

Nitrified Urine as Organic Fertilizer: A Transdisciplinary Approach to Solutions-Oriented Community Development

Mercator Research Program Call 5

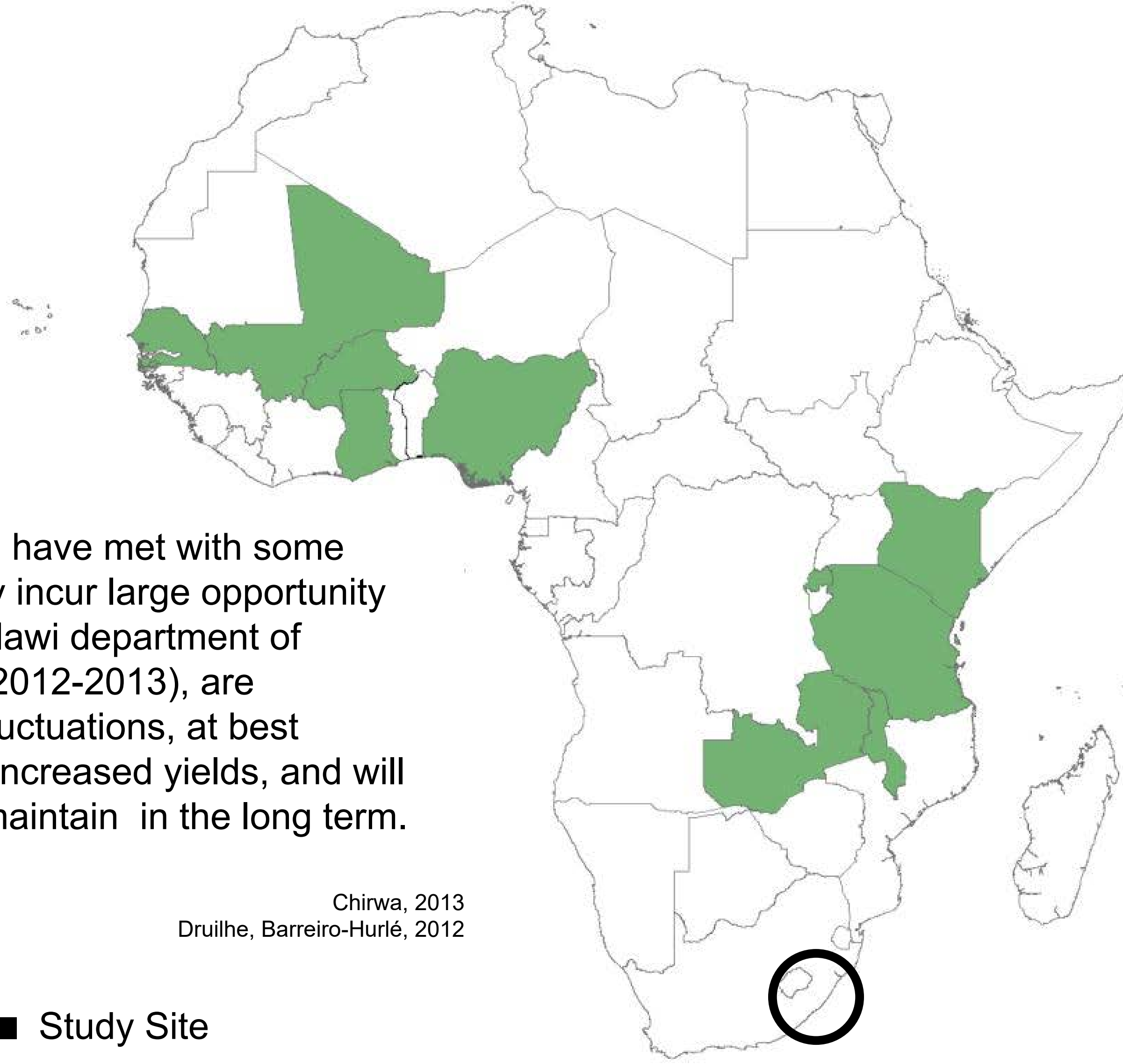
Ben Wilde, Prof. Dr. Johan Six, Dr. Astrid Oberson, Dr. Eva Lieberherr, Dr. Alfred Odindo, Dr. Engil Isadora Pujol Pereira
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Food System Relevance

Poor soil fertility is a leading biophysical cause of food insecurity in Africa. This research is focused on assessing the biophysical and social implications of utilizing nitrified urine as a sustainable fertilizer source to ameliorate this development challenge.

Existing Solution:

The fertilizer input subsidy program is a policy option that has been used extensively across Africa to combat food insecurity.



Input subsidy programs have met with some success. However, they incur large opportunity costs (54.4% of the Malawi department of agriculture's budget in 2012-2013), are susceptible to market fluctuations, at best provide one season of increased yields, and will likely prove difficult to maintain in the long term.

Chirwa, 2013
Druihe, Barreiro-Hurlé, 2012

Can innovative sanitation technology play a role in providing viable alternatives to chemical fertilizer inputs to improve food security in Africa?

Ion	Concentration
Nitrogen (N)	50 g/L
Phosphorus (P)	2.1 g/L
Potassium (K)	15 g/L
Sulphur (S)	1.6 g/L
Calcium (Ca)	0.4 g/L
Magnesium (Mg)	0.04 g/L
Iron (Fe)	0.5 mg/L
Copper (Cu)	0.3 mg/L
Zinc (Zn)	15 mg/L
Boron (B)	16 mg/L

Final Nutrient Content of NUF.
eawag.ch

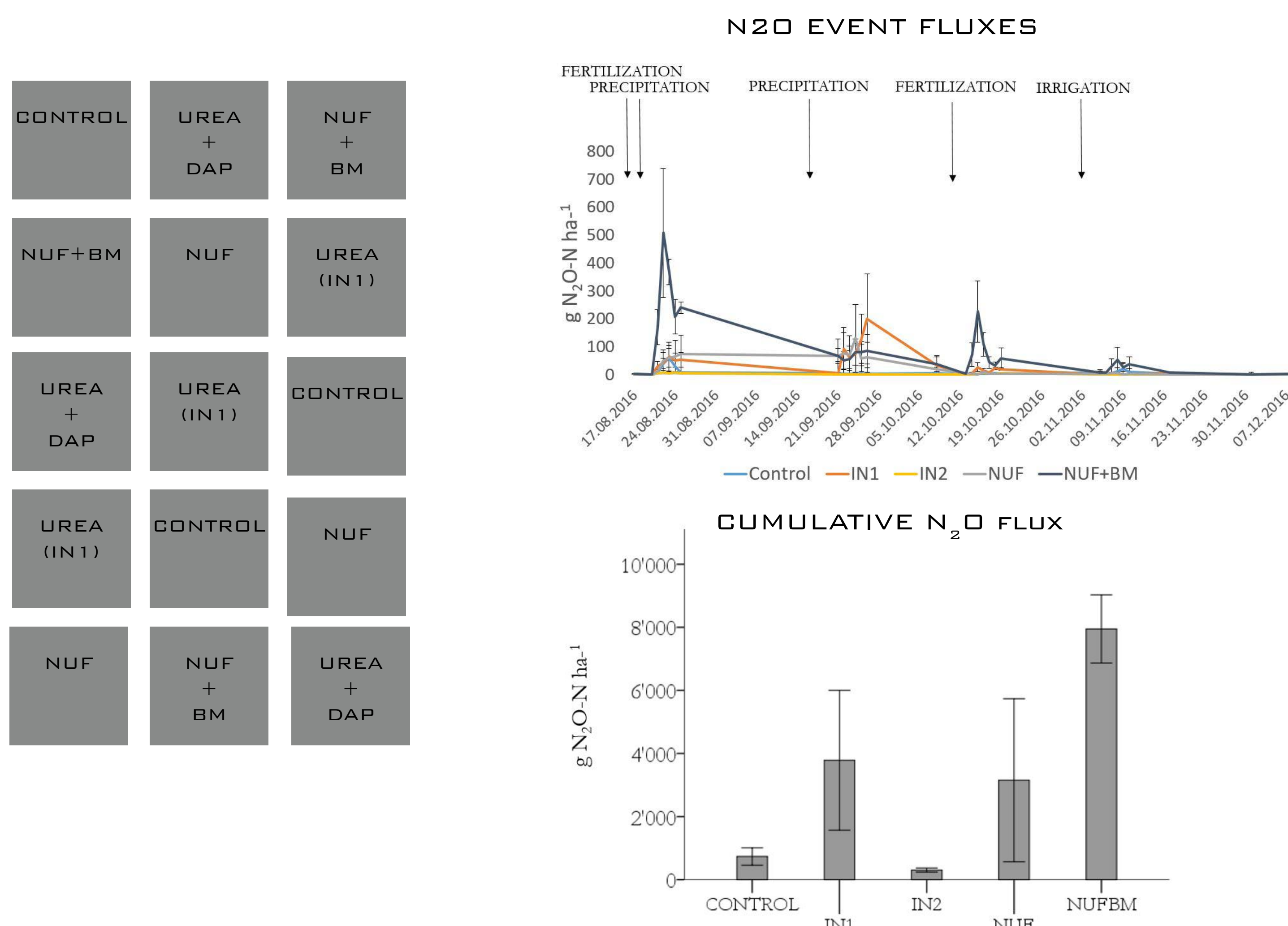
NUFSOC will build on VUNA, a recently completed research project that sought to "develop a new and improved sanitation system that allows for nutrient recovery from urine in order to promote sanitation." A key product of this research was the successful development of Nitrified Urine Fertilizer (NUF). The final product differs from raw urine in three critical aspects:

- Nitrogen stable
- Hygienically Safe
- Pharmaceutical



Work Package 1: Biophysical maize field trial

Purpose: to quantify ecological implications of utilizing NUF at a field scale.

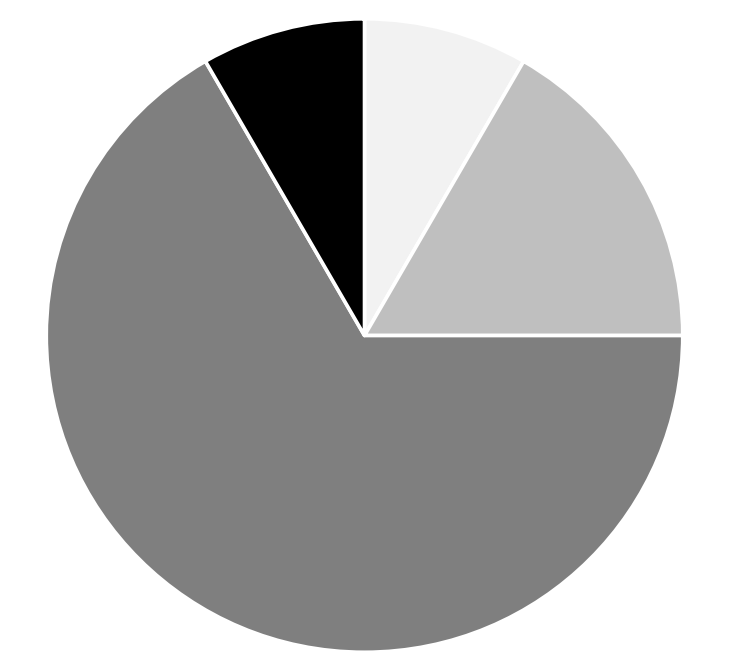
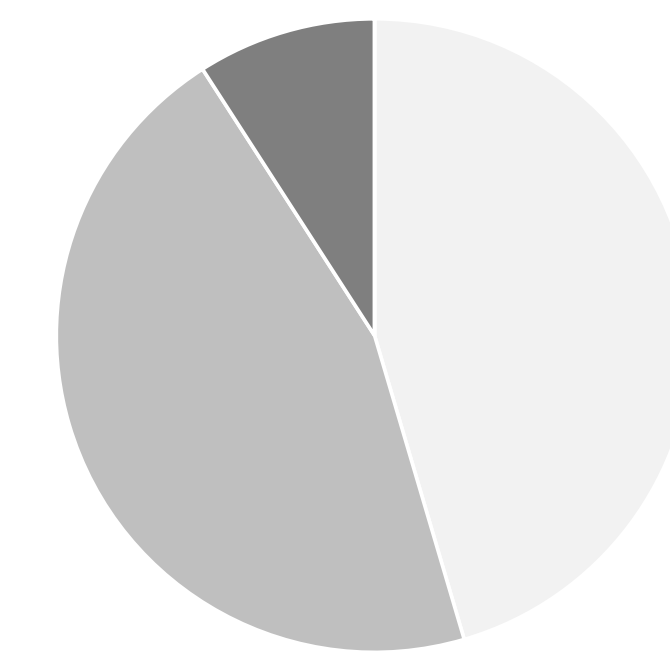


Work Package 2: Participatory action research trial

Purpose: to elucidate farmer perceptions of utilizing NUF

WHITE MOUNTAIN

SWAYIMANE

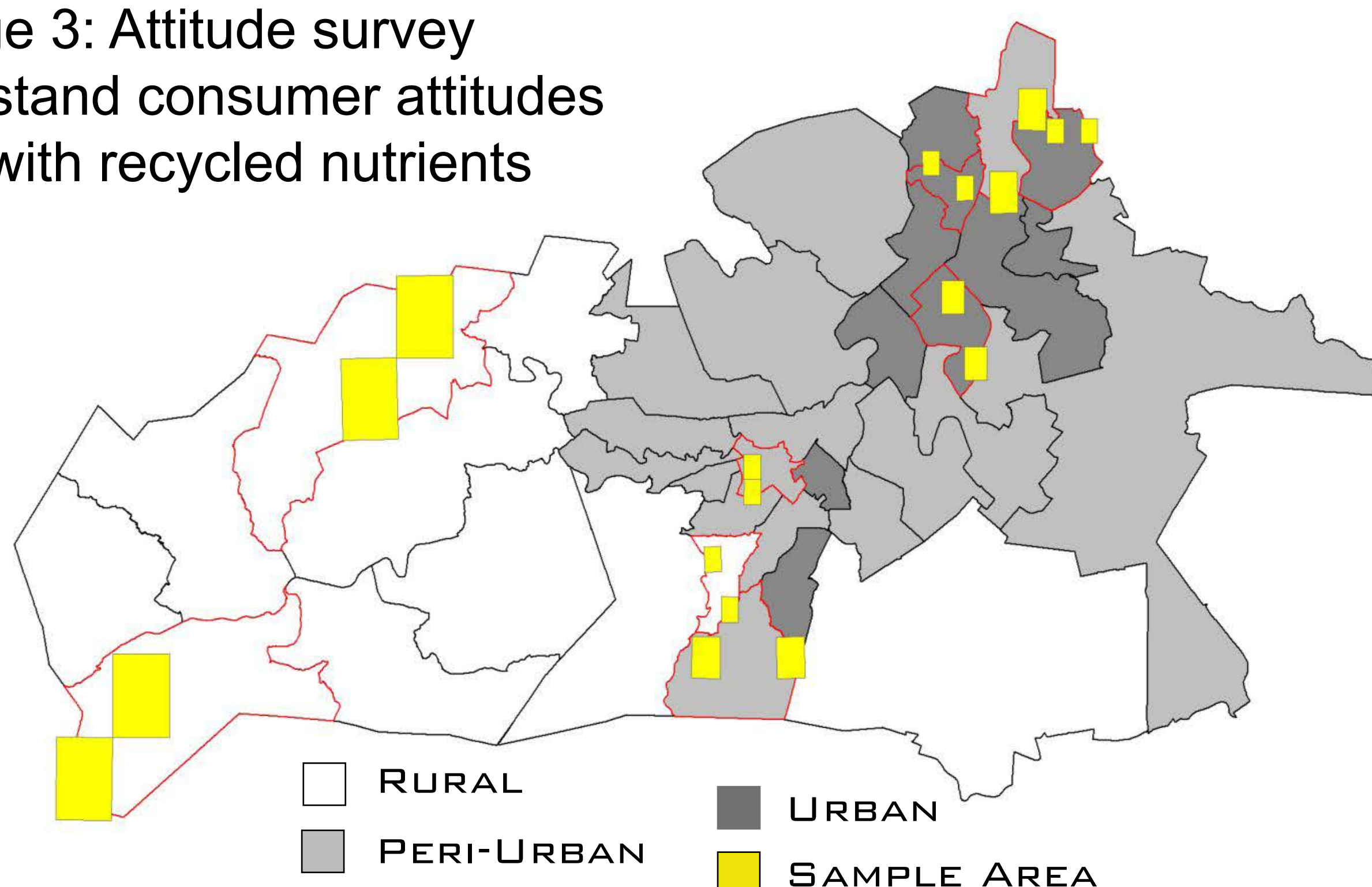


WILLING TO PURCHASE WITH NUF



Work Package 3: Attitude survey

Purpose: to understand consumer attitudes of food grown with recycled nutrients



Work Package 4: Policy implications

Purpose: To understand the potential of nutrient recycling technology to improve food security for small-holder farmers in Africa.

