Outline

1. Bangladesh Agriculture Overview
2. Enabling environment
3. Investment plan and opportunities
Section 1: Bangladesh Overview

Per Capita Income is USD 2824 (current price) in 2021-22 (a threefold increase in last decade)

- GDP growth rate is 7.25% (2021-22). Currently, 41st largest economy (GDP USD 463B) in the world
- Attained lower middle income country status in 2015, LDC graduation by 2026
- Vision of attaining upper middle-income status by 2031, high income country by 2041
- Poverty rate reduced by half: 20.5% in 2019, down from 40% in 2005
- Prevalence of undernourishment 11.4% in 2019-21 declined from 15.9% in 2000-2002

Population (BBS 2022), 8th highest
- Pop density 1,113 per Km²

USD 71B national budget for 2022-23 (12% higher than previous year)

USD 5.8B processed food market by 2030*

Population 165M, 8th highest

Poverty rate reduced by half: 20.5% in 2019, down from 40% in 2005

Prevalence of undernourishment 11.4% in 2019-21 declined from 15.9% in 2000-2002

Source: Bangladesh Bureau of Statistics 2022; Bangladesh Investment Development Authority; *Foreign Investors Chamber of Commerce & Industry publication

Household income is 47% spent on food now

Broad Sectoral GDP Growth at Constant Prices

10/6/2022
Agriculture share to GDP & value added to GDP from agriculture

- Agriculture contribution to GDP: 37%
- National labor force in agriculture: 3.7 times
- Rice production increased since 1971

Increase in production of major crops

- Bangladesh among Top 10 producers of rice, jute, jackfruit, mango, onion, tea, vegetables, potato, farm fish

Production of fruits and vegetables increased several folds

- 70% people live in rural areas

Sources: World Bank, 2020; 2021; BBS (2022); FAO 2022
Agriculture Sector Challenges and Opportunities

**Challenges**

- 85% of total farmers are small-holders
- Climate change with extreme climatic events (cyclones, tidal surges)
- Water management issues: drought, flood, salinity, and water logging

**Opportunities**

- Dynamic and resilient agricultural human resources
- Abundant natural resources:
  - fertile land (7.77M hectare of arable land - 58.2% of total land)
  - water resources (700 rivers, tributaries, and thousands of canals)
  - adequate rainfall (2,200 mm annually)
  - sunlight (daily solar radiation 4-5 kWh/m²)
  - Agro-climatic suitability for year-round crop production
- Dynamic research system across the country (17 Agri-based research institutes)
- High potential for export market (export of agro-products doubled in last 7 years)
Enabling Infrastructure and Fiscal Policy

- **Building of 100 Special Economic Zones**
- **580 km coastline with 90% international trade, Chittagong 64th busiest seaport**
- **Double Taxation Treaties (DTTs) with 36 countries**
- **100% foreign ownership is allowed in nearly all sectors**
- **14 FTAs SAFTA BIMSTEC**
- **3 international, and 5 domestic airports**
- **International accredited laboratories**
- **100% foreign ownership is allowed in nearly all sectors**
- **Continuously increase digital literacy**

### GOVERNMENT SUPPORT

<table>
<thead>
<tr>
<th></th>
<th>Regular tax break</th>
<th>20% cash incentives for exports</th>
<th>Regular facilities for diversification, new investment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENTREPRENEUR INCENTIVES</strong></td>
<td>Adoption of modern technology</td>
<td>Ensuring quality of products</td>
<td></td>
</tr>
</tbody>
</table>

### OUTCOMES

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Around 500 agriculture factories</strong></td>
<td><strong>500,000 direct employment</strong></td>
<td><strong>Export-oriented factories: 200</strong></td>
<td><strong>Agro-food processing industry contributes 1.7% to GDP</strong></td>
</tr>
</tbody>
</table>

**The Government agencies to support private sector investments**

- **Private Sector Development Policy Coordination Committee**
- **Bangladesh Economic Zones Authority (BEZA)**
- **Bangladesh Export Processing Zones Authority (BEPZA)**
- **Bangladesh Investment Development Authority (BIDA)**
- **Supportive national policies and plans- Bangladesh Delta Plan 2100, Mujib Climate Prosperity Plan- Decade 2030.**

*Source: Bangladesh Investment Development Authority*
Investments and FAO-Private Sector Engagement

Through the HiHi the Private Sector got a unique opportunity to discuss with the Government and Development Partners to share their plans for concerns for investment in agriculture.

Foreign direct investment in agro-processing

- Agriculture budget in 2021-22: USD 1.72B
- Increased by 50%
- Agriculture budget in 2022-23: USD 2.58B

Partial amount for Implementation of NAP

- USD 2.9B program
- USD 1.8B Gov. funds
- USD 1.1B gap filled by:
  - USD 500M – WB
  - USD 43M - IFAD
  - USD 100M – ADB (under discussion)
  - USD 50M – IsDB (under discussion)
  - USD 400M – remaining gap

Potential Investment areas of WB funded PARTNER project

Source: World Bank 2021
Section 3: Bangladesh offers a rich portfolio of investments

**Cold storage and Post harvest management**
- Mango: Rajshahi, Naogaon, Chapainawabganj, Satkhira, CHTs
- Potato: Rajshahi, Bogura, Munshiganj, Rangpur
- Tomato: Rajshahi, Bogura, Cumilla, Jashore
- Onion: Rajshahi, Faridpur
- Carrot: Dhaka, Manikganj
- Additional value chains e.g. litchi, vegetables etc.
- Multipurpose cold storage is in the agenda

**AgroProcessing and Marketing**
- Mango: Rajshahi, Naogaon, Chapainawabganj, Satkhira, CHTs
- Potato: Bogura, Munshiganj, Rajshahi, Rangpur
- Litchi: Dinajpur
- Vegetables: Rajshahi, Bogura, Rangpur, Cumilla, Jashore, Kushtia
- Jackfruit: Gazipur, Tangail, Mymensingh, Narsingdi, CHTs
- Pineapple: Tangail, CHTs

**Climate Smart Agriculture**
- Develop and disseminate stress tolerant crop varieties e.g. rice, wheat, maize, lentil, sunflower, peanut, sesame and mung bean
- & develop smart water management practices
- Two Research Centre/Sub-Station in each region - Rajshahi, Sylhet, Barishal, Khulna, CHTs, Noakhali

**Irrigation and Water Management**
- Excavation of ponds, canals, lakes, Buried pipeline for irrigation and drainage; and solar energy powered irrigation
- Barind, coastal and hill areas for rain water harvesting and solar energy use
- Haor Area- flash flood protection, irrigation facilities with buried pipe, sprinkler, and drip (for efficiency).

Stakeholders of several Bangladesh’s key agricultural areas, including Government, Private Sector, NGO and Farmer identified agro-processing and cold storage as key priorities for the development of the agricultural sector.
Opportunities reducing post harvest loss for key value chains prioritized

Why prioritize Cold Storage and Agro Processing?

Cold storage facilities for fruits and vegetables (except potato) are almost not existent in Bangladesh, post harvest losses are 25-50% for several value chains.

Benefits of investing in cold storage and agro processing

- Reduced post-harvest losses
- More stable crops' supply availability
- Reduced seasonal price volatility
- Higher prices achieved by farmers
- Improved practices and technologies
- Improved food quality and safety
- Improved cool chain
- Improved livelihood of farmers and food security
- Energy savings and climate mitigation
- Enhanced climate adaptation (strengthened agricultural value chain)
- Increased production, enhanced value addition and private sector development (e.g. food processing, machinery industry..)
- Reduced import and enhanced export

Value chains with the highest impact potential prioritized for HiH

2nd most produced crop
Most imported spice
Most produced fruit, but price paid is low
35% losses; high reliance on tomato products imports
Immediate additional investment in next 5 years ~USD 1.5bn

Investment needed by theme
(only main value chains shown)

USD M

- Cold storage, 737
- Climate Smart Agriculture, 316
- Irrigation and water management, 265
- AgroProcessing and marketing, 193

Cold storage and Agro Processing investment needs
USD M

- Mango, ~90
- Onion, ~75
- Potato, ~410
- Pineapple, 21
- Jackfruit, 44
- Other vegetables and fruits, ~278
- Tomato, ~15

Sum = ~USD 930M

Sum = ~USD 1.5B
Key opportunities in the Potato value chain

**Improvement areas**

Potato is the 2nd largest produced crop, production has recently overtaken annual demand, with >25% post-harvest losses

**Key Improvement Areas:**
- Increase cold storage infrastructure
- Increase share of value added products being created in value chain
- Invest in climate resilient seed varieties

<table>
<thead>
<tr>
<th>Cold storage</th>
<th>Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD ~329M</td>
<td>USD ~79M</td>
</tr>
</tbody>
</table>

To increase cold storage to 25% of annual production

To increase processing to 2% of annual production

**Sales markets**

Produce to be sold domestically to improve supply in summer months

50% chips to be exported to Gulf countries, and 50% sold domestically

**Beneficiaries**

<table>
<thead>
<tr>
<th>Direct</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>~642,000 farmers</td>
<td>~1,965,000 household members</td>
</tr>
<tr>
<td>~74,000 farmers</td>
<td>~225,000 household members</td>
</tr>
<tr>
<td>~28,800 jobs created</td>
<td>~400 jobs created</td>
</tr>
</tbody>
</table>

**Environmental Impact (tonnes CO₂ saved)**

~4.49mn

~514k

**Sample Key Investments**

<table>
<thead>
<tr>
<th>Scope</th>
<th>NPV</th>
<th>IRR</th>
<th>Investment</th>
<th>Per facility new jobs</th>
<th>Per farmer benefit p.a.</th>
<th>Risks and mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>To increase cold storage to 25% of annual production in e.g. Rajshahi, Bogura, Munshiganj</td>
<td>~USD 0.4M</td>
<td>~15%</td>
<td>~USD 1.14M</td>
<td>~100</td>
<td>~USD 180 profit increase</td>
<td>Issues with power can be mitigated by using solar</td>
</tr>
<tr>
<td>To increase processing to 2% of annual production in Munshiganj</td>
<td>~USD 5M</td>
<td>~15%</td>
<td>~USD ~4M</td>
<td>~20</td>
<td>~USD 15 profit increase</td>
<td>Shortage of skilled staff to be mitigated through training programs</td>
</tr>
</tbody>
</table>

**NPV**

~USD 0.4M

~USD 5M

**IRR**

~15%

~15%

**Investment**

~USD 1.14M

~USD ~4M

**Per facility new jobs**

~100

~USD 180 profit increase

**Per farmer benefit p.a.**

~USD 15 profit increase

**Enablers**

- Stable seasonal supply: ~10M MT every year
- Potato industry gets 5-10 year tax exemption on income
- No duty on export
- Exporters enjoy 20% cash incentives on export
- Bonded warehousing facility for export-oriented industry

**Scope**

Plant of 6,000 MT yr cold storage capacity in e.g. Rajshahi, Bogura, Munshiganj

1 plant of 10,000 MT/year of potatoes processed per year in Munshiganj

**NPV**

~USD 0.4M

~USD 5M

**IRR**

~15%

~15%

**Investment**

~USD 1.14M

~USD ~4M

**Per facility new jobs**

~100

~USD 180 profit increase

**Per farmer benefit p.a.**

~USD 15 profit increase

**Risks and mitigation**

Issues with power can be mitigated by using solar

Shortage of skilled staff to be mitigated through training programs
Key opportunities in the Mango value chain

**Improvement areas**

Mango is the highest produced fruit, >30% post-harvest losses, due to high supply and moderate demand, price is low

**Key Improvement Areas:**
- Increase cold storage infrastructure
- Increase share of value added products being created in value chain
- Invest in climate resilient seed varieties
- Enable better credit facilities for farmers

**Cold storage**

<table>
<thead>
<tr>
<th>National level investment needed</th>
<th>USD ~40M</th>
</tr>
</thead>
<tbody>
<tr>
<td>To increase cold storage to 25% of annual production</td>
<td></td>
</tr>
</tbody>
</table>

**Processing**

<table>
<thead>
<tr>
<th>National level investment needed</th>
<th>USD ~49M</th>
</tr>
</thead>
<tbody>
<tr>
<td>To increase processing to 10% of annual production</td>
<td></td>
</tr>
</tbody>
</table>

**Sales markets**

- 80% produce to be sold domestically and 20% exported to Gulf countries
- 100% of products exported to Gulf countries, Europe in case of higher quality

**Beneficiaries**

<table>
<thead>
<tr>
<th>Direct</th>
<th>~408,000 farmers</th>
<th>~234,000 farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect</td>
<td>~125,000 household members</td>
<td>~715,000 people household members</td>
</tr>
<tr>
<td>~2500 new jobs</td>
<td>~12,800 new jobs</td>
<td></td>
</tr>
</tbody>
</table>

**Environmental Impact (tonnes CO₂ saved)**

- ~552k
- ~315k

**Enablers**

- Stable seasonal supply: ~1.2M MT every year
- Mango industry gets 5-10 year tax exemption on income
- No duty on export
- Cash incentives on exports
- Bonded warehousing facility for export-oriented industry

**Sample Key Investments**

<table>
<thead>
<tr>
<th>Scope</th>
<th>Plant of 1,000 MT/yr cold storage capacity in e.g. Rajshahi</th>
<th>1 plant of 10,000 MT/year of mangoes processed per year in e.g. Rajshahi</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV</td>
<td>~USD 65,000</td>
<td>~USD 4-9M</td>
</tr>
<tr>
<td>IRR</td>
<td>~15%</td>
<td>20-40% for pulp, 60-70% for juice</td>
</tr>
<tr>
<td>Investment</td>
<td>~USD 190,000</td>
<td>USD ~4M</td>
</tr>
<tr>
<td>Per facility new jobs</td>
<td>10-20</td>
<td>60-70</td>
</tr>
<tr>
<td>Per farmer benefit p.a.</td>
<td>~USD 480 profit increase</td>
<td>~USD 25 profit increase</td>
</tr>
</tbody>
</table>

**Risks and mitigation**

- Manage input (mango) price volatility through offtaker contracts
- Issues with power can be mitigated by using solar
- Shortage of skilled staff to be mitigated through training programs
Key opportunities in the Onion value chain

**Improvement areas**

Onion is the crop with most dependence on imports while facing >25% post-harvest losses, typically acute shortages are felt during 4-5 off-peak months

**Key Improvement Areas:**
- Increase cold storage infrastructure
- Invest in climate resilient seed varieties

**Cold storage**

USD ~75M

To increase cold storage to 25% of annual production

**Sales markets**

100% to be sold domestically to meet the shortage in off-peak months

**Beneficiaries**

Direct

~266,300 farmers

~815,000 people

~3000 new jobs

Indirect

~1mn

**Environmental Impact (tonnes CO₂ saved)**

~1mn

**Enablers**

- Stable seasonal supply: ~2.3M MT every year
- Regarded as priority agro-product by the Government for attaining self-sufficiency
- Onion industry gets 5-10 year tax exemption on income

**Sample Key Investments**

**Scope**

Plant of 2000 MT/yr cold storage capacity in e.g. Rajshahi, Faridpur

**Financials per plant**

<table>
<thead>
<tr>
<th>NPV</th>
<th>~USD 130,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRR</td>
<td>15%</td>
</tr>
<tr>
<td>Investment</td>
<td>~USD 380,000</td>
</tr>
</tbody>
</table>

**Benefits per plant**

~15 new jobs created

Increase in farmer income by USD 243 p.a.

**Risks and mitigation**

- Issues with power can be mitigated by using solar
- Insufficient trained staff can be mitigated by creating programs and hiring international specialists
Key opportunities in the Tomato value chain

Improvement areas

Experiences ~40% post-harvest losses; high dependence on import of processed products

Key Improvement Areas:
Increase cold storage infrastructure to meet local demand and potentially tap into export market
Invest in climate resilient seed varieties

<table>
<thead>
<tr>
<th>Cold storage</th>
<th>Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD ~15M</td>
<td></td>
</tr>
</tbody>
</table>

To increase cold storage to 25% of annual production

Sales markets

100% to be sold domestically to meet shortage in offpeak months
80% to be sold domestically and 20% exported to Gulf countries, Australia, and South East Asia

Beneficiaries

Direct
~40,000 farmers
~124,000 people
~1000 new jobs

Indirect
-not sized-

Environmental Impact (tonnes CO₂ saved)
57k, assuming 30% of tomatoes stored were previously wasted

Enablers

• Stable seasonal supply: total nearly 0.5M MT every year
• Tomato industry gets 5-10 year tax exemption on income
• No duty on export
• 20% cash incentives on exports
• Bonded warehousing facility for export-oriented industry

Sample Key Investments

<table>
<thead>
<tr>
<th>Scope</th>
<th>Plant of 1,000 MT/yr cold storage capacity in e.g. Rajshahi, Cumila, Bogura</th>
<th>Plant of 10,000 MT/yr producing tomato paste</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV</td>
<td>~USD 65,000</td>
<td>~USD 200-400K</td>
</tr>
<tr>
<td>IRR</td>
<td>~15%</td>
<td>~15-20%</td>
</tr>
<tr>
<td>Investment</td>
<td>~USD 190,000</td>
<td>~USD 300,000</td>
</tr>
<tr>
<td>Per facility new jobs</td>
<td>10-20</td>
<td>~60-70</td>
</tr>
<tr>
<td>Per farmer benefit p.a.</td>
<td>~USD 690 p.a.</td>
<td>~USD18 p.a.</td>
</tr>
</tbody>
</table>

Risks and mitigation

• Issues with power can be mitigated by using solar
• Insufficient trained staff can be mitigated by creating programs and hiring international specialists
<table>
<thead>
<tr>
<th><strong>KEY INVESTMENTS</strong></th>
<th><strong>INTRODUCTION</strong></th>
<th><strong>COST (USD)</strong></th>
<th><strong>IRR (%)</strong></th>
<th><strong>VPN</strong></th>
<th><strong>SUSTAINABILITY BENEFITS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potato</strong></td>
<td>Grow cold storage capacity to 25% and processing capacity to 2% (of production)</td>
<td>~15M</td>
<td>15%</td>
<td>USD 5M</td>
<td>~164,000 Beneficiaries</td>
</tr>
<tr>
<td><strong>Tomato</strong></td>
<td>Grow cold storage capacity to 25% of production</td>
<td>~410M</td>
<td>15-20%</td>
<td>USD 211M</td>
<td>~2.9mn Beneficiaries</td>
</tr>
<tr>
<td><strong>Onion</strong></td>
<td>Grow cold storage capacity to 25% of production</td>
<td>~90M</td>
<td>15%</td>
<td>USD 87M</td>
<td>~2.6mn Beneficiaries</td>
</tr>
<tr>
<td><strong>Mango</strong></td>
<td>Grow cold storage capacity to 25% and processing capacity to 10% (of production)</td>
<td>~75M</td>
<td>15%</td>
<td>USD 26M</td>
<td>~1.08mn Beneficiaries</td>
</tr>
</tbody>
</table>
### Why prioritize Climate Smart Agriculture (CSA) and Irrigation and Water Management (IWM)?

Prioritizing CSA is essential to set Agriculture on a resilient growth path given the resource constraints (e.g. Labor and Land), IWM is important because about 80% of water is used in agriculture and because of soil erosion and salinization. Also, while 97% of population has access to water; its quality is a major concern.

<table>
<thead>
<tr>
<th>Immediate Investment in CSA: USD 316M</th>
<th>Immediate Investment in IWM: USD 265M</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Establishment/ strengthening of Specialized Research Stations in Coastal Area, CHT Area, Barind Area</td>
<td></td>
</tr>
<tr>
<td>• Developing climate resilient rice varieties</td>
<td></td>
</tr>
<tr>
<td>• Developing market driven tomato and potato varieties</td>
<td></td>
</tr>
<tr>
<td>• Buried pipe and sprinkler irrigation in Barind Area and Jashore Region</td>
<td></td>
</tr>
<tr>
<td>• Shallow Tube-Well establishment in Haor Region</td>
<td></td>
</tr>
<tr>
<td>• Rain water harvesting through excavation/ reexcavation of ponds, canals, beels etc. in Coastal Area and CHT area</td>
<td></td>
</tr>
<tr>
<td>• Developing solar irrigation system</td>
<td></td>
</tr>
</tbody>
</table>

### Why investing in pineapple and jackfruit value chains (VCs)?

With a production of 0.47 and 1.87 M MT, and yields of 15 and 35 MT/ha, respectively, pineapple and jackfruit have positive VC margins and potential for development.

<table>
<thead>
<tr>
<th>Key Improvement in Pineapple Value Chain:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increase cold storage infrastructure and processing (juice and canned fruits)</td>
</tr>
<tr>
<td>• Increase share of VC products being created in VC</td>
</tr>
<tr>
<td>• Invest in climate resilient seed varieties</td>
</tr>
<tr>
<td>• Enable better credit facilities for farmers</td>
</tr>
<tr>
<td><strong>Key growing regions</strong>: Tangail and CHTs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Improvement in Jackfruit Value Chain:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increase cold storage infrastructure and processing (chips and canned fruits)</td>
</tr>
<tr>
<td>• Increase share of VC products being created in VC</td>
</tr>
<tr>
<td>• Invest in climate resilient seed varieties</td>
</tr>
<tr>
<td>• Enable better credit facilities for farmers</td>
</tr>
<tr>
<td><strong>Key growing regions</strong>: Gazipur, Tangail, Mymensingh, Narshindi and CHTs</td>
</tr>
</tbody>
</table>

**Immediate Investment in Pineapple processing: USD 21M**  **Immediate Investment in jackfruit processing: USD 44M**
Next steps

1. Commitment on cold storage and agro-processing (590M USD), with focus on potatoes, tomatoes, mangoes and onions

2. Exploration of other profitable value chains (ie: pineapple, jackfruit, banana, carrots, litchi, vegetables) and Specialized Cold storage for flowers (343M USD)

3. Development and commitment to CSA (316M USD) and irrigation and water management opportunities – rain water harvesting through excavation & re-excavation of ponds & canals (265M USD)