

India is one of the largest grain producers in the world. It produces 200 million MT (metric tons) of wheat and rice annually. Every year, 10 percent of production, or 20 million MT (the annual production for Australia) is lost, although this loss is believed to be preventable as per the Government of India's Ministry of Food and Civil Supplies.

Seventy-five percent of total grain loss occurs at the farm level. The majority of farm level losses are driven by inadequate storage (22%), drying of crops (15%), transportation (12%), and threshing (10%) while the rest of the loss scatters among several activities.

Farm level storage is inadequate because of lack of attention and investment. The Green Revolution increased yields so dramatically that leakages in the system were not a concern. But now, with yields stabilizing in the context of a growing population there is a renewed focus on plugging holes in the value chain. In 2040, it is estimated India will need an incremental 150 million MT of grain just to maintain current levels of nutrition in the population. Investment in the sector has mostly been government driven as agriculture has remained one of the least liberalized sectors in the economy.

Proper grain storage facilities should provide a controlled atmosphere, weather-tight protection from precipitation, barriers to pests, aeration, suitable access for someone who is managing the grain, and should be easy to clean. The facilities currently in use at the farm level in India are deficient on all of these elements. Small holder farms use three main grain storage techniques. One option is to store bags of grain on husks and then cover the pile with husks. A second option involves digging a pit, and storing bagged or loose grain covered with some husks, mud or sacks. The third option involves building a small cement storage facility.

The Indian government has placed agriculture as a top priority, and storage is a key topic of interest as storage needs are expected to grow. To this end, the government is providing a 15 percent capital subsidy to private companies or funds for construction of crop storage facilities in India. Many of the facilities built today are used for wholesale storage in cities or major hubs, but not at the village level. Farmers are eligible for a subsidy also, but they would need sufficient capital to fund the construction, limiting this option to larger scale farmers.

The Grain Depot Fund (GDF) will focus on building grain storage facilities and renting this space to small farmers in each of the 460 villages in Punjab and Uttar Pradesh, the two largest grain producing regions in the country. Together, these states produce 49 percent of all wheat and 24 percent of all rice in India.

GDF will lease land in villages and build storage facilities with a 1000 MT capacity. Farmers will pay rent of 10 INR / month per quintal (100 kg) and their crops will be used as insurance in the event of default. We estimate farmers will have spent 825 INR per quintal when they bring crops to be stored, but after storing for a few months will be able to increase revenues by 5 to 15 percent.

GDF will build the 460 structures over a five year period, starting with 50 in 2012, 100 for each year thereafter, ending construction by 2016. Each structure of 1000 MT capacity will cost \$30,000 USD to build, will generate net annual operating income of \$12,000. Rent will be charged at 10 INR per month per quintal and we estimate a 80 percent capacity utilization. Rice and wheat are grown in different seasons so we expect to maintain this utilization throughout the year. We will be cash flow positive by year 4, the initial investment will be recovered by year 7, and by year 15, the investment will have grown 8X.

GDF is looking for an equity investment of \$17M USD. Value will be generated for multiple stakeholders. Investors will earn an IRR of ~19%, an NOI yield of 25%, and dividends from operating income over a 15 year time horizon. Farmers will have better storage facilities to avoid losses due to storage and will have increased negotiating leverage with traders, which will lead to an increase in revenues by 5 to 15 percent. These storage structures will generate employment opportunities in each village. Each structure will save an incremental 45 tons which can feed ~550 individuals. Together, these structures will feed 250,000 people annually.

Once these structures are in place, there will be opportunities to create additional revenue streams and generate higher returns. If unused capacity exists in a facility we can hold government-subsidized supplies (seed, fertilizer) for farmers to pick up when they drop off their crops for storage. Each facility could be used to facilitate grading of wheat and rice to help further increase revenues and give farmers more leverage. These facilities could also be a hub for micro finance loans or other banking services. Bio-digesters could be installed at each structure where farmers could bring waste from harvesting to generate methane, nutrients and water. The methane could produce electricity to help address the second-largest farm-level inefficiency, drying.

There are risks associated with this investment. The government could repeal the capital subsidy but this is not driving our returns and with a looming storage gap of 110M MT in 2012, we do not anticipate this will happen. Hyperinflation could cause land values to appreciate but we will sign long-term contracts to avoid impacts of short-term fluctuations. Natural disasters or general instability in the Indian economy will have to be addressed if and when they occur.

Still, after weighing the risks against the returns and impact of this investment we are confident that GDF can generate significant value for multiple stakeholders.