



Health co-benefits of sustainable agriculture

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Climate Change, Nutrition and Health Symposium

Heidelberg, 5 May 2021

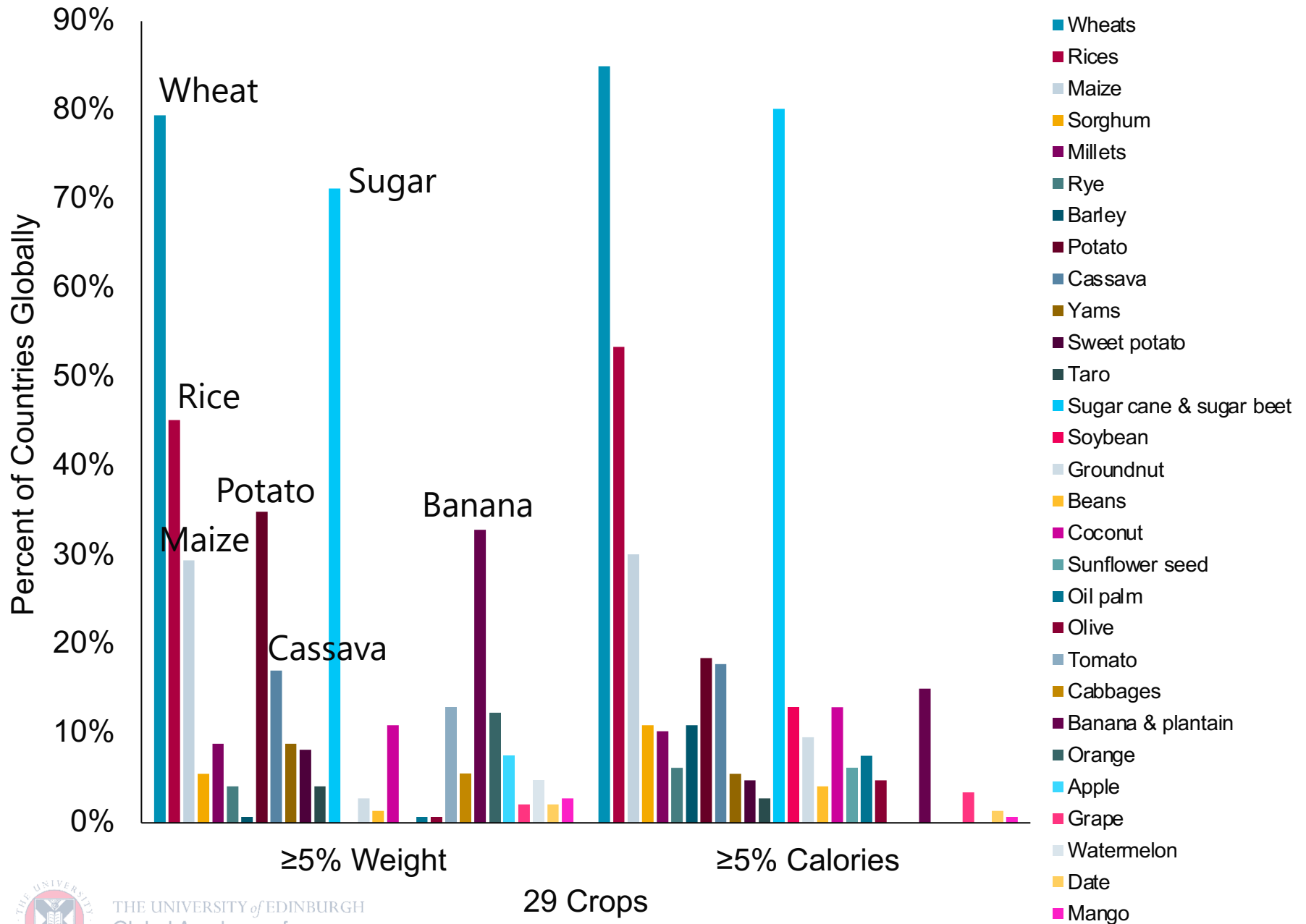
More diverse diets



Lower pesticide exposures



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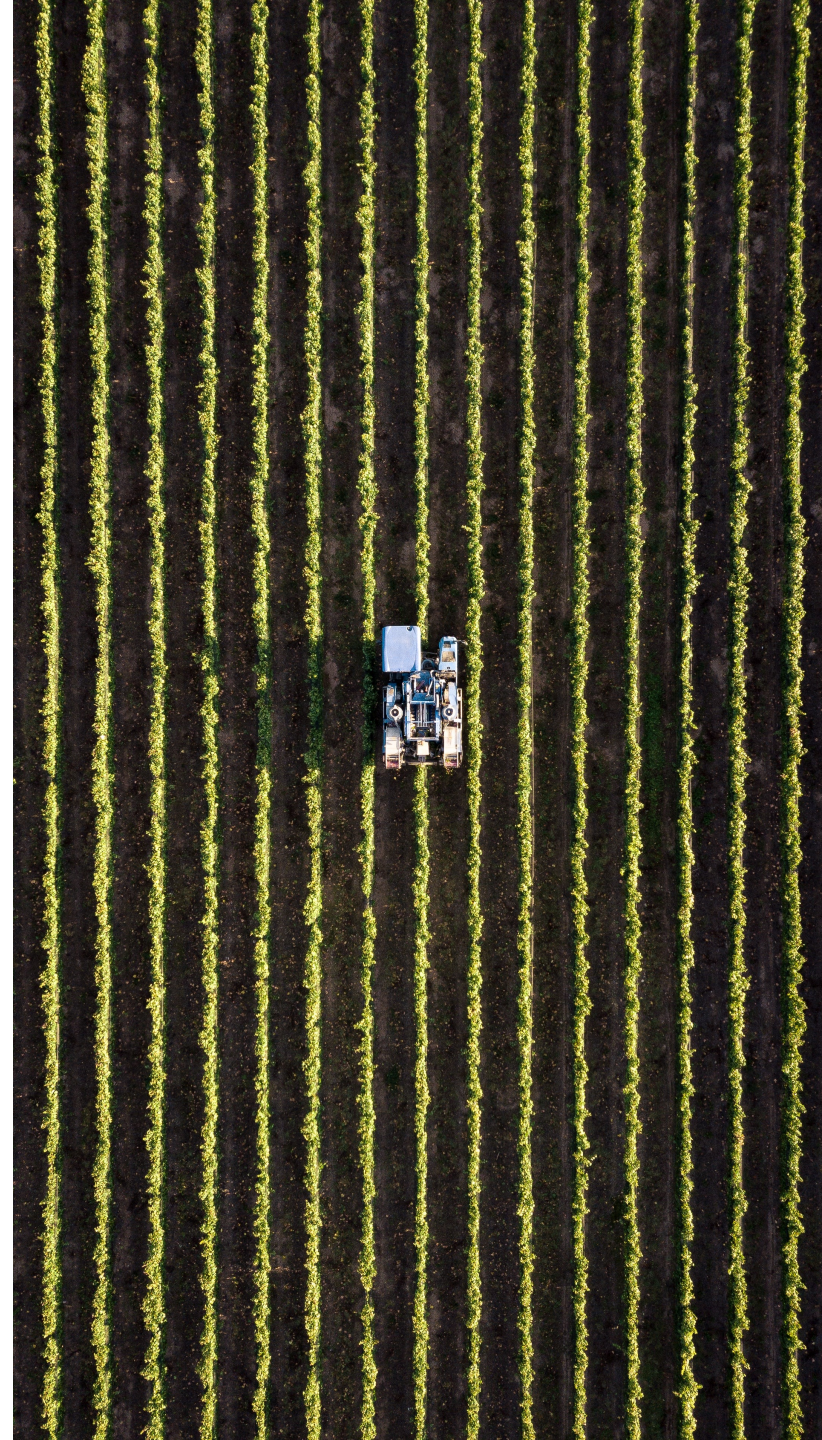
Diet Diversity and Health

- Modest association with reduced risk of ischemic heart disease
 - 7% lower risk for 1 SD increase in diet diversity score (MDDW)
- Modest association with reduced risk of stunting (6-23 months)
 - 31-37% lower risk comparing 5+ food groups vs. 1 food group on previous day

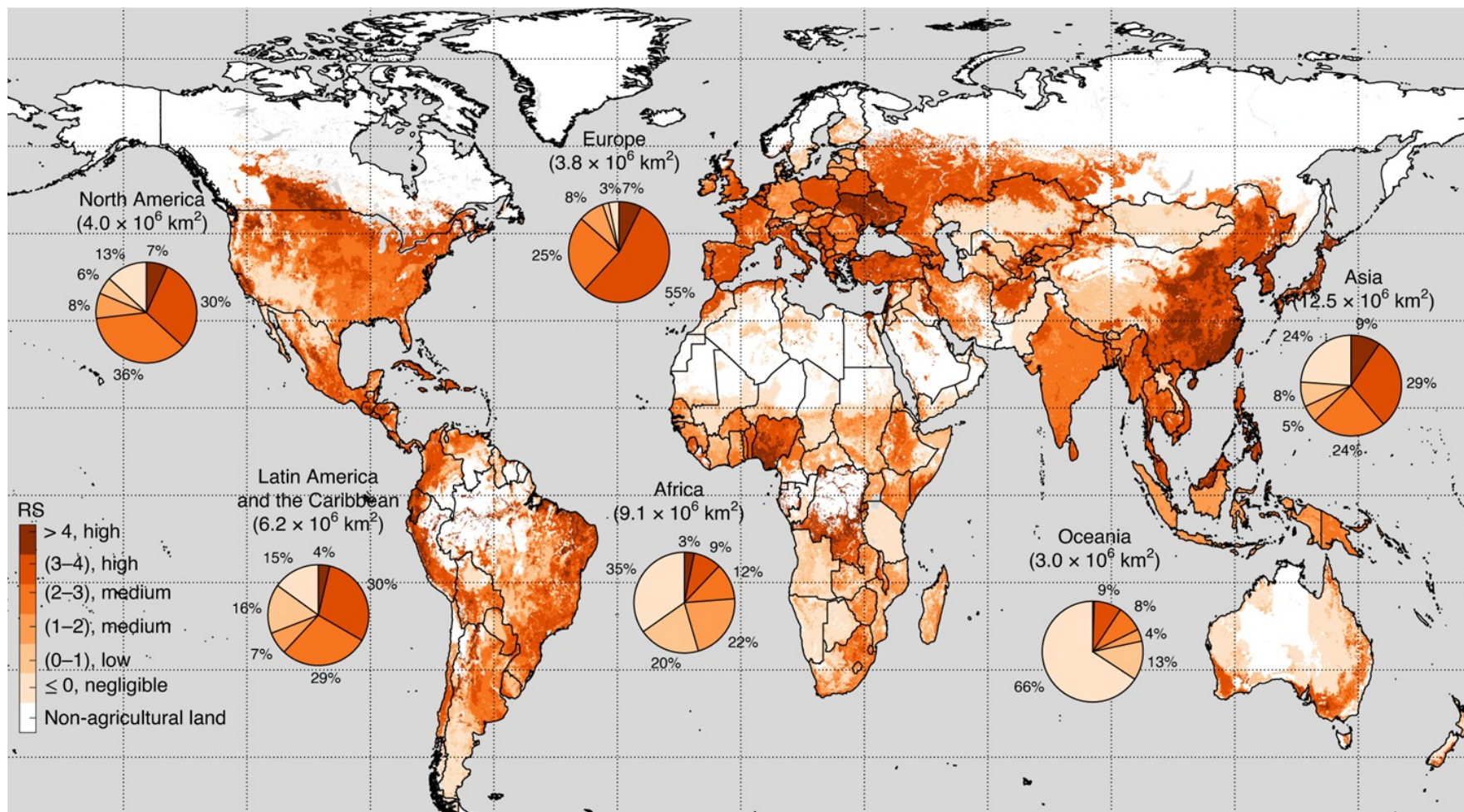


We Have Created Conditions Conducive to (Pest) Outbreaks

- Large-scale, genetically uniform monocropping
- Globalization
- Climate change
- Indiscriminate overuse of pesticides



Our world is contaminated with pesticides



Health Effects of Pesticides

- Many pesticides are potent acetylcholinesterase inhibitors (e.g., Chlorpyrifos), impact:
 - Brain development
 - Neurological function (→ Parkinson's)
- Others are potent endocrine disrupting chemicals (e.g., atrazine), impact:
 - Cancer
 - Reproductive function (→ testicular damage)



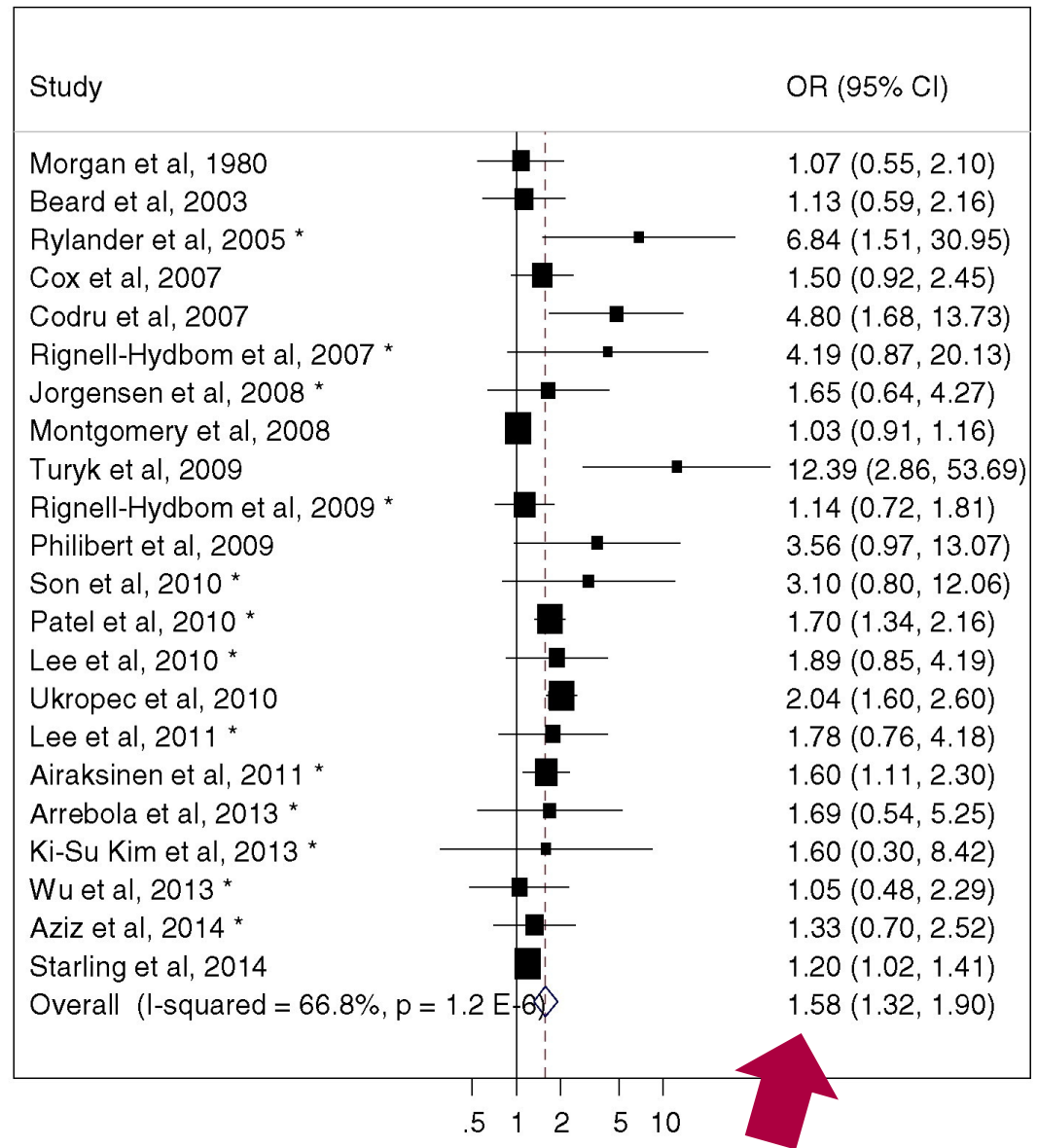
Pesticides Associated with Increased Risk of Preterm Birth and Low Birth Weight

Relative Risk (95% CI)		Preterm Birth	Low Birth Weight
TCPY (metabolite of chlorpyrifos and chlorpyrifos methyl)	Quartile 1 (n=73)	Ref	Ref
	Quartile 2 (n=71)	1.07 (0.60, 1.92)	1.98 (0.86, 4.58)
	Quartile 3 (n=72)	0.97 (0.52, 1.82)	0.76 (0.25, 2.27)
	Quartile 4 (n=27)	1.67 (0.92, 3.04)	2.17 (0.90, 5.24)
4-nitrophenol (metabolite of parathion and methyl parathion)	Quartile 1 (n=72)	Ref	Ref
	Quartile 2 (n=72)	1.21 (0.48, 3.06)	0.79 (0.25, 2.49)
	Quartile 3 (n=72)	2.98 (1.37, 6.48)	2.30 (0.93, 5.71)
	Quartile 4 (n=27)	2.84 (1.29, 6.24)	1.95 (0.76, 5.00)

Adjusted for household income, gravidity, and hemoglobin level



Pesticides Associated with Increased Risk of Diabetes



Compare to 1.30 (1.20, 1.40) which is relative risk of diabetes for high versus low intake of sugary beverages



People who consume organic foods have a lower risk of diabetes

- 33,256 participants (76% women, mean age: 53 years) in French NutriNet-Santé prospective cohort study (2014–2019)
- Participants with the highest quintile of organic food intake had **35% lower risk** of type 2 diabetes (95% CI = 0.43–0.97) compared to those in the lowest quintile
- **Each increment of 5%** in the proportion of organic food in the diet was associated with **3% lower risk** of type 2 diabetes (HR 0.97, 95% CI = 0.95–0.99)
- Adjustment for many confounders (physical activity, smoking status, alcohol consumption, etc.)



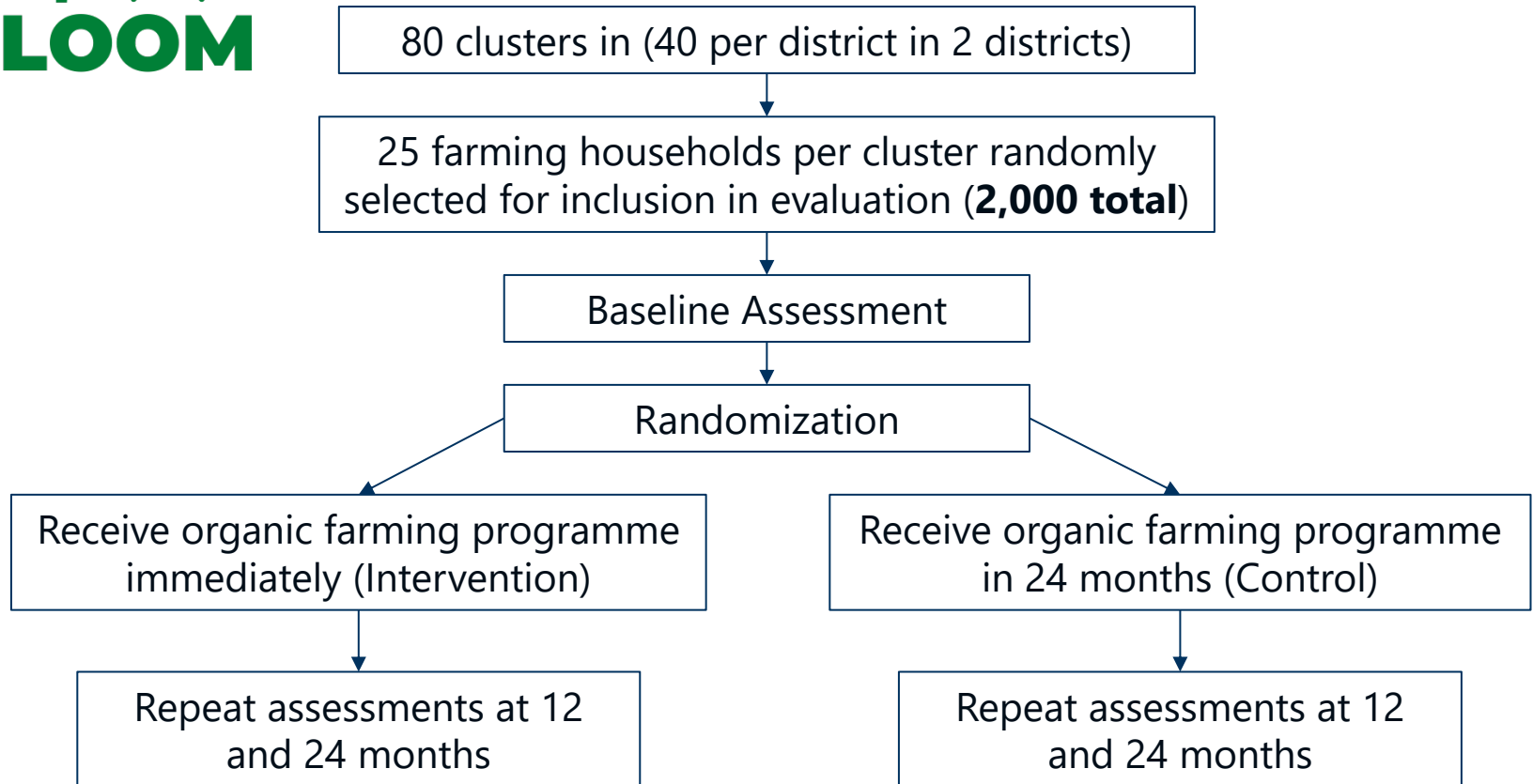


	European Union	Andhra Pradesh, India
Total Population	446 million	49 million
No. Farmers	10.5 million	6 million
Cultivated Land	173 million hectares	7.4 million hectares
Organic Target	25% by 2030	100% by 2030





Co-Benefits of Largescale Organic Farming on Human Health



Primary Objectives (12 months)

Compared to standard farming practices, to determine if APCNF results in:

- Reduced pesticide exposure
- Improved dietary diversity
- Improved crop yields
- Improved household income

Secondary Objectives (24 months and beyond)

Compared to standard farming practices, to determine if APCNF results in:

Adults (>25 years)

- Lower fasting blood sugar
- Improved kidney function
- Fewer respiratory and skin symptoms
- Less body pain
- Fewer headaches
- Improved mental health

Children (<3 years)

- Improved growth (length-for-age)
- Improved cognitive development



Take-home Messages

- Business as usual agriculture is not sustainable and is producing health problems
- Transition away from monocropping is key – for pest management too!
- A diversity of healthy foods prevents undernutrition and nutrition-related chronic diseases
- Need more research on health effects of pesticide reduction from experimental studies

