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Gender, Climate, and Nutrition Integration Initiative (GCAN): Insights for Bangladesh

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CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security CCAFS

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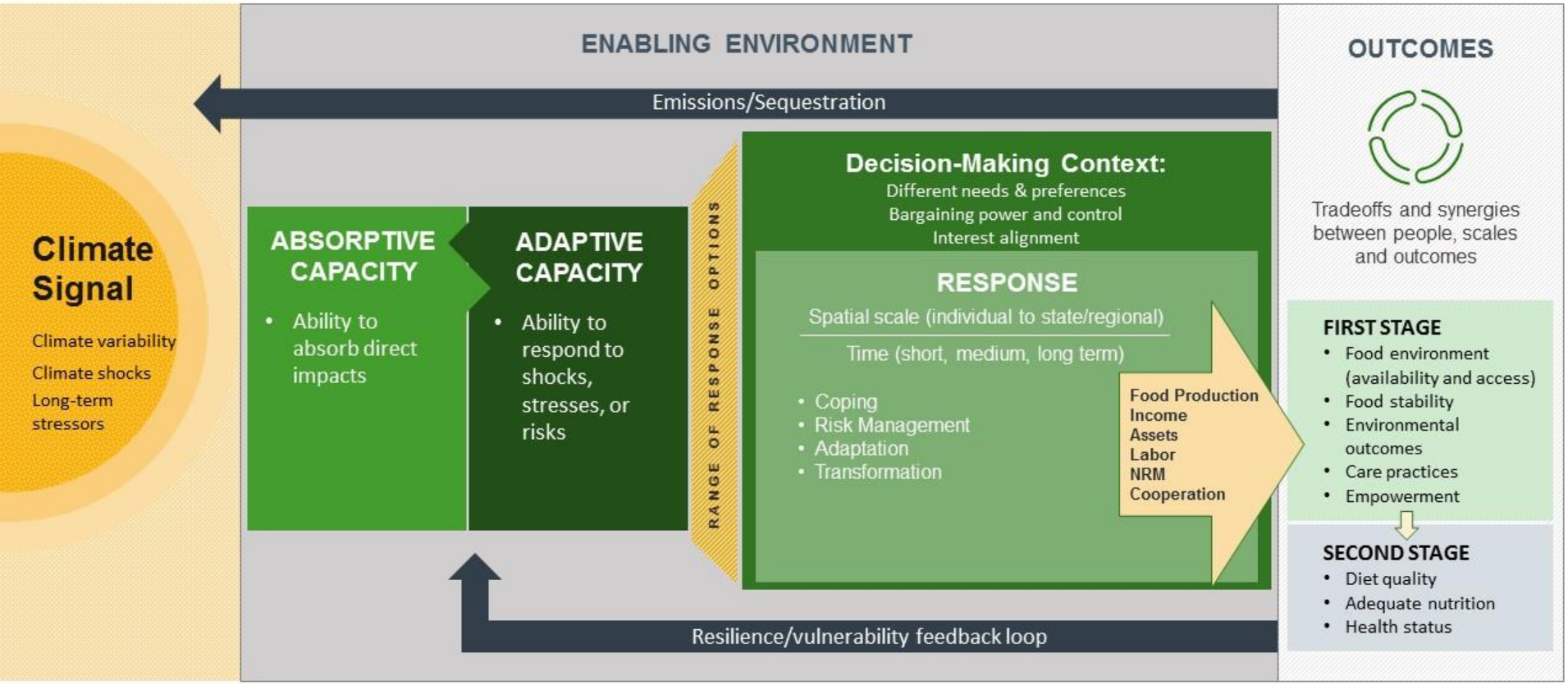
GCAN ACTIVITIES

- **Objective:** Support FTF focus countries to understand and use climate data for climate-smart agriculture (CSA) programming that integrates nutrition and gender
- **Activities include:**
    1. Framework and tools for understanding conceptually the structural connections among climate change and CSA, gender and nutrition.
    2. Research and knowledge management to help answer missions' priority questions related to climate, gender, and nutrition
    3. Enhanced use of FTF open data, including mapping

Framework for Climate, Gender, and Nutrition



CLIMATE ADAPTATION POLICY IN THE WORLD'S MOST VULNERABLE COUNTRY

- Bangladesh has a long history of coping with climactic hazards, but traditional adaptive strategies are failing in the face of ***new*** hazards in new places and ***increasing frequency and intensity*** of climactic events.
- An estimated $40 billion is needed for adaptation from 2015-2030; of that amount, $8 billion for food security, livelihood, health protection, water security (World Bank 2010)
- Bangladesh Climate Change Strategy and Action Plan (BCCSP, 2009-2018), National Adaptation Programme of Action (NAPA, 2005, revised in 2009), & Nationally Determined Contributions (2015) are key policies which identify priority investments for climate adaptation; two multi-donor funds for adaptation (BCCTF and BCCRF) invest in activities; NDC implementation roadmap under development
- Food security, social protection, and health = a priority theme

WHAT NEXT FOR CLIMATE ADAPTATION?

- BCCSAP and recent climate change/disaster management background paper for 7th year plan call for:
  - **Support food security, social protection, and health** to ensure the poorest and most vulnerable are protected from climate change and that all programs focus on the needs of this group
  - **Advancing research of impact** of climate change on different sectors of the economy and different socioeconomic groups to underpin investment strategies
  - **Building capacity and strengthening institutions to better integrate climate change adaptation activities with development** at various levels - in order to ensure development gains are not lost, and to guide development in such a way to increase resilience going forward

OBJECTIVES OF PRESENTATION

- Review the projected impact of climate change on agriculture and livelihoods in the FTF ZOI, looking at the climate science
- Consider how climate change affects nutrition (& what to do)
- Consider how gender affects ability to adapt to climate change (& what to do)
- Start the conversation about potential research and mission support that can fill evidence gaps to inform USAID programming

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Climate Change Projections for Bangladesh

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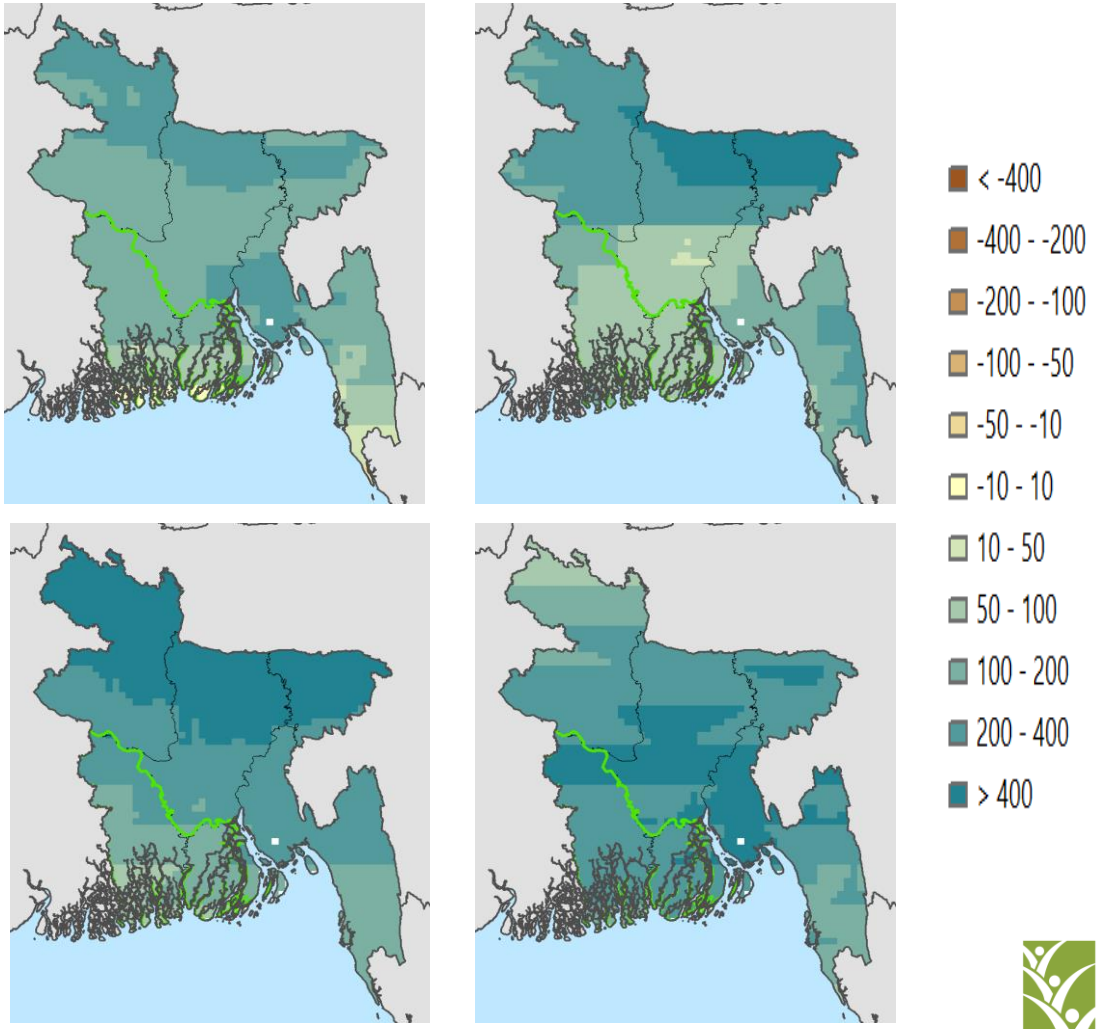
CHANGE IN MEAN ANNUAL PRECIPITATION, MM, 2000-2050

Note: RCP 8.5. Climate models clockwise from top left: GFDL, HadGEM, MIROC, and IPSL. Feed the Future zone is outlined in green.



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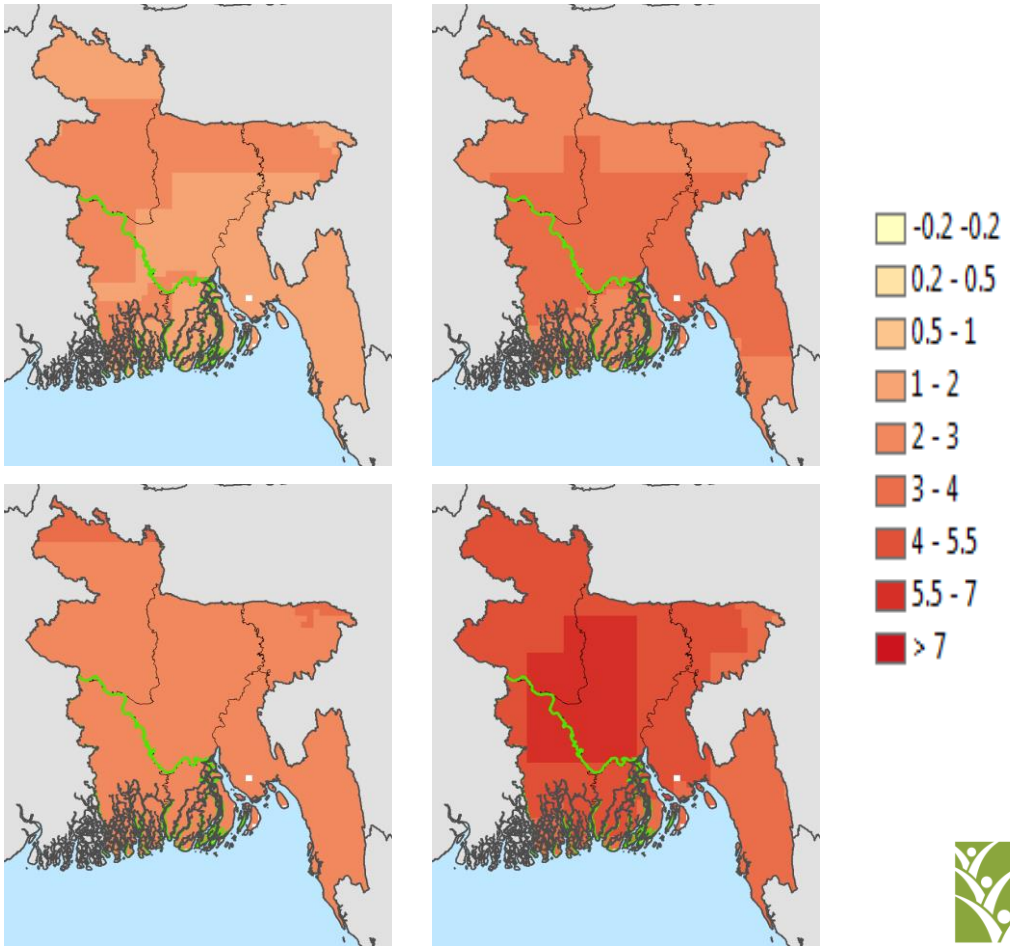
CHANGE IN MEAN DAILY MAXIMUM TEMPERATURE FOR THE WARMEST MONTH, ^{0}C, 2000-2050

Note: RCP 8.5. Climate models clockwise from top left: GFDL, HadGEM, MIROC, and IPSL. Feed the Future zone is outlined in green.



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Projected Impact of Climate Change on Agriculture

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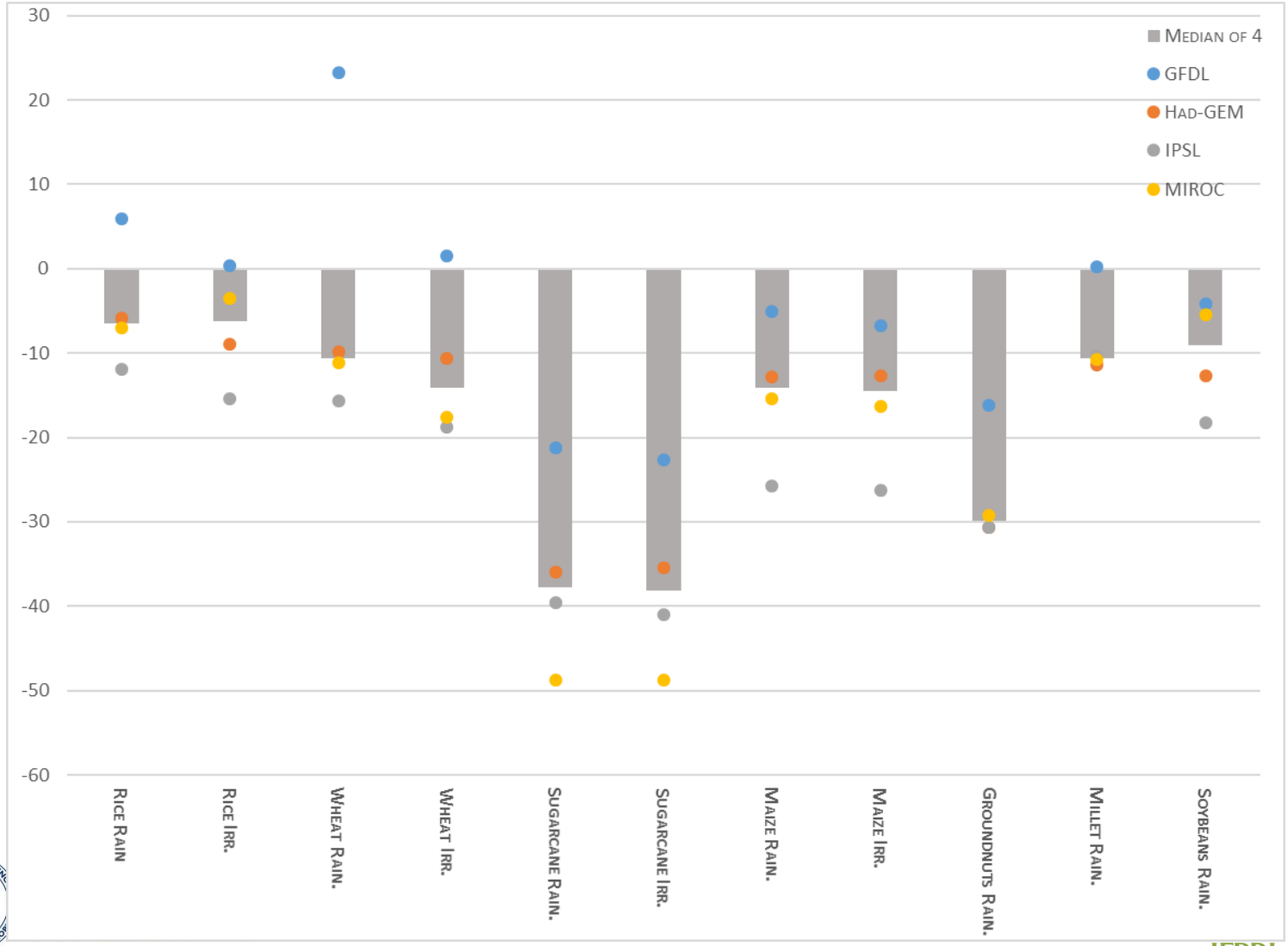
IMPACT OF CLIMATE CHANGE ON CROP YIELDS, 2000-2050, PERCENT



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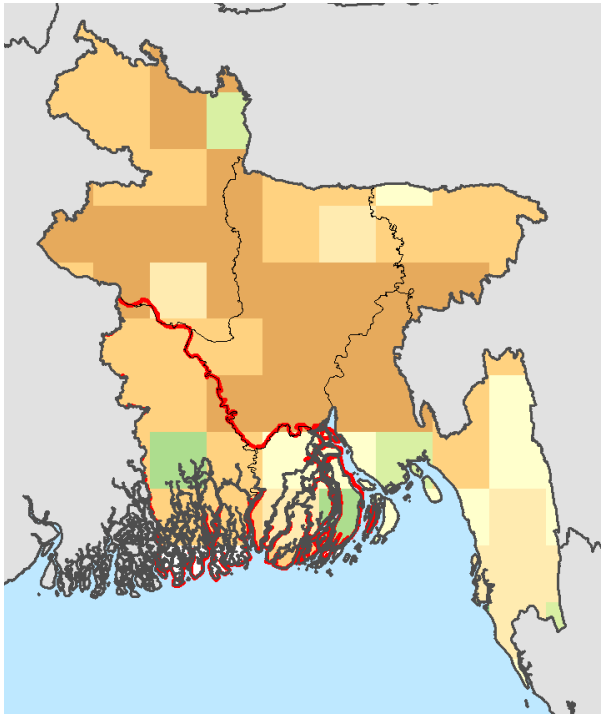
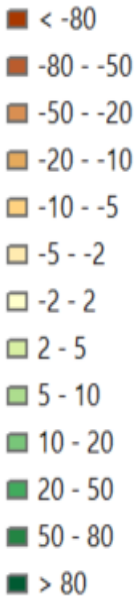
Source: AgMIP GGCMI; SPAM 2005.

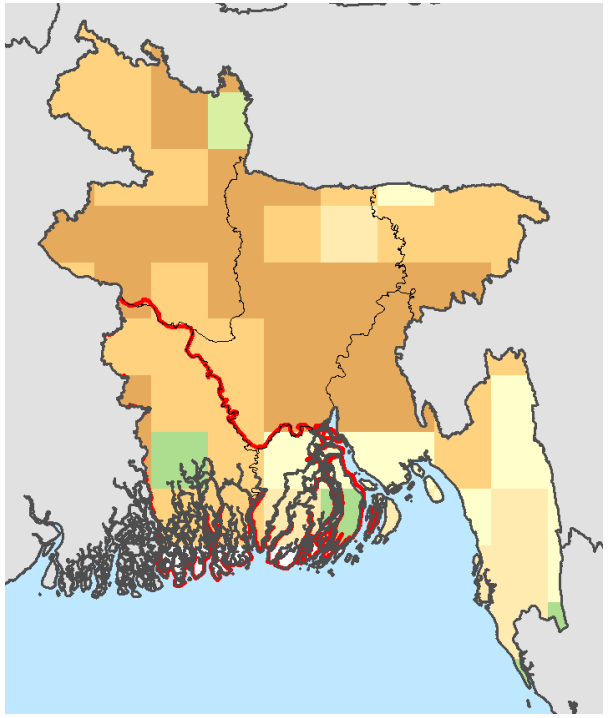
CHANGE IN YIELD DUE TO CLIMATE CHANGE, RICE, 2000-2050

Rainfed Rice





Irrigated Rice

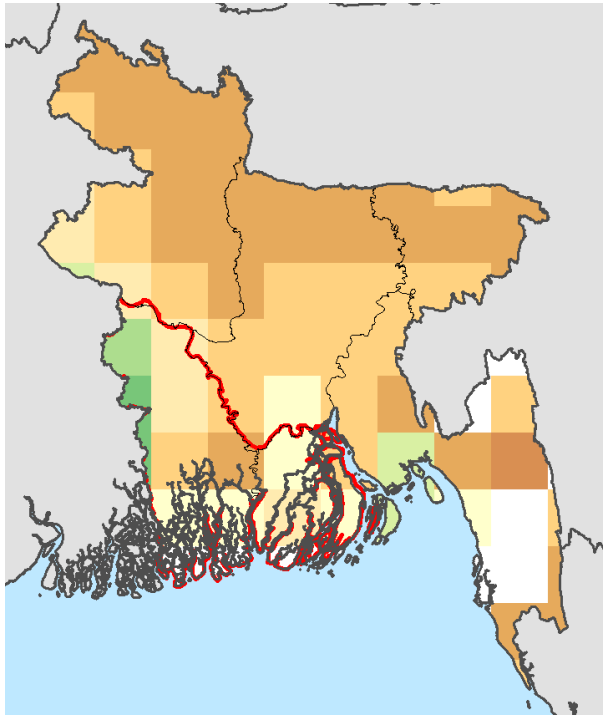


Source: AgMIP GGCMI; SPAM 2005.

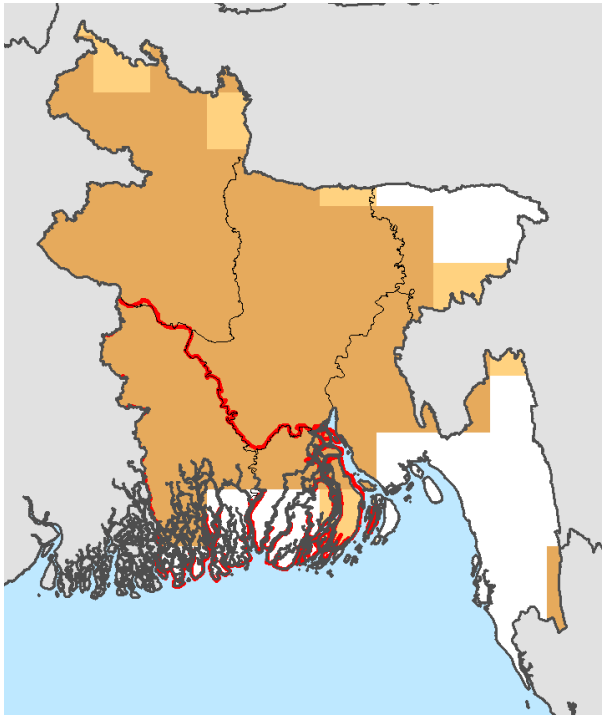
Note: Median derived from using four General Circulation Models and three crop models.. Evaluated with CO2 fertilization.

CHANGE IN YIELD DUE TO CLIMATE CHANGE, WHEAT, 2000-2050

Rainfed Wheat



Irrigated Wheat



Source: AgMIP GGCMI; SPAM 2005.

Note: Median derived from using four General Circulation Models and four crop models. Evaluated with CO2 fertilization.

AGRICULTURE AND NRM PRIORITIES

- Adaptation priorities (NDC) in agriculture and NRM include:
  - Stress tolerant (salinity, drought, and flood) variety improvement and cultivation, including livestock and fisheries
  - Afforestation
- Not mentioned in NDC but with potentially high payoff:
  - Ag risk management
  - Agriculture, Forests and Other Land Uses (AFOLU) sector
  - Interface of agriculture and forest, landscape approach, multifunctional landscapes/integrated farming systems

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Climate and nutrition: Considerations for nutrition-sensitive climate resilience programming

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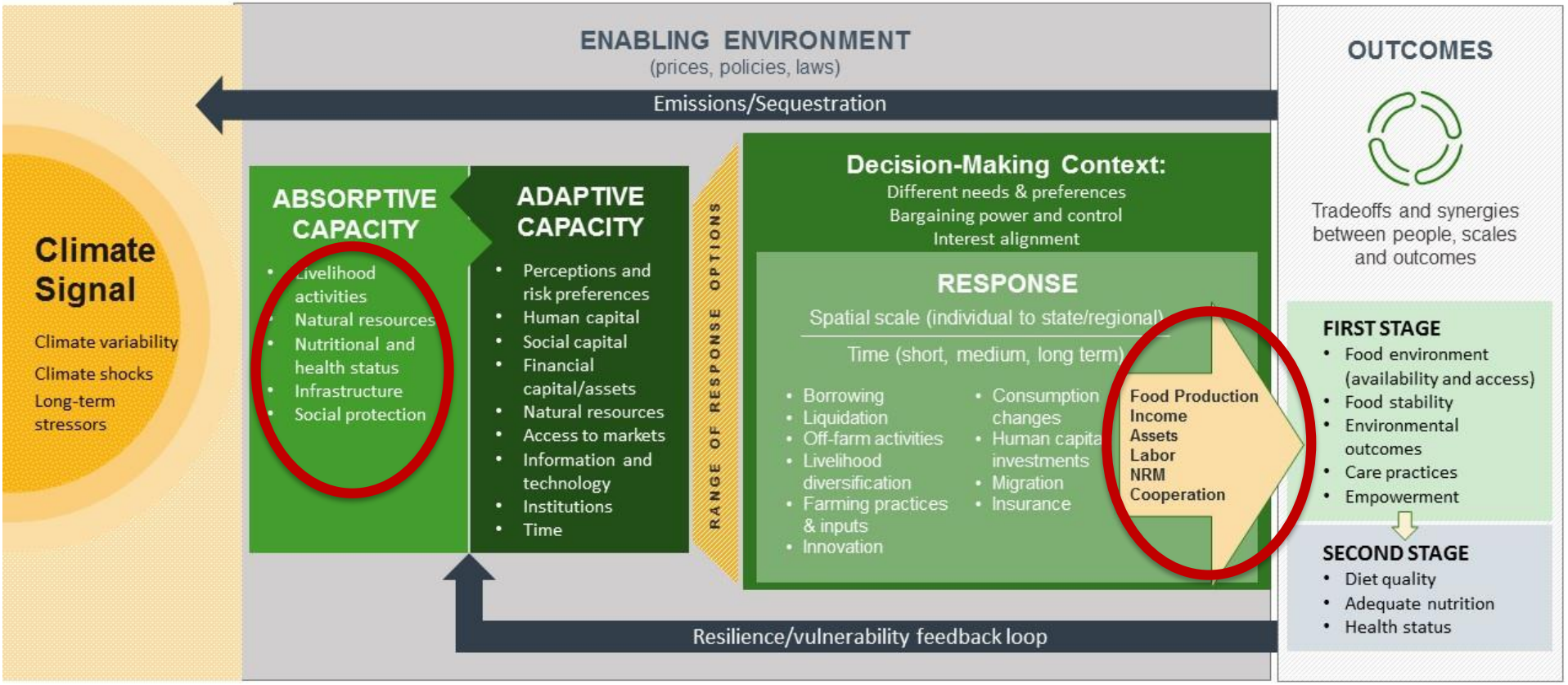
WHERE ARE THE GENDER DIFFERENCES?

Framework for Climate, Gender, and Nutrition – Household Level



NUTRITION PROFILE

- **Priorities**:
  - Global Hunger Index 2016= Score 27.1 (Serious) (-5.4 since 2008)
  - Stunting in children under 5 years: 36% (31% urban, 38% rural)(WHO cutoff ≥20%). Rank: 107/132. Large disparities between lowest and highest wealth quintiles and at the sub-national region.
  - Wasting in children under 5 years: 14% (WHO cutoff ≥5%). 117/130
  - Overweight and Obesity in women ≥20 years: 19% (2013)

- **Micronutrient deficiencies** (varies with urban/rural, wealth quintile)
  - Anemia in women of reproductive age: 44% (WHO cutoff ≥20%) Rank: 158/185
  - Anemia in preschool-aged children: 33%
  - Zinc deficiency in preschool-aged children: 45%

Global Nutrition Report 2016; BDHS 2014; Global Burden of Disease Study 2013; National Micronutrients Survey 2011-12

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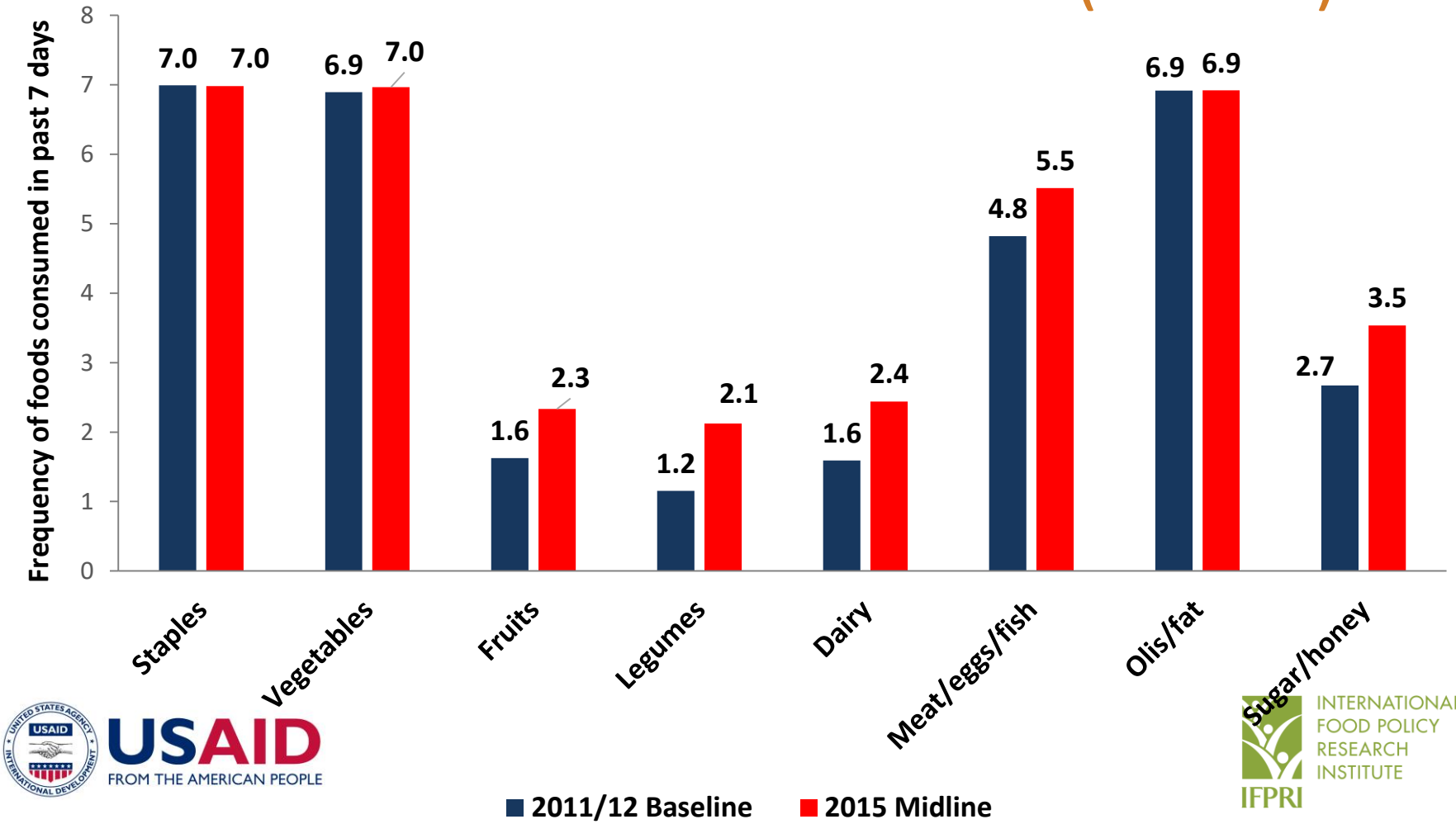
BIHS 2015 - FREQUENCY OF FOOD GROUPS CONSUMED IN PAST 7 DAYS (RURAL)



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FOOD PRICES AND NUTRITION

- Rice prices positively associated with prevalence of child underweight, inversely associated with dietary quality (represented by expenditure on non-grain food). Dietary diversity score significantly associated with monthly per capita food and total expenditures.[1]
- Households that spent a greater proportion on non-rice foods and less on rice had lower prevalence of maternal and child malnutrition. When food prices increase, weekly per capita rice consumption does not change, resulting in less money spent on non-rice foods (decreased dietary diversity)[2].

→ Need to consider implications of climate change on production and the effects on food prices, rice prices, price of non-rice foods.

[1] Thorne-Lyman et al; [2] Campbell et al

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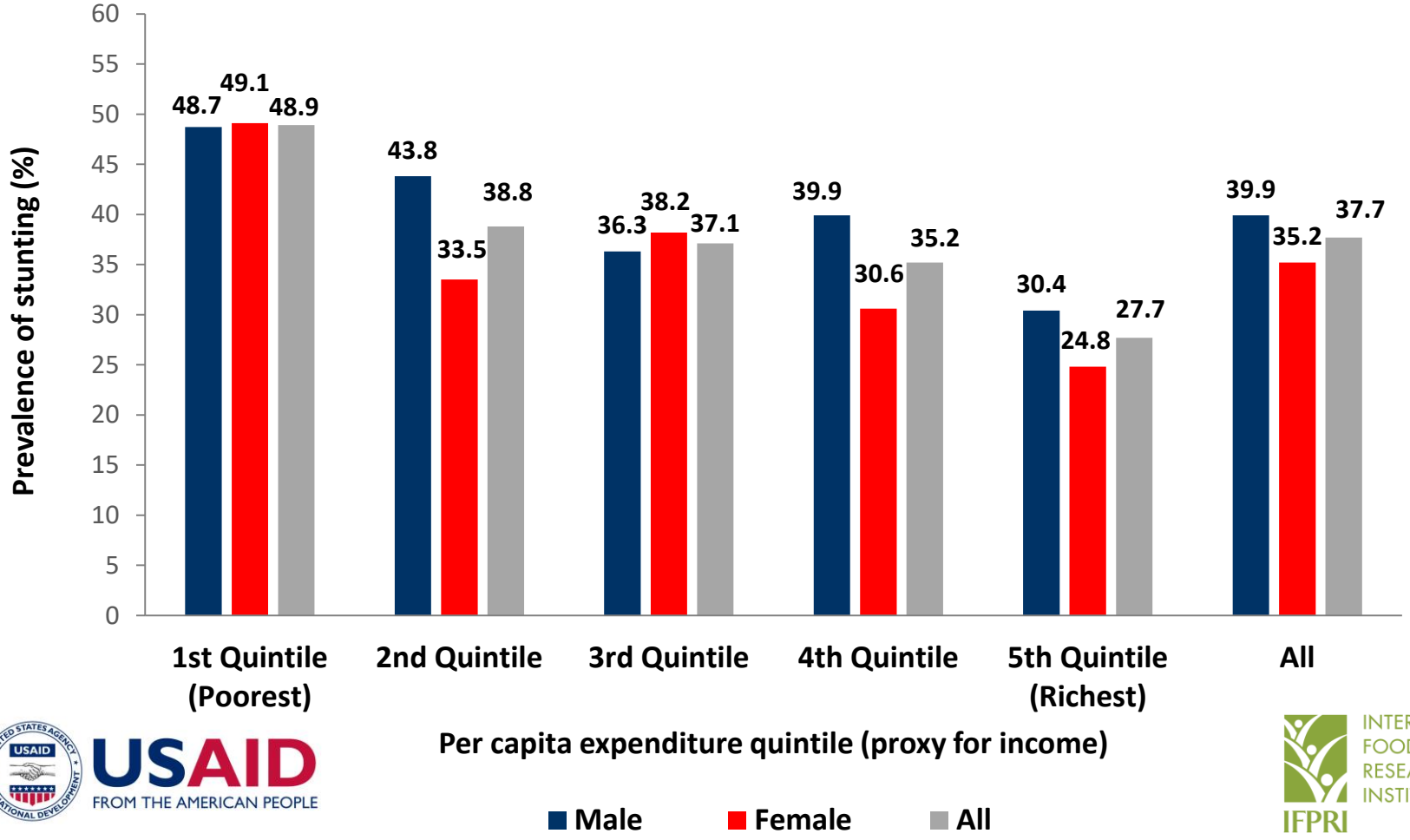
PREVALENCE OF STUNTING FOR CHILDREN UNDER 5 BY INCOME (BIHS 2015, RURAL)



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WATER AND NUTRITION

- Risk of dilapidated flood infrastructure and collapse of flood-vulnerable infrastructure[1]
  → risk collecting stagnant water: diarrhea, cholera, water-borne illness
- Increased pests/insects and vector-borne disease[2]

- Link between agriculture and arsenic needs more research: role of irrigation (and tubewells) in increasing arsenic concentrations, modes of exposure, presence of arsenic in food chain, impact on nutrition, strategies to mitigate presence and impacts of toxins[3]
- Impact of pesticides and nitrogen and phosphorus pollution on freshwater fisheries (and drinking water) is understudied[4]

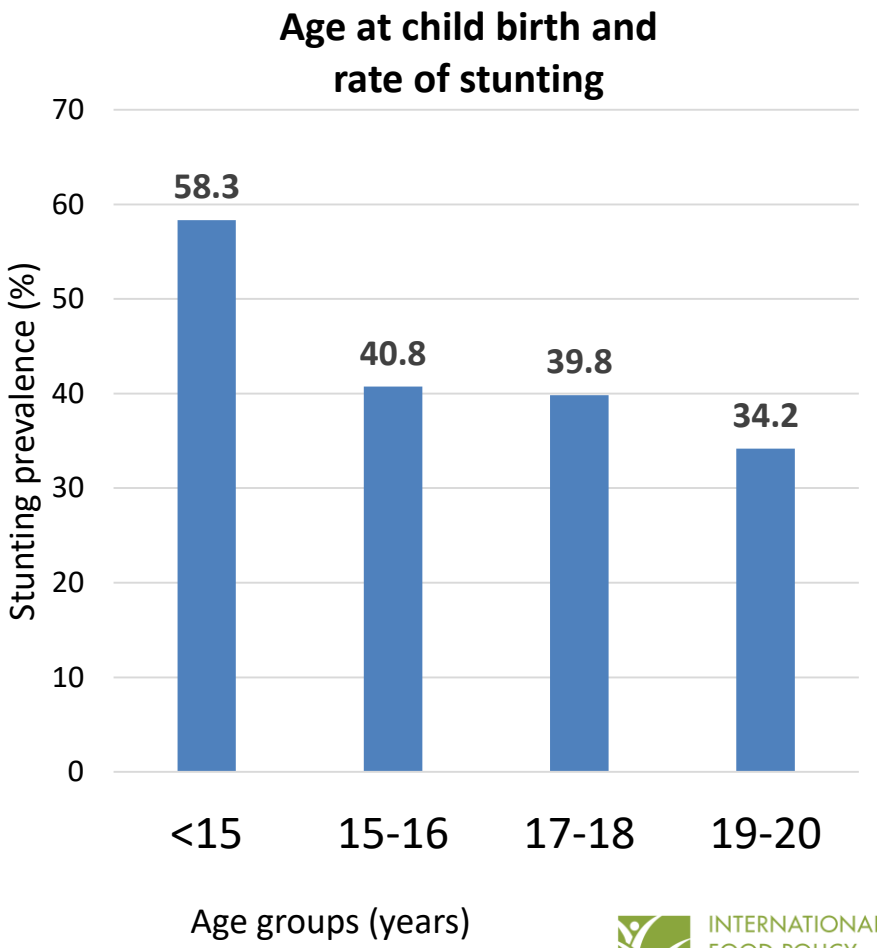
- Increased salinity of drinking water increases risk of pre-eclampsia and gestational hypertension in pregnant women in coastal regions[5]

[1] Osmani et al 2016; [2] Ali et al; [3] Yunus et al; [4] Parveen and Nakagoshi; [5] Khan et al (2014) and Khan et al (2011)

GENDER, CLIMATE & NUTRITION

BIHS 2015: Adolescent pregnancies and stunting

- 58% of girls in rural areas get married before age 18
- Adolescent girls aged <19 account for 36% of all child births in rural Bangladesh
- Early marriage → Early pregnancy → Low birthweight →Stunting
- Potential for early marriage to be a response to climate (and other) shocks – warrants more research



[1] Osmani et al 2016; [2] Yunus et al; [3] Khan et al (2014) and Khan et al (2011)

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CLIMATE, NUTRITION SMART VALUE CHAINS

Maximize nutrition "entering" the food value chain

Input Supply	Production	Post Harvest Storage	Processing	Distribution	Marketing and Retail	Consumption Food Utilization
Improved varieties, bio-fortification, fertilizer, irrigation	New production locations, diversification, CO2 fertilization, focus on women farmers, extension	Aflatoxin control, refrigeration	Fermentation, drying, fortification, product reformulation (reduce salt, sugar, unhealthy fats)	Moving food from areas of shortage to areas of surplus, targeting of vulnerable groups	Messaging on the importance of nutrition and sustainability, benefits of certain foods	Home fortification (fish powders), training in nutritious food preparation, time mgmt, food preservation
Lack of access to inputs (seeds, fertilizer, irrigation, extension)	Limited available land, soil degradation, loss of biodiversity, temperature and water stress, CO2 effects	Contamination, spoilage, increased electricity demands, damage from extreme weather events	Improper processing of foods, nutrient losses during milling, combination with unhealthy ingredients	Climate impacts on transportation and retail infrastructure, export/import impacts on prices and availability	Advertising campaigns for unhealthy foods, loss of small food retailers	Lack of knowledge of nutrition, nutrient losses during preparation, increased diarrhea & enteropathy

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Minimize nutrition "exiting" the value chain

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Source: Fanzo, Downs and McLaren 2017

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Climate and gender:

Considerations for gender-responsive climate resilience programming

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GENDER & CLIMATE PRIORITIES

- In early policies (e.g. BCCSAP 2009), women only mentioned as victims of climate change
- Bangladesh Climate Change Gender Action Plan (2013)
  1. Proposes integration of gender across sectors
  2. Calls for increasing women's access to resources necessary for adaptation
  3. Aims to increase women's participation in institutions
- Great lessons from Bangladesh (and elsewhere) about how to do these three things, but knowledge gaps remain on how to do so in a way that enhances women's ability to adapt to climate change, and how to unleash women's contributions to household/community resilience

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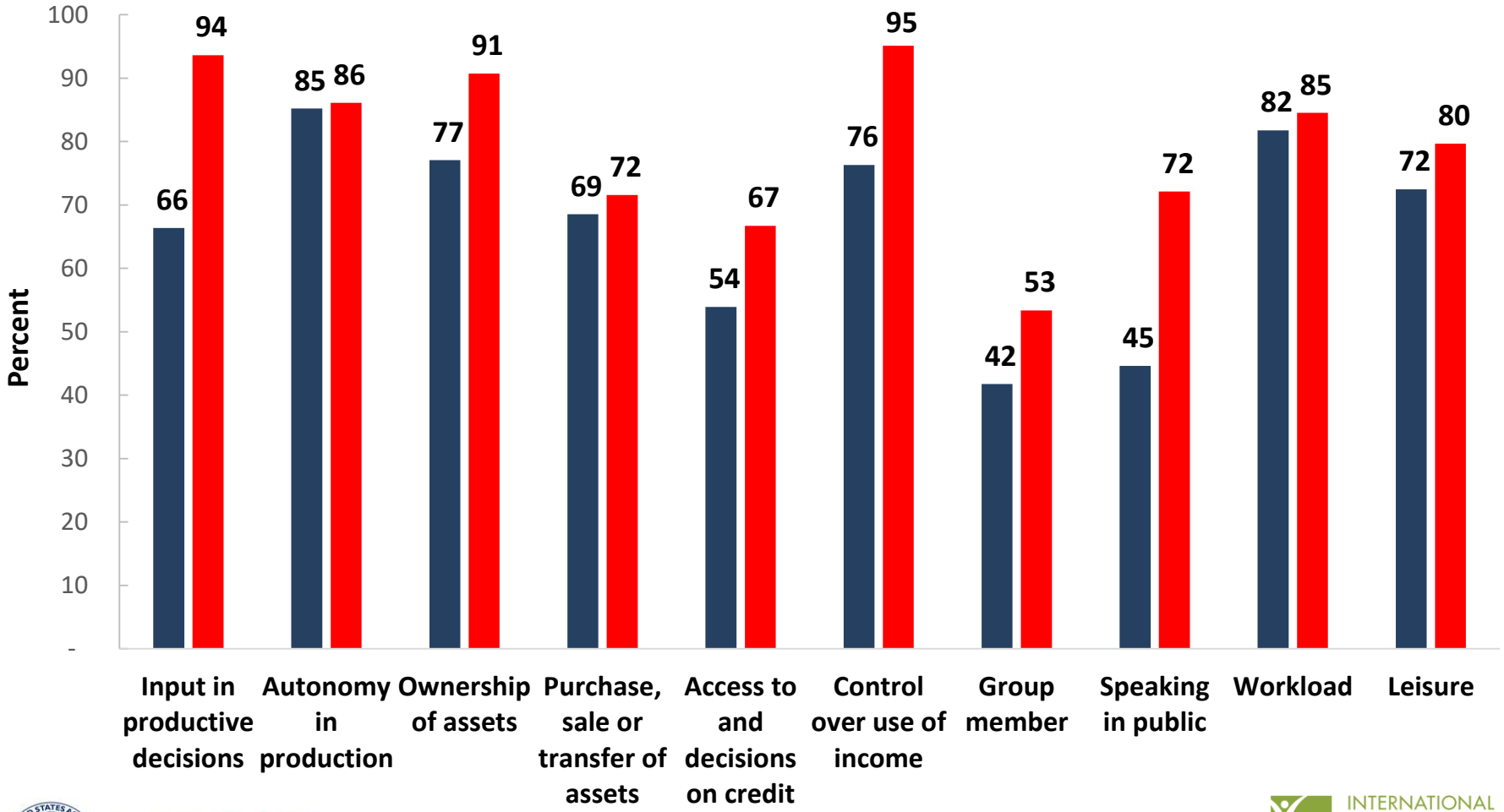
IMPROVEMENTS IN WOMEN'S EMPOWERMENT



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WHERE ARE THE GENDER DIFFERENCES?

Framework for Climate, Gender, and Nutrition – Household Level

GENDER INEQUALITIES IN CLIMATE ADAPTATION

- Common to have jointly managed agricultural plots, but still have different **gender roles** in agriculture (f.ex. Women focus on small livestock), livelihood activities, and domestic chores
- Women have much **lower levels of assets**, education, mobility, time/labor, and less secure property rights
- Women can have **less access to services -** often not recognized as farmers, their domestic work overlooked, so less likely to be targeted by extension/climate info/other programs, and…
- **Less participation/voice in institutions** that make decisions on climate change adaptation

different impacts, limited ability to adapt, & less say over how to respond to climate change

INFO GAP – AND DIFFERENT SOURCES

		Men	Women
Agricultural sources of information	Government extension services	**0.28**	0.07
	Agricultural service providers	**0.04**	0.00
	Farmer field days	**0.12**	0.01
Group-based sources	NGO	0.14	0.10
	Community meetings	0.03	0.00
	Farmer orgs, coops, CBOs	0.02	0.01
Informal sources	Family members	0.13	0.05
	Neighbors	0.50	**0.81**
Media and schools	**Radio**	0.72	**0.88**
	Television	**0.58**	0.32
	Newspaper/bulletin	**0.87**	0.55
	Schools/teacher	**0.15**	0.04
	Cell phone	0.02	0.01
	Internet	0.02	0.01
Traditional sources	Traditional forecasters, indigenous knowledge, etc.	**0.55**	0.39

Source: Quisumbing et al under preparation, Bangladesh

INFO GAP – AND ADOPTION

	Whether respondent is aware of practice			Whether respondent adopted practice in past year if they were aware of it		
	Male	Female	p-value	Male	Female	p-value
Planting stress-tolerant varieties	**0.03**	0.02	*	0.31	0.17	
Improved high yielding varieties	**0.62**	0.42	***	0.55	0.48	
Irrigation	0.97	0.97		**0.62**	0.55	*
Applying crop residue	0.56	0.54		0.42	0.40	
Composting	**0.79**	0.70	***	0.37	0.40	
Livestock manure management	0.62	0.60		**0.48**	0.33	***
More efficient fertilizer use	**0.88**	0.56	***	**0.83**	0.64	***
Cover cropping	**0.14**	0.09	**	0.02	0.03	
No till/minimum tillage	0.31	0.27		0.06	0.04	
Improved livestock feed management	0.31	0.26		0.53	**0.67**	**
Integrated pest management	**0.79**	0.65	***	0.51	0.48	

Source: Quisumbing et al. under preparation, Bangladesh

WILL RESPONSES TO CLIMATE CHANGE CLOSE OR WIDEN THE GENDER GAP?

The costs and benefits of climate adaptation responses and interventions are not distributed equally across household members or community members:

- ❑ Who gains/loses assets (based on relative value, liquidity)? (Quisumbing, Kumar, and Behrman 2011; Rakib and Matz 2016)
- ❑ How does labor and time use change for different livelihood activities, and for whom?
- ❑ How does relative control over income change?
- ❑ What are the costs and benefits in terms of human capital (e.g. education, health, early marriage, violence)? (BIHS 2015)
- ❑ What employment and migration opportunities are accessible?
- ❑ Who changes consumption patterns, and how?

WOMEN AS AGENTS FOR CLIMATE ADAPTATION

Let's not miss the opportunity to draw upon women's knowledge, networks, and skills to:

- Mobilize their network and disseminate information
- Advise on community risk and vulnerability assessments
- Contribute to community decisions and maintenance of community natural resources & infrastructure (e.g. irrigation schemes, embankments, afforestation, etc)
- Create accountability and feedback mechanisms
- Learn about what works (and doesn't) from women to effectively target and tailor programs, technologies, infrastructure

NEXT STEPS & GOALS FOR THIS WEEK

- Meet with different climate, gender, and nutrition officers at USAID, government stakeholders, and implementing partners to understand priorities
- Develop possible research topics, knowledge products, tools, maps, or other forms of support and learning – feasible to complete in a relatively short time period
- *Some initial ideas include:* study linkages between empowerment and access to information; analyze relationship between early marriage and climate shocks, or migration and climate resilience (BIHS data); synthesize list of promising program approaches that integrate these themes

Thank you for your time!