

SUDDEN ONION PRICE SURGE IN BANGLADESH: A SITUATION ANALYSIS FOR POLICY

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September 8, 2013

Summary

From early July through August 18, 2013, the market prices of onion rose dramatically in Bangladesh. Although prices have shown a downward trend since the end of August, they are still much higher than those seen in previous months. What caused this sudden onion price surge? The International Food Policy Research Institute's evaluation identified a variety of linked factors.



Photo: Wikimedia Commons

Onion is popular in Bangladeshi cooking, so demand for it is high—and growing steadily alongside increasing incomes and population. In fact, demand is expected to increase by 51 percent this decade—from 1.23 million metric tons in 2010 to 1.86 million metric tons in 2020—under the business-as-usual scenario. Under an optimistic income growth scenario, it's expected to increase by 69 percent to 2.08 million metric tons.

Onion cultivation is quite profitable in Bangladesh. In 2012, the crop had a profitability rate of 91 percent per ton produced on a cash-cost basis.² That rate decreases but still remains profitable at 37 percent per ton produced when the estimated values of land rent and family labor are taken into consideration. The crop is a highly commercial commodity, and onion farmers sold an estimated 86 percent of their gross onion production, according to data from the 2011–2012 IFPRI-PRSSP Bangladesh Integrated Household Survey.

Despite the domestic onion's profitability and production growth at an annual rate of 7.3 percent between 2004/05 and 2011/12, imports from India dominate the market in Bangladesh. In 2011–2012 imported onions constituted about one-fourth of the estimated 1.3

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The authors gratefully acknowledge the analytical support and information provided by Samira Choudhury, Samita Kaiser, Shafiqul Karim, Aminul Islam Khandaker, Wahid Quabili, Fiona Shaba, and Rahmana Shamsad of the IFPRI-PRSSP team; and Zahidul Hassan and his team at the Data Analysis and Technical Assistance (DATA).

² This calculation is based on results from the 2011–2012 IFPRI-PRSSP Bangladesh Integrated Household Survey and an average cost-per-ton for onion in 2012. As a "cash cost" calculation, the imputed values of land rent and family labor are not taken into account.

million metric tons of “total onion availability” (the sum of net domestic production and imports), they accounted for nearly 60 percent of the average total onion stocks at wholesale markets in Dhaka city, the main consumption center of the country, during the price-surge period of July 22–August 22, 2013. These patterns indicate that the Indian onion plays a key role in determining the market price of onions in Bangladesh.

India produces around one-quarter of the global onion supply (second only to China), and exports about 10 percent of its total onion output—much of it to Bangladesh, Malaysia, and Singapore. In fact, historically, India has been the only source of onion imports to Bangladesh. Because of this, when recent drought in India’s main onion production zones led to major crop losses, onion imports in Bangladesh obviously decreased as well.

With India in the midst of its own onion-price crisis (see media reports in Appendix C), Bangladeshi traders took advantage of the decrease in imports by hoarding any available onions to make extra profits. The scarcity brought about a price surge. Then, in the last week of August, the Bangladesh government announced its decision to import onion from sources outside of India, namely Myanmar. Traders released the hoarded onions into the local market, and prices showed a downward trend. Based on the situation analysis detailed in this report, the authors offer the following policy recommendations for managing onion production and prices in the short-, medium-, and long-term.

Short-term policy recommendations:

- Decrease dependency on India and vulnerability to climate-induced losses by importing onions from alternative sources. Consider China, Egypt, Malaysia, Myanmar, Pakistan, Turkey, and Vietnam.
- Carefully assess the impacts of onion imports on prices to avoid reducing prices so much so that they become a disincentive for Bangladeshi farmers to produce onion.
- Be vigilant against hoarding between September and December, when Bangladesh is most dependent on onion imports.
- Supply farmers with high-quality inputs—particularly seeds, fertilizers, and pesticides—in a timely manner to increase domestic production of onion and reduce the country’s overall dependency on imports. Inputs should come from the government and the private sector.

Medium-term policy recommendations:

- Explore ways to establish an enabling environment that promotes more participation in the onion trade and guards against hoarding. This would increase competition in the supply market and erode the scope for seeking windfall profits through speculation.
- Take measures to reconcile the major discrepancies between data reported by the Bangladesh Bureau of Statistics (BBS) and data reported by the Department of Agricultural Extension (DAE). Improve the quality of information available on agricultural production and minimize its delivery time to help policy formulation and decision-making.

Long-term policy recommendations:

- Mitigate dependency on onion imports by taking steps to increase domestic production. Since Bangladesh has very little fallow arable land available, future production increases will have to come from higher yields rather than increased cultivation area. Research has a pivotal role to play in developing new agricultural technologies and innovations to address onion production problems. Effective extension systems, appropriate policies, and supportive institutions will allow farmers to make use of those technologies to their benefit.

Background

The onion is a key ingredient in most Bangladeshi meals, so its sudden price spurt in the domestic market since early July 2013 has raised concerns in the population and the government. While the price surge hits low-income consumers the hardest, it can also become an important political issue. For example, in India, onion prices were regarded as the decisive factor in the 1998 state elections in Delhi and Rajasthan and were responsible for bringing down the central government in 1980.

Upon request from the USAID Mission in Bangladesh on August 21, 2013, the IFPRI-PRSSP team has undertaken this situation analysis of the onion price surge with a view to derive policy recommendations for onion price stabilization in the country.

Sources of Information

Based on information collected from the sources listed below, we have analyzed the recent onion price situation in Bangladesh.

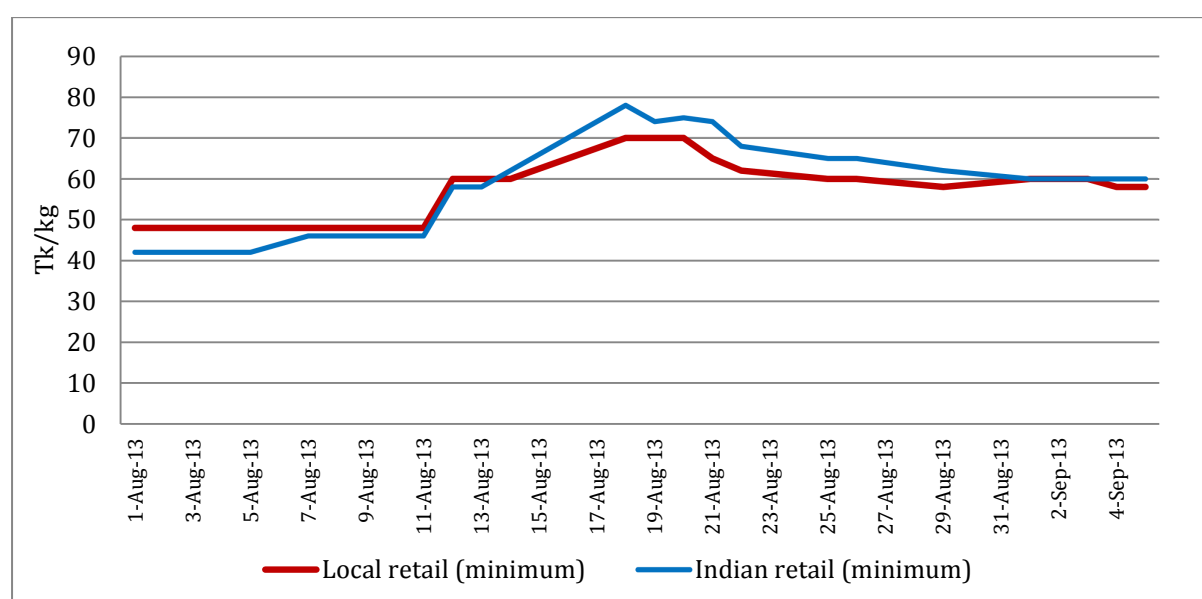
- Consultations with relevant officials in the Ministry of Agriculture, Ministry of Commerce, and the Tariff Commission
- A rapid surveillance of onion wholesale markets in Dhaka city to collect information from wholesalers on daily stocks and selling prices of both local onions and those imported from India during the period from July 22 to August 22
- Interviews with onion importers and traders on the suspected causes of the onion price hike
- Estimates of production costs and marketed surplus of onion based on data from the IFPRI-PRSSP 2011–2012 Bangladesh Integrated Household Survey (BIHS) results
- Telephone interviews with selected onion farmers from the 2011–2012 BIHS sample
- Analysis of (1) secondary time series data on daily and monthly onion wholesale and retail prices from the Department of Agricultural Marketing; (2) yearly onion production trends from the Bangladesh Bureau of Statistics and the Department of Agricultural Extension; and (3) weekly and monthly onion import data from the Bangladesh Bank (Central Bank)
- Reviews of online and print media about the onion price issue in Bangladesh and India

Onion Price Analysis

Two types of onion are available in the domestic market: local (Bangladeshi) and imported (from India). From early July to August 18, 2013, the market prices of both types rose sharply. The price of Indian onion jumped from 25 taka per kilogram (Tk/kg) on June 2 to Tk 78/kg on August 18—a 212 percent price increase in only two and a half months. The average retail price of local onion registered a 133 percent increase during the same timeframe, starting at Tk 30/kg on June 2 and reaching Tk 70/kg on August 18 (Figure 1 and Table A1). In the span of one year—from August 18, 2012, to August 18, 2013—the retail price of Indian onion rose by 290 percent and that of local onion by 133 percent (Figure 2).

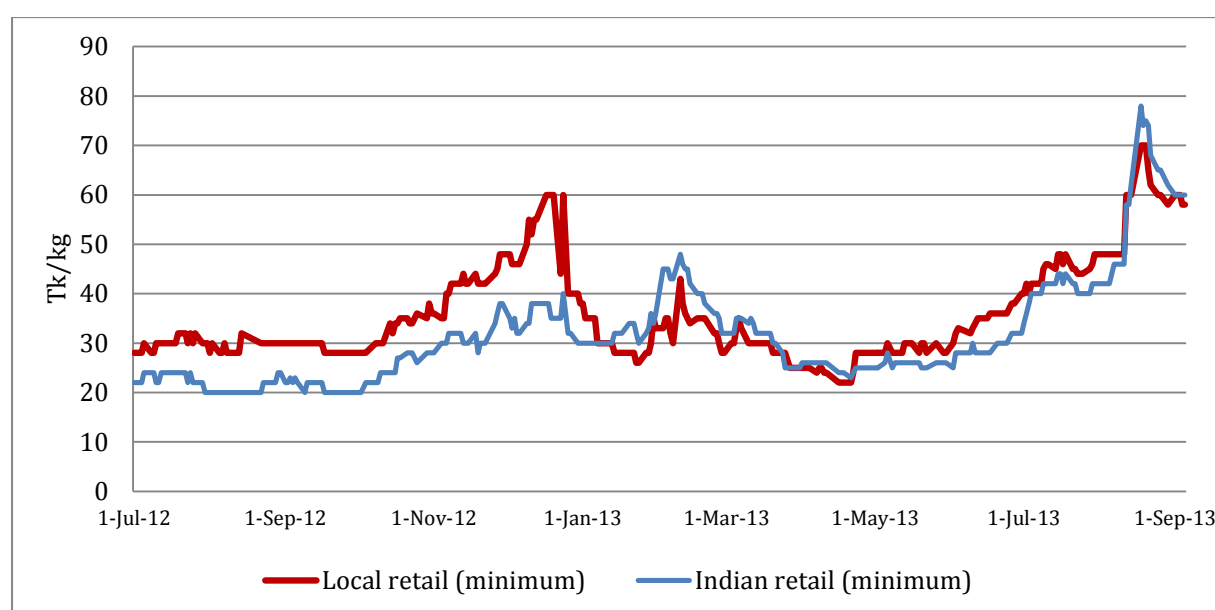
Indian onion's retail price began falling on August 19, local onion's on August 21. By September 5, the retail prices were Tk 60/kg for Indian onion (down 23 percent from the peak price) and Tk 58/kg for local onion (down 17 percent from the peak price) (Figure 1).

Figure 1. Trends in daily retail prices of Bangladeshi and Indian onions in Dhaka city, August 1–September 5, 2013



Source: Data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A1.

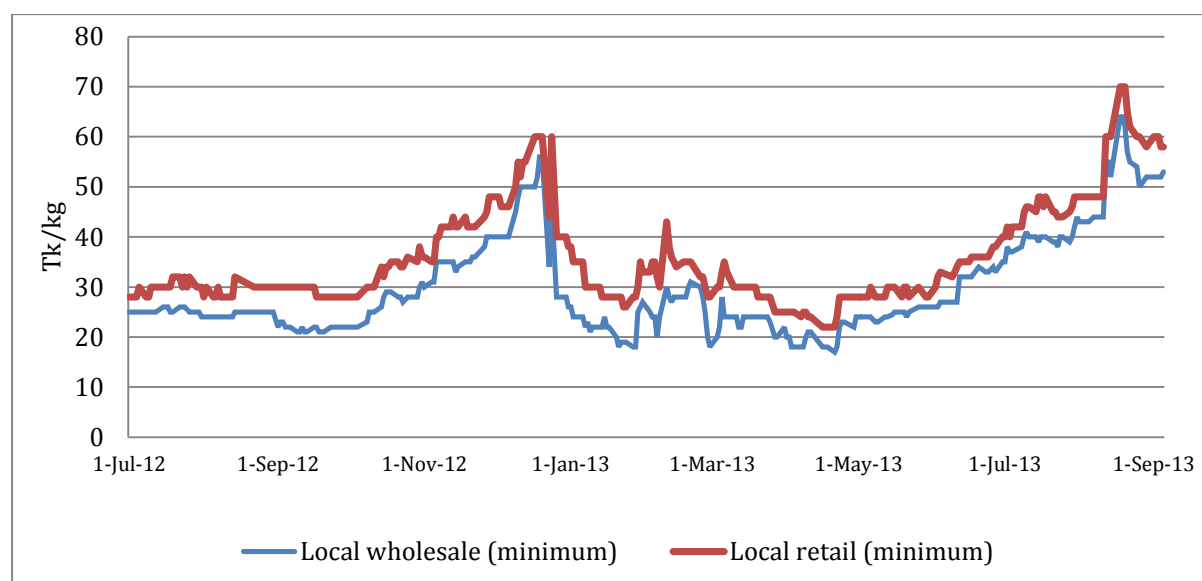
Figure 2. Trends in daily retail prices of Bangladeshi and Indian onions in Dhaka city, July 1, 2012–September 5, 2013



Source: Data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A1.

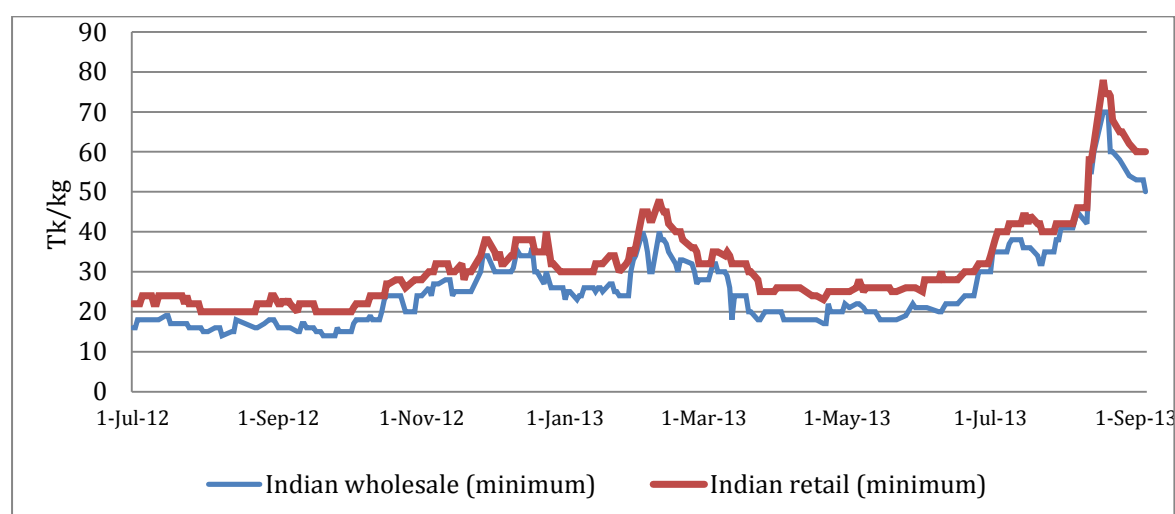
Although the average wholesale prices of local and Indian onions came down in the last week of August and early September, the reductions have not been fully translated into the retail prices (Figures 3 and 4). This is probably because the retailers who purchased onions at higher wholesale prices would not reduce retail prices until they exhaust their stock purchased at higher prices. Local onion prices have typically been higher than Indian onion prices, but that pattern reversed during the recent price surge, as seen in Figures 1 and 5.

Figure 3. Trends in daily wholesale and retail prices of Bangladeshi onion in Dhaka city, July 1, 2012–September 5, 2013



Source: Data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A1.

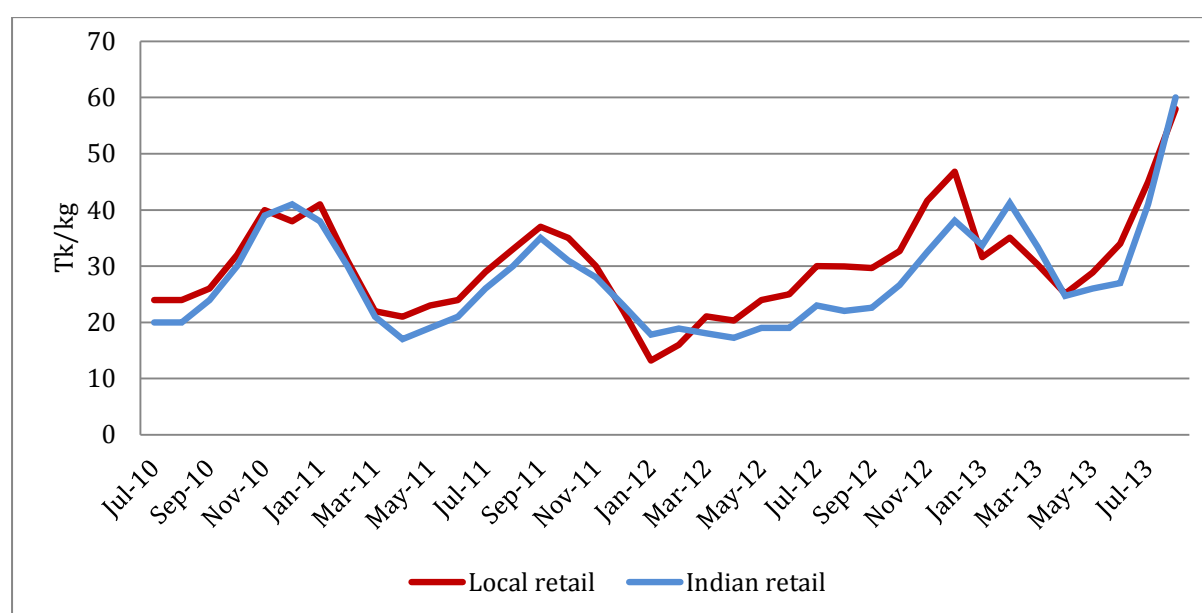
Figure 4. Trends in daily wholesale and retail prices of Indian onion in Dhaka city, July 1, 2012–September 5, 2013



Source: Data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A1.

Onions in Bangladesh are produced in two ways: from roots (15 percent of total production) and from seed (85 percent of total production). Onions from roots are harvested in December while those from seed are harvested between early April and early May. The monthly price trends shown in Figure 5 suggest that onion prices are relatively low during harvest time, particularly during April of 2011, 2012, and 2013, when prices were indeed at their lowest.

Figure 5. Trends in monthly average national retail prices of Bangladeshi and Indian onions, July 2010–August 2013



Source: Data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A2.

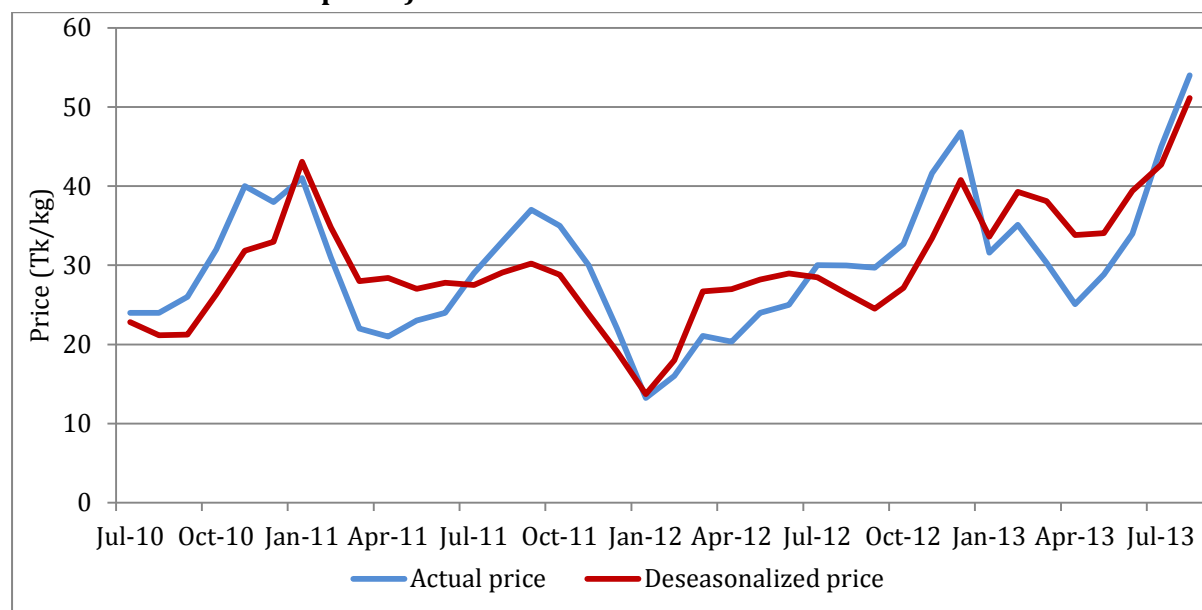
To examine the extent of irregularities in onion prices, we separated the seasonal price effects resulting from onion harvests from the price trends.³ Figure 6 shows that the seasonal effects of onion harvests on prices have largely been removed from the deseasonalized price series.

Figure 7 shows the irregular movements of onion prices.⁴ The maximum positive deviation from the mean was 73 percent in August 2013, followed by 46 percent in January 2011, 45 percent in July 2013, and 38 percent in December 2012. The maximum negative deviation was 54 percent in January 2012. These variations were mostly caused by irregular or random factors rather than by changes in domestic onion production. The irregular factors would likely include fluctuations in onion imports and import prices, hoarding by onion traders, or transportation problems.

³ First, we computed a seasonal index for the monthly average prices of local onion by using the “ratio to moving average” method, which involves the estimation of a 12-month centered moving average of the price series. Then, we “deseasonalized” the price series by dividing every entry in the original price data by the seasonal index.

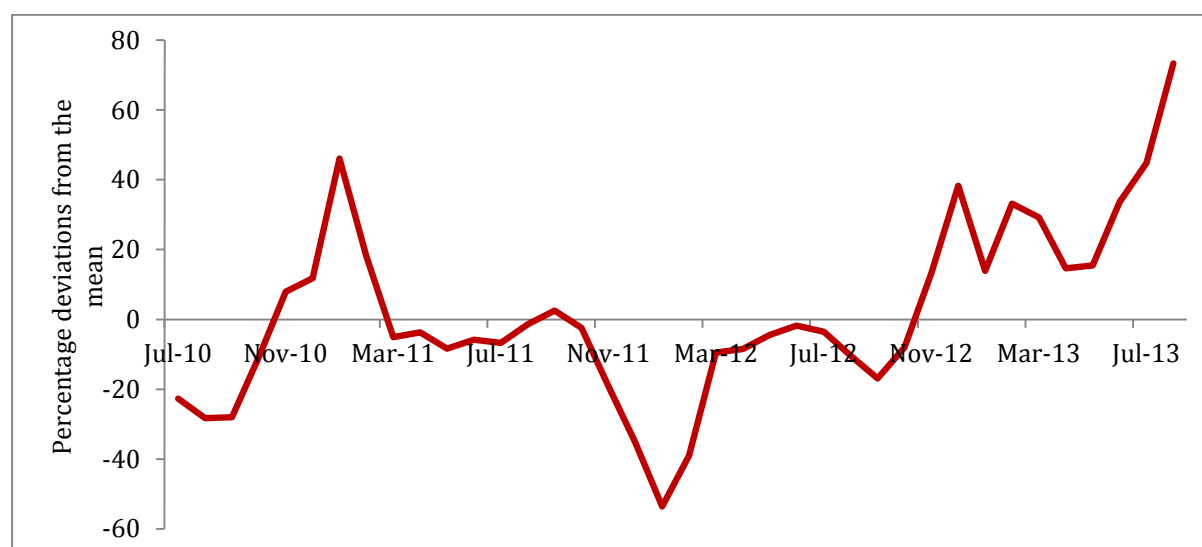
⁴ We transformed the deseasonalized prices into percentages of the overall deseasonalized-price-series average and presented the results in Figure 7 as percentage deviations from the average.

Figure 6. Trends in monthly prices of Bangladeshi onions, July 2010–August 2013 (actual versus deseasonalized prices)



Source: Calculated by authors using data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A2.

Figure 7. Irregular variations in prices of Bangladeshi onions, July 2010–August 2013

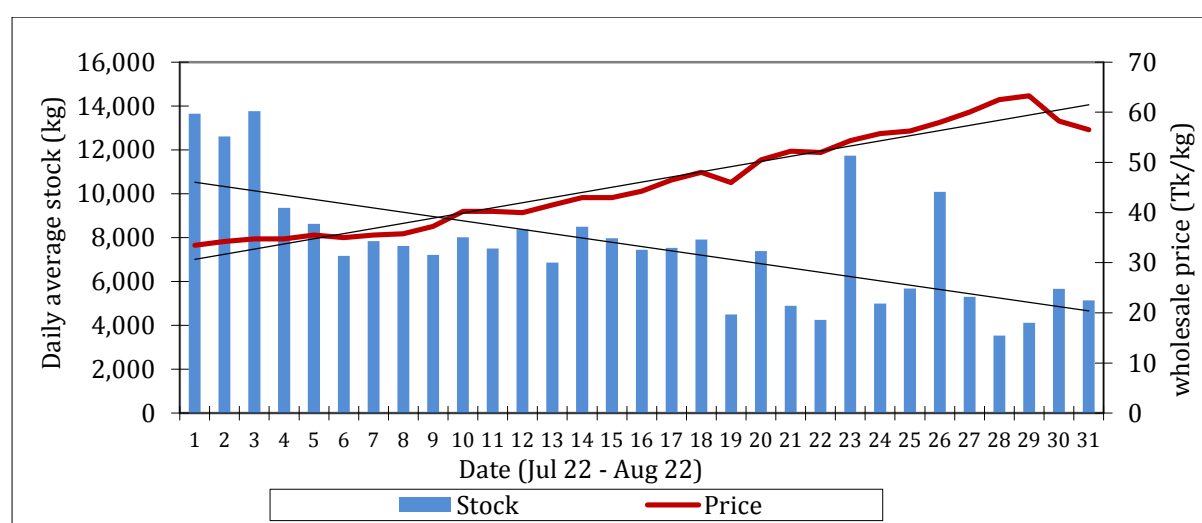


Source: Calculated by authors using data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A2.

Data Analysis and Technical Assistance (DATA), a Bangladeshi survey firm that has conducted numerous surveys for IFPRI, collected information from onion wholesalers on daily stocks and selling prices of imported and local onions from July 22 to August 22 and interviewed traders for their views on what caused the onion price hike. The DATA team collected information from four wholesale markets in Dhaka city: Kawran Bazar, Mohammadpur Krishi Market, Moulavi Bazar, and Shyambazar.

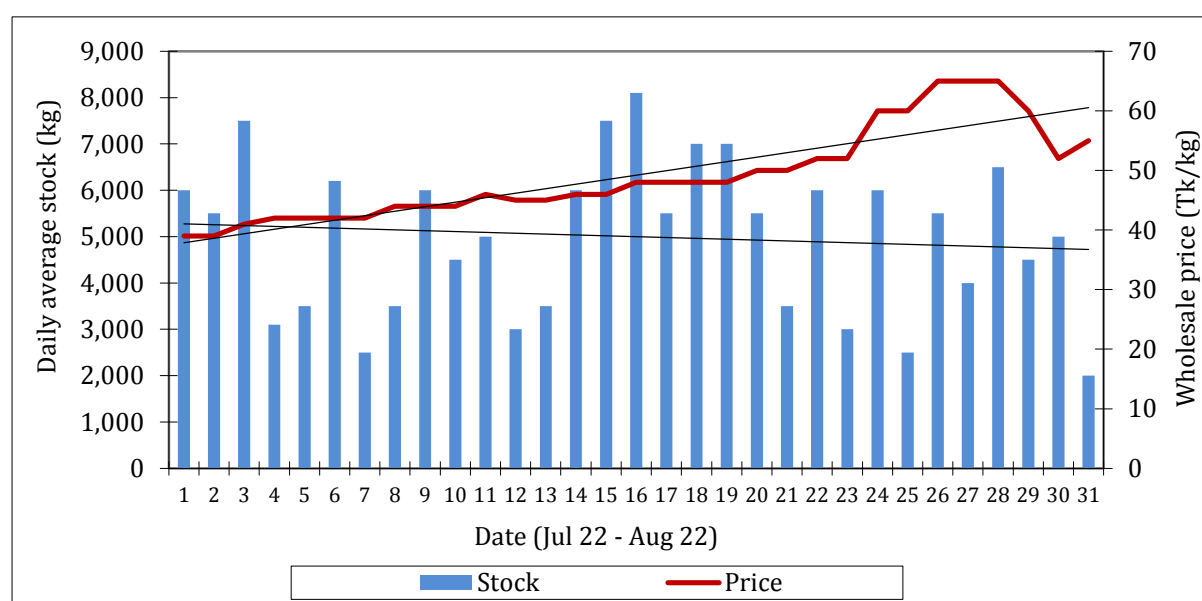
The following figures show the daily average stocks and selling prices of Indian onions (Figure 8) and local onions (Figure 9) at Shyambazar, the largest wholesale market for onions in Dhaka city, from July 22 to August 22, 2013.

Figure 8. Daily average stocks and selling prices of Indian onion at the Shyambazar wholesale market in Dhaka city, July 22–August 22, 2013



Source: Rapid surveillance data collected by Data Analysis and Technical Assistance.

Figure 9. Daily average stocks and selling prices of Bangladeshi onion at the Shyambazar wholesale market in Dhaka city, July 22–August 22, 2013



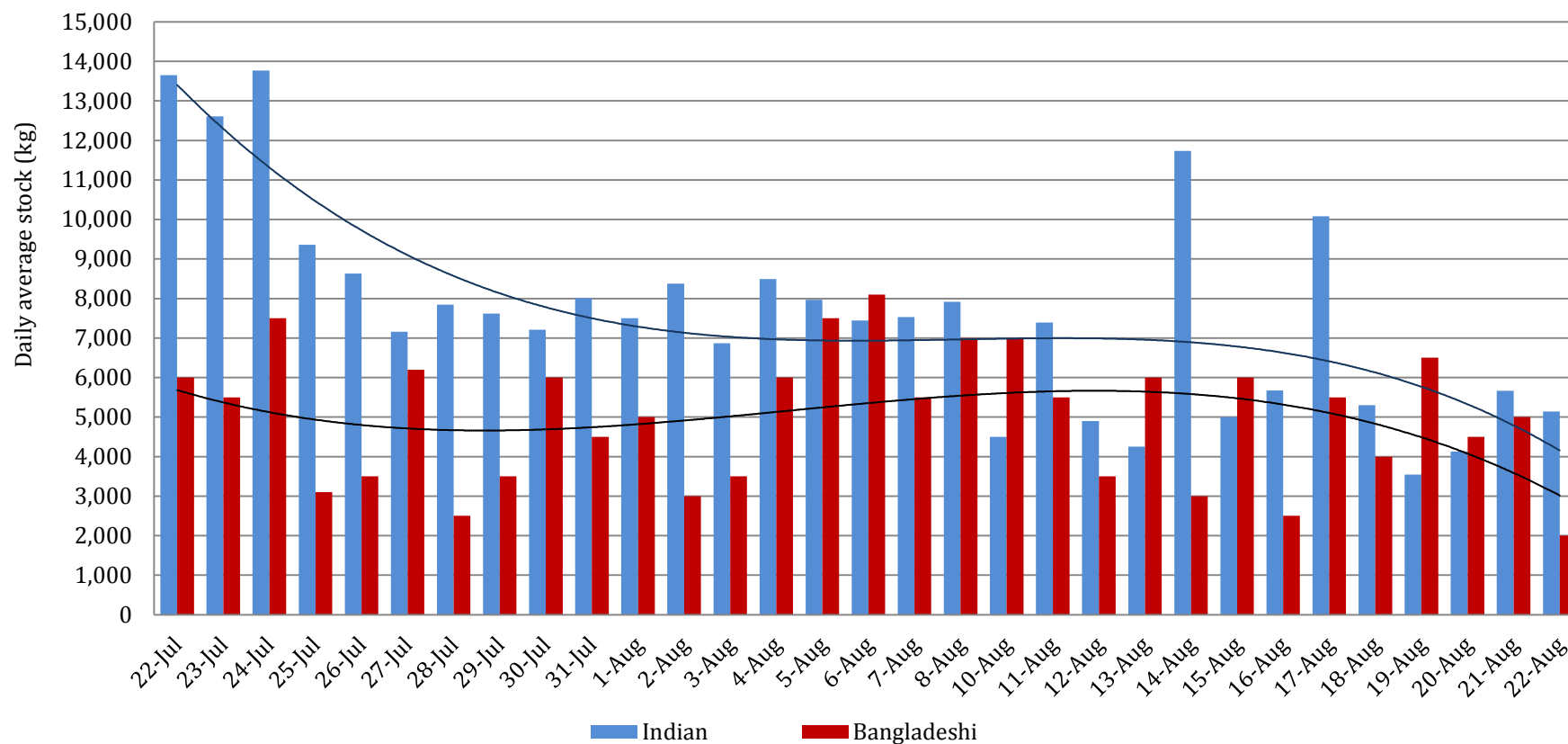
Source: Rapid surveillance data collected by Data Analysis and Technical Assistance.

Figure 8 shows that the fitted trend lines for onion selling prices and onion stocks are negatively associated; that is, as the stocks increase, the selling price decreases and vice versa. This relationship is much stronger for the imported Indian onions than for the Bangladeshi onions (Figure 9). These patterns at the wholesale market indicate that the Indian onion plays a key role in determining the market price of onions.

Figure 10 compares the patterns of daily average stocks of Bangladeshi and Indian onions at the Shyambazar wholesale market from July 22 to August 22, 2013. Imported onions constitute less than one-third of total onion availability (that is, the total of domestic production and imports) in the country. Even though the day-to-day variation in daily stocks of local and Indian onions have been quite large, imported onions accounted for 60 percent of the average total stocks

(Indian plus local) during the period from July 22 to August 22 in the largest wholesale market in Dhaka city, the main consumption center of the country. These patterns again show the dominance of imported Indian onions in the domestic market.

Figure 10. Daily average stocks of Bangladeshi and Indian onions at the Shyambazar wholesale market in Dhaka city, July 22–August 22, 2013



Source: Rapid surveillance data collected by Data Analysis and Technical Assistance.

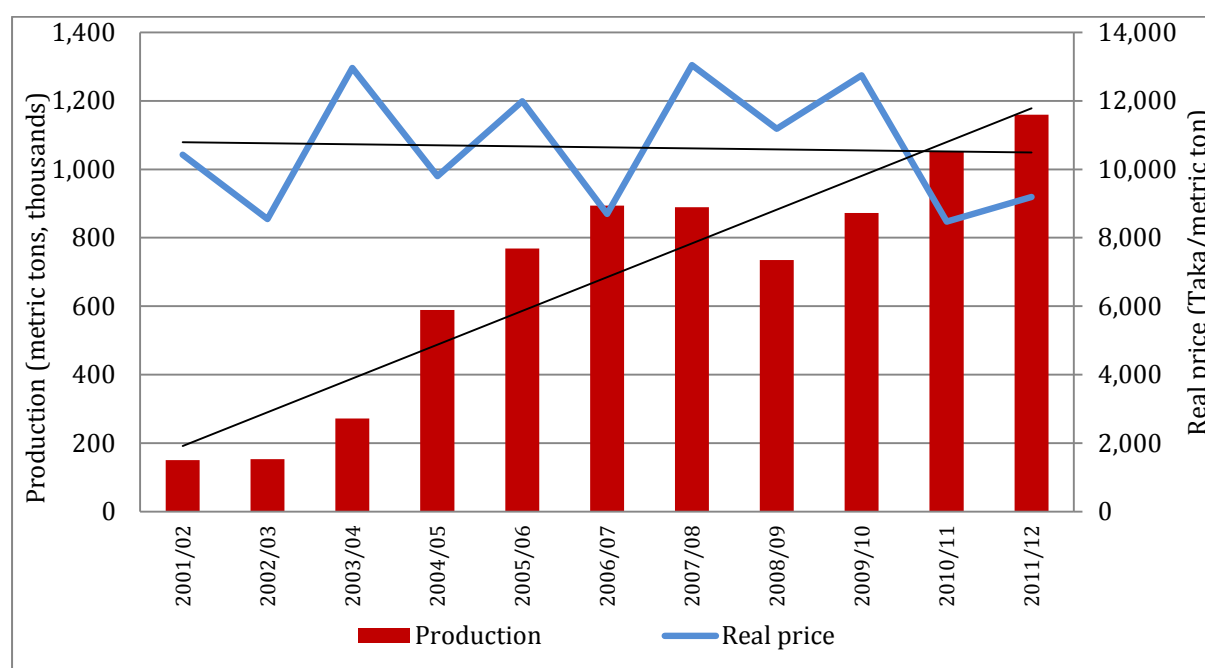
Supply of Onion

The supply of onion in Bangladesh consists of domestic production by farmers and imports (mainly by private importers but also by the government).

Domestic production and long-term price trends

Figure 11 shows the trends in domestic production and real prices, which are adjusted for inflation and expressed in constant 1995/96 prices.⁵ Onion production in Bangladesh has increased remarkably—by almost sevenfold—from only 150 thousand tons in 2001/02 to 1.16 million tons in 2011/12. The changes in real prices within the domestic market, however, do not reflect any noticeable association with the changes in national production levels. Actually, the pattern of onion prices more likely reflects the production situation in India.

Figure 11. Trends in domestic onion production and real (inflation-adjusted) wholesale onion prices, 2001/02–2011/12



Notes: Annual nominal prices of onion have been deflated by the general consumer price index, where 1995/1996=100.

Source: Production data from the Bangladesh Bureau of Statistics; price data from the Department of Agricultural Marketing, Ministry of Agriculture. See Table A3.

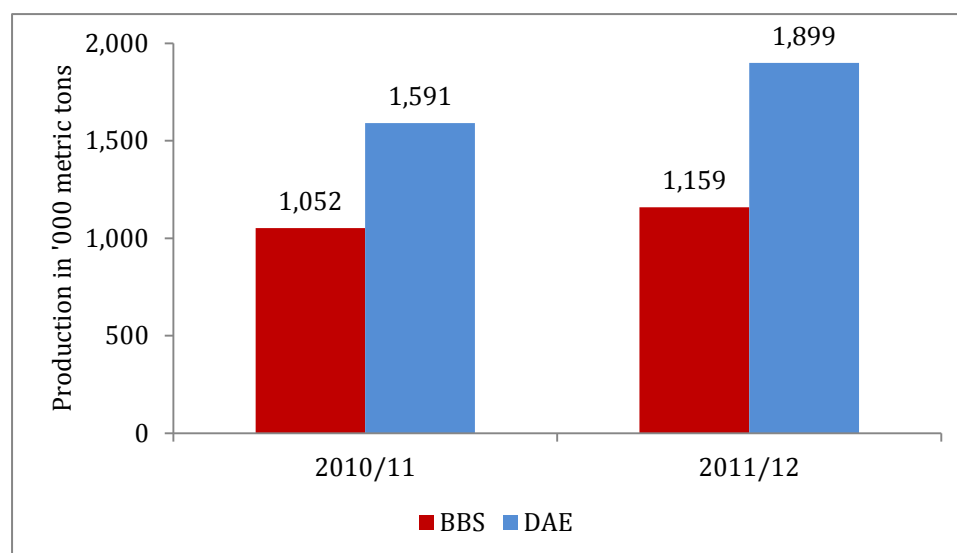
Discrepancies in onion production statistics

The official source of agricultural statistics on cultivated area, production, and yields is the Agriculture Wing of the Bangladesh Bureau of Statistics (BBS), Statistics Division, Ministry of Planning. The Department of Agricultural Extension (DAE) of the Ministry of Agriculture also reports these statistics. However, there are often major differences in the statistics provided by these two government agencies. For example, the most recent BBS onion production estimate for 2011/12 is 1,159 thousand metric tons while the DAE estimate is 64 percent higher at 1,899

⁵ The annual nominal prices of onion have been deflated by the general consumer price index (CPI base: 1995/96=100).

thousand metric tons (Figure 12).⁶ During our consultations, DAE and Tariff Commission officials said the discrepancy comes from the fact that the DAE makes its production estimates immediately after harvest, when onions are wet and their leaves are still attached. The onions weigh 30–40 percent more at this time than at a later stage when they are dry and leafless.

Figure 12. Discrepancies in estimates of onion production: BBS versus DAE



Source: Agricultural Statistics Wing, Bangladesh Bureau of Statistics (BBS), Ministry of Planning, and Department of Agricultural Extension (DAE), Ministry of Agriculture.

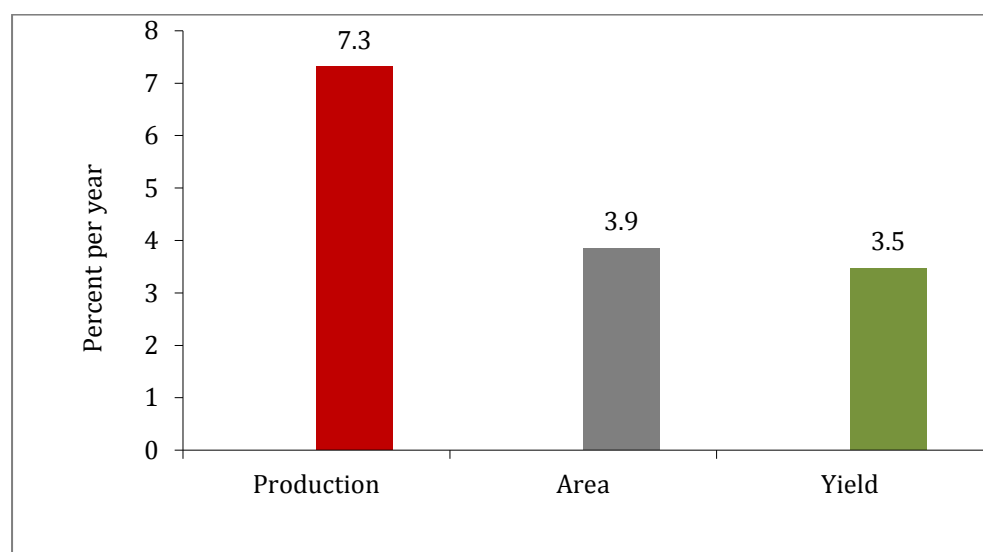
Growth rates of onion production, area, and yields

Figure 13 shows the annual growth rates of production, area, and yields from 2004/05 to 2011/12.⁷ Onion production grew at an annual rate of 7.3 percent, which is quite remarkable even though the base year production level in 2004/05 was relatively low. The expansion of onion cultivation area contributed to 53 percent of the production increase; the remainder (47 percent) was due to the increase in yields. This suggests that research can play an important role in increasing onion production through productivity improvements.

⁶ For the current year (2012/13), the DAE website reports that the total production was 1.914 million metric tons. The BBS estimate for 2012/13 is not yet available.

⁷ Least-square growth rates calculated by authors based on BBS data.

Figure 13. Annual growth rates of onion production, area, and yields, 2004/05 to 2011/12



Source: Estimated by the authors using data from the Bangladesh Bureau of Statistics. See Table A3.

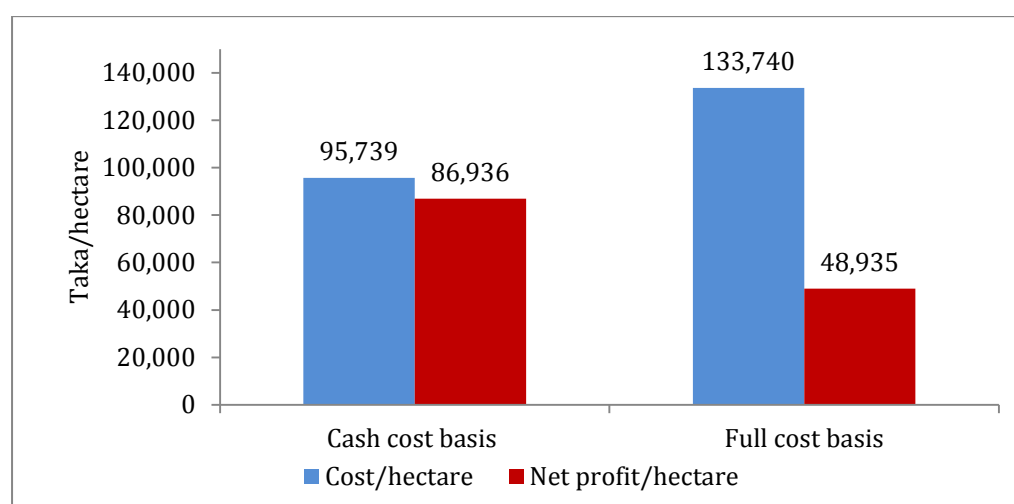
Costs and profitability of onion production

We estimated costs and profitability of onion production based on data from the 2011–2012 Bangladesh Integrated Household Survey (BIHS), a nationally representative survey developed and conducted by IFPRI-PRSSP that collected detailed plot-level data on agricultural production practices and numerous other aspects of livelihoods of rural households.⁸

Figure 14 provides the estimates of production costs and net profits from onion cultivation in 2012. The average cost of onion production on a cash-cost basis (that is, when imputed values of land rent and family labor are *not* taken into account) was Tk 95,739/hectare; on a full-cost basis (including the imputed values of land rent and family labor) the production cost is Tk 133,740/hectare. Net profit (gross revenue minus the cost of production) therefore was Tk 86,936/hectare on a cash-cost basis and Tk 48,935/hectare on a full-cost basis.

⁸ Total cost per hectare is obtained by adding the costs of: inputs (seeds, fertilizers, manure, and pesticides), irrigation, seedling raising, equipment/bullock/mechanical power rentals, hired and family labor, and imputed land rent for both farmer-owned and rented-in land. Dividing the cost per hectare by onion yield gives cost per metric ton of onion. On the revenue side, average onion yield per hectare (9,689 kg) is multiplied by farmers' average selling price (Tk 18.85/kg) to calculate gross revenue or return per hectare in 2012. Dividing the gross revenue per hectare by onion yield gives gross revenue per metric ton of onion. Subtracting the cost of production from gross revenue gives the net profit of producing onion.

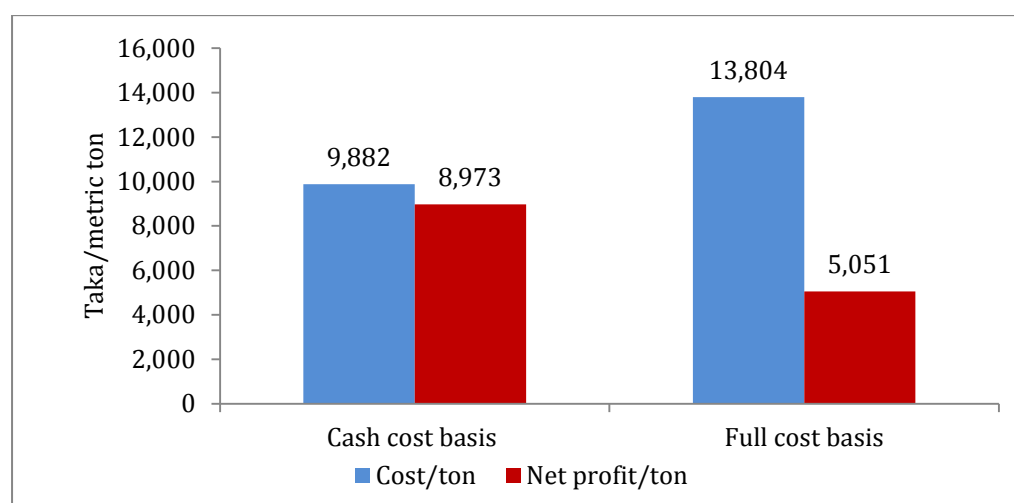
Figure 14. Cost of production of onion per hectare, 2012



Source: Estimated using data from the IFPRI-PRSSP 2011–2012 Bangladesh Integrated Household Survey.

The cost of producing one metric ton of onion can be viewed in terms of a break-even point, which indicates the price a farmer must receive for their crop in order to cover costs. On a cash-cost basis, the rate of profit per ton was quite high: 91 percent of the average cost per ton of onion produced. Even when the imputed values of land rent and family labor were accounted for in the cost calculations, the profitability was 37 percent of full cost of production per ton of onion (Figure 15).

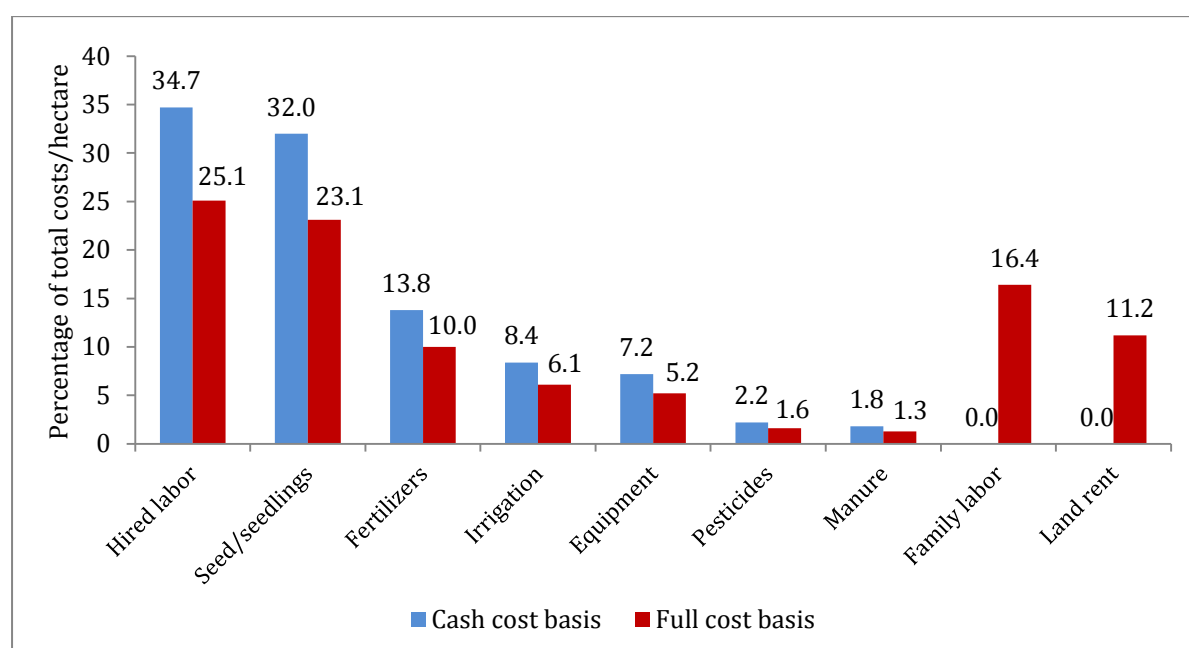
Figure 15. Cost of production of onion per metric ton, 2012



Source: Estimated using data from the IFPRI-PRSSP 2011–2012 Bangladesh Integrated Household Survey.

Figure 16 presents input costs as percentages of both cash costs and full costs of onion production per hectare. Labor has the biggest share of costs followed by seeds and seedlings. Family labor and imputed land rent account for 16 percent and 11 percent of full costs, respectively.

Figure 16. Shares of input costs in cash and full costs of production of onion, 2012



Source: Estimated using data from the IFPRI-PRSSP 2011–2012 Bangladesh Integrated Household Survey.

Will farmers grow more onion next year in response to the current price surge?

According to a recent estimate, the short-run price elasticity of onion supply is 0.23, meaning a 10 percent increase in price would induce farmers to produce 2.3 percent more onion.⁹ Farmers will probably make their production decisions based on market price before the planting season (around November).

At our request, DATA interviewed 25 selected farm households from those that participated in the 2011–2012 BIHS. Twelve of the 25 households cultivated onions this year (harvested in April 2013), and farmers in those households said they would substantially increase the area under onion cultivation next year because of the expected high profits. Mofizul Islam, a farmer from Kumarkhali Upazila of Kushtia District, said:

Of course I will cultivate more onion next year. Compared to other crops, onion is more profitable. Market price remains between 800 and 1,000 taka per *maund* [37.32 kg]. For every *bigha* [one-third of an acre], the yield is 30 to 40 *maunds*, and expenses are between 12,000 to 15,000 taka per *bigha*. So, the profit is almost double the production cost. However, if farmers could get loans, then many more farmers could grow onion and much more area could be under onion cultivation.

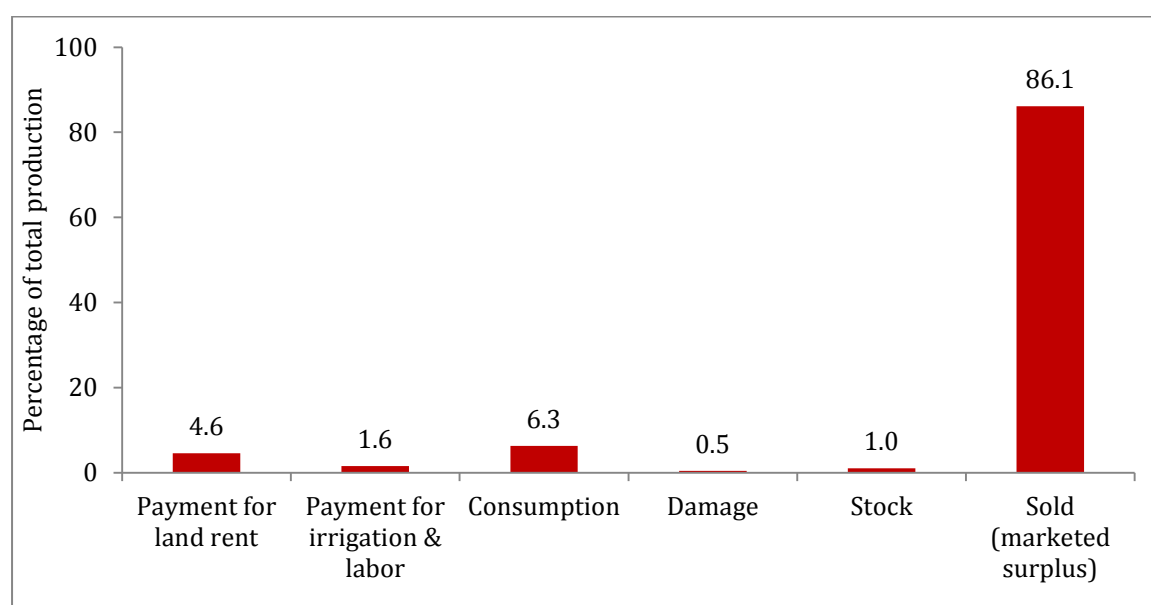
⁹ M. Yunus and Q. Shahabuddin, *Farmers' Supply Response to Prices and Non-Price Factors in Bangladesh*, Policy Research and Strategy Support Program Report (Dhaka, Bangladesh: International Food Policy Research Institute and Bangladesh Institute of Development Studies, 2013).

Farmers who did not cultivate onion this year expressed a strong interest in producing it next year with the expectation of high profits. *“I will cultivate onion next year because the price is so high. I regret that I did not grow [it] this year. I could earn a huge profit,”* said Alamgir Hossain, a farmer from Bhanga Upazila of Faridpur District.

How much onion produced domestically comes to the market?

The results of our analysis of the 2011–2012 BIHS data (presented in Figure 17) show that onion has a high marketed surplus rate and suggest that it is a highly commercial commodity.¹⁰ In 2012, onion farmers in Bangladesh sold about 86 percent of their gross onion production.

Figure 17. Uses of onion produced by Bangladeshi farm households



Source: IFPRI-PRSSP 2011–2012 Bangladesh Integrated Household Survey.

Onion imports

Although the government imported onion from Myanmar in the last week of August 2013, historically, India has been the only source of onion imports to Bangladesh. Second only to China, India produces around one-quarter of the global onion supply and exports about 10 percent of its total onion output—much of it to Bangladesh, Malaysia, and Singapore. However, recent drought-induced losses in India’s main producing regions, Maharashtra and Karnataka, led the price of onion to rise sharply in July and August 2013. The National Horticultural Research and Development Foundation of India recently predicted an estimated 10 percent decrease in production. To stabilize the price of onion, India’s state-run trading agencies issued import tenders in the last week of August 2013. The main importing firm—New Delhi-based state-run National Agricultural Cooperative Marketing Federation of India—mentioned on its website that it was exploring import potentials from China, Egypt, Iran, and Pakistan. Another

¹⁰ We analyzed the use of onion produced by Bangladeshi farm households using data from the 2011–2012 BIHS, which collected plot-level data on in-kind payments for land rent, irrigation, and labor use; crop production; input use; farmers’ home consumption; loss/damage after harvest; farm-level stock; and the marketed quantity for one year (from December 1, 2010, to November 30, 2011).

state-run international trading company based in New Delhi (PEC Ltd.) also saw interest from international suppliers to supply 300,000 tons of onions.

On August 18, 2013, amid concerns about the political repercussions of spiraling onion prices, India's Commerce Ministry set the minimum export price at US\$650 per ton to discourage exports and control rising prices.¹¹ This measure contributed to the price hike for Bangladeshi onion importers.

To deal with the price surge, the Trading Corporation of Bangladesh decided to import 5,000 tons of onion from both India and Myanmar through private importers.¹² Since August 30, 2013, the government has been selling onion directly to consumers through its open market sale program at a fixed price of Tk 47/kg.

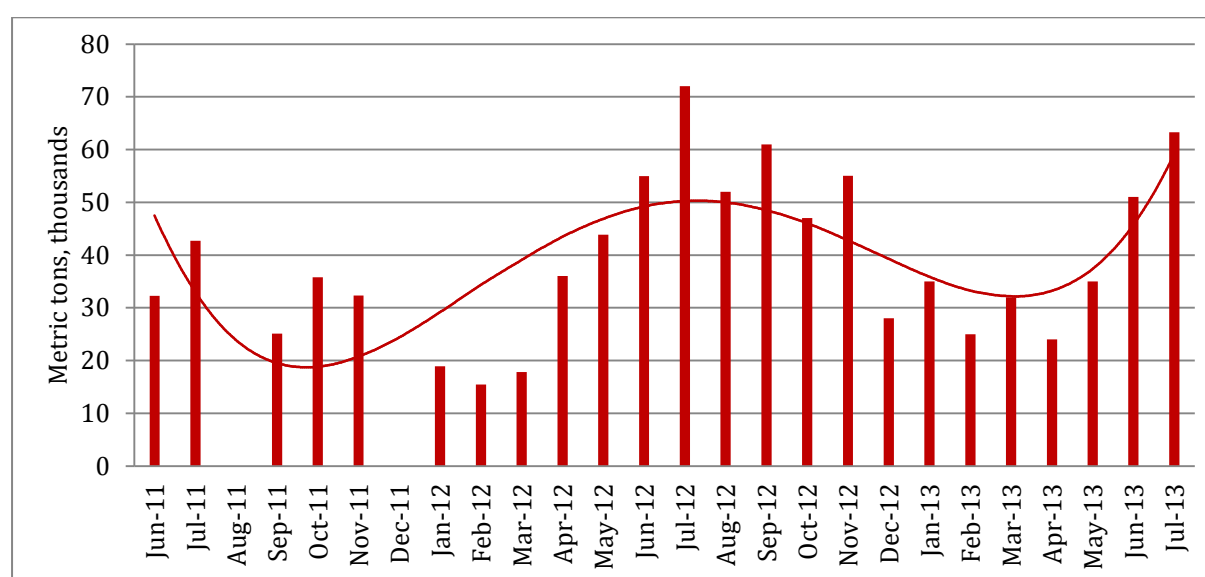
According to an official at the Tariff Commission, alternative sources of onion import are China, Egypt, Malaysia, Myanmar, Pakistan, Turkey, and Vietnam, but the cost-effectiveness and technical feasibility of importing from these countries needs to be carefully examined. Although Myanmar is closest in proximity to Bangladesh and its current onion price is low compared to India, the process of opening a letter of credit and settlement with Myanmar would be quite cumbersome and time-consuming. This must be weighed against importing onion from countries that are farther away, which would result in higher transit losses of the semi-perishable crop.

Figure 18 shows the trends in monthly imports of onion from June 2011 to July 2013. The level of import has fluctuated considerably during this period. Figure 19 shows the trends in annual imports of onion from 2005/06 to 2012/13 and illustrates that imports have increased three folds during this period.

¹¹ The minimum export price was US\$250/ton on August 4, 2013, and jumped to US\$400/ton just after the Eid celebration on August 10.

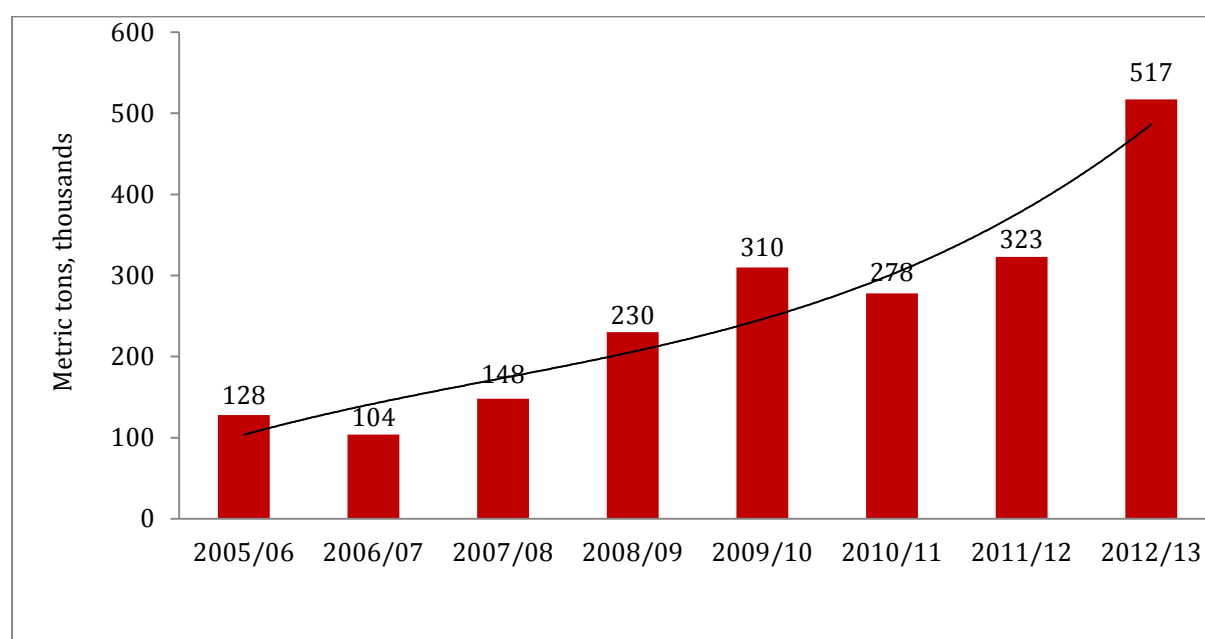
¹² To date, 500 tons have been imported from India, and another 100 tons are in the pipeline.

Figure 18. Trends in monthly onion imports, June 2011–July 2013



Source: Data from the Import Monitoring Section, Bangladesh Bank. See Table A4.

Figure 19. Trends in annual onion imports, 2005/06 to 2012/13



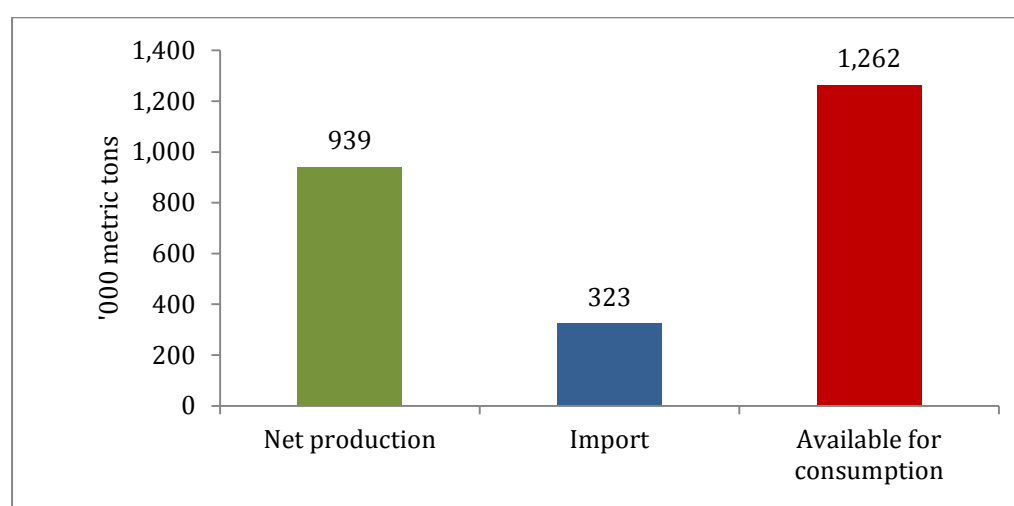
Source: Data from the Bangladesh Tariff Commission, Ministry of Commerce. See Table A5.

Onion availability for consumption

The annual onion availability for consumption in Bangladesh consists of net domestic production plus imports. Based on this, we estimated onion availability for consumption at 1.3 million metric tons in 2011/12 (Figure 20).¹³

¹³ Customarily in Bangladesh, the total of seed, feed, and wastage for foodgrains (such as rice and wheat) is considered to be 10 percent, which is deducted from gross production to calculate net production. However, unlike

Figure 20. Onion availability for consumption, 2011/12



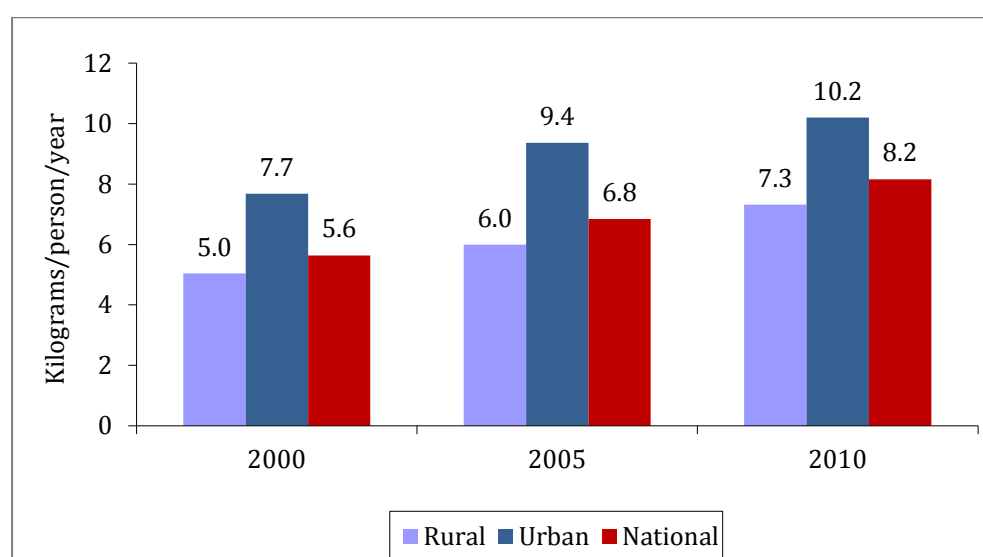
Source: Estimated by the authors using data from the Bangladesh Bureau of Statistics.

Onion Consumption

The Bangladesh Bureau of Statistics conducts the nationally representative household income and expenditure survey (HIES) in both rural and urban areas every five years. This survey covers household expenditures for food and non-food as well as quantities of food consumed. Based on three rounds of HIES data, we estimated annual per capita onion consumption in 2000, 2005, and 2010. Figure 21 shows the trends at the country, rural, and urban levels for per capita onion consumption, which increased by 46 percent nationwide from 2000 to 2010. Urban residents eat more onions than rural households; in 2010, they consumed 40 percent more onions per person than rural residents did.

cereals, which are not perishable, onion is a semi-perishable commodity. There exists no standard for estimation of net domestic onion availability for consumption. Without an available standard, we calculated the net production quantity by deducting 20 percent from total onion production to account for seeds, excess moisture, and post-harvest losses and taking into consideration the perishability of onion.

Figure 21. Trends in per capita onion consumption per year, 2000, 2005, and 2010



Source: Household Income and Expenditure Survey reports published in 2002, 2007, and 2012 by the Bangladesh Bureau of Statistics.

Demand for Onion

There are differing estimates for the demand for onion in 2013. The Department of Agricultural Extension provides two estimates—2.1 million metric tons and 2.7 million metric tons¹⁴—while the Tariff Commission estimated demand at 2.4 million metric tons in a recent position paper.¹⁵ In an August 19 newspaper article,¹⁶ a Ministry of Commerce official remarked that the estimates for onion production differ drastically between the government agencies that provide them (that is, DAE and BBS). The article stated that the Ministry was concerned that without knowing the actual quantity of onion demand, it would not be able to determine how much onion to import in order to contain the market price. Considering the need for this information, IFPRI-PRSSP undertook an exercise to estimate aggregate demand for onion and make demand projections.

The concept of demand is different from that of requirement. In economics, demand is a consumer's desire, willingness, and ability to pay a price for a specific good or service.¹⁷ In our analysis, we made onion-demand projections from 2010 to 2020. The estimate for change in demand is based on changes in income and population, holding prices and other factors constant at their 2010 levels.¹⁸ We made per capita annual onion demand projections under two

¹⁴ Department of Agricultural Extension, Ministry of Agriculture.

¹⁵ Ministry of Commerce position paper prepared for the June 3, 2013, meeting at the Prime Minister's Office.

¹⁶ "Ministry in Dark on Onion Production," *Dhaka Tribune*, 19 August 2013.

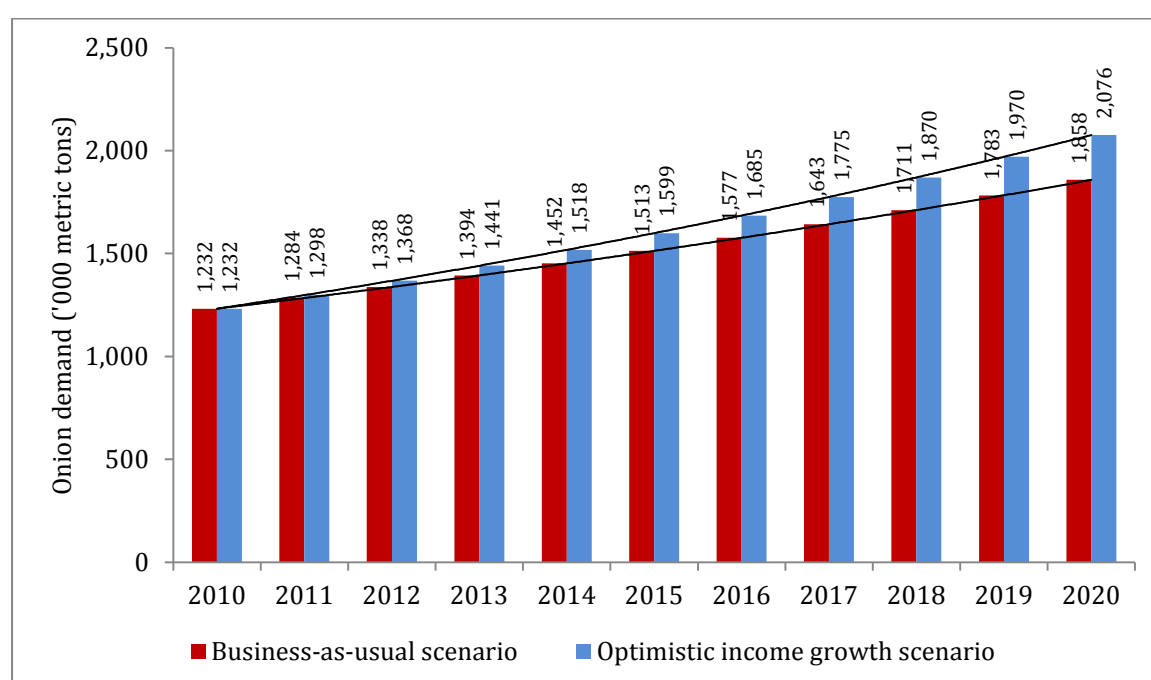
¹⁷ The quantity demanded is the amount of a product people are willing to buy at a certain price; the relationship between price and quantity demanded is known as the "demand relationship." Movement along a demand curve due to a change in the good's price results in a change in the quantity demanded, not a change in overall demand. Rather, a change in overall demand refers to a shift in the quantity demanded based on changes in factors other than the price of the good. For example, if a person's income increases, his demand is likely to increase. If the population grows, demand will also increase. Demand can also change due to changes in taste and preference or changes in the prices of related commodities.

¹⁸ We used the 2010 HIES estimate of actual per capita consumption (8.16 kg/year/person) as the base year demand. For income, we used the gross national income per capita from the World Bank World Development Indicators. We used 0.54 as the value of income elasticity of demand for onion.

scenarios on the growth of real per capita income. First, we envisage a business-as-usual scenario, where the current trend in real (that is, inflation-adjusted) income growth of 3.6 percent per capita from 2000 to 2010 is expected to continue.¹⁹ Second, we used an optimistic scenario of 5 percent per capita real income growth.

Figure 22 presents the projected total demand for onion under the two income growth scenarios from 2010 to 2020.²⁰ From the base year demand of 1.23 million metric tons, the demand for onion is expected to increase to 1.86 million metric tons in 2020 (51 percent increase) under the business-as-usual scenario and to 2.08 million metric tons (69 percent increase) under the optimistic income growth scenario. The estimates show that the projected demand of 1.3 million metric tons in 2012 under the business-as-usual scenario reflects the availability of onion for consumption (net production plus import) of 1.3 million metric tons, as shown in Figure 20.

Figure 22. Projected onion demand, 2010–2020



Source: Estimated by authors using data from the Bangladesh Bureau of Statistics and the World Bank.

Estimated Effects of Onion Imports on Market Price

Amid the onion price surge, the Trading Corporation of Bangladesh is importing 5,000 metric tons of onion to dampen the domestic market price. But, specifically, what impact will this have? We used a mathematical demand-supply model to estimate it under different scenarios (see Appendix B for a description of the model and parameters used for the estimations).

The price of a commodity is determined by the interaction of its demand and supply in the market. We assume that the retail market price of onion before the import (the “base price”) is Tk 62/kg. If the entire quantity of imported onion is distributed in the country within a span of

¹⁹ A. Ganesh-Kumar, S. K. Prasad, and H. Pullabhotla, *Supply and Demand for Cereals in Bangladesh, 2010–2030*, IFPRI Discussion Paper 1186 (Washington, DC: International Food Policy Research Institute, 2012).

²⁰ To calculate the total demand for onion by the population, we have multiplied the annual per capita consumption forecasts with the predicted annual population figures obtained from the World Bank.

one week, then the market supply of onion would increase by 5,000 metric tons, and the retail price would drop to Tk 51/kg. However, if the imported quantity is distributed within a span of two weeks, then the market price would only fall to Tk 56/kg. If no subsequent new supply comes to the market after the 5,000 metric tons is exhausted, then the price would return to the base level. These effects are calculated with the assumption that all other things (for example, private imports, stocks held by farmers and traders, the transportation situation, income, prices of other commodities, and additional factors) are held constant at the base level in order to isolate the effects of the Trading Corporation of Bangladesh's import from other factors.

We have presented the above analysis as an illustrative example. The same analytical model can be used to estimate the simulated effects of changes in demand on prices.

What Contributed to the Steep Price Rise?

From our situation analysis as well as our review of recent media reports (see Appendix C), we conclude that the main reason for the recent onion price surge was a decline in onion production in India due to unfavorable weather conditions in its major onion production zones. Based on the media reports from Bangladesh and India, it can be inferred that there is actually an onion-price crisis in India as well. Bangladeshi traders took advantage of the situation and started hoarding onions to make extra profits. But, once the Bangladeshi government announced its decision to import onion from other sources besides India, the traders began supplying the hoarded onions in the local market. As a consequence, the price of onion showed a downward trend. Sources at different levels indicated that there was no other reason for an onion price hike at that time, especially when no festivals were being observed.

Conclusions for Policy

The market supply of onion in Bangladesh declined not only because of the reduction in imports from India but also because local traders took advantage of the situation by hoarding onions to make extra profit. On August 17, 2013, the Bangladesh government announced its decision to import onion from Myanmar. Following this announcement, the market price of onion began to drop, likely because the traders supplied their previously hoarded stock of onion into the local market. Despite the drop, however, onion prices still remain high in the market compared with prices from early June 2013.

We have drawn the following conclusions and short-, medium-, and long-term policy recommendations regarding management of onion production and prices.

Short-term recommendations:

- Bangladesh's dependency on India as virtually the only source of onion imports makes the country vulnerable. The government needs to carefully examine the feasibility of alternative sources such as China, Egypt, Malaysia, Myanmar, Pakistan, Turkey, and Vietnam.
- Although government imports have the potential to decrease market price, their expected impacts on prices need to be more carefully assessed. While relatively small imports distributed over a long period of time would not have much impact on the market price, too much price reduction could create disincentive for farmers to produce onion.
- Bangladesh is mostly dependent on onion imports between September and December. Therefore, the government has to be vigilant against hoarding during this period.
- Timely provision of high quality inputs to farmers—particularly seeds, fertilizers, and pesticides—by both the government and private sector is important for increasing domestic production of onion and reducing the dependency on imports.

Medium-term policy recommendations:

- In order to guard against future hoarding by traders, the government should explore ways to create an enabling environment that promotes more participation in the onion trade. This would increase competition in the supply market and thereby erode the scope for seeking windfall profits through speculation.
- Timely, adequate, and accurate information is the basis for policy formulation and decision-making, but there are often major discrepancies in the information and data on agricultural production reported by the two government agencies responsible for collecting it—the Bangladesh Bureau of Statistics (BBS) and the Department of Agricultural Extension (DAE). Measures should be taken to reconcile the data reported by these agencies, improve their quality, and minimize their delivery time.

Long-term policy recommendations:

- The most efficient and sustainable way to tackle the onion crisis would be to mitigate dependency on imports by taking steps to increase domestic onion production. Research can play a pivotal role in this by finding ways to increase that production by improving productivity. Since Bangladesh currently has very little fallow arable land available, future production increases will have to come from higher yields of onion. This will mean developing new technologies and innovations through research to address production problems. Agricultural technologies can offer significant promise for augmenting onion productivity, but only if they are disseminated to farmers through effective extension systems and supported by appropriate policies and institutions.

APPENDIX A

Table A1. Daily wholesale and retail prices of local and Indian onions (taka/kg), July 1, 2012–September 5, 2013

Date	Local		Indian	
	Wholesale	Retail	Wholesale	Retail
1-Jul-12	25	28	16	22
2-Jul-12	25	28	16	22
3-Jul-12	25	28	18	22
4-Jul-12	25	28	18	22
5-Jul-12	25	30	18	24
8-Jul-12	25	28	18	24
9-Jul-12	25	28	18	24
10-Jul-12	25	30	18	22
11-Jul-12	25	30	18	22
12-Jul-12	25	30	18	24
15-Jul-12	26	30	19	24
16-Jul-12	26	30	19	24
17-Jul-12	26	30	17	24
18-Jul-12	25	30	17	24
19-Jul-12	25	32	17	24
22-Jul-12	26	32	17	24
23-Jul-12	26	30	17	22
24-Jul-12	26	32	17	24
25-Jul-12	26	30	16	22
26-Jul-12	25	32	16	22
29-Jul-12	25	30	16	22
30-Jul-12	25	30	16	20
31-Jul-12	24	30	15	20
1-Aug-12	24	28	15	20
2-Aug-12	24	30	15	20
5-Aug-12	24	28	16	20
6-Aug-12	24	28	16	20
7-Aug-12	24	30	16	20
8-Aug-12	24	28	14	20
12-Aug-12	24	28	15	20
13-Aug-12	24	28	15	20
14-Aug-12	25	32	18	20
22-Aug-12	25	30	16	20
23-Aug-12	25	30	16	22
26-Aug-12	25	30	17	22
28-Aug-12	25	30	18	22
29-Aug-12	25	30	18	24
30-Aug-12	25	30	18	24
1-Sep-12	22	30	16	22
2-Sep-12	23	30	16	22
3-Sep-12	23	30	16	23
4-Sep-12	22	30	16	22
5-Sep-12	22	30	16	23
6-Sep-12	22	30	16	22
9-Sep-12	21	30	15	20
10-Sep-12	21	30	15	22
11-Sep-12	22	30	17	22
12-Sep-12	21	30	17	22
13-Sep-12	21	30	16	22

Date	Local		Indian	
	Wholesale	Retail	Wholesale	Retail
16-Sep-12	22	30	16	22
17-Sep-12	22	28	15	20
18-Sep-12	21	28	15	20
19-Sep-12	21	28	15	20
20-Sep-12	21	28	14	20
23-Sep-12	22	28	14	20
24-Sep-12	22	28	14	20
25-Sep-12	22	28	14	20
26-Sep-12	22	28	16	20
27-Sep-12	22	28	15	20
30-Sep-12	22	28	15	20
1-Oct-12	22	28	15	20
2-Oct-12	22	28	15	20
3-Oct-12	22	28	17	21
4-Oct-12	22	28	18	22
8-Oct-12	23	30	18	22
9-Oct-12	25	30	18	22
10-Oct-12	25	30	19	24
11-Oct-12	25	30	18	24
14-Oct-12	26	34	18	24
15-Oct-12	28	32	20	24
16-Oct-12	29	34	23	24
17-Oct-12	29	34	24	27
18-Oct-12	29	35	24	27
21-Oct-12	28	35	24	28
22-Oct-12	28	34	24	28
23-Oct-12	27	34	24	28
25-Oct-12	28	36	20	26
29-Oct-12	28	35	20	28
30-Oct-12	30	38	24	28
31-Oct-12	31	36	24	28
1-Nov-12	30	36	24	28
4-Nov-12	31	35	26	30
5-Nov-12	31	35	24	30
6-Nov-12	35	40	27	30
7-Nov-12	35	40	27	32
8-Nov-12	35	42	27	32
11-Nov-12	35	42	28	32
12-Nov-12	35	42	28	32
13-Nov-12	35	44	28	30
14-Nov-12	33	42	24	30
15-Nov-12	34	42	25	30
18-Nov-12	35	44	25	32
19-Nov-12	35	42	25	28
20-Nov-12	35	42	25	30
21-Nov-12	36	42	25	30
22-Nov-12	36	42	25	30
26-Nov-12	38	44	30	34
27-Nov-12	40	45	34	36
28-Nov-12	40	48	34	38
29-Nov-12	40	48	34	38
2-Dec-12	40	48	30	35
3-Dec-12	40	46	30	33
4-Dec-12	40	46	30	35
5-Dec-12	40	46	30	32

Date	Local		Indian	
	Wholesale	Retail	Wholesale	Retail
6-Dec-12	40	46	30	32
9-Dec-12	45	50	30	34
10-Dec-12	48	55	31	34
11-Dec-12	50	52	34	38
12-Dec-12	50	55	35	38
13-Dec-12	50	55	34	38
17-Dec-12	50	60	34	38
18-Dec-12	52	60	36	38
19-Dec-12	56	60	30	35
20-Dec-12	56	60	30	35
23-Dec-12	34	44	27	35
24-Dec-12	46	60	30	40
26-Dec-12	28	40	26	32
27-Dec-12	28	40	26	32
30-Dec-12	28	40	26	30
31-Dec-12	26	38	26	30
1-Jan-13	26	38	23	30
2-Jan-13	24	35	25	30
3-Jan-13	24	35	25	30
6-Jan-13	24	35	23	30
7-Jan-13	22	30	24	30
8-Jan-13	23	30	24	30
9-Jan-13	21	30	26	30
10-Jan-13	22	30	26	30
13-Jan-13	22	30	26	30
14-Jan-13	22	28	25	32
15-Jan-13	24	28	26	32
16-Jan-13	22	28	26	32
17-Jan-13	22	28	25	32
20-Jan-13	20	28	27	34
21-Jan-13	18	28	27	34
22-Jan-13	19	28	25	34
23-Jan-13	19	26	25	32
24-Jan-13	19	26	24	30
27-Jan-13	18	28	24	32
28-Jan-13	18	28	24	33
29-Jan-13	25	30	30	36
30-Jan-13	26	35	33	34
31-Jan-13	27	33	34	36
3-Feb-13	25	33	40	45
4-Feb-13	24	35	38	45
5-Feb-13	24	35	35	45
6-Feb-13	20	32	30	43
7-Feb-13	24	30	30	43
10-Feb-13	30	43	40	48
11-Feb-13	28	38	38	46
12-Feb-13	27	36	38	45
13-Feb-13	28	35	37	45
14-Feb-13	28	34	35	42
17-Feb-13	28	35	32	40
18-Feb-13	28	35	30	40
19-Feb-13	30	35	33	40
20-Feb-13	31	35	33	38
24-Feb-13	30	32	32	36
25-Feb-13	28	32	30	36

Date	Local		Indian	
	Wholesale	Retail	Wholesale	Retail
26-Feb-13	25	30	27	35
27-Feb-13	20	28	28	32
28-Feb-13	18	28	28	32
3-Mar-13	20	30	28	32
4-Mar-13	22	30	30	32
5-Mar-13	28	33	32	35
6-Mar-13	24	35	32	35
7-Mar-13	24	33	30	35
10-Mar-13	24	30	30	34
11-Mar-13	24	30	29	35
12-Mar-13	22	30	26	34
13-Mar-13	22	30	18	32
14-Mar-13	24	30	24	32
18-Mar-13	24	30	24	32
19-Mar-13	24	30	24	32
20-Mar-13	24	28	20	30
21-Mar-13	24	28	20	30
24-Mar-13	24	28	18	28
25-Mar-13	23	28	18	25
27-Mar-13	20	25	20	25
28-Mar-13	20	25	20	25
31-Mar-13	22	25	20	25
1-Apr-13	20	25	20	26
2-Apr-13	20	25	20	26
3-Apr-13	18	25	20	26
4-Apr-13	18	25	18	26
7-Apr-13	18	24	18	26
8-Apr-13	18	25	18	26
9-Apr-13	20	25	18	26
10-Apr-13	21	24	18	26
11-Apr-13	21	24	18	26
16-Apr-13	18	22	18	24
17-Apr-13	18	22	18	24
18-Apr-13	18	22	18	24
21-Apr-13	17	22	17	23
22-Apr-13	18	24	17	24
23-Apr-13	22	28	22	25
24-Apr-13	23	28	20	25
25-Apr-13	23	28	20	25
29-Apr-13	22	28	20	25
30-Apr-13	24	28	22	25
2-May-13	24	28	21	25
5-May-13	24	28	22	26
6-May-13	24	30	22	28
8-May-13	23	28	21	25
9-May-13	23	28	20	26
12-May-13	24	28	20	26
13-May-13	24	30	20	26
15-May-13	24.5	30	18	26
16-May-13	25	30	18	26
19-May-13	25	28	18	26
20-May-13	25	30	18	25
21-May-13	24	30	18	25
22-May-13	25	28	18	25
26-May-13	26	30	19	26

Date	Local		Indian	
	Wholesale	Retail	Wholesale	Retail
29-May-13	26	28	22	26
30-May-13	26	28	21	26
2-Jun-13	26	30	21	25
3-Jun-13	26	32	21	28
4-Jun-13	27	33	21	28
9-Jun-13	27	32	20	28
10-Jun-13	27	33	20	30
11-Jun-13	27	34	21	28
12-Jun-13	32	35	22	28
16-Jun-13	32	35	22	28
17-Jun-13	32	36	22	28
20-Jun-13	34	36	24	30
23-Jun-13	33	36	24	30
24-Jun-13	33	36	24	30
26-Jun-13	34	38	30	32
27-Jun-13	33	38	30	32
30-Jun-13	35	40	30	32
1-Jul-13	35	40	30	34
2-Jul-13	38	42	35	36
3-Jul-13	37	40	35	38
4-Jul-13	37	42	35	40
8-Jul-13	38	42	35	40
9-Jul-13	40	45	37	42
10-Jul-13	41	46	38	42
11-Jul-13	40	46	38	42
14-Jul-13	40	45	38	42
15-Jul-13	39	48	36	44
16-Jul-13	40	48	36	44
17-Jul-13	40	46	36	42
18-Jul-13	40	48	36	44
21-Jul-13	39	45	34	42
22-Jul-13	39	45	32	42
23-Jul-13	38	44	32	40
24-Jul-13	40	44	35	40
25-Jul-13	40	44	35	40
28-Jul-13	39	45	35	40
29-Jul-13	40	46	38	42
30-Jul-13	42	48	38	42
31-Jul-13	44	48	41	42
1-Aug-13	43	48	41	42
4-Aug-13	43	48	41	42
5-Aug-13	43	48	41	42
7-Aug-13	44	48	45	46
11-Aug-13	44	48	42	46
12-Aug-13	55	60	55	58
13-Aug-13	55	60	55	58
14-Aug-13	52	60	60	62
18-Aug-13	64	70	70	78
19-Aug-13	64	70	70	74
20-Aug-13	62	70	70	75
21-Aug-13	57	65	60	74
22-Aug-13	55	62	60	68
25-Aug-13	54	60	58	65
26-Aug-13	50	60	57	65
29-Aug-13	52	58	54	62

Date	Local		Indian	
	Wholesale	Retail	Wholesale	Retail
1-Sep-13	52	60	53	60
2-Sep-13	52	60	53	60
3-Sep-13	52	60	53	60
4-Sep-13	52	58	53	60
5-Sep-13	53	58	50	60

Source: Department of Agricultural Marketing, Ministry of Agriculture.

Table A2. Monthly wholesale and retail prices of local and Indian onion (taka/kg), July 2010–August 2013

Date	Local		Indian	
	Wholesale	Retail	Wholesale	Retail
Jul-10	21	24	17	20
Aug-10	22	24	17	20
Sep-10	23	26	21	24
Oct-10	28	32	28	30
Nov-10	37	40	36	39
Dec-10	34	38	34	41
Jan-11	37	41	34	38
Feb-11	37	31	32	30
Mar-11	18	22	17	21
Apr-11	16	21	14	17
May-11	20	23	16	19
Jun-11	22	24	17	21
Jul-11	28	29	22	26
Aug-11	32	33	27	30
Sep-11	35	37	30	35
Oct-11	32	35	26	31
Nov-11	27	30	23	28
Dec-11	18	22	19	23
Jan-12	11	13	15	18
Feb-12	13	16	16	19
Mar-12	18	21	16	18
Apr-12	16	20	14	17
May-12	20	24	16	19
Jun-12	22	25	16	19
Jul-12	26	30	19	23
Aug-12	26	30	18	22
Sep-12	26	30	19	23
Oct-12	28	33	23	27
Nov-12	40	42	28	33
Dec-12	41	47	34	38
Jan-13	27	32	30	34
Feb-13	30	35	37	41
Mar-13	26	30	29	33
Apr-13	21	25	21	24.7
May-13	25	29	22	26
Jun-13	31	34	24	27
Jul-13	42	45	35	41
Aug-13	52	58	55	60

Source: Department of Agricultural Marketing, Ministry of Agriculture.

Table A3. Onion production, area, and yields in Bangladesh

Year	Production in metric tons (thousands)	Area in acres (thousands)	Yield (metric tons/acre)
2001-02	150	91	1.6
2002-03	153	93	1.6
2003-04	272	128	2.1
2004-05	589	213	2.8
2005-06	769	286	2.7
2006-07	894	318	2.8
2007-08	889	309	2.9
2008-09	735	266	2.8
2009-10	872	291	3.0
2010-11	1,052	312	3.4
2011-12	1,159	335	3.5

Source: Yearbook of Agricultural Statistics of Bangladesh, Bangladesh Bureau of Statistics.

Table A4. Monthly onion imports, June 2011–July 2013

Date	Onion import in metric tons (thousands)
Jun-11	32
Jul-11	43
Sep-11	25
Oct-11	36
Nov-11	32
Jan-12	19
Feb-12	15
Mar-12	18
Apr-12	36
May-12	44
Jun-12	55
Jul-12	72
Aug-12	52
Sep-12	61
Oct-12	47
Nov-12	55
Dec-12	28
Jan-13	35
Feb-13	25
Mar-13	32
Apr-13	24
May-13	35
Jun-13	51
Jul-13	63

Source: Import Monitoring Section, Bangladesh Bank.

Table A5. Annual onion imports, 2005/06-2012/13

Date	Onion import in metric tons (thousands)
2005/06	128
2006/07	104
2007/08	148
2008/09	230
2009/10	310
2010/11	278
2011/12	323
2012/13	517

Source: Bangladesh Tariff Commission, Ministry of Commerce.

APPENDIX B

An Analytical Model for Estimating the Effects of a Supply Shift on Onion Price

The model is within the Marshallian framework of partial equilibrium analysis and based on an analytical framework that takes into account the fact that a share of total food production in developing countries is consumed by producers themselves.²¹ The model is based on the assumption that the market for food crops produced by numerous small growers and sold to a mass of consumers is competitive. This implies that the crop prices are set by demand and supply in the domestic market. The analytical model is graphically illustrated in Figure B1, and the mathematical formulation of the model is below.

We undertake this analysis for the Bangladesh domestic onion market. In Figure B1, the vertical line D_hH represents the onion demand curve of producers for home consumption. This demand curve is drawn as insensitive to changes in onion price. The vertical demand curve for producers' home consumption represents the amount of onion consumed by the surplus farmers and the total quantity produced by the deficit farmers. The horizontal distance between the demand curve for farmers' home consumption (D_hH) and the market demand curve (D_mD_o) measures the quantity of onion bought by consumers. This quantity called the "gross marketed surplus" is supplied by the surplus onion producers.

The supply curve for onion OS_o represents the aggregate supply of onion from domestic production. Imports of onion will induce a shift in the onion supply curve. While the market equilibrium before the supply shift of onion is at A, the market equilibrium is established at B after the rightward shift in the aggregate supply curve from OS_o to OS_1 .

To quantify the impact of the supply shift for onion, a mathematical treatment of the above relationship is developed. Assuming a constant price elasticity of demand, the market demand function can be represented as

$$(1) \quad q = ap^{-\varepsilon},$$

where p and q are the price and quantity demanded of onion, respectively. The constant a includes demand shifters, and ε is the price elasticity of demand.

A constant elasticity supply function for onion without a shift in supply can be expressed as

$$(2) \quad q = bp^{\beta},$$

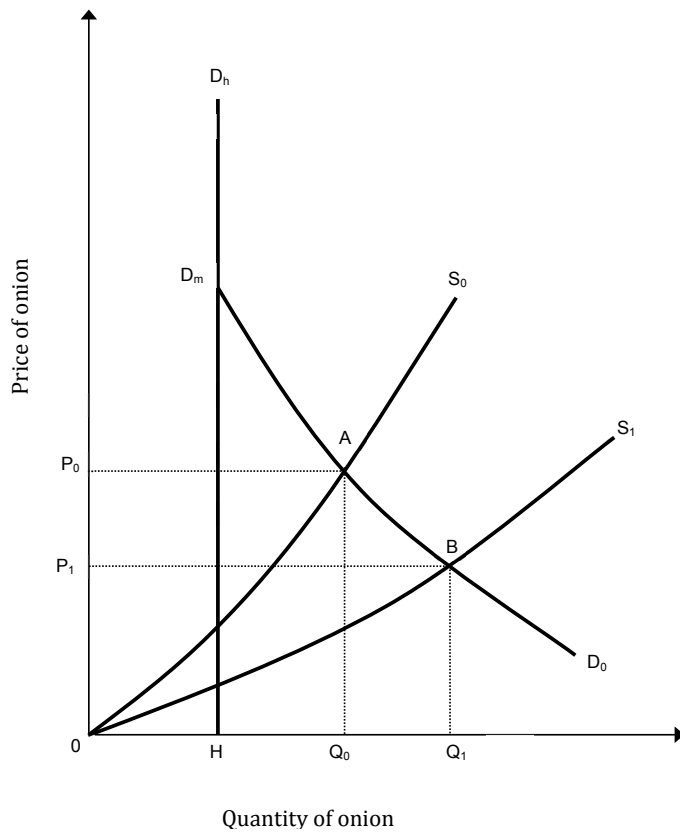
where p and q are the price and the quantity supplied, b includes supply shifters, and β is the price elasticity of supply.

Assuming an m shift in demand schedule, the new demand function can be expressed as

$$(3) \quad q = a(1 + m)p^{-\varepsilon}.$$

²¹ A. U. Ahmed and R. K. Sampath, "Effects of Irrigation-Induced Technological Change in Bangladesh Rice Production," *American Journal of Agricultural Economics* 74, no. 1 (1992): 144–57.

Figure B1. Effects of a change in onion supply on market price of onion



If the import of onion results in a k shift in onion supply schedule, then the new supply function can be expressed as

$$(4) \quad q = b(1 + k)p^\beta$$

The two equilibrium prices of onion (P_0 and P_1), without the supply shift and with the supply shift, respectively, can be derived by equating equations (1) and (2) and (3) and (4) and solving them for P_0 and P_1 . Thus,

$$(5) \quad P_0 = \left(\frac{a}{b} \right)^{1/(\beta+\varepsilon)}, \text{ and}$$

$$(6) \quad P_1 = P_0 \left(\frac{1+m}{1+k} \right)^{1/(\beta+\varepsilon)}.$$

Similarly, we can obtain the equilibrium quantities of onion (Q_0 and Q_1) with the supply shift as

$$(7) \quad Q_0 = a^{\beta/(\beta+\varepsilon)} b^{\varepsilon/(\beta+\varepsilon)}, \text{ and}$$

$$(8) \quad Q_1 = Q_0 (1 + m)^{\beta/(\beta+\varepsilon)} (1 + k)^{\varepsilon/(\beta+\varepsilon)}.$$

with subscripts 0 and 1 indicating the situations without and with the supply shift, respectively.

Assumptions and parameters used for the present exercise

- For estimating the value of the supply shift parameter (k), we used the import of 5,000 metric tons of onion by the Trading Corporation of Bangladesh.
- For estimating the impact of imports on the market price of onion, we assume no shift in the demand for onion; therefore, the value for m is set at 0.
- We used the predicted 2013 consumption of 1.394 million metric tons of onion as the baseline quantity (Q_0).
- We used the retail price of Tk 62/kg prevailing on August 29, 2013, as the base price.
- We used 0.82 as the value of price elasticity of demand for onion.
- Since domestic production of onion will not change in response to the high price before next year, we used a low value of 0.1 for the price elasticity of supply. We did not set the value at zero because farmers and traders are likely to release their onion stock in response to the high price.

APPENDIX C

Media Report on the Onion Price Situation

COVERAGE IN BANGLADESH

August 27, 2013:

From the Indian news agency Press Trust of India: The sudden price hike can be attributed to India's Commerce Ministry's recent notification to impose a minimum export price of \$650 per ton on onion to restrict shipments and control rising prices.

August 26, 2013:

The *Financial Express* reported that at a joint meeting of the Ministry of Commerce and the Chittagong Chamber of Commerce and Industry (CCCI) held in the CCCI auditorium on the previous evening (Sunday, August 25), Mr. Mahbubul Alam, president of CCCI, called to investigate the reason behind onion price hike as its price was very much normal during the entire month of Ramadan. The article quoted the importers in Chittagong stating that the onion price is unlikely to further increase as there is adequate supply and several hundred tons are expected to reach the market within the next three or four days.

From a report by *Samakal*, a daily Bangla newspaper: Five containers of onion from China arrived in the Chittagong port and were unloaded on August 25, 2013.

From the news agency United News of Bangladesh: On Sunday, August 25, 2013, a Commerce Ministry official held a meeting with importers and leaders of CCCI in Chittagong to find out ways to keep the market stable before Eid and Puja. The official was quoted as saying: "The import of onion, a key cooking ingredient, from neighboring country Myanmar has started to ensure sufficient supply in the overheated market ahead of Eid-ul-Azha."

August 22, 2013:

From a report in *Prothom Alo*, a leading daily Bangla newspaper: With a reduction in onion price in India and import of onions starting over the last few days, the price of the commodity in the wholesale market in Bangladesh has started falling although it has minimal effect on the retail market. At the wholesale market at Shyambazar, the price of onion, both imported from India and locally produced in the country, showed a receding trend in the wholesale market. However, the reduced price at the wholesale market has no effect on general buyers as it is being sold at a higher price in the retail market. At Kawran Bazar on August 21, 2013, Indian onion was sold for Tk 78 to Tk 80 per kilogram while the locally produced onion was between Tk 68 and Tk 70 per kilogram.

From an article in the *Daily Star*: Onion prices have started coming down in the local market with an increased supply from India as imports resumed through land ports on Wednesday, August 21, 2013, after a lull of two days. At wholesale markets in Dhaka, onion was selling at Tk 2,100 per *maund* [37.32 kg] yesterday [Wednesday], a fall by 22.22 percent from the previous day, according to the traders.

From the *Financial Express*: The price of onion in the wholesale market is declining but it is yet to come down to a tolerable level in the retail market of the capital. The newspaper expressed its optimism that the first import consignment of onion of 5,000 tons would arrive next week, which would help further ease the onion prices.

From the *Independent*: Onion import through Hilli land port restarted after two days on Tuesday [August 20] afternoon as traders agreed to import onion with increased price. As the import

resumed, the price started decreasing in wholesale markets in the northern district including Dinajpur.

August 21, 2013:

From *Prothom Alo*: With the decision by the government to import 5,000 tons of onion from India and Myanmar, the onion price has reduced by Tk 600–700 at Sathia and Sujanagar Upazilas of Pabna District, the largest producer of onion. At Sathia's Karmaja *haat* [market], onion was being sold between Tk 2,000 and 2,200 per *maund* on Tuesday [August 20] compared to Tk 2,600 to 2,700 on the previous day.

From *Ittefaq*, a daily Bangla newspaper: There was an onion surplus of four lakh metric tons in the country. The annual demand being 20 lakh tons and annual production was 19 lakh 14 thousand tons. And as per Bangladesh Bank sources, another five lakh tons were imported in the last fiscal year. The report said that a section of unscrupulous traders have increased onion price by taking advantage of the onion crisis in India. The present stock of onion in the country will last for another three months.

August 20, 2013:

From the *Financial Express*: Onion prices are unlikely to rise further in Bangladesh as supplies have started going up in India. It has prompted the downtrend in prices in the wholesale and retail outlets in several regions in India, market monitors said. Bangladesh imports some 600,000 tons of onion a year, mainly from India, to meet its annual demand of 1.5 tons against local production of 900,000 tons, according to officials from the Ministry of Commerce.

From the daily *Ittefaq*: Import of onion through Hilli land port in Dinajpur stopped as hundreds of trucks with Indian onion were found waiting at the port since Sunday. The price of onion increased in India over the last few days, and the Indian central government is discouraging onion export to Bangladesh. Bangladeshi importers opened letters of credit at the rate of US\$350 per ton of onion while the Indian government fixed a ceiling of onion export to the tune of US\$650 per metric ton.

August 19, 2013:

From the *Dhaka Tribune*: Prices of onion increased by 43 percent in the past three days in the local markets because the price in international markets rose to US\$650 per ton on August 14. The Commerce Ministry appeared unaware of the country's onion production and demand as the two government agencies [responsible for recording this information] gave different figures in the wake of skyrocketing onion prices. "We cannot finalize the demand and production of onion because there is this big difference of 700,000 tons between what the Agriculture Ministry and Bangladesh Bureau of Statistics says," said a senior official of the Commerce Ministry.

From the *Daily Star*: Indian exporters were taking back onion-laden trucks from land ports and asked Bangladeshi importers to hike prices. "Even yesterday, large shipments of onion were waiting at Indian land ports to enter Bangladesh, but those were taken back and sold in the local [Indian] markets at higher prices," said Khandakar Babul, general secretary of Dhaka Mahanagar Krishipanno Amdanikarok Association, a platform of perishable goods importers.

August 18, 2013:

From *Prothom Alo*: To tackle the onion situation, the Commerce Ministry advised onion importers to look for other neighboring countries besides India to import onion in view of the price spike. The government also considered importing onion through the Trading Corporation of Bangladesh. Commerce Secretary Mahbub Ahmed, however, said that the price of onion has

started reducing in India. The present onion stock in the country is satisfactory. The report quoted Trading Corporation of Bangladesh (TCB) Chairman Sarwar Jahan Talukder as saying that TCB would continue to import onion until the market stabilizes. TCB would be importing 5,000 tons of onion from India and Myanmar. "Indian exporters have sold the onions, which were supposed to arrive in Bangladesh, in their local market as prices soared there too," claimed Vice President of Federation of Bangladesh Chamber of Commerce and Industry Helal Uddin, after a meeting with the secretary of commerce on Saturday, August 17.

From the daily *Samakal*: The Commerce Secretary said there is sufficient stock of onion in the country. The Bangladesh Bank and the Agriculture Ministry stated that the onion production in the country this year was 19 lakh 14 thousand tons. Another five lakh tons were imported, which is more than the country's annual consumption. According to them, the market would be stable in a few days.

COVERAGE IN INDIA

Similar to the situation in Bangladesh, the Indian media also carried news extensively on the onion price situation, which can literally be a political game changer: In 1998, the heavy losses suffered by the Bharatiya Janata Party in Delhi state elections were widely blamed on high onion prices.

This August, with angry lawmakers protesting in Indian Parliament, the government was forced to announce steps to curb price rises. It banned onion exports for two weeks then hiked the minimum export price to discourage exports. At the time of this publication, India was considering importing onions from Pakistan. The Indian government claimed that there was no shortage and it blamed rising prices on traders, accusing them of hoarding stocks to push up prices. It said it will import onions from Pakistan, China, Iran, and Egypt to ease pressure.

With production of some 16 million tons a year, India has a 19 percent share of the global onion production, second only to China, which yields nearly 21 million tons annually. The United States is the third-largest onion producer with yields of nearly 4 million tons, according to US Department of Agriculture.

August 28, 2013:

From the *Wall Street Journal* ("[India's Onion Prices Play Pivotal Role in Election](#)"): India's struggle with a plunging currency, decrepit infrastructure, and government corruption. But at the top of the pre-election agenda now: the price of onions and wheat. On Tuesday, August 27, a day after India's lower house of Parliament passed a sweeping food aid bill that would guarantee subsidized grain for nearly 70 percent of the country's citizens, the upper house was busy debating the cost of onions.

August 23, 2013:

From Voice of America ("[Spiraling Onion Prices Worry Indian Government](#)"): India's main opposition party, Bharatiya Janata Party, hopes to cash in on voter disgruntlement over high onion prices as it gears up for state elections due in Delhi later this year. Onions have become the centerpiece of their campaign to slam the government for mismanaging the economy and failing to protect the interests of poor people. To woo voters, it has set up stalls to sell onions at rates significantly lower than the market price in New Delhi. High onion prices helped former Prime Minister Indira Gandhi wrest back power in 1980, and they were largely responsible for the defeat of the Delhi state government 15 years ago.

A report said that the Indian government shortlisted Pakistan among the countries from where it plans to import onions in order to tide over the shortage of the staple. On Wednesday, August 21, the Centre settled the import option, identifying China, Iran, and Egypt in addition to Pakistan to source onions and help ease the domestic supply shortage.

August 20, 2013:

From the *Times of India*: Onion prices started falling as supplies started growing in Delhi following new crop harvest. The supply rose to 900 tons on Monday, August 19, at Lasalgaon, against 458 tons a week ago. The supply in Pimpalgaon and Delhi rose to some 2,200 tons.

From *India Real Time* ("[Onion Diplomacy between India and Pakistan](#)"): Tensions between India and Pakistan were running high over border clashes in Kashmir, but a crippling shortage of onions in India forced New Delhi to turn to Islamabad for help, though not everyone's happy about going cap-in-hand to the neighboring sparring partner. Separately, private traders in India have also been importing from Pakistan, but some have stopped in protest of the alleged killing of Indian soldiers on the Kashmir border by Pakistani troops earlier this month.

August 15, 2013:

From the *Times of India* ("[Amid LoC firing, India Plans to Buy Onions from Pakistan](#)"): India exported 6.39 lakh tons of onions from April through July, compared to 6.94 lakh tons in the same period one year ago. Production stood at 16.6 million tons in 2012–2013.