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Accelerating Public Private Partnership in Agricultural Storage Infrastructure in India

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Abstract- Agriculture occupies a prominent position in Indian economy, not only because it accounts for 17 per cent of India's gross domestic product (GDP) but also engages more than 50 per cent of the country's workforce. However, Indian Agriculture is confronting the major challenges with respect to ever growing population to feed, reducing natural resources, increasing global competitiveness, deficiency of scientific storage facilities, and above all, uncertainties of the monsoon and changing climate. The small farmers do not have the financial strength to hold the produce with them and are unable to get better off season prices of their agricultural produce. The government buys food grains from the farmers but likewise does not have the space to store it.

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Accelerating Public Private Partnership in Agricultural Storage Infrastructure in India

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Abstract- Agriculture occupies a prominent position in Indian economy, not only because it accounts for 17 per cent of India's gross domestic product (GDP) but also engages more than 50 per cent of the country's workforce. However, Indian Agriculture is confronting the major challenges with respect to ever growing population to feed, reducing natural resources, increasing global competitiveness, deficiency of scientific storage facilities, and above all, uncertainties of the monsoon and changing climate. The small farmers do not have the financial strength to hold the produce with them and are unable to get better off season prices of their agricultural produce. The government buys food grains from the farmers but likewise does not have the space to store it. Every year tonnes of food grains go waste because of inadequate storage and infrastructure facilities. Due to inadequate infrastructure facilities Post-harvest losses accounts an average 10 to 25 per cent, being particularly high in horticulture, livestock and fisheries. Large investments are required in developing agricultural markets, quality certification, warehouses, and cold storages. Such large investments are possible only with the participation of the private sector. Public-private partnerships are a key mechanism to develop and deliver a reliable stream of technology in the face of changing demands. Collaborative partnerships can effectively bridge the gap between public and private sector's distinctive competencies in order to meet farmer's needs. The objective of this paper is to summarize the issues and challenges facing the agricultural warehousing, to find out the gaps in Storages/Warehouses in India and attempt to find possible solutions to bridge this gap. The study is based on secondary data taken from different sources.

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1. INTRODUCTION

India is one of the fastest growing economies and the seventh largest country in the world in terms of its geographical size. India has a population of nearly 1.27 billion which makes it the second most populous nation in the world. The majority of population draws their livelihood from agriculture and agriculture allied activities. But, the Storage facilities for storing agriculture output are either totally absent or grossly inadequate. Under such conditions the farmers are obliged to sell their produce instantly after the harvest at the prevailing market prices which are bound to be low. Such distress sale deprives the farmers of their legitimate income.

The Parse Committee estimated the post-harvest losses at 9.3 per cent of which nearly 6.6 per cent occurred due to miserable storage conditions alone. Scientific storage is therefore very crucial to avoid losses and to benefit the farmers and the consumers alike. At present there are number of agencies engaged in warehousing and storage activities. The food corporation of India (FCI), the central warehousing corporation (CWC) and state warehousing corporation (SWC) are among the principal agencies engaged in this task. These agencies help in building up buffer stock, which can be used in the hour of need.

The food Corporation of India (FCI) has insufficient modern scientific storage facilities, and covered godowns with enough storage capacities. Hence grains are stored in outdoors under cover and plinth (CAP) storage round the country. This makes grains prone to rodents, wet and moisture, birds and pests. Unexpected rainstorms and weather makes matters worse. Every year tonnes of food grains wasted because of inadequate storage and infrastructure facilities. The wastage of fruits and vegetables is even higher than grains. Therefore, food logistic chain in India needs vast investment in providing proper storage facilities. Storage infrastructure is necessary for carrying over the agricultural produce from production periods to the rest of the year and to prevent distress sales.

There is a huge gap in the quantity of agricultural produce and the available storage. An estimated cumulative loss of Rs 550 million is expected, owing to the lack of proper cold storage facilities for agricultural produce. The huge gap between the demand and supply of logistics services, which was left unattended due to the unorganised nature of the market, has opened up many opportunities for other stake holders. Many new initiatives were taken up during the Eleventh Plan, including both terminal markets under Public-Private Partnership (PPP) mode.

The private participants and investors on Agricultural Warehousing including PSUs, are diverting their resources to such economically more attractive and viable options. Private sector intervention should be promoted by soft loan facilities for construction of agricultural godowns at potential locations and provide subsidy and tax incentives to such entrepreneurs. Perhaps, such positive approach from the part of the planning commission and recommendations of the inter-ministerial committees of the Govt. may go a long

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way to narrow the gap between production and storage requirements and feed thousands of poverty ridden human population.

II. OBJECTIVE

The objective of this paper is to provide an insight into the matter of storage of food grains in India, the losses which are occurring due to non-availability of proper scientific storage practices, to find out the warehousing gap and a role Public-Private Partnerships as the govt. strategy to bridge that gap.

III. METHODOLOGY

The research is exploratory type based on secondary data, collected from various sources, namely research papers, World Bank reports, text books, different websites of related ministry, published and unpublished reports, like the Comptroller and auditor General of India report on storage management and movement of food grains in FCI, report of the Working Group on warehousing development and regulation for the 12th plan year by Planning Commission, government of India etc.

IV. DISCUSSIONS AND ANALYSIS

a) *Agricultural Marketing Infrastructure*

Indian agriculture is at critical point where the sector has to work towards food security as well to meet inevitable global competition brought by advent of multi brand retail. Agriculture sector needs streamlined supply chain in the form of well functioning marketing infrastructure. However, In India, the high value supply chain is complex and the infrastructure connecting the various partners in the chain is very weak. The studies conducted by Directorate of Marketing and Inspection (DMI) reveal that Costs and Margins account for 30 to 35 per cent of consumer's price in foodgrains, 45 to 55 per cent in fruit and vegetables and 12 to 36 per cent in oilseed crops. In order to provide dynamism and efficiency into the marketing system, large investments are required for the development of markets, post harvest and cold chain infrastructure.

Agriculture/agricultural marketing being a state subject, it is the responsibility of respective state governments to take necessary steps for reforming marketing infrastructure. At present farm output is traded through a network of 27738 wholesale and primary rural markets and 7157 regulated markets scattered across the states. Out of the 21,221 rural periodical markets, 15% function under the ambit of regulation. The advent of regulated markets has helped in mitigating the market handicaps of producers-sellers at the wholesale assembling level. But, the Rural Periodic Markets in general, and the Tribal Markets in particular, remained out of its developmental ambit.

i. *Position of Agriculture Marketing Infrastructure*

- ✓ One-fourth of the markets have common drying yards, trader modules;
- ✓ Covered or open auction platforms exist in two third of regulated markets;
- ✓ Trader modules, namely, shop, godown and platform in front of shops exist in only 2/3rd of regulated markets;
- ✓ Cold Storage units exist only in 9% of markets;
- ✓ Grading facilities exist in less than 1/3rd of markets;
- ✓ Farmers' resting facilities 50% of markets;
- ✓ Basic facilities like internal roads, boundary walls, electric lights, loading and unloading facilities, weighing equipments etc. not available in nearly 20% markets;
- ✓ Inaccessibility to markets as markets are located far from farms;
- ✓ Restriction on the sale of produce outside regulated market yards in almost all the market reformed States;
- ✓ Multiple intermediaries and exploitation by middleman;
- ✓ Lack of cleaning, grading, electronic weighing and quality certification facilities;
- ✓ Prevalence of multiple simultaneous auctions and even undercover system of auction; and Electronic auctioning present in very few markets

ii. *Food Grains Rot Due To Insufficient Storage Capacity*

The problem of insufficient storage capacity has attracted both political and media attention. Commentators in the media bemoan that India lets grains rot when there are people that go to bed hungry. Similar comments have echoed in the Parliament. In September 2010, hearing the Right to Food public interest petition, the Supreme Court asked the government to distribute to the poor the food grains that would otherwise rot.

b) *Post Harvest Losses*

Food Wastage takes place at different stages

- Loss of production due to:
 - o *Biotic &*
 - o *Abiotic*
- Post Harvest losses
 - o *Lack of infrastructures & scientific storage*
 - o *Lack of adequate processing facilities*
- Excess production causing glut
 - o Low market prices not enough to meet harvesting, labour & transportation costs

Table 1 : Status of Post-harvest Losses

Crop	Minimum % Loss	Maximum % Loss
Cereals	3.9 (Sorghum)	6.0 (Wheat)
Pulses	4.3 (Chick Pea)	6.1 (Black Gram)
Oilseeds	2.8 (Cottonseed)	10.1 (Groundnut)
Fruits	5.8 (Sapota)	18.0 (Guava)
Vegetables	6.8 (Cauliflower)	12.4 (Tomato)
Spices	3.9 (Black Pepper)	7.4 (Turmeric)
Livestock	0.8 (Milk)	6.9 (Inland Fish)

Source: *The Indian Council of Agricultural Research (ICAR) Study, 2010*

It is evident from the above table that the post-harvest losses in different commodities are a matter of serious concern, so drastic measures need to be taken in order to minimise this loss.

i. *Need to Reduce Post-harvest Losses*

There is a need of application of modern technology to improve the handling systems of horticultural perishables and assure their quality and safety, overcoming the socio-economic constraints, such as inadequacies of infrastructure, poor marketing systems, and weak R&D capacity. Thus encourage consolidation and establish vertical integration among producers and marketers.

Post-harvest losses, accounts nearly an average 10 to 25 per cent, being particularly high in

horticulture, livestock and fisheries. Very large investments are required in developing agricultural markets, grading and standardisation, quality certification, warehouses, cold storages and other post-harvest management programs to address this problem.

c) *Warehousing Capacity*

There is no exact data regarding warehousing capacities available in various sectors at present. However, some of the substantial capacities available in public, cooperative and private sectors are estimated as given below

Table 2 : Estimated warehousing capacity available in various organisations and sectors

S.No.	Name of the organization / Sector	Storage capacity (in million metric tonne)
1.	Food Corporation of India (FCI)	38.34
2.	Central Warehousing Corporation (CWC)	10.30
3.	State Warehousing Corporations (SWCs) and State Civil Supplies	34.84
4.	Cooperative Sector	15.07
5.	Private Sector	18.97
	Total	117.52

Source: *FCI's and CWC's portals and Department of Food and PD's Grain Bulletin, Oct.2014*

The storage capacity available with the FCI and a part of warehousing capacity available with the CWC and the SWCs is used for the storage of foodgrains procured by the Government agencies for Central Pool. The present total storage capacity is 731.74 lakh MT, comprising covered godowns of 571.89 lakh MT and Cover and Plinth (CAP) of 159.85 lakh MT. The average stock of rice and wheat in the Central Pool during last

year (Dec 2013 to Nov 2014) was 482.10 LMT, ranging from a low of 379.28 LMT on 16-04-2014 to a peak of 622.31 LMT on 01-06-2014.

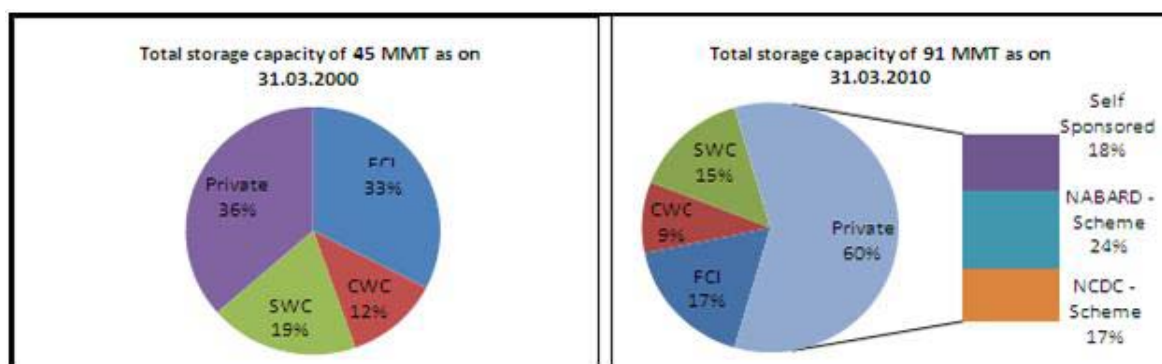
Table 3 : Total storage capacity occupied by Central Pool Stocks as on 1st June, 2014

Commodities	Quantity (in million MTs as on 1st June, 2014)
Rice	20.645
Wheat	41.586
Coarse grains	1.189
Total	63.42

Source: Food Corporation of India FCI's portal

Thus, the covered storage space available in the country is not sufficient to cater to the procured stocks for Central Pool. As a result, during peak

procurement period, some quantity of foodgrains is stored in Cover and Plinth (CAP) and the same is evacuated to consuming states on priority

**Fig 1 :** Total storage capacity in the country and the ownership distribution from (31.03.2000 to 31.03.2010)

Source: Credit Analysis & Research Ltd. (CARE Ratings). Analyzing the problems and opportunities existing in Agri-Warehousing in India.

As evident from the chart above, private sector interest in warehousing industry picked up after the "Rural Godown Scheme" was introduced in year 2001-02 under national bank for agriculture and rural development (NABARD) and national cooperative development corporation (NCDC).

The warehousing capacity built over past 10 years, especially those sanctioned by NABARD have an average storage capacity per warehouse of 1,261 metric tonne (MT) and around 75% of numbers of godowns have capacity of less than 1,000 MT. The development of small and medium godowns indicates that most of them have been built by farmers or a community of farmers thus ensuring that distress sale is reduced and better prices are paid to farmer for their produce.

Apart from this there are few large national level players which have emerged over the last decade owing to the available capital subsidy. These include National bulk handling corporation Ltd., National collateral management services Ltd., Adani agri logistics, Star agri warehousing & collateral management Ltd., Shree shubham logistics Ltd., Ruchi infrastructure Ltd., Guru warehousing corporation, Paras warehousing and LTC commercial.

i. Regional Imbalance

The storage capacity in India is mainly concentrated towards production centres as indicated by the graph below:

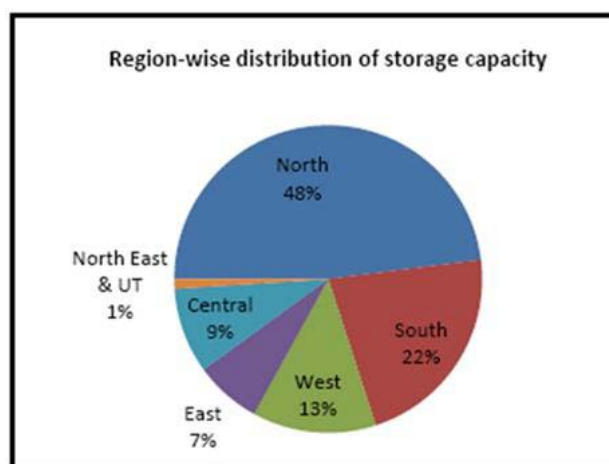


Fig 2 : Storage Capacity Disparity in India

Source: Credit Analysis & Research Ltd. (CARE Ratings). Analyzing the problems and opportunities existing in Agri-Warehousing in India.

Only 22% of total storage capacity is available in the major consumption states. Even some of the states have got storage capacities of less than one month of their requirement. While obvious factors like proximity to the major mandis in the state, differences in the quantities of food grain and pulses produced within the state, etc. are the major causes behind the regional imbalances, other key factors like the extent of interest and initiative shown by bank officials in promoting the concept of rural godowns to local entrepreneurs, publicity and awareness created about the scheme at the local level, etc. also played a major role behind these regional imbalances. In short, dominant producers of food grain and related agricultural products comprise the majority of godowns and storage capacity.

ii. Gap between Required and Existing Storage Capacity

The Food Corporation of India (FCI) the central government agency responsible for procurement and

storage of grain for the Public Distribution System (PDS) - has a storage capacity of 32 million tonnes, of which about half is hired. Hence, assuming that the FCI has hired all the capacity that is possible then the gap between FCI's existing capacity (32 million tonnes) and the required capacity (46 million tonnes) is about 14 million tonnes. Incidentally, in the 11th five year plan, the FCI identified a gap of 16 million tonnes of capacity that needed to be created.

iii. Marketing Surplus, Storage Gap and Warehousing Demand

The working group on agricultural marketing infrastructure of planning commission has estimated the marketing surplus and the warehousing demand as shown below

Table 3 : Marketing surplus and the warehousing gap

1	Total marketable surplus of all major crops 130 Million MT	130 Million MT
2	Total marketable surplus of all major crops estimated to grow by the end of the 12th Plan	150 Million MT
3	Total storage capacity estimated	108 Million MT
4	Storage capacity to be created for FCI to meet TPDS requirement in 12th Plan	15 Million MT
5	Existing gap for meeting private commercial demand	10 Million MT
6	New demand in next five years	10 Million MT
7	Total warehousing gap	35 Million MT

Source: Report of the working group on agricultural marketing infrastructure, secondary agriculture and policy required for internal and external trade for the xii five year plan 2012- 17. december, 2011.

The warehousing capacity gap arrived by the planning commission has been used for calculation in planning and construction of storage capacity by government departments / Ministries. Over the years,

about 8.0 million MT storage capacity has been added. So now, the gap can be estimated to be at 27 million MT. Also the Government position of keeping the large stocks of procured foodgrains in warehouses for long

periods is changing. The stocks of procured foodgrain by Central Government are being brought down to reasonable levels required for food security. This needs to be looked into for future planning of storage capacity requirement in the country.

From the above mentioned section it can be said that the food logistic chain in India needs huge investment in providing proper storage facilities. There is a huge gap in warehousing infrastructure facilities in country; the investment requirements are gigantic which could not be met by the public sector alone due to fiscal constraints and mounting liabilities of the Government. This calls for participation of private sector in coordination with the public sector to develop the public infrastructure facilities. In this direction, the government of India had initiated different schemes, eased FDI norms and promoting PPPs to pump more investments in warehouses in the country.

d) *Private Entrepreneurs Guarantee (PEG), 2008 Scheme*

To meet the situation arising out of high procurement level of wheat and rice as a result of increase in Minimum Support Price (MSP) during last five years and to reduce the storage in Cover and Plinth (CAP), the Government of India formulated a scheme in 2008 for creation of additional storage capacity for foodgrains through private sector. The scheme is known as Private Entrepreneurs Guarantee Scheme (PEG-2008). Later, this scheme was extended to Decentralized Procuring (DCP) States in 2009.

The ceiling of rate fixed for hiring of godowns has been revised from Rs. 3.80 per quintal per month to Rs. 4.78 per quintal per month under the PEG scheme godowns. In appropriate cases, the High Level Committee (HLC) of the FCI has been empowered to decide higher rate by recording reasons in writing.

A state wise mapping of existing capacities and analysis of additional requirements was undertaken based on subjective criteria by State level committees and a High Level Committee of the Food Corporation of India (FCI). Under the scheme, the Food Corporation of India gives a guarantee of ten years to private parties for assured hiring.

For expeditious construction of godowns, it was decided that wherever CWC / SWCs have their own land and if this is within the identified locations and storage gap approved by High Level Committee of the FCI, the CWC / SWCs will construct godowns on priority for which FCI would give a guarantee of 9 years for storage charges.

So far, 121 lakh MT capacity has been completed, 93 lakh MT by the private entrepreneurs and 28 lakh MT by the CWC / SWCs.

e) *Public-Private Partnerships to Develop Agriculture Infrastructure*

The Public-Private Partnerships are viewed as the governance strategy to minimize transaction costs and co-ordinating and enforcing relations between partners engaged in production of goods and services. They enable an optimal policy approach to promote social and economic development, bringing together efficiency, flexibility and competence of the private sector with the accountability, long-term perspective and social interest of the public sector. Both the partners have mutual gains from such arrangements.

Public-private sector partnership (PPP) brings in synergy, mobilize resources, generate, validate and transfer technologies. Signs of progress in forging alliances among partners are seen in the last few years in some pockets, but such examples making system-wide impact are not many. The success stories have raised expectations, but a high-level policy statement unequivocally promoting PPP is still wanting. Further, there are still misperceptions between public and private sectors with regard to intentions, goals and credibility of achievements. And another problem is lack of accurate mapping of proprietary assets and responsibilities between these sectors for effective functioning. There should be appreciation and follow-up of best practices followed by public and private sectors with regard to business approach and skills, decision-making and operational procedures, connectivity with largest constituency farmers, traders and consumers, technology generation, interface with civil society organizations, response style and time and incentive. All these, if mutually imbibed and internalized, will add to run-away success of PPP.

i. *Construction of Modern Warehousing Facilities (Silos) Through PPPs*

As a part of the PEG scheme, efforts are being made for creating integrated modern warehousing capacities in the form of silos in the country. FCI has identified 11 sites for viability gap fund (VGF) based silos and preparing feasibility reports for approval of the Department of Economic Affairs. For meeting the capital expenditure on construction of these silos, the private entrepreneurs would be eligible for Viability gap funding (VGF), where land would be provided by FCI/State Governments. For storage of wheat in these silos, the developer will be entitled to receive a recurring service charge, provided he meets the required performance and maintenance standards. Where land is not available with FCI/Government, silos would be constructed in non-VGF mode.

During the 12th Plan period, the sub-scheme on AMI is being implemented with central assistance of Rs. 4000 crores for creating 4000 marketing infrastructure projects and storage capacity of 230 lakh tons.

ii. Private Players Taking Initiatives to Develop Warehousing Infrastructure

DHL Global Forwarding is planning to establish Free Trade Warehousing Zone (FTWZ) at Sriperumbudur near Chennai, with an investment of Rs 45 million to provide the advantages of a duty-free zone with high-quality infrastructure.

Arshiya International's 165 acre state-of-the-art Free Trade Warehousing Zone (FTWZ) at Panvel near Mumbai, is located near the container terminal of the Jawaharlal Nehru port Trust. It is expected to yield higher profits, lower costs and higher efficiency for its customers. The company plans to set up another five Free Trade Warehousing Zone (FTWZs), five district Parks and a 75-train pan-India rail charter with an investment of Rs 200 billion over the next five years.

Players like Star Agri that provide integrated post harvest management solutions, apart from providing warehousing services, Star Agri, which recently raised funding from IDFC PE, provides collateral management and other value added services (quality testing, agri insurance, bulk procurement and rural retailing) to its clients.

Sohan Lal Commodity Management, which raised funding from Nexus and Mayfield and Shree Shubham Logistics are other comprehensive agri-

logistics solutions players providing services across the spectrum. SV Agri that provides end-to-end solutions for the potato supply chain.

Other major players include, National Bulk Handling Corporation and National Collateral Management Service with such investments in infrastructure, global companies are increasingly looking at Indian markets as a source hub for their business requirement. According to the survey, about 15% of the CEOs surveyed were looking forward to source their supplies from India, due to its cost-competitiveness.

iii. Encouraging Private Sector Participation

Private sector participation would be sought and encouraged for development of infrastructure for the integrated bulk handling, storage and transportation through measures such as Build-Own-Operate-Transfer (BOOT), Build-Own-Lease-Transfer (BOLT), Build-Own-Operate (BOO), Lease –Develop-Operate (LDO), Joint Ventures etc. ii) Generation of funds through public issues by private enterprise. iii) Automatic approval for foreign direct Investment (FDI) up to 100%. iv) Loans from financial institutions, NABARD, external commercial borrowings, etc. Integrated bulk grain handling, storage and transportation facilities to the tune of 5.5 lakh MTs have been created through private sector participation at the following locations:

Table 4 : Storage and transportation facilities through private sector participation

Circuit 1		Circuit 2	
Location	Storage Size (MTs)	Location	Storage Size (MTs)
Base Depot Moga	200,000	Base Depot Kaithal	200,000
Field Depots Chennai	25,000	Field Depots Navi Mumbai	50,000
Coimbatore	25,000	Hooghly	25,000
Bangalore	25,000		

Source: Report of working group on warehousing development and regulation for the twelfth plan period (2012-17)

The project had been implemented in 36 months and it had become operational at all the locations and special wagons had also been procured by the DCO for bulk movement of wheat from base depots to field depots.

V. CONCLUSION

The warehousing plays a vital role in promoting agricultural marketing, rural banking and financing and ensuring food security in the county. The paper highlighted the primary agricultural marketing infrastructure, insufficient storage capacity, warehousing gap and government of India initiative to bridge this gap, as much of the agricultural produce is getting spoiled due to inefficient storage facilities, overtime delivery and mismanagement. So much more is needed as India has huge potential for agricultural production, because it has a wide geographical range. More and more provisions must be made available to integrate the marketing systems for agriculture, which must be available all over the country.

To overcome inefficiencies in the distribution system, substantial investment may be required to be taken up in infrastructure like warehousing, storage facility, roads and railways connectivity. This would create substantial opportunity for the private sector also. Private sector intervention should be encouraged by soft loan facilities for construction of agricultural godowns at potential locations and provide subsidy and tax incentives to such entrepreneurs. Perhaps, such positive approach from the part of the planning commission and recommendations of the inter-ministerial committees of the Govt. may go a long way to narrow the gap between production and storage requirements and feed thousands of poverty ridden human population.

In recent years, public-private partnerships have been heavily promoted in the education, health, infrastructure, and community-development sectors in order to improve efficiency in the generation and performance of public services. This has also been true in the field of agricultural development, where public and private actors hope to use partnerships to generate and

spread innovations that would otherwise be complicated to develop separately.

There is a need for transparency and trust for mid-term review and for bilateral agreement for developing new technologies. Clear laws for transfer of technology and sabbatical provisions for scientists to work with industry need to be established. It would be appropriate to say that any partnership requires patience and trust to succeed. We are looking at the long-term benefits and it is very necessary to iron all creases at the first step itself. Regular inputs from both the parties and meetings would be an effective way to check any issue that would emerge at any stage.

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