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G-CAN: Gender-responsive and Climate-resilient Agriculture for Nutrition

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G-CAN ACTIVITIES

1. Process/template for FTF focus countries to help understand climate science and implications for CSA programing that integrates nutrition and gender
2. An innovative new framework for integrating gender and nutrition into CSA decision-making
3. Enhanced effectiveness and sustainability of investments in focus countries, based on country/mission tailored analysis and assessment of the potential for agricultural technologies

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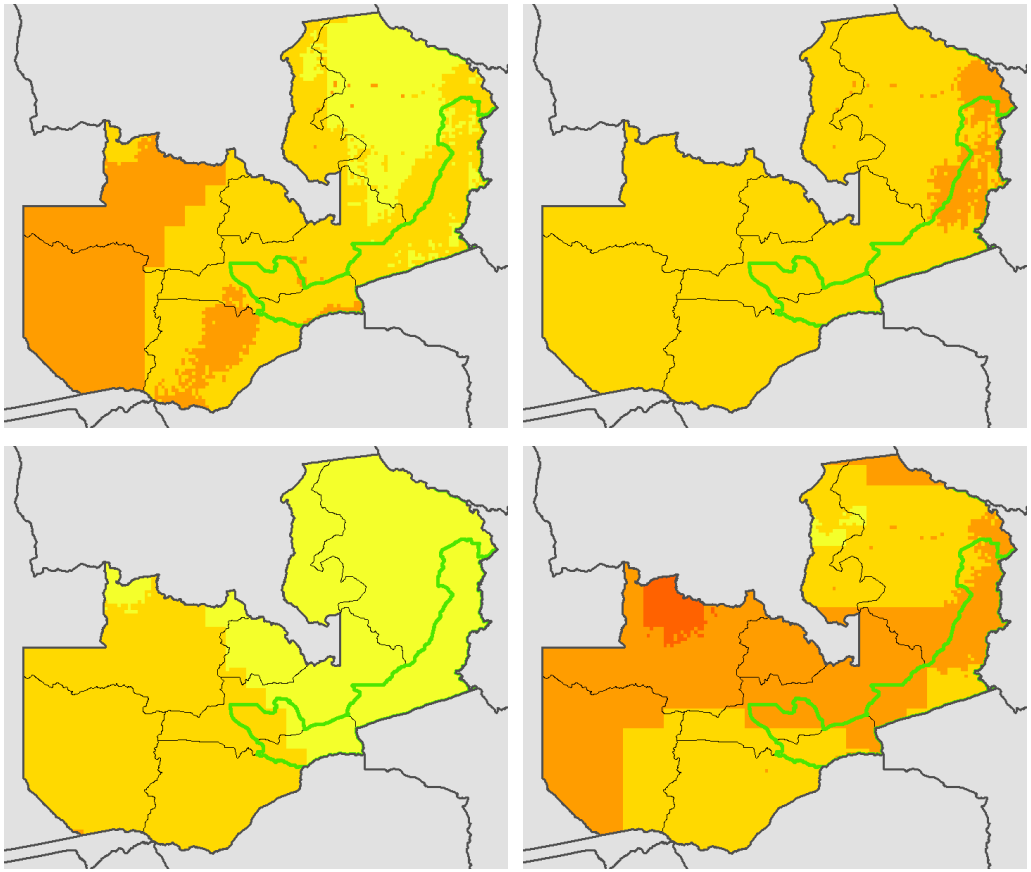
G-CAN ACTIVITIES

4. Enhanced use of FTF open data to improve our understanding of ZOI for better program planning
5. Advisory services to allow end-users quick access to summaries of existing and new research with programmatic implications in the areas of CSA, gender and nutrition

Making sense of climate projections and models

DETAILED SPATIAL ANALYSIS OF CLIMATE DATA

Zambia, Temperature change, ^{0}C, 2000-2050, RCP8.5

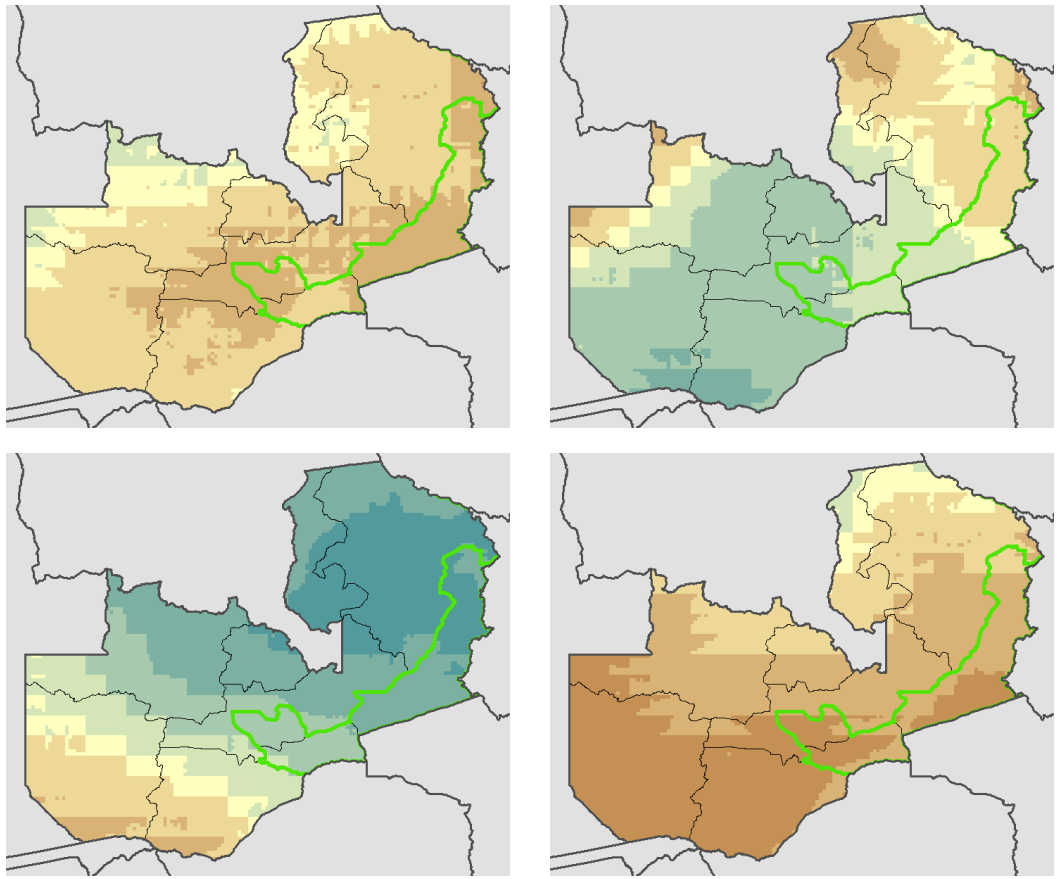


Climate models, clockwise, from top left: GFDL, HadGEM, MIROC, and IPSL.

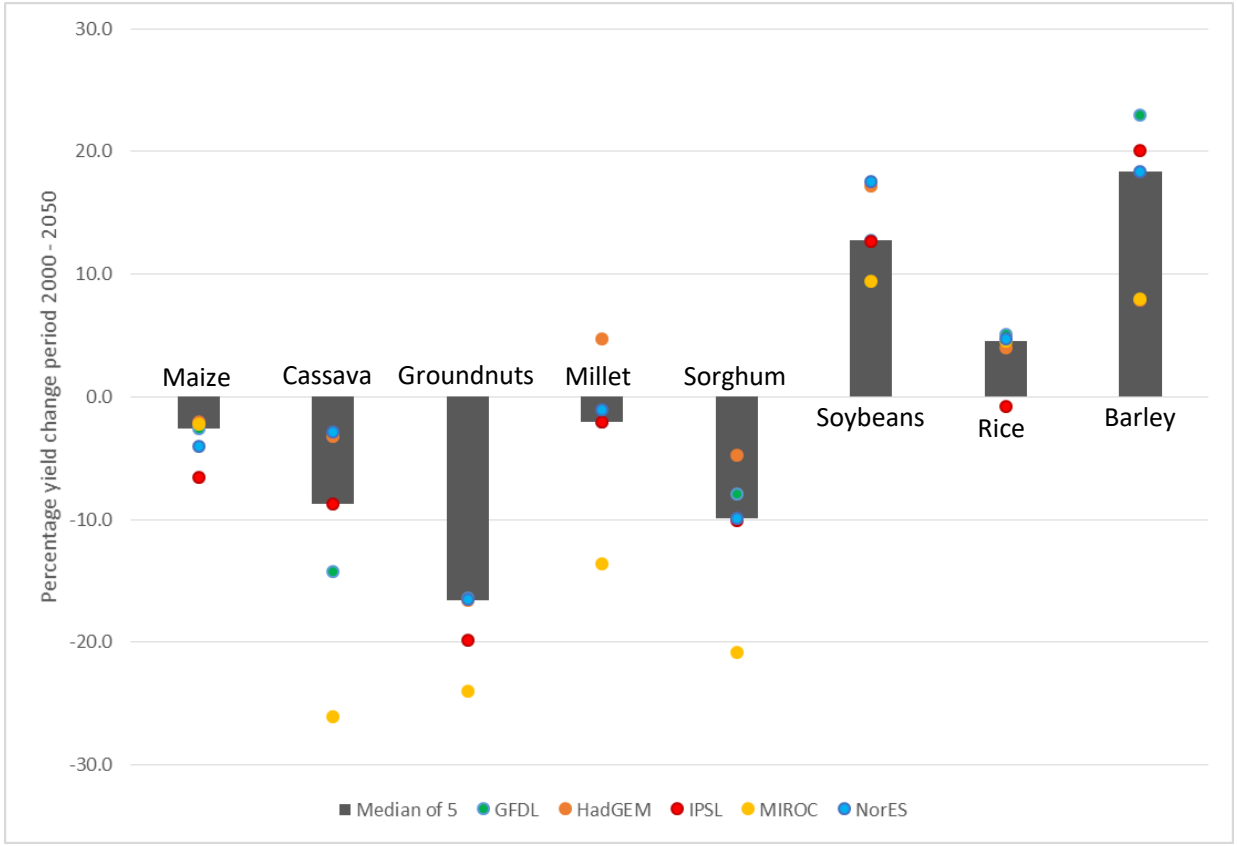
DETAILED SPATIAL ANALYSIS OF CLIMATE DATA

Zambia, Annual Rainfall change, mm, 2000-2050, RCP8.5

Climate models, clockwise, from top left: GFDL, HadGEM, MIROC, and IPSL.



CONSOLIDATED DATA FOR ZAMBIA



Percent yield change due to climate change for different GCMs, period 2000 - 2050

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Climate-smart agriculture in Zambia

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CSA IN ZAMBIA, FROM INDC

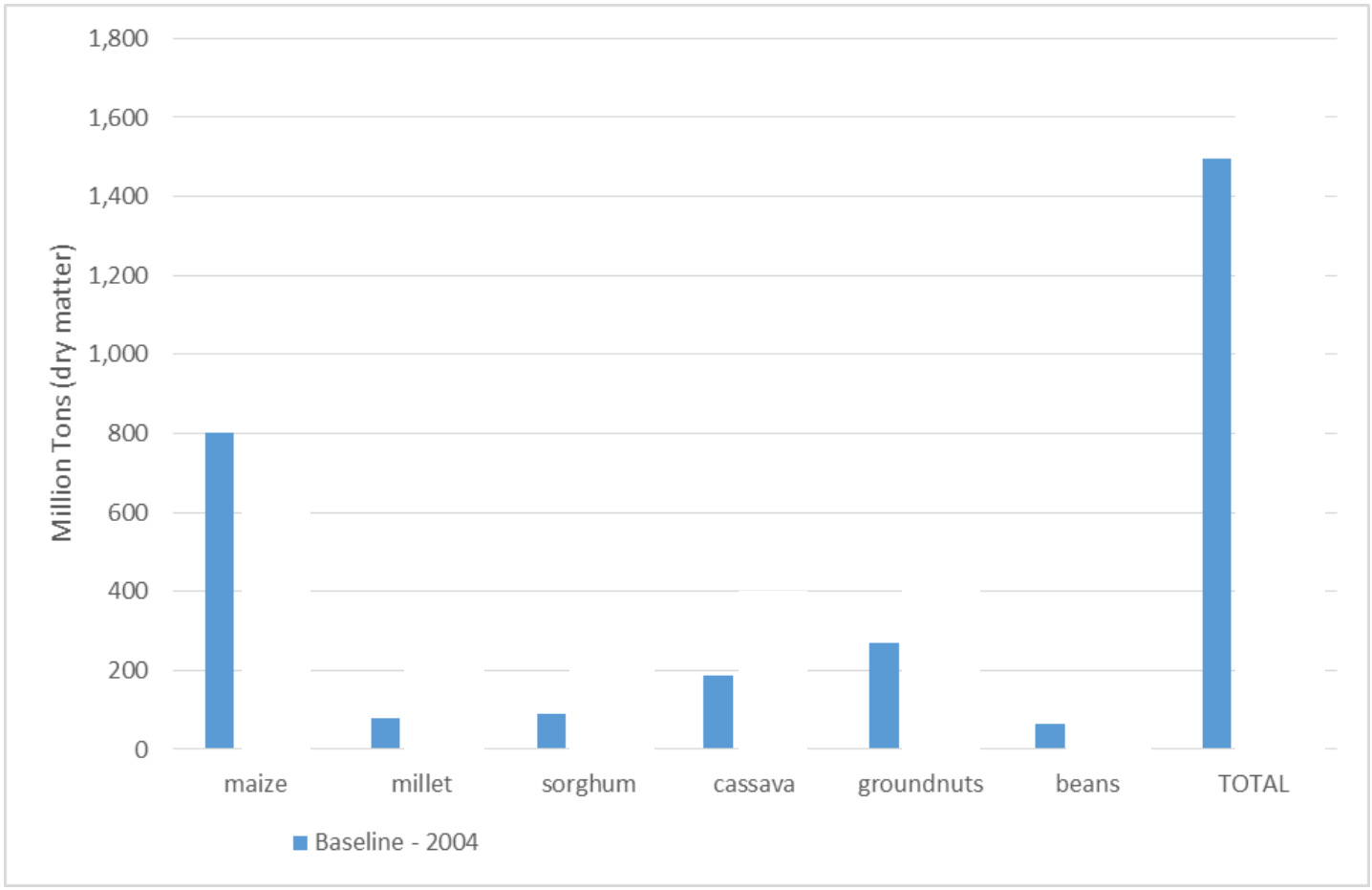
- Promote CSA practices through conservation agriculture, agroforestry, use of DT varieties, WUE management and fertilizer use efficiency management.
- Promote crop landraces of cassava, maize, sorghum, finger millet, beans, cowpea and their wild relatives.
- Promote livestock CSA practices through: improved feed management, improved animal health, improved rangeland management and use of drought-tolerant breeds.
- Promote sustainable aquaculture practices through improved water management, improved feeding regimes and use of appropriate stocks.

CLIMATE-SMART AGRICULTURE

- Initially very prescriptive in nature: a menu of practices/technologies from which to choose
- Evolved in a more "holistic" approach which includes systems, landscapes, risk management, institutions/governance, value chains, gender, and nutrition

BEYOND PRODUCTION, MODELING RISK AVERSION IN LAND ALLOCATION

- 2004 Zambia Rural Income and Livelihoods Survey a country-scale smallholder farmer survey designed and administered by Central Statistical Office.
- Over 5,000 observations in the sample, representative at the province level.
- We attempt to explain, econometrically, farm-level land allocation of risk-adverse households
- Household, biophysical, and socio-economic characteristics are accounted for.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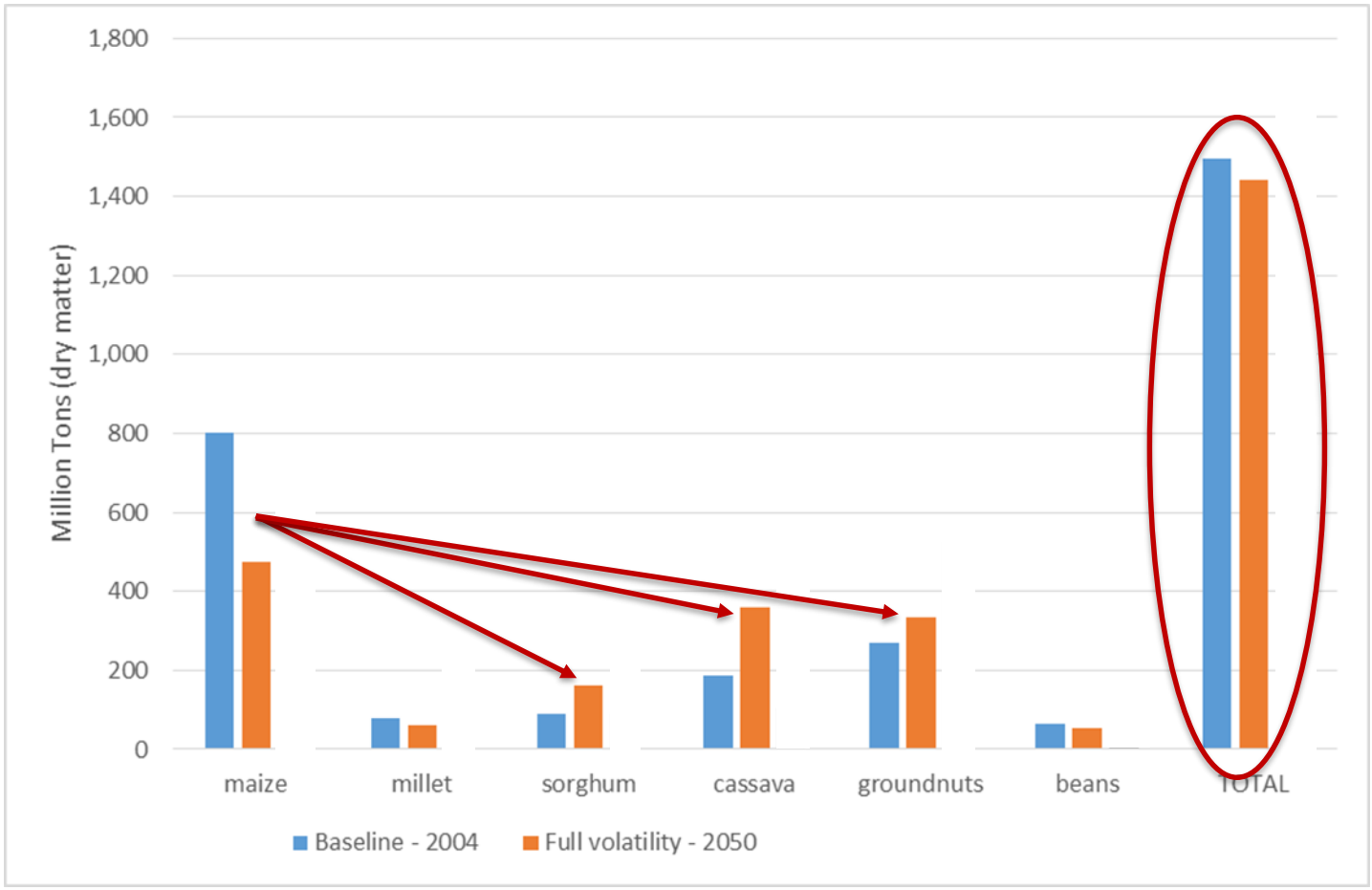
Million Tons (dry matter)
maize
millet
sorghum
cassava
groundnuts
beans
TOTAL
Baseline - 2004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Baseline - 2004
Full volatility - 2050


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groundnuts
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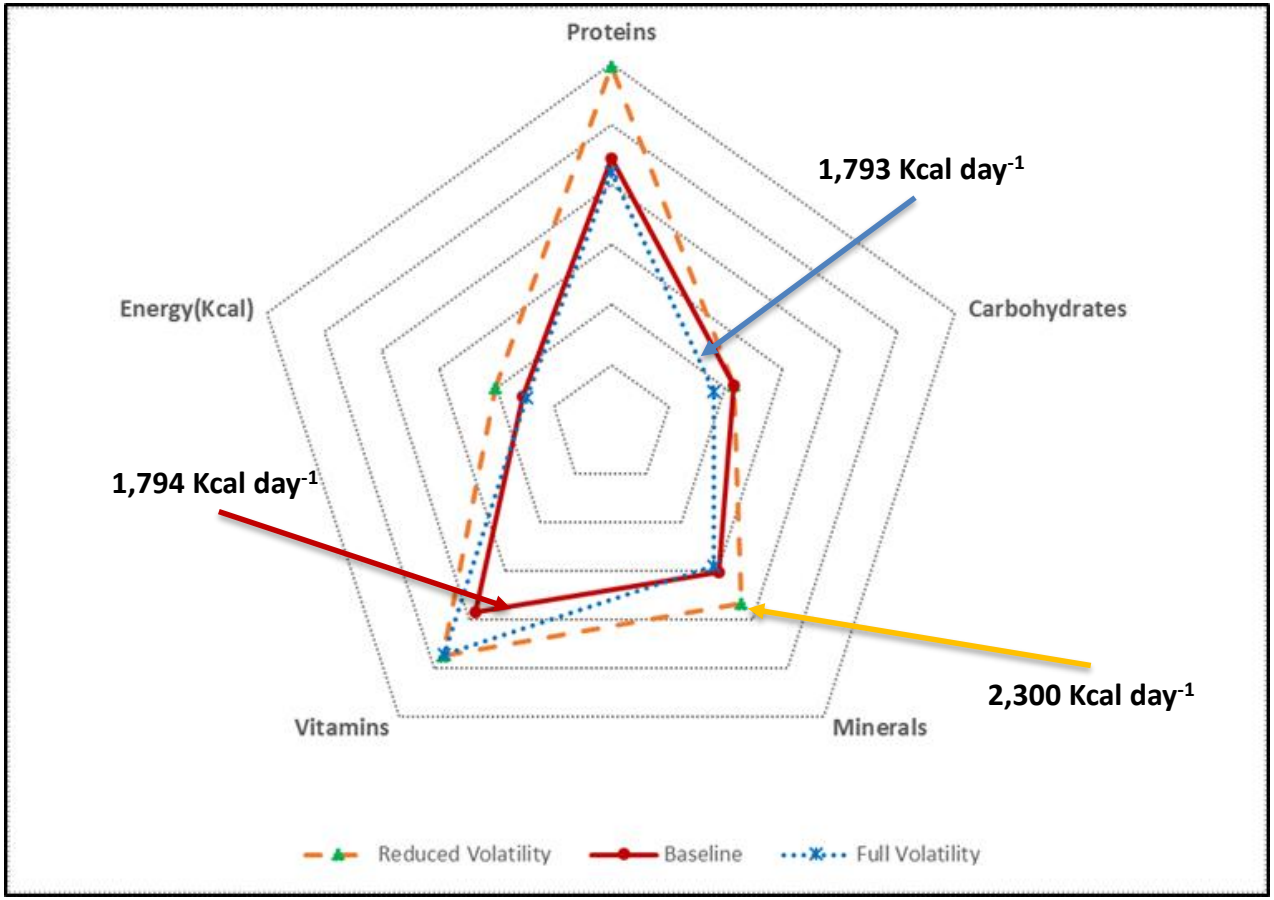
TOTAL
Baseline - 2004
Full volatility - 2050
Volatility Reduced - 2050

EFFECTS ON NUTRIENT AVAILABILITY



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Considerations for nutrition-sensitive approaches

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NUTRITION PROFILE

- **Priorities**:
  - Global Hunger Index 2016= Score 39 (Alarming) – ranked third out of 118 countries (descending order of hunger)
  - Stunting in children under 5 years: 40% (WHO cutoff ≥20%). Rank: 116/132
  - Anemia in women of reproductive age: 29.2% (WHO cutoff ≥20%) Rank: 124/185

- **Micronutrient deficiencies** (as of 2011)
  - Children
    - Iodine (<100 mcg/L): 14%
    - Iron deficiency anemia (HB<11g/dL): 58%
    - Vit A (serum retinol < 20 mcg/dL): 54% (2003)
  - Women
    - Iron deficiency anemia – pregnant women: 36%
    - Iron deficiency anemia – non-pregnant women: 28%
    - Vit A (serum retinol < 20 mcg/dL): 13% (2003)

Global Nutrition Report 2016; Haggblade et al 2016.

ENTRY POINTS FOR NUTRITION

- **Production diversity** - RAIN project – Mumbwa District.
  - Positive association with dietary diversity in young (6-23 months) and older children (24-59 months)
  - Positive association with stunting but not wasting in older children. No association in younger children.
  - Mother with income + greater influence over d/m associated with dietary diversity
- **Consumption of animal-source food** (ASF)
  - Fish is the most commonly consumed ASF, consumed by 41% of households
  - Fish was the most commonly consumed ASF by pregnant women and children
  - Poorer households consume more fish (37% share of ASF consumed) compared to more affluent households.

Kumar et al 2015; Disha et al 2012

Longley et al 2014; Hichaambwa 2012 (IAPRI)

ENTRY POINTS FOR NUTRITION

- **Aflatoxins**: Maize + Groundnut
  - Aflatoxin levels rise during storage for both crops
  - Maize: Low contamination levels but high exposure due to consistent consumption
  - Groundnuts: Very high levels and commonly consumed by children (41% in 6-23 mo old; ZDHS2009). Implications for poor households that may consume rejected nuts that are not sold.

→ Implications of climate change on aflatoxin levels in crops (curing, storage, processing, women's roles)

Ismail et al 2014

WATER-NUTRITION ENTRY POINTS

- Malaria infection significantly associated with vitamin A (bidirectional) and iron deficiency
  Implications of increased rainfall
- Household access to water, proper sanitation

→ Implications of lack of water

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Considerations for gender responsive approaches for climate resilience

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How gender **differences** and gender **relations** can influence climate adaptation strategies

Because of their different roles and resources in rural livelihoods, men and women, even in the same household:

1. **Are affected differently by climate change and perceive different effects.**
2. Do not always share the same **priorities and preferences.**
3. **Have different capacity and options for responding to change.**

Men and women have a different **set of options and preferences for how to respond** to climate change.

If priorities differ within the household, who has more bargaining power?

Possible responses:

- On-farm adaptation (technologies, practices)
- Community NRM
- Off-farm income
- Liquidate (sell assets, use savings)
- Change in consumption
- Change in investments in health/schooling
- Migration

Impact on gender relations:

How do these responses affect division of labor, control over resources, and decision making power?

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HOW CAN WE ENHANCE RESILIENCE FOR MEN AND WOMEN?

- **Information:** Gendered differences in access to extension services, ICTs, mobility, producer groups
- **Assets:** Well-documented gender differences and gaps in assets: women's assets often lower value, more liquid, and more likely to be sold.
- **Technologies and new practices:** Differences in preferences, e.g. risk aversion, consumption/nutrition vs. income, technology preferences, different access to enabling factors (capital/credit, land, labor, etc.)

HOW DO STRATEGIES FOR RESILIENCE AFFECT GENDER RELATIONS?

- What is the distribution of the costs and benefits in the short and long term?
  - Benefits: control over decisions and income affect production and nutrition
  - Costs: time use, labor, control over resources (e.g. crop residues for fodder)

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Integrating gender, nutrition and CSA for climate resilience

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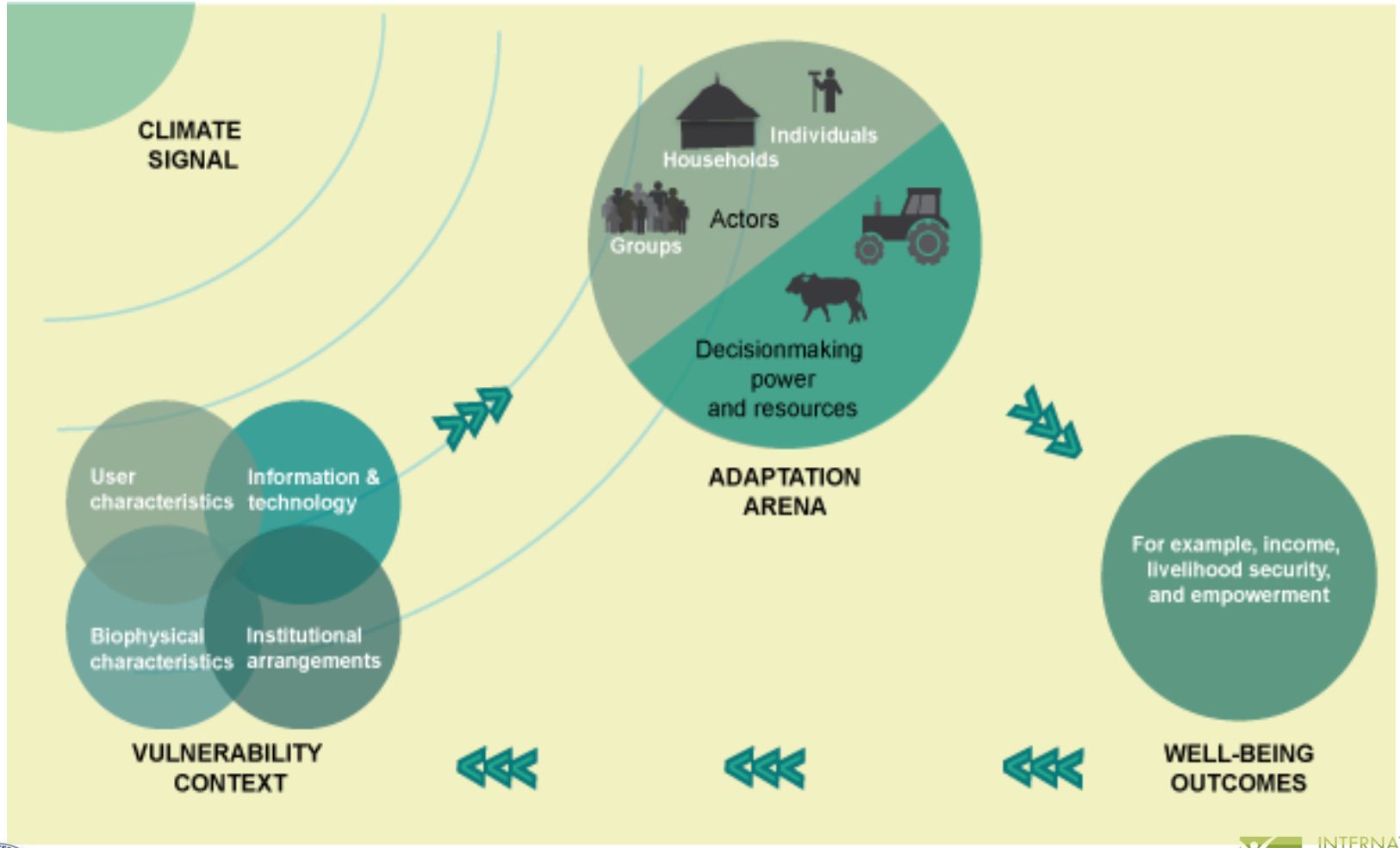
LINKING CLIMATE, GENDER AND NUTRITION



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Key questions for future programming

CSA –GENDER-NUTRITION QUESTIONS

- What are the economic barriers that prevent sustained adoption?
- What is the appropriate role of risk management in CSA?
- How can we integrate value chains in CSA?
- What is the role of water management for CSA, gender, health and nutrition?
- What is the role of land use planning and a landscape approach for climate resilience? What institutions exist or are needed to govern resources at the landscape scale?

CSA –GENDER-NUTRITION QUESTIONS

- What are the nutrition implications of production shifts due to CC (i.e. maize moving north)?
- How can markets compensate for nutritional shortfalls under growing production variability?
- What is the potential to expand aquaculture and consumption of small fish for improved nutritional status?
- What are best approaches to manage aflatoxin in the production, processing, storage, and disposal of cereal and grain used for general consumption?

CSA –GENDER-NUTRITION QUESTIONS

- What is the relationship between rainfall, standing water, malaria and nutrition?
- What are preferences and decision making power of women in relation to main crops produced and consumed, and implications on nutritional status of the household?
- How do adopted technologies/crop production affect labor, time use, and energy expenditure, and how does this impact nutrition (women and children)?

Questions?

Further assistance?