Global Trends in Public-Private Partnerships in Grain Storage

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Approach and Content

- Brief Overview: Food Prices, SGRs and Government Policies
- The Rationale for PPP
- PPP Models
- Brief Overview of Countries
  - India
  - Pakistan
  - Oman
  - Nigeria
  - Zambia
  - Philippines
- Structuring of the Punjab Silo Project
KNOWLEDGE PRODUCT ON PPP IN GRAIN STORAGE

Objective:

Convert tacit knowledge of internal and external practitioners into explicit knowledge for adding to PPP knowledge base

Content:

- Country cases
- Related technical information
- New Bite-sized videos
- BBL for internal audiences
- Webinar/s for external & internal audiences

Extended Team

<table>
<thead>
<tr>
<th>IFC/WB</th>
<th>Government</th>
<th>Private Sector</th>
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<tbody>
<tr>
<td>Yusra Baloch</td>
<td>Sutura Bello</td>
<td>Keith Smith</td>
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<td>Yasser Altaf</td>
<td>Survesh Kumar</td>
<td>J.S. Oberoi</td>
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<tr>
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<td>Sheo Shekhar Shukla</td>
<td>Christopher Helm</td>
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<td>Ali Habaj</td>
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<td>Arvind Mayaram</td>
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<td>Indira Ekanayake</td>
<td>Anoop Kumar</td>
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<td>David McKee</td>
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<td>Brien Desilets</td>
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# Food Prices, SGRs and Government Policies

<table>
<thead>
<tr>
<th>Country</th>
<th>Reserves/ Planned Reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>700000 metric tonnes</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Increase in public stocks of wheat and rice to 1.5 million MT from a previous level of 700,000 MT</td>
</tr>
<tr>
<td>India</td>
<td>SGR of 2 million MT of rice and wheat; plus separate buffer stock norms; FCI procurement: 90 million MT of wheat and rice in 2013</td>
</tr>
<tr>
<td>Jordan</td>
<td>33% increase proposed in wheat reserves</td>
</tr>
<tr>
<td>Kenya</td>
<td>National Cereal and Produce Board to double reserves to 720000 MT of maize</td>
</tr>
<tr>
<td>Nigeria</td>
<td>15% of total annual grain harvest with 5% as core reserve</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Stock on hand of imported wheat to 1.5 million MT</td>
</tr>
<tr>
<td>South Korea</td>
<td>Rice reserves with a record of up to 1.5 million metric MT</td>
</tr>
<tr>
<td>Zambia</td>
<td>Currently holding about 2 million MT. The reserve target for 2014 is 500,000 MT.</td>
</tr>
<tr>
<td>Oman</td>
<td>Declared increase from 6 to 17 months of consumption</td>
</tr>
</tbody>
</table>

Source: IFPRI; FAO; IFC; FCI India; ICRC Nigeria; Government of Zambia

- Price spike of 2007-08
- Several countries expressed intent/policy to increase SGRs
- Focus on losses in the logistics chain
Value Drivers for PPP

Risk transfer—Optimal risk allocation with specific risks transferred to the private party can reduce the cost to government.

Whole of life costing—Bundling of design, construction, operation and maintenance can reduce total project costs as well as provide predictability of costs over project life.

Innovation—Specifying outputs in a contract provides opportunity for innovation as private players compete for the best way to deliver the outputs at least cost.

Focus on service delivery—Management in the PPP firm is focused on service delivery and is free from the objectives or constraints that are typical drivers in the public sector.

Mobilization of financing—PPPs can provide additional sources of financing.

Accountability—PPPs can ensure higher levels of accountability given that government payments are conditional on the timely provision of the agreed quality and quantity of outputs.

Rationale for PPP in Storage

Public Provision

- Inability to scale-up storage
- Lack of fiscal space
- Inefficient management
- Poor repair and maintenance
- Unscientific methods
- Loss in quantity and quality

Private Participation

- On time and at cost delivery
- Transfer of construction and commissioning risk
- Upfront investment
- Deferred government payments
- Private sector managerial skills
- Better processes, cost savings
- Incorporation of maintenance in life-cycle costs
- Opportunity for modernization of sector
- Introduction of state of the art storage
- Transfer of performance risk

- Post harvest losses approx. US $ 4 billion in SSA in 2007
- Equivalent to annual calorific requirement of 48 million persons

Source: WB, NRI and FAO
## Global PPP Models

<table>
<thead>
<tr>
<th>Public</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria, Serbia</td>
<td>BOT project in Nigeria (concessioning government storage, commercial risk with private party)</td>
</tr>
<tr>
<td>Madhya Pradesh, India, Oman</td>
<td>BOT project in MP (10 year guaranteed tonnage, VGF, land)</td>
</tr>
<tr>
<td>Punjab, FCI, India &amp; Pakistan</td>
<td>BOO project (government payments)</td>
</tr>
<tr>
<td>Oman</td>
<td>Joint venture with private party (government and commercial use)</td>
</tr>
<tr>
<td>Philippines</td>
<td>Outright Sale of PHPTCs</td>
</tr>
</tbody>
</table>
Evolution of Private Finance/PPP in Grain Storage

- National Policy on Handling, Storage and Transportation of Food Grains 2000
- Private Financing of Storage Infrastructure through the Private Entrepreneurs Guarantee Schemes (PEG), 2008 & 2009
- Silo project in Punjab (PUNGRAIN)
- Silo projects in MP (MPWLC)
- FCI Silo Project, 2013-2014

**Food Stock Index**

<table>
<thead>
<tr>
<th>Month</th>
<th>Current</th>
<th>Proposed</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 1</td>
<td>21.20</td>
<td>32.26</td>
<td>52.16</td>
</tr>
<tr>
<td>July 1</td>
<td>31.90</td>
<td>53.97</td>
<td>67.30</td>
</tr>
<tr>
<td>October 1</td>
<td>21.20</td>
<td>63.51</td>
<td>105.25</td>
</tr>
<tr>
<td>January 1</td>
<td>25.00</td>
<td>33.21</td>
<td>32.84</td>
</tr>
</tbody>
</table>

Source: Food Corporation of India

**Capacity created under the PEG scheme, ‘000 MT**

- West Bengal: 26
- Uttar Pradesh: 598.364
- Tamil Nadu: 138
- Punjab: 209
- Odisha: 334.697
- Maharashtra: 222.67
- Madhya Pradesh: 273.37
- Kerala: 15
- Karnataka: 40
- Jammu and Kashmir: 2.5
- Himachal Pradesh: 1621.513
- Haryana: 5.8
- Gujarat: 247.35
- Chhattisgarh: 33.667
- Bihar: 199

Source: Food Corporation of India
Projected investment in storage by Government of Madhya Pradesh

<table>
<thead>
<tr>
<th>Private Investment</th>
<th>Investment incentives</th>
<th>Business Guarantee</th>
<th>Rural Godowns</th>
<th>Steel Silos with VGF</th>
<th>Steel Silos with Business Guarantee</th>
<th>TOTAL</th>
<th>Public Investment</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.50 m MT</td>
<td>1.30 m MT</td>
<td>0.35 m MT</td>
<td>0.50 m MT</td>
<td>0.35 m MT</td>
<td>4.00 m MT</td>
<td>2.00 m MT</td>
<td>6.00 m MT</td>
</tr>
</tbody>
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Salient features of the MP silo project

<table>
<thead>
<tr>
<th>PPP Model</th>
<th>Locations</th>
<th>Capacity</th>
<th>Government Support</th>
<th>Bid Criterion</th>
<th>Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBFO</td>
<td>Dewas, Harda, Hoshangabad, Raisen, Satna, Sehore, Ujjain, Vidisha, Bhopal and Indore.</td>
<td>50000 MT in each location and a total of 0.5 m MT</td>
<td>20% VGF each by MP state/ Government of India in upfront and operational payments</td>
<td>Lowest Viability Gap Financing required</td>
<td>The same tariff as for conventional godowns. The tariff is set from time to time by the Government of Madhya Pradesh for all MPWLC owned storage</td>
</tr>
</tbody>
</table>

Source: Sheo Shekhar Shukla, ex-Managing Director, MPWLC

Status

- Low level of VGF
- Premium for two locations
- Agreements for all locations executed

Source: Sheo Shekhar Shukla, ex-Managing Director, MPWLC
Pakistan

FAO Investment Center Statistics
- Annual wheat production: 20-24 m MT
- USAID estimate of wheat stock: 3.3 m MT
- SBP estimates: 7 m MT
- Losses: 13% of total costs, PKR 3874/tonne/year

Market Feedback
- Excessive bundling
- Sophistication unacceptable
- Perception of high payment risk/default by government

Lessons Learned
- RFQs indicate government’s caution this time around
- No specific indication of number of locations in Sindh RFQ
- Sindh RFQ suggests VGF support
- Punjab has advertised one multi-grain facility

2010-11
- Feasibility Study by Government
- EoI for transaction Advisor
- IFC retained

2012
- RFQ for BOO projects
- 7 pre-qualified bidders
- No response to RFP

2014
- Repeat RFQ in January 2014
- Good response
- RFP to be issued
Nigeria

- 13 Pre-existing storage complexes
- 20 more recent ones
- FGN not procuring up to stated level
- Low level of use
- Desire of government to put the existing storage to use

Public-Private Partnerships
- Diagnostic of agricultural production and storage assisted by the World Bank
- FGN decision to concession out 33 storage complexes
- EoI for transaction advisors early this year
- RBOT model for commercial use of storage with demand risk by private party

Increased and improved Food Storage in Nigeria

- Stability in food supply and food prices
- Improved food quality post-harvest
- Improved agro-dependent industrial (Processors) productivity

Initiatives
- Increase in Slots & Warehouse Capacity
- Guaranteed Minimum Food Pricing
- Warehouse Receipt
- Commercial Banks/ MFIs
- Security & Exchange Commission

Stakeholders
- FMA & WR
- Private Investors
- FMA & WR?
- Marketing Boards
- Commodity Exchange

National Food Security Program 2008

WORLD BANK GROUP
Public-Private Partnerships
**Zambia**

- Pre-feasibility for PPP silos by IFC
- Unsolicited bid from ADAS
- Agreement signed but in limbo
- Meanwhile, government policy to limit maize purchases by FRA
- Construction contracts for storage

**Oman**

- Oman thrives on food grain import
- Objective of silo program: import and store food grains for consumption, export
- Increase storage capacity to 17 months of consumption
- PASFR JV with Oman Flour Mills: 51:49
- PASFR JV with Salalah Flour Mills: 4:96
- Development of Food Cluster within Sohar Port and Freezone
- Negotiations ongoing for BOT in silos

Source: Food Reserve Agency, Zambia; World Food Program; University of Greenwich; World Resources Institute
Philippines

- DA-NabCor jointly owned 19 PHPTCs with LGUs
- 11 PHPTCs identified
- Sale of assets to private parties
- Compliance with Government Auditing Code, and Local Government Code
- Regulation by DA/ BAFPS quality accreditation system
- IFC is advisor to the transaction
Early lessons and concerns

- Structuring projects
  - Costs and bid parameters
  - Packaging several projects / project size
  - Sector modernization
  - Risk identification and allocation

- Setting pre-qualification criteria
  - Sector experience vs PPP experience

- Bid requirements relating to site in BOO projects
  - Location
  - Cost
  - Land ownership / access

- Requirements relating to connecting infrastructure / logistics
  - Location
  - Cost
  - Volumes
  - Unbundling of functions
  - Other uses
The Case of Punjab, India

Neeraj Gupta
Principal Investment Officer
ngupta@ifc.org
Project Background

- Significant shortage of adequate modern wheat storage capacity in India – estimated to be 10mn metric tons (MT) for wheat
  - Punjab, the highest food producing state in India, has storage shortage of 7mn MT
  - Most grain is stored in low quality structures using open-air cover and plinth facilities

- Systemic inefficiencies, procurement bottlenecks, and considerable wastage and production losses in the wheat value chain
  - Bag-bag-bag procurement system
  - Long waiting time for farmers at procurement centers

- Punjab State Grains Procurement Corporation (PUNGAIN) launched a pilot PPP project for a 50,000 MT bulk storage facility
The Wheat Storage Problem

As crops rot, millions go hungry in India

*Reuters, July 1, 2012*

India’s wheat left to rot due to lack of storage

*AP, May 10, 2012*
IFC’s Role

- Partnered with the Government as Transaction Adviser to conceptualize the PPP and support them in the bid management
- Several policy choices to be made:
  - Scope of the project – only storage or procurement, transportation, handling, etc.
  - Rail linkage – significant for Punjab which is a surplus production area
  - Role of stakeholders – particularly commission agents
  - Removal of bags and double handling from the system
  - Optimal silos technology – steel or concrete
  - Packaging, sizing and location issues
  - Future project migration aligned with greater sector reforms
- Guiding principles of cost-benefit, practicality, political economy and bankability (often not aligned)
- Assisted the Government with detailed due diligence, technical, financial, commercial, and legal structuring
Issues with the current storage system:

- General shortage of storage space & increasing production
- Wheat stored beyond its shelf life
- Lack of optimum storage environment for preservation of grain
- Rice requires covered storage space; wheat typically ends up in CAP
- In CAP, grain exposed to natural vagaries and deterioration

Long term, scientific storage facilities (temperature controlled) required to:

- Supplement storage space
- Preserve grains for a longer period; carry stocks for longer duration
- Reduce losses due to deterioration
- Achieve objective of food security

Land footprint of warehouses is more than 3 times that of silos
## Strategic Design Options

### STEEL VS CONCRETE

<table>
<thead>
<tr>
<th></th>
<th>Steel</th>
<th>Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost competitive bins (Rs. 300/MT)</td>
<td>Cost competitive bins (Rs. 300/MT)</td>
<td>Significantly more expensive (Rs. 500/MT)</td>
</tr>
<tr>
<td>Faster to build ~ 10 months</td>
<td>Faster to build ~ 10 months</td>
<td>Takes more time ~ 15-16 months</td>
</tr>
<tr>
<td>Larger storage capacities available 10-12,000 tons / bin</td>
<td>Larger storage capacities available 10-12,000 tons / bin</td>
<td>Smaller storage capacities ~ 3000-4000 tons/bin</td>
</tr>
<tr>
<td>Can be mounted even where quality of the soil is not optimum</td>
<td>Can be mounted even where quality of the soil is not optimum</td>
<td>Requires specific quality soil to erect</td>
</tr>
<tr>
<td>Requires lesser planning and lower maintenance</td>
<td>Requires lesser planning and lower maintenance</td>
<td>Requires special concrete painting to maintain tightness &amp; avoid corrosion of inside iron</td>
</tr>
<tr>
<td>More suited for inland locations</td>
<td>More suited for inland locations</td>
<td>More suited to corrosive atmosphere (ports)</td>
</tr>
<tr>
<td>Industrial Life is 25-30 years</td>
<td>Industrial Life is 25-30 years</td>
<td>Industrial Life is 50-60 years</td>
</tr>
<tr>
<td>Light weight, less prone to earthquakes</td>
<td>Light weight, less prone to earthquakes</td>
<td>More prone to earthquakes</td>
</tr>
</tbody>
</table>
Strategic Design Options

Steel vs. Concrete

- Considerations for Policy Makers
  - Inland location?
  - Local cost of steel vs. concrete
  - Ease and cost of mounting, maintenance & repair
  - Experience and expertise of local companies to build concrete silos (slip form)
  - Speed of implementation
  - But perhaps a misplaced debate?
    - Output/performance specifications more important
    - Choice of material can be left to the bidders
    - Unless the Government has a compelling reason (time?)
Strategic Design Options

**Bulk vs Bags**

**Grain handling in India**

- At *mandis*
  
  - Farmers bring wheat in bulk (3 MT tractor trolleys)
  
  - Commission agents play an important role in procurement
  
  - Wheat is bagged and transported to warehouses

- Storage points
  
  - Storage is mostly in bags
  
  - For onward movement, bags transported in trucks to railheads

- Dispatch
  
  - Bags loaded onto railway wagons and transported
  
  - Receiving provinces store these bags in their warehouses
  
  - Bags allocated from there to PDS fair-price shops
**Strategic Design Options**

**Bulk vs Bags**

- **Issues for consideration**
  - Minimize losses in the system & optimize system costs
  - Linkage with national systems and infrastructure
  - Reducing multiple handlings is always preferable, but practicality?
  - At *mandis*
    - Bulk handling can be instituted – not much impact on costs
    - If silos can be constructed at *mandis* (or silos facility declared as a *mandi*), then save handling costs and investments on special trucks
  - Storage
    - Storage is in bulk – handling through a system of hoppers and conveyors
  - Dispatch
    - Can be in bulk – but trucks/rail should be able to handle bulk movement
    - Depends on infrastructure at receiving end
PPP Options

- **Key considerations**
  - Silos to be developed & operated by private entity
  - Private entity to buy land?
  - Ownership of Silos post concession period?
  - Private entity to arrange power, water & other utilities?
  - BOO model might be appropriate
    - Returns after concession period makes it more attractive than BOT/BOOT
    - After concession period, silos still available for storage to GOP
    - Concessionaire’s obligation to purchase & own land more appropriate in this model
    - At the end of concession period, both parties have the option to mutually extend the contract
PPP Options

• **Key features of the contract**
  
  – Minimum payment by Government based on capacity created (Rs./MT)
  
  – This can be the bidding variable
  
  – Can be structured as a two/three-part payment – fixed and variable
  
  – However, minimal upside potential. Can we consider some “revenue enhancement” measures (which can reduce Government payment)?
    
    • Negotiable warehouse receipts?
    
    • Procure extra land to create excess capacity for private use?
    
    • Provide ancillary services to farmers – extension, fertilizers, etc.
Project Structure

**PPP Model: Build-Operate-Own**

- **Construction**
  - Private Sector to procure land and construct facility
  - Construction to be undertaken as per agreed specifications
  - 50,000 MT facility

- **Operation**
  - Private Sector Investor to operate facility as per agreed KPIs for 30 years of operations
    - Grains will be accepted from farmers in bags, tested, cleaned, and stored in bulk
    - Grain to be dispatched to Government in bags
  - PUNGRAIN to pay a fixed and variable concession fee, as per the bid, to the Operator
  - At the end of the concession term, the Operator continues to own the facility and will have no further responsibility towards PUNGRAIN
Grain Silos PPP Operations

By design, a stable, predictable cash flow business based on availability based payments
Project Commercials

- Current wheat procurement price is USD225/MT
- USD 8 = 3.5% of the procurement price
- If losses in the system exceed 3.5%, the project is financially viable for PUNGRAIN
- Current losses in the system are estimated to be far greater than 3.5%

**Project Cost**

USD 6 million

In addition, there are significant qualitative benefits of silos over CAP/warehouses

- Grain can be stored in silos for up to 3 years, compared to < 1 year in warehouses
- Silos need 1/3rd the land footprint
Design

3-D Representation
Design

Grain Flow – Storage Capacity
Design Parameters
Design Parameters

- **Output Capacity:** Hourly output to be met by the grain handling process within the facility is estimated at 166 MT/hour:
  - 50,000 MT of Wheat shall arrive during a period of 25 days (Harvest Period)
    ~ 2,000 MT / day

<table>
<thead>
<tr>
<th>Element</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unloading Bags</td>
<td>20 MT/hr</td>
<td>8 unloading bays</td>
</tr>
<tr>
<td>Transfer of good grain</td>
<td>200 MT/hr</td>
<td>Chain conveyor</td>
</tr>
<tr>
<td>Transfer of bad grain</td>
<td>10 MT/hr</td>
<td>Chain conveyor (EGH01, EGS02)</td>
</tr>
<tr>
<td>Head House</td>
<td>200 MT/hr</td>
<td>Cleaner, Circuit weigher, uncloder (E01)</td>
</tr>
<tr>
<td>Transfer to Silos</td>
<td>200 MT/hr</td>
<td>Chain conveyors (E04)</td>
</tr>
<tr>
<td>Transfer of waste</td>
<td>200 MT/hr</td>
<td>Chain conveyor (E06)</td>
</tr>
<tr>
<td>Transfer for bagging</td>
<td>100 MT/hr</td>
<td>Chain Conveyor (E05)</td>
</tr>
<tr>
<td>Bagging process</td>
<td>100 MT/hr</td>
<td>Two lines of 50 MT/hr</td>
</tr>
</tbody>
</table>
Significant Development Impact

- These projects are at the core of food security
- Storage sector was made eligible for Viability Gap Funding Scheme of Government of India based this project – huge replication potential

<table>
<thead>
<tr>
<th>Metric</th>
<th>Punjab Silos</th>
<th>FCI Silos (INDIA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Poor people to receive more nutritious grain</td>
<td>500,000</td>
<td>20 million</td>
</tr>
<tr>
<td>• Farmers benefitting</td>
<td>6,660</td>
<td>266,400</td>
</tr>
<tr>
<td>• Private sector investment mobilized (USD million)</td>
<td>7.70</td>
<td>300</td>
</tr>
</tbody>
</table>

- Potential intervention for greater private sector participation (like in Pakistan) and loosening Government control
Recognition of the Punjab silos model
The Operational Facility in Punjab!
IFC Advisory Services Grain Storage PPP Projects

**Punjab and Sindh Silos (Pakistan)**
- Grain Storage facilities to be built in Punjab and Sindh provinces
- Projects to be undertaken in phases
- Transactions terms expected to be:
  - 20-year Concession
  - Build-Own-Operate

**Punjab Silos (India)**
- 50,000 MT wheat silos facility
- Concession awarded in May 2010, and signed in July 2011
- 30-year concession
- Private investment mobilized: $8m
- Winning bidder: LT Foods, leading exporter of basmati rice

**Philippines Grain Central**
- Project structuring being completed
  - Post harvest facilities have been identified as bottlenecks of corn’s value chain
  - Improve the chain and develop new facilities
  - Pilot transaction in the Philippines agricultural sector
- Investor consultations ongoing
- Bid process to be launched

**FCI Silos roll-out (India)**
- 2 million MT wheat storage through silos on PPP basis
- Across 10 states, 42 locations
- Expected Investment: $200-300mn
Thank you and please watch out for the following paper:
World Bank PPP Group and IFC Advisory Services in PPP (2014, forthcoming)