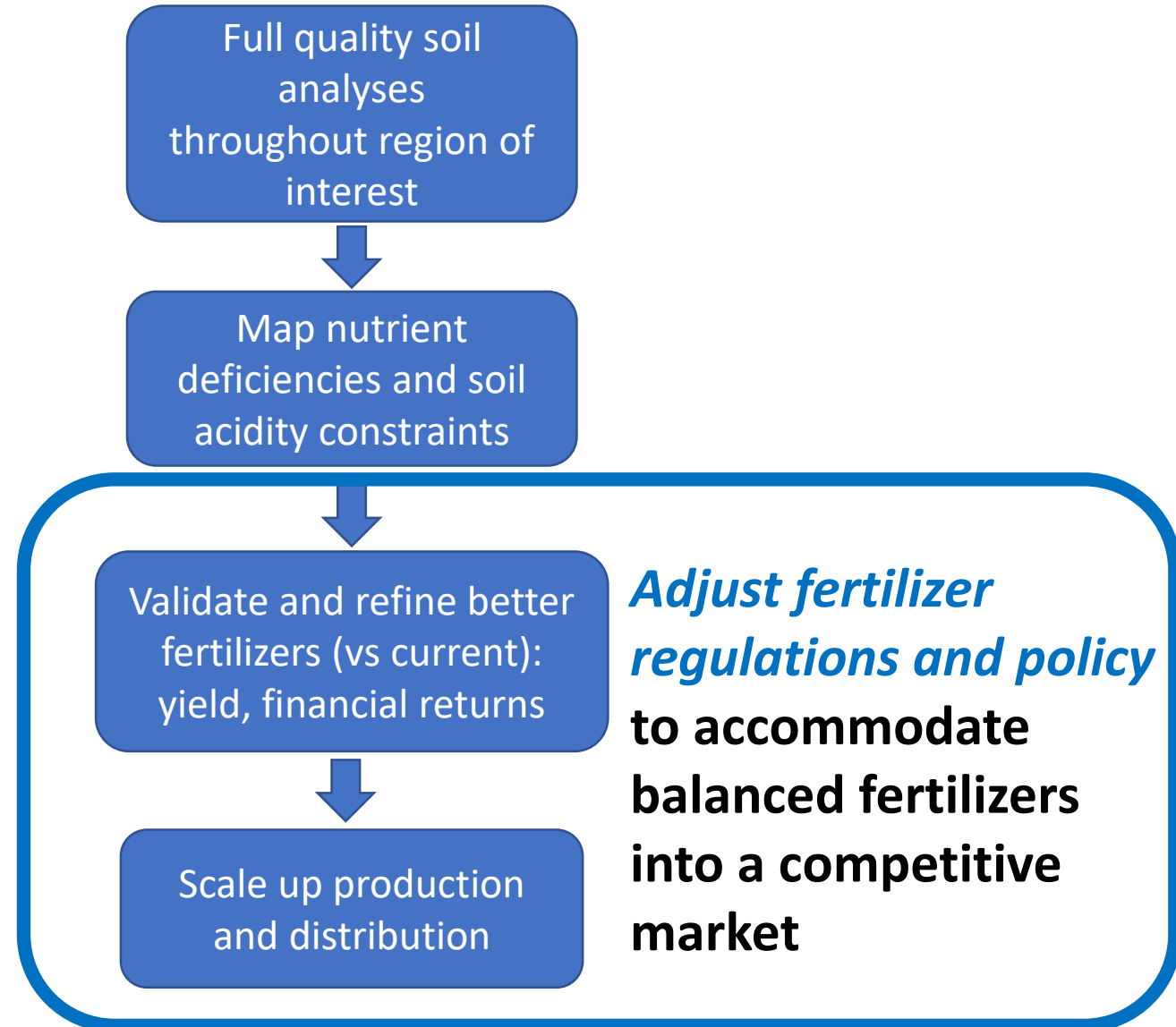
From soil analysis to smallholder fertilizer use: The **SMaRT** approach

Soil Analysis

Mapping

Recommendations
development

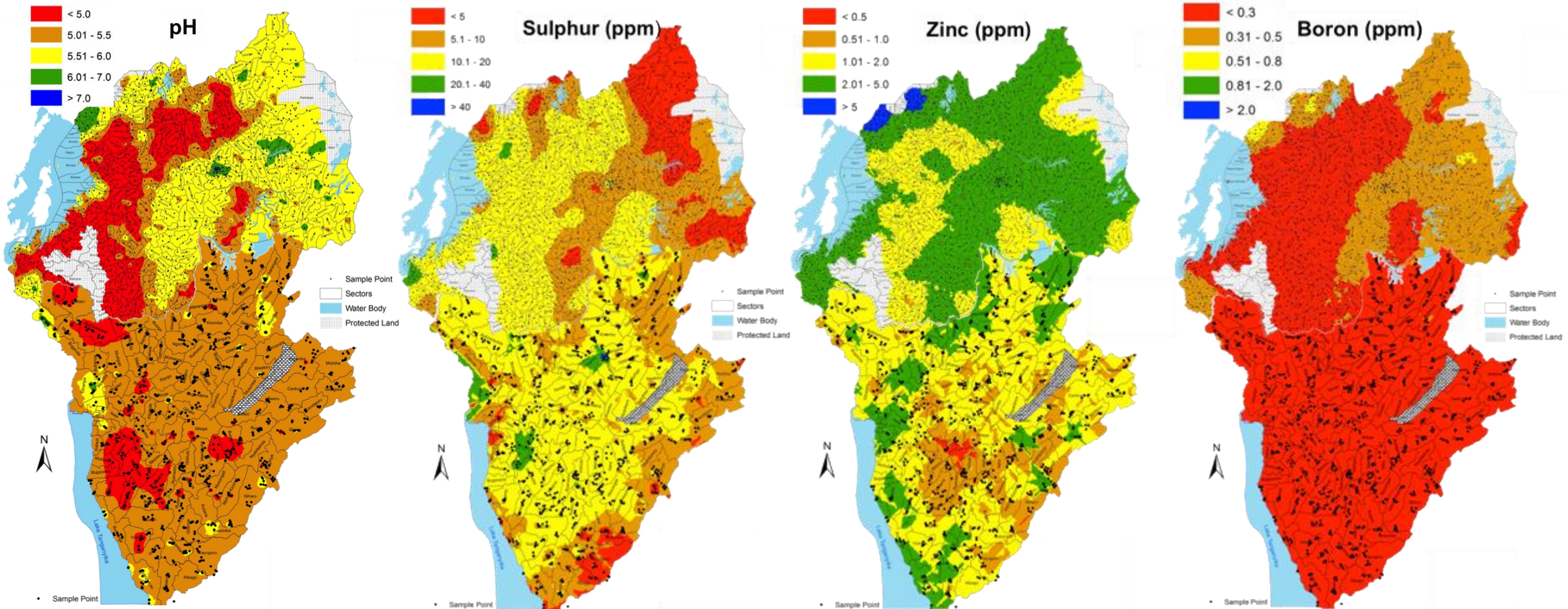
Transfer to farmers



Soil analysis and Mapping

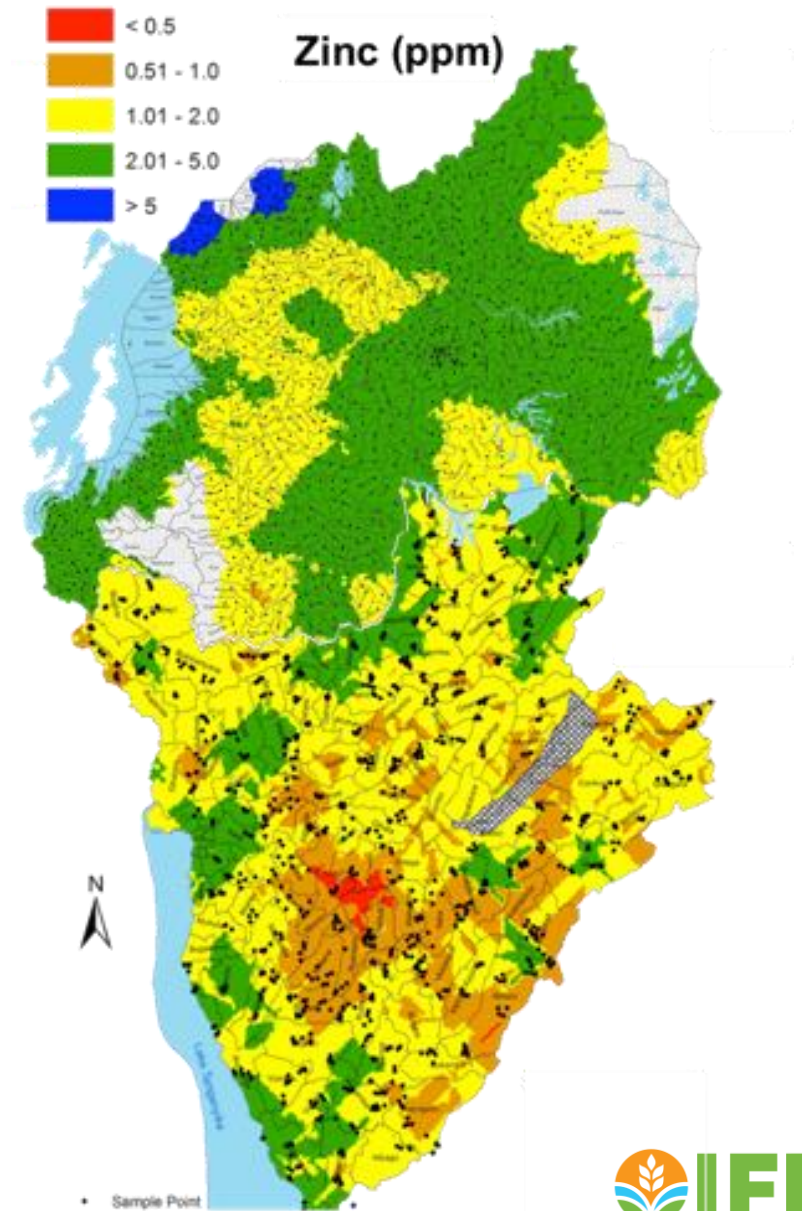
- **Full soil analysis** throughout the **region** of interest
 - Use highest quality analysis available
 - Complete analyses are required to capture all nutrients
 - Samples must be geo-referenced for mapping
- **Mapping** shows the geographic distribution of deficiencies and soil acidity constraints
 - Helps target fertilizer products and lime
 - Guides fertilizer suppliers on targeting products
 - Influences policy: for example, on best products to subsidize

Soil test pH, S, Zn, and B: Rwanda and Burundi



Recommendations development

- Soil analysis indicates likely deficiencies. **It is not a prescription.**
- Fertilizer formulations need to be developed and **field validated.**
- Validation provides the economic proof of better formulations.
- Goal: A better fertilizer, not the perfect fertilizer
- Must be done in partnerships with fertilizer producers





Balanced
fertilizer



Balanced
fertilizer



Balanced
fertilizer



Balanced
fertilizer

Transfer to farmers

- Farmer sensitization through demonstrations, fertilizer and lime small packs
- Extension support
- Should be facilitated through a fair subsidy environment if subsidies exist

Policy and regulations

- In Kenya, vibrant private sector and quality blenders exist
- Regulations facilitate rapid product entry

However,

- Subsidized blanket fertilizers are preferred by smallholders due to cost
- Either a fair subsidy environment or elimination of subsidies is necessary to facilitate widespread use of better fertilizers

Progress and challenges in Kenya

- Lots of soil analyses, but maps not generally available and gaps exist; many analyses are not complete or not geo-referenced for mapping.
- Over 40 balanced fertilizer products available, but not widely used by smallholders.
- Successful but limited validation of new products.
- Cooperation between the public and private sectors is required to
 - Create an enabling environment regarding subsidies
 - Develop and validate better fertilizers and lime
 - Increase farmer awareness

Thank you!



NPK

NP + S Zn B