Overview of the major impact of agricultural research of the CGIAR

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Food Systems Challenges in the Region

GROWING INEQUITIES
ASEAN has successfully slashed poverty rates, but aggregates hide women’s disadvantage

COVID-19 IMPACTS
COVID-19 impact on nutrition security due to decreased income – less nutritious foods on the plates of the poor

URBANIZATION
Presents a set of new challenges like labor shortages in rural areas

CLIMATE CHANGE
IPCC AR6 notes that heat extremes have increased while cold extremes have decreased, and these trends will continue over the coming decades in the whole of Asia

BIODIVERSITY LOSS
Many key components of biodiversity for food and agriculture at genetic, species, and ecosystem levels are declining while threats to diversity are increasing

FOOD AND NUTRITION INSECURITY
The subregion experiences a malnutrition burden among children under 5 years of age and its adult population
Our strategy in addressing these challenges

- **Pressing challenges** to food systems, human and planetary health require a powerful and unified global effort

- CGIAR as a key player in global food, land and water systems transformation

- CGIAR will work towards:
  - **Transformative change** across five SDG-related Impact Areas
  - Investment in innovation systems, partnerships, capacity development and policy engagement across all five areas
CGIAR has a solid track record

- Over the years, we have delivered innovations that support, empower, and improve the livelihoods of our stakeholders.

- In a study about “Payoffs to half a century of CGIAR research”, authors concluded that CGIAR research yielded a tenfold return to investment.

- According to an article on “Projected Benefits of CGIAR Research”, the integrative strategy of the One CGIAR has the potential to result in substantial benefit to both people and planet, as it embraces four pillars of socio-technical innovation bundles.
Climate change poses major risks for food production, livelihoods and nutrition through high temperatures, erratic rainfall, drought, flooding, and sea level rise.

**Climate-smart rice**: Rice varieties that are resilient to stresses such as drought, salt, flood, and temperature tolerant.

**Asian Mega Deltas**: Securing the Asian Mega-Deltas from sea-level rise, flooding, salinization and water insecurity.

- Around 4.8 million people will benefit from climate adaptation through use of digital climate advisory services, improved agronomic practices, and income gains derived from use of these innovations.
Climate adaptation and mitigation

Supporting vulnerable small-scale producers to adapt to climate change and reducing greenhouse gas emissions from agrifood value chains are essential for sustaining food systems and ensuring food and nutrition security.

Greenhouse gas (GHG) mitigation in rice

- Covers rice management practices, data on biophysical and socioeconomic suitability of farming technologies and practices, and policy actions in Bangladesh, Colombia, and Vietnam.

Alternate Wetting and Drying (AWD)

- More controlled irrigation strategy that can significantly reduce methane emissions (average of 48%) as well as water consumption (up to 30%) and pumping costs.

Improved direct seeding

- Reduce water use by 40% and GHG emissions by 47%, and lessen cultivation time, labor, and cost of production.
Environmental Health and Biodiversity

A third of the world’s soils are degraded, and agriculture accounts for about 70% of global freshwater withdrawals.

Models to safely reuse wastewater and nutrients
- Will benefit 885 million urban residents exposed to food produced with unsafe irrigation water.

Fertilizer Microdosing
- Can result in crop yield increases ranging from 43% to 120%.

Water pricing
- In India, pricing of irrigation water was implemented to conserve water resources.
- This policy remains a challenge, yet, CGIAR research is positioned well to lead discussions on refining water policy and economics taking into consideration the social and economic factors of water pricing.
Gender equality, youth and social inclusion

In low- and middle-income nations, women work in agriculture at a rate of 43% on average, but they have limited access to resources, rights, and services, which hinders everyone's progress.

Smart valley approach
- Low-cost, participatory and sustainable approach to develop the bottoms of inland valleys for rice-based systems.
- Recorded a 94% increase in rice yield in five countries in West Africa. Increase net income by $267 per hectare under climate change-affected conditions; 1,370 hectares have been developed using this approach, benefitting at least 14,027 households.
- To date, 21 countries, including South and Southeast Asia, are potentially benefiting millions of farmers.

Women Producer Company (WPC) initiative
- Over 1300 members in Odisha have been provided with comprehensive services including input provision (seed, fertilizers, bio-pesticides), hiring of agricultural machinery, financial services, marketing and access to latest technologies. This contributes to increased incomes and better livelihoods for these farmers and their families.
Poverty reduction, livelihood and jobs

More than 3 billion people cannot afford a healthy diet. Twenty-five (25%) of the world's population lives on less than US $3.20 per day.

- In this study, 17 ex-post impact assessment studies on rice innovations were reviewed.

- Authors found out that stress-tolerant rice varieties in Asia and Africa significantly increased rice yield and income. Innovations, training, and natural resource management practices, have had a considerable positive effect on smallholder rice farmers’ economic well-being.
Nutrition, health and food security

Human health is threatened by poor food safety and diseases transmitted within food systems. Diet-related non-communicable diseases are also increasing across the globe.

Product diversification and higher quality output:
- Developed biofortified varieties with enriched micronutrient content such as provitamin A, iron, and zinc, and rice varieties with lower glycemic index and antioxidant properties.
- IR64 or the mega rice was widely cultivated in over 10 million hectares.

Sustainable Rice-Based Food System:
- Three Reductions, three Gains or One Must Do, Five Reductions and Sustainable Rice Platform (SRP). These practices resulted having domestic consumers in Vietnam willing to pay a 9–33% premium for certified sustainably produced rice.

Healthy aquatic food systems for nutrition and livelihoods:
- Polyculture of micronutrient-rich indigenous fish species (carp, tilapia and mola) enhances nutritional value of food readily available.
- Reached 700,000 households in Bangladesh, and scaling to reach another 65,000 households in Odisha, in household ponds and women-run community ponds.
## A paradigm shift to food system transformation

<table>
<thead>
<tr>
<th>Agricultural productivity paradigm</th>
<th>Food system efficiency paradigm</th>
<th>Possible implications of the evolution</th>
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<tbody>
<tr>
<td>Farm systems focused on agricultural production</td>
<td>Food systems focused on healthy and sustainable diets</td>
<td>Need to look beyond the agricultural sector. Involve several institutions beyond ministries of agriculture.</td>
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<tr>
<td>Agricultural supply/availability</td>
<td>Food demand, access, quality, safety, utilization</td>
<td>Shift from a primary focus on production/producer welfare to a primary focus on consumption/consumer welfare.</td>
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<tr>
<td>Cheap &amp; abundant staples</td>
<td>Nutritious &amp; diversified foods</td>
<td>Higher prices are likely for consumers. They may require safety nets for the poorest households. Small farmers may get higher prices and become more competitive.</td>
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<tr>
<td>Calories, proteins</td>
<td>Macronutrients, micronutrients, &amp; vitamins</td>
<td>Methods, tools and mechanisms to measure and monitor nutrition performance of food systems would need to adjust.</td>
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<tr>
<td>Crop productivity</td>
<td>Sustainable intensification, Total factor productivity</td>
<td>More complex management of the farm environment with multiple and sometimes competing performance indicators.</td>
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<tr>
<td>Mono-cropping</td>
<td>Farm diversification</td>
<td>Less control of agribusiness in the short term. Likely more diversified foods and biodiversity.</td>
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<tr>
<td>Economy of scale</td>
<td>Value addition, quality</td>
<td>Change in performance measurement with a focus on value addition per unit of labor as opposed to yield.</td>
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<td>Land access</td>
<td>Land restitution</td>
<td>Possible negative consequences for marginal farmers relying on marginal land. Likely increase of land price and speculation on land markets.</td>
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<tr>
<td>Feeding people</td>
<td>Nourishing people</td>
<td>Change in quality and price of food.</td>
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Matching partnerships to specific challenges

Peer relationships: NARES will be CGIAR’s primary peers

Multi-stakeholder platforms, global and regional bodies to help with regional integration

Partnerships with the private sector to accelerate sector-wide progress

- Specific demands of regions, countries and landscapes will shape partnerships
- Greater diversity in the range of partners — beyond agriculture
- As a trusted independent party, CGIAR provides a single point of entry
- Solutions from coordinated action across sectors
- CGIAR will work with partners to:
  - Co-identify challenges and research foci
  - Co-generate evidence and awareness
  - Co-deliver innovations
CGIAR and Crawford Fund

+ largest agricultural research network
+ global presence including Australia
+ transform food, land and water systems in climate crisis for future generations

+ capacity building among young Australian students and scientists in international agricultural research and development

+ stronger and impactful agricultural research investment enabling greater benefits of science for a food-secure world

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Thank you