Panelist Comments

Win more, lose less:
Capturing synergies between SDGs through agricultural research

Crop productivity and agrobiodiversity

Marianne Bänziger

CIMMYT
Appreciation

- Careful collection and review of a wide range of relevant data, insights and conclusions
- Found very little link between productive major staples, biodiversity and malnutrition
- Show that wanting something to be true – based on popular belief - does not make it true
- Highlight different context and covariates of individual studies; danger of taking a conclusion out of its context, or keeping eyes shut of results that do not align with hypothesis
- Encourage us to assess agricultural interventions *viz* other interventions to achieve objectives
Interpretation and Conclusions (DeFries, 2018)

Fig 3: Nutrient yields of millets and sorghum are indeed less than nutrient yields of whole wheat and maize.

Conclusion sustained by the data: “Whole wheat and maize sustain dietary requirements for more people per area”

Higher nutrient concentrations are achieved with low yields (US grain yields)

- Maize 10.7 t/ha
- Millet 1.8 t/ha
- Sorghum 4.6 t/ha

If we increased yields of millet and sorghum, nutrient concentration would reduce as for any other crop.
Interpretation and Conclusions

**Fig 8:** “Investment in sorghum and millet” to maximize advantages for nutrition and climate resilience

**Appropriate conclusions:**

- The case can be indeed made for “sorghum and millet to replace some rice area in India”
- However, the same case could be made for “maize to replace some rice area in India”.
- “Sorghum to replace some wheat area in India” has outcomes very similar to the baseline.
Other issues

• **BIG question:** “What is needed to change consumer preferences / habits?”
  - DeFries states “Indian households could overcome nutrient deficiencies within their food budgets by diversifying their diets towards coarse cereals, pulses, and leafy vegetables and away from rice.”

• **Generalization is challenging:** Diversity of consumers and life circumstances >> context-specific interventions
  - Cultural, socio-economic context
  - Farmers, rural landless poor, urban poor
  - Men – women – children

• **Comparing interventions:** “Increase farmers’ income to improve nutrition” (M. Qaim @ ISPC)
CIMMYT interventions

- **Climate resilient crops** that combine high yield and resilience: heat tolerant wheat, drought, heat and water-logging tolerant maize

- **Biofortification**: combine high nutrients and high yields: High Zn wheat, high Zn maize, High ProVit A maize

- **Systems based approaches; working in collaboration with multiple commodities:**
  - CIMMYT today invests as much in **farmer-acceptable sustainable intensification approaches** as in crop breeding; optimizing sustainability, food security, incomes, nutrition
  - In South Asia, **diversifying cropping systems**: maize-wheat-legumes-vegetables to replace rice-wheat; indeed no stove pipes

- **Research focus in major crops:**
  - It is not about keeping the green revolution-type interventions going
  - Addressing distinct threats: climate change, newly virulent pest and diseases, malnutrition, water and fertilizer use efficiency, further use of genetic diversity
  - Maize, rice, wheat: hugely important and impactful crops > ROI
Win more, lose less:
Capturing synergies between SDGs through agricultural research

Contribution to food security (or nutrition) as a function of size of land holding (x axis)

Key: Is a different approach acceptable to, and adoptable by farmers?
Summary

• Need for scientific rigor in view of popular press/beliefs: interpretation that is supported by data; generalization is challenging

• Assess likeliness of success of possible interventions

• Define pathway to and adoptability of proposed change, and regularly test hypothesis
  • Low-income consumers: availability and accessibility of affordable, nutritious foods
  • Special focal group for nutrition: women and children
  • Understand farmers’ decision making what crops they grow
  • Policy makers: analyze and highlight unintended impact of subsidies / lack of policy decisions

• Consider that other, non-farm based interventions may be more effective

• Research focus in major crops is different than 50 years ago
  • Resilience in production, food price stability, water and fertilizer use efficiency, human nutrition, genetic diversity, continuing demand increase
  • Hugely important and impactful crops – ROI