# How can we make genetic innovation more impactful? A CGIAR perspective

MATTY DEMONT Research Leader Markets, Consumers & Nutrition CGIAR International Rice Research Institute (IRRI), Los Baños, Philippines

100 - 1200 µl LIS



## The CGIAR 2030 Research and Innovation Strategy in a nutshell



and innovation for impact.





# Genetic Innovation: 6 Initiatives (2022–2024)

- 1. Accelerated Breeding Initiative (ABI): Meeting Farmers' Needs with Nutritious, Climate-Resilient Crops
- 2. Conservation and Use of Genetic Resources (Genebanks)
- 3. Market Intelligence and Product Profiling Initiative (MIPPI) (\$36M)
- 4. Network 4 Enabling Tools, Technology and Shared Services (N4ETTSS)
- 5. Precision Genetic Technologies (PGT)
- 6. SeEdQUAL: Delivering Genetic Gains in Farmers' Fields

# Market Intelligence and Product Profiling Initiative (MIPPI)

- Investment decision making in CGIAR genetic innovation systems often unilateral and **technology-** or **supply-driven**
- Slow varietal turnover, high average age of varieties in field
- Product profile design biased towards agronomic & stress tolerance traits, **missing out opportunities** for contributing to other Impact Areas: nutrition; livelihoods & jobs; gender equality, youth and social inclusion; climate adaptation/mitigation; environmental health
- Social scientists & national partners **insufficiently empowered** in product profile design
- Market intelligence is **limited**, fragmented & commodity-specific

### MIPPI: Vision

"CGIAR and its partners **maximize investment returns** in breeding, seed systems and other Initiatives across the **five Impact Areas** based on reliable and timely market intelligence. Stronger demand orientation generated by market intelligence strengthens **co-ownership** and coimplementation by CGIAR, NARES, private sector, and NGOs, leading to more strategic efforts to getting high quality products into the fields of women and men smallholder farmers, enhancing livelihoods and diets of populations at large."

# MIPPI: How? MIPPI ABI, N4ETTSS SeEdQUAL

### Market intelligence & benefit assessment

- Effective approaches
- Use and evolve capabilities

Joint hypothesis: Product profiles with greatest uptake and benefit

### Develop varieties most effectively

- Best process incl. speed
- Use and evolve capabilities

**Assess** seed sector uptake and projected benefit

### Scale-up varieties most effectively

- Best process incl. speed
- Use and evolve capabilities

**Assess** farmer uptake and realized benefit

### MIPPI: How?

#### WP1: Market Intelligence

WP2: Product Profile Design

WP3: Behavioral Intelligence

> WP4: Pipeline Investment Cases

#### WP5: Institutional Scaling and MELIA

#### End of Initiative Outcome 1:

Transdisciplinary teams across CGIAR and partners are empowered in coimplementation of market and behavioral intelligence and co-design of product profiles

#### End of Initiative Outcome 2:

CGIAR and partners adopt institutional standards, share market and behavioral intelligence, and monitor outcomes

#### End of Initiative Outcome 3:

Seed industry, food industry, and NGOs use market and behavioral intelligence in strategic decision making

#### End of Initiative Outcome 4:

Research leaders and investors make investment decisions in genetic innovation using pipeline investment cases and the Investor Dashboard

#### Action Area Outcome 2:

CGIAR & partners use highquality market intelligence to guide the development of new varieties to meet the needs and expectations of a wide-range of users, with special attention to marginalized groups

#### Action Area Outcome 5:

Cooperation and coinvestment by CGIAR, publicand private-sector seedsystem actors supports coordinated and effective research and investment in the sector

#### Action Area Outcome 7:

Farmers have access to and use climate-resilient, nutritious, market-demanded crop varieties

#### Action Area Outcome 8:

Women, youth and marginalized groups participate in and benefit from improved crops and value chains Nutrition, health and food security target: End hunger for all and enable affordable healthy diets for the 3 billion people who do not currently have access to safe and nutri tious food.

Poverty reduction, livelihoods and jobs target: Reduce by at least half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.

Gender equality, youth and social inclusion target: Close the gender gap in rights to e conomic resources, access to ownership and control over land and natural resources for over 500 million women who work in food, land and water systems.

Climate adaptation and greenhouse gas reduction target: Equip 500 million small-scale producers to be more resilient to climate shocks, with Climate adaptation solutions a vailable through national innovation systems.

Environmental health and biodiversity target: Stay within planetary and regional environmental boundaries consumptive water use in food production of less than 2500 km3 per ye ar (with a focus on the most stressed basins), zero net deforestation, nitrogen a pplication of 90 Tg per year (with a redistribution towards low-input farming system) and increased use efficiency; and phosphorus application of 10 Tg per year.







# Market Intelligence: What is it?

"Market intelligence" is strategic information\* on future crops, market segments and trait priorities aligned to the needs and preferences of farmers, agri-business and consumers that can be incorporated into product profiles, pipeline investment cases and seed system strategies, enabling genetic innovation systems to contribute to five Impact Areas."

\* "Information" includes future trends in international and domestic markets for the commodity and its by-products, dietary patterns, urbanization, labor and land markets, structural transformation of economies, domestic, regional and international policies, abiotic and biotic stress incidence and severity, environmental conditions and climate.

### Prioritization

• MIPPI designed to become primary **priority setting unit** of CGIAR Genetic Innovation

Global impact challenges

Regional opportunities for genetic innovation

Market segments and product profiles

Pipeline investment cases

### Number of people undernourished



Nutrition, health and food security target: End hunger for all and enable affordable healthy diets for the 3 billion people who do not currently have access to safe and nutritious food.



# Proportion of population under global poverty line (<1.9 US\$/day)



Poverty reduction, livelihoods and jobs target: Reduce by at least half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.



### Age group (for youth)



Gender equality, youth and social inclusion target: Close the gender gap in rights to economic resources, access to ownership and control over land and natural resources for over 500 million women who work in food, land and water systems.



### Global gender gap index



Gender equality, youth and social inclusion target: Close the gender gap in rights to economic resources, access to ownership and control over land and natural resources for over 500 million women who work in food, land and water systems.

Global gender gap index [Quantiles] 0.49 - 0.65 0.66 - 0.69 0.70 - 0.72 0.73 - 0.75 0.76 - 0.88

- Somean

Source: World Economic Forum, Global Gender Gap Report. http://reports.weforum.org/global-gender-gap-report-2020/ Imparity near to 0. Parity near to 1.

### Greenhouse gas emissions on croplands



Climate adaptation and greenhouse gas reduction target: Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.



### Exposure to potential climatic hazards



Climate adaptation and greenhouse gas reduction target: Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.



# Hazards in areas with more than 10% of population under global poverty line (<1.9 US\$/day)

Climate adaptation and greenhouse gas reduction target: Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.

Δ

2

Poverty reduction, livelihoods and jobs target: Reduce by at least half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.



# Predicted global burden of hunger in 2030 under climate change

- mount

DALYs due to chronic and hidden hunger (2030)

[millions] 0.1 2.5 3.8 4.3 6.2 51.7 104.7 Climate adaptation and greenhouse gas reduction target: Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.

Nutrition, health and food security target: End hunger for all and enable affordable healthy diets for the 3 billion people who do not currently have access to safe and nutritious food.

Source: Sulser, T.B., Beach, R.H., Wiebe, K.D., *et al.* 2021. Disability-adjusted life years due to chronic and hidden hunger under food system evolution with climate change and adaptation to 2050. *The American Journal of Clinical Nutrition*, 114(2): 550–563. https://doi.org/10.1093/ajcn/nqab101

Δ

### Crop wild relatives species richness map

- Somean

Environmental health and biodiversity target: Stay within planetary and regional environmental boundaries consumptive water use in food production of less than 2500 km3 per year (with a focus on the most stressed basins), zero net deforestation, nitrogen application of 90 Tg per year (with a redistribution towards low-input farming system) and increased use efficiency; and phosphorus application of 10 Tg per year.

Source: Castañeda-Álvarez, N., Khoury, C., Achicanoy, H., et al. 2016. Global conservation priorities for crop wild relatives. *Nature Plants*; 2: 16022. https://doi.org/10.1038/nplants.2016.22

5



### Soil erosion

Environmental health and biodiversity target: Stay within planetary and regional environmental boundaries consumptive water use in food production of less than 2500 km3 per year (with a focus on the most stressed basins), zero net deforestation, nitrogen application of 90 Tg per year (with a redistribution towards low-input farming system) and increased use efficiency; and phosphorus application of 10 Tg per year.

Global Soil Erosion R-factor [Mg ha-1 yr-1] 0 1 - 1 2 - 4 5 - 10 11 - 325

- moren

Source: Borrelli, P., Robinson, D.A., Fleischer, L.R., *et al.* 2017. An assessment of the global impact of 21st century land use change on soil erosion. *Nature Communications*, 8(1): 2013. <u>https://doi.org/10.1038/s41467-017-02142-7</u>

5





## Expected impacts



Nutrition, health and food security

Poverty reduction, livelihoods and jobs

Gender equality, youth and social inclusion

 Climate adaptation and greenhouse gas reduction

Environmental health and biodiversity

### Investor Dashboard



# Take home messages

- MIPPI = exciting new Initiative aiming at making CGIAR Genetic Innovation decision making more inclusive and impactful
- More diversified impact portfolio expected, beyond productivity and food security
- Increased transparency on impacts and returns to investment expected to attract donor investment
- MIPPI wants to catalyze more inclusive decision-making in breeding networks around the world
- Strong engagement with public and private sector partners is key

# Thank you!

m.demont@irri.org

100 – 1200 µl. LT

