

Foresight for Maize and Wheat

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Role of foresight in international maize and wheat research

- Cluster of Activities 1.1 in both Maize and Wheat is dedicated to foresight and targeting
 - Foresight Looking into the crystal ball at the future to understand what it means for us today
 - We define ex-ante impact assessment as the analysis at how pipeline technologies fit into farming systems and livelihood strategies and at the impact of research investments
 - Targeting looks at short term questions of where, when, what and how of technology deployment
- Why Foresight
- *Time gap between IAR4D and deployment 10-25 years.*



Role of foresight in international maize and wheat research

- Maize and wheat are important sources of energy and protein for many poor people in low and middle-income countries
- This will remain the case as we move towards 2050
 - Climate change
 - Population growth
 - Overall economic development
- We have to produce more food with less resources.
- Foresight research is a priority for maize and wheat in which we leverage PIM foresight funding to coalesce CGIAR-wide partnerships. But our foresight research is more than just GFSF



Major topics of foresight research

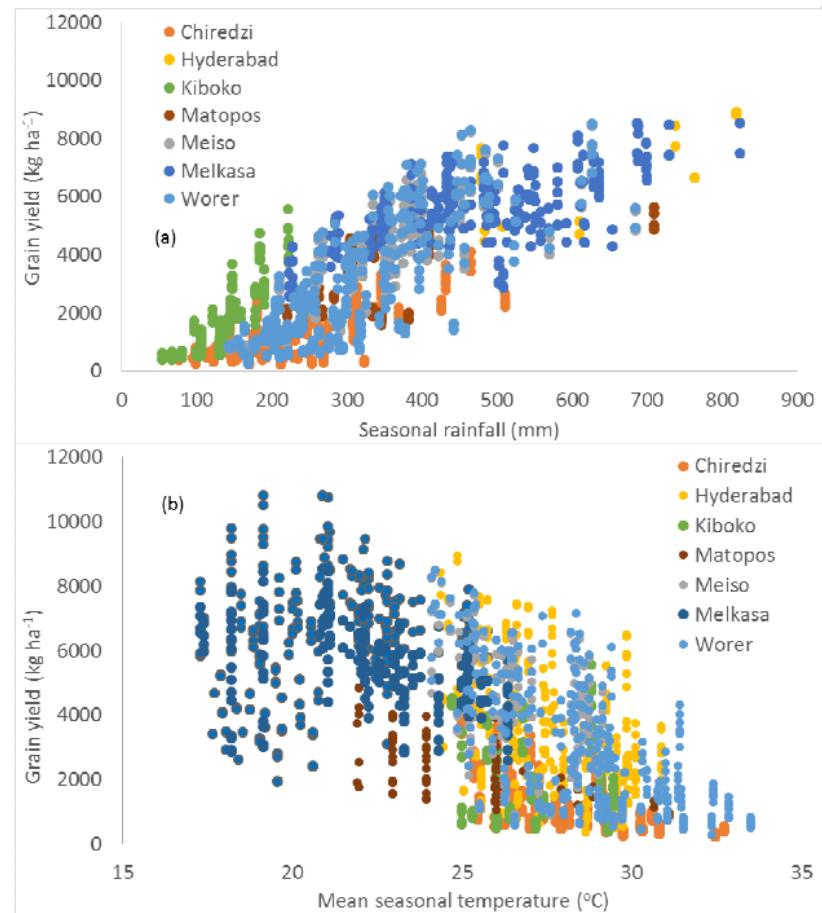
- Discuss our 5 major foresight topics common to both maize and wheat CRPs
- The presentation mentions some recent publications on these topics
- We skip over
 - Ex-ante impact assessment of pipeline technologies
 - Targeting research (GIS based mapping exercises)



Climate change

Major topics of foresight research

- **90%** of research linked to the maize and wheat CRPs has a climate change component
- Accelerated release of abiotic stress tolerant varieties
- GFSF-IMPACT and other models AGMIP
- Publications/studies
 - Potential benefits of drought and heat tolerance for adapting maize to climate change in tropical environments. Kindie Tesfaye, et al. 2018
 - Simulated baseline global wheat production: Gbegbelegbe et al., 2017
 - Impact of long-term climate change on maize production and food security in SSA: Tesfaye et al., 2015



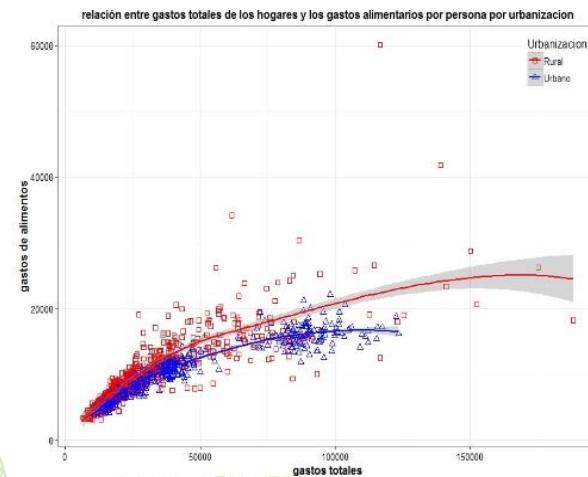
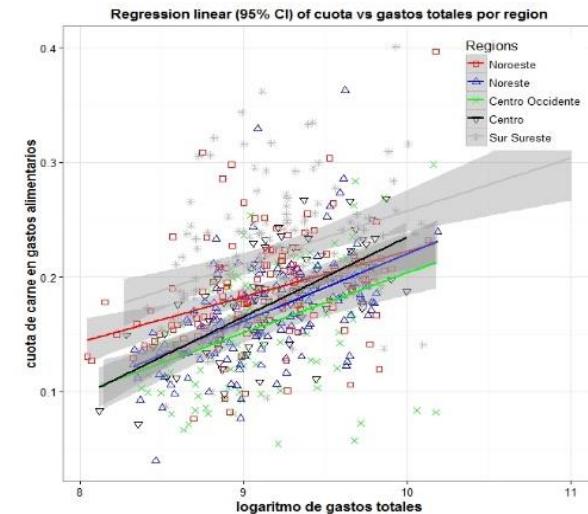
Source: Tesfaye et al. 2018



Changing diets

Major topics of foresight research

- Increased income leads to **changing diets**, not so much a increase or decrease in demand for major staple cereals, but rather:
 - Increased demand for other food commodities that requires **freeing up land** → need to accelerate major cereal productivity growth
 - Change in the required traits of major cereals to address urbanization and longer value chains
- Ensure that major cereals contribute to healthy diets **Nutrition and health** opportunities and challenges: tackling the double burden of malnutrition

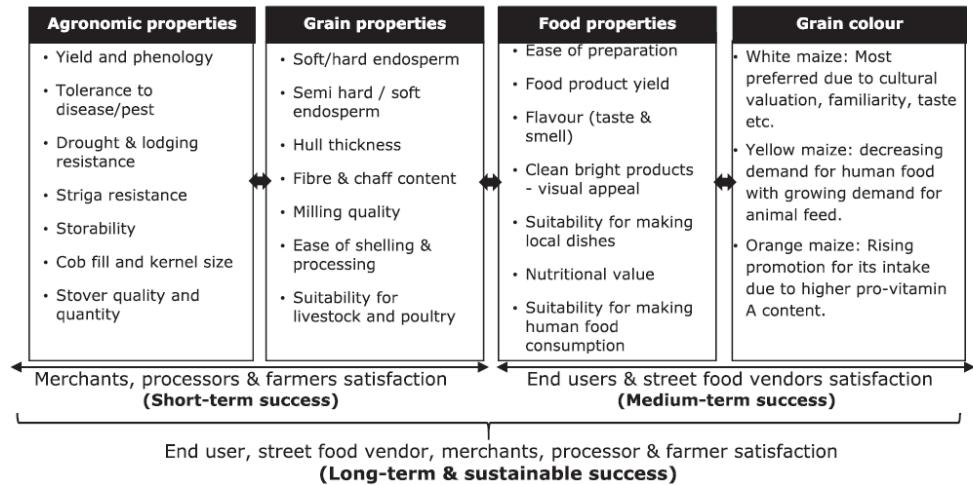


Changing diets

Major topics of foresight research

- Publications/studies

- Mottaleb, et al. 2018a Changing Food Consumption of Household in Developing Countries: A Bangladesh Case.
- Mottaleb, et al. 2018b. Wheat production and consumption dynamics in an Asian rice economy: The Bangladesh case.
- Ekpa et al 2018. Sub-Saharan African maize-based foods: Technological perspectives to increase the food and nutrition security impacts of maize breeding programmes



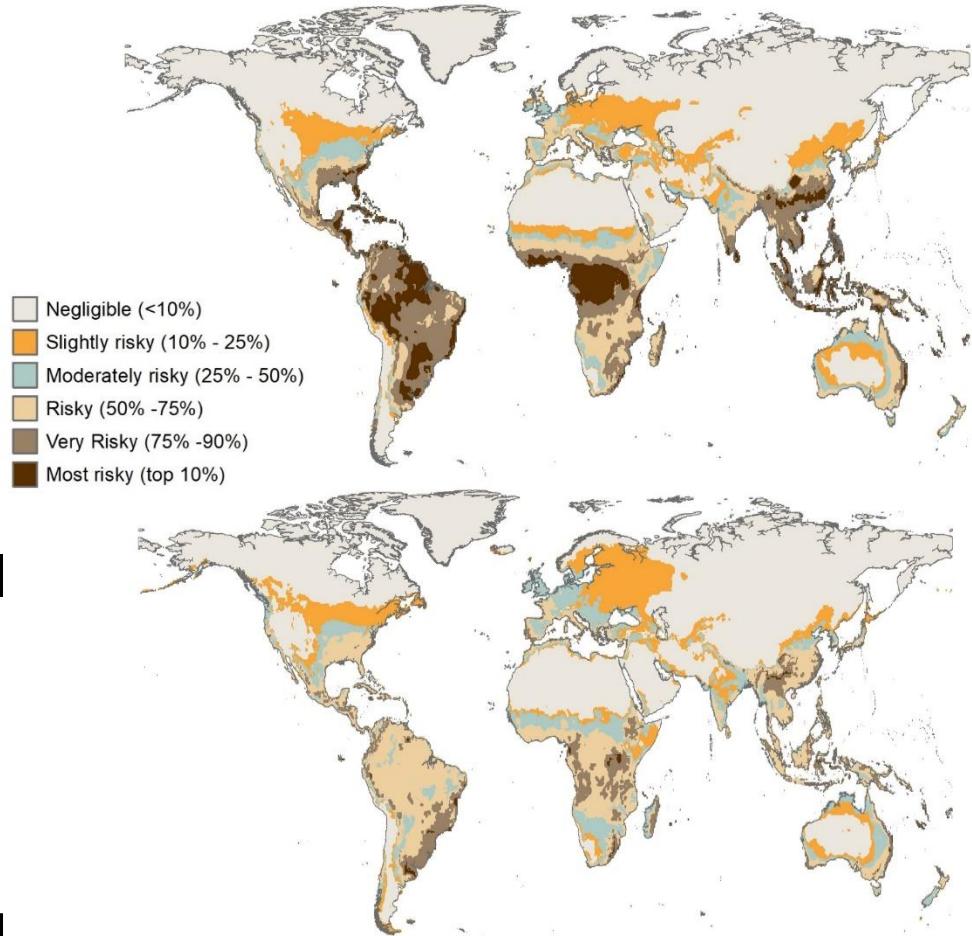
Source: Ekpa et al. 2018



New and emerging pests and diseases

Major topics of foresight research

- Recent issues
 - Maize lethal necrosis east Africa
 - Fall Army Worm in Africa
 - Wheat blast in south Asia
 - Tar spot in the Americas
- These outbreaks are symptomatic of what cereal systems face in terms of emerging biotic stress
- Map the risk
- Prepare for the unexpected

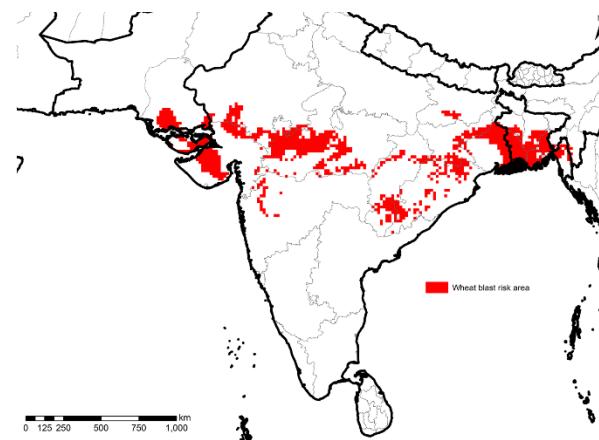


Source: Senay et al. 2018

New and emerging pests and diseases

Major topics of foresight research

- Publications/studies
 - Threats of Tar Spot Complex Disease of Maize in the United States of America and Its Global Consequences: Mottaleb et al., 2018
 - Threat of Wheat Blast to South Asia's Food Security: An Ex ante Analysis: Mottaleb et al. 2018 (accepted for publication)
 - Multi-peril pest risk analysis. Senay et al. submitted

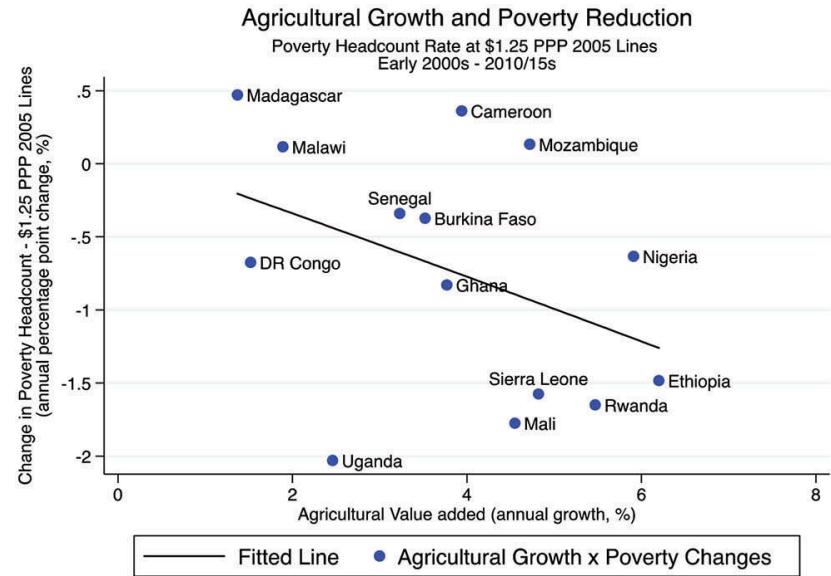


Source: Mottaleb et al. 2018

Rural transformation

Major topics of foresight research

- Market access, population growth, institutional development
- Influence on technology choice and hence technology demand
- Links with value chain development
- Demographics (differential impact on young people)
- Changing roles for men and women
- Publications/studies
 - Kruseman et al (forthcoming) Using rural transformation to understand the future of cereal-based agri-food systems
 - Jayne et al 2018. Africa's Unfolding Economic Transformation
 - Kruseman et al (forthcoming) tipping points in gender inclusive rural transformation



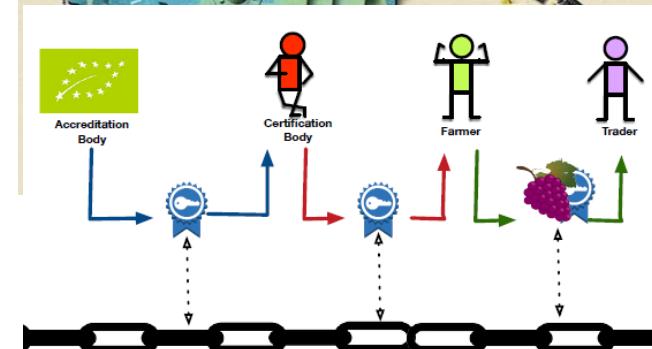
Source: Jayne et al. 2018



Emerging disruptive technology from outside the realm of IAR

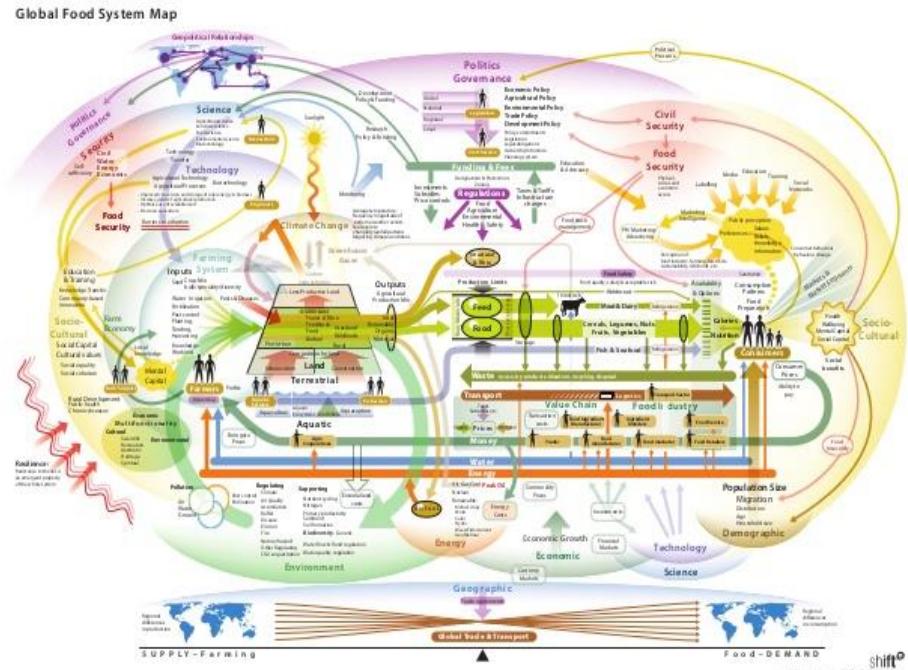
Major topics of foresight research

- Data driven farm management
- Distributed ledger technology
- IoT
- Interactive voice response services
- Publications/studies
 - Kruseman and De Ruyter de Wildt (forthcoming) Distributed Ledger technology for agri-food system value chains: state of the art and future potential



Opportunities

- Foresight and ex-ante impact assessment research is complex and very important
 - We will continue to leverage partnerships such as GFSF, AgMIP and our relationships in academia to further our agenda.



Source: ShiftN <www.shiftn.com>



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