Appendix 1: Afghanistan

Among all South Asian countries, the food price crisis probably hit hardest in Afghanistan, one of the poorest countries in the region and indeed the world. Per capita income is US$426 per year (FY2008-09) and an estimated 36 percent of the population is classified as poor with another 20 percent living just above the poverty line. According to the 2005 National Risk and Vulnerability Assessment (NRVA) conducted by the Ministry of Rural Rehabilitation and Development (MRRD) and the Central Statistical Office (CSO), even before the food crisis about 30 percent of all Afghan households were unable to meet their minimum daily caloric intake requirements, and 46 percent had an insufficiently diverse diet. These percentages likely increased significantly during the food crisis. Since wheat is the major staple food in Afghanistan (accounting for about 70 percent of total cereal consumption and 50 percent of total caloric intake) and was most severely affected by the food crisis, the analysis in this Appendix mostly focuses on wheat.46

Afghanistan is a cereal deficit country. Cereal supply in Afghanistan is usually unable to meet cereal demand even in good harvesting years (Table A1.1). Average wheat production during the five-year period between 2003 and 2007 amounted to 3.7 million MT but ranged from 2.3 million MT in 2004 to 4.3 million MT in 2007. Combined with other cereals (i.e. rice, maize, and barley) total average cereal production was 4.7 million MT but with a range between 3.1 million MT (2004) and 5.4 million MT (2007). The average self-sufficiency rate in cereals during 2003-07 was about 80 percent but varied widely over time, from 53 percent in 2004 to 89 percent in 2005.

Domestic production of cereals in Afghanistan is very sensitive to weather conditions. Agricultural production in Afghanistan is highly dependent on rain and snowfall. Approximately 45 percent of Afghanistan’s wheat area in a normal year is irrigated, while the remaining 55 percent depends entirely on rainfall. The timing and quantity of the annual snowmelt is a key factor in determining the quantity and duration of water availability for irrigation throughout the cultivated areas of Afghanistan. Productivity of wheat differs significantly between irrigated and rain-fed areas. Average wheat yield (without fertilizers) on irrigated land is about 2.7 MT/ha (3.5 MT/ha with fertilizer) versus only 1.1 MT/ha on rain-fed land.

46 Wheat is by far the most important cereal crop in Afghanistan, accounting for about 80 percent of total cereal production in most years. The remaining 20 percent is made up by rice, maize, and barley.
**Table A1.1 Supply-demand balance of cereals in Afghanistan (’000 MT)**

<table>
<thead>
<tr>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigated wheat</td>
<td>3,017</td>
<td>1,867</td>
<td>2,728</td>
<td>2,604</td>
<td>2,878</td>
<td>2,619</td>
<td>-</td>
</tr>
<tr>
<td>Rain-fed wheat</td>
<td>1,345</td>
<td>426</td>
<td>1,538</td>
<td>759</td>
<td>1,465</td>
<td>1,135</td>
<td>-</td>
</tr>
<tr>
<td>Total wheat production</td>
<td>4,362</td>
<td>2,293</td>
<td>4,266</td>
<td>3,363</td>
<td>4,343</td>
<td>3,725</td>
<td>2,767</td>
</tr>
<tr>
<td>Milled rice</td>
<td>291</td>
<td>310</td>
<td>325</td>
<td>361</td>
<td>370</td>
<td>331</td>
<td>-</td>
</tr>
<tr>
<td>Maize</td>
<td>310</td>
<td>234</td>
<td>315</td>
<td>359</td>
<td>360</td>
<td>316</td>
<td>-</td>
</tr>
<tr>
<td>Barley</td>
<td>410</td>
<td>220</td>
<td>337</td>
<td>374</td>
<td>370</td>
<td>340</td>
<td>-</td>
</tr>
<tr>
<td>Total cereal production</td>
<td>5,373</td>
<td>3,957</td>
<td>5,243</td>
<td>4,447</td>
<td>5,443</td>
<td>4,713</td>
<td>3,860</td>
</tr>
<tr>
<td>Total demand</td>
<td>5,572</td>
<td>5,717</td>
<td>5,866</td>
<td>6,018</td>
<td>6,175</td>
<td>6,335</td>
<td>6,500</td>
</tr>
<tr>
<td>Demand-supply gap</td>
<td>199</td>
<td>2,660</td>
<td>623</td>
<td>1,571</td>
<td>732</td>
<td>1,594</td>
<td>2,640</td>
</tr>
<tr>
<td>Self-sufficiency rate (%)</td>
<td>96</td>
<td>53</td>
<td>89</td>
<td>74</td>
<td>88</td>
<td>75</td>
<td>59</td>
</tr>
</tbody>
</table>

Source: Agriculture Prospects Report, Ministry of Agriculture, Irrigation and Livestock (MAIL) May 2009; World Bank; and own calculations.

The 2008 domestic wheat harvest was particularly poor. The main reason was widespread drought, in particular a lack of rainfall in the rain-fed areas in the northern and western parts of the country; exacerbated by below-normal snowfall and earlier-than-normal melting of snow, both of which adversely affected the timing of water availability in irrigated areas. Compared to the previous year, wheat production in 2008 declined by nearly 40 percent to about 2.8 million MT (Table A1.2). As a result, total cereal production in 2008 was about 3.9 million MT, meeting only 59 percent of total cereal demand.

**Table A1.2 Area, production, and yield of wheat, 2007-08**

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>Yield</td>
<td>Production</td>
</tr>
<tr>
<td>2007</td>
<td>'000 ha</td>
<td>MT/ha</td>
<td>'000 MT</td>
</tr>
<tr>
<td>Irrigated</td>
<td>1,071</td>
<td>2.69</td>
<td>2,878</td>
</tr>
<tr>
<td>Rain-fed</td>
<td>1,395</td>
<td>1.05</td>
<td>1,465</td>
</tr>
<tr>
<td>All wheat</td>
<td>2,466</td>
<td>1.76</td>
<td>4,343</td>
</tr>
</tbody>
</table>

Source: Ministry of Agriculture, Irrigation and Livestock (MAIL).

Afghanistan traditionally depends on imports from neighboring countries for part of its food security. Once self-sufficient in cereals and in some years a small exporter, Afghanistan now imports wheat virtually every year. These imports consist nearly entirely of private imports (legal or illegal) from neighboring countries supplemented by food aid shipments. The import share of domestic wheat consumption has varied between 11 and 47 percent over the past five years and correlates nearly perfectly with droughts. The latter now seem to hit in a regular sequence virtually every other year (e.g., 2002, 2004, 2006, 2008). Most wheat-producing households are net buyers of wheat, having food self-sufficiency for only a few months of the year. In 2007,

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47 But not in 2009 and 2010.
total wheat imports into Afghanistan amounted to about 1 million MT (including food aid). Pakistan supplied 50 percent of the total, followed by Uzbekistan (20 percent) and Kazakhstan (15 percent) (Figure A1.1).

**Figure A1.1 Afghanistan imports of wheat and wheat flour, 2007**


**The demand-supply gap of wheat in 2008 was largely filled by imports.** The total requirement for cereals in Afghanistan is about 6 million MT. But in 2008 Afghanistan produced only about 4 million MT (including 2.8 million MT of wheat). Average wheat consumption in Afghanistan is 0.48 kg/capita/day (nearly three times as much as the world’s average) implying a requirement of about 5 million MT per year (based on an assumed population of 28.5 million48), leaving a gap of 2.2 million MT of wheat in 2008. In 2008, the World Food Program distributed 0.28 million MT of wheat and the government (through private companies) imported 70,000 MT from Kazakhstan and also received 50,000 MT from Pakistan under a government-to-government deal. This implies that about 1.8 million MT (80 percent of the wheat deficit) were imported by the private sector, which therefore played a crucial role in stabilizing market supplies.49 This was despite the fact that in 2008 legal private sector imports from Pakistan had dried up following Pakistan’s export ban on wheat introduced in February 2008. Also, Pakistan

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48 Since the latest population census in Afghanistan dates from 1979, no official figures regarding the current population are available. But the consensus is that the current population is between 28 and 29 million.

49 It can be argued that private wheat imports helped stabilize prices as well since there is evidence that wheat delivered through food aid is at least US$125/MT more expensive than wheat supplied through private markets. See World Bank (2005a).
had tightened border controls in an attempt to contain smuggling. Iran and Kazakhstan also imposed export bans on wheat.

Even though private sector wheat imports filled the demand-supply gap, the food security of many households was seriously compromised. While private imports (mostly illegal imports from Pakistan) more or less safeguarded food security from a national perspective in quantity terms, there are two important caveats. First, national estimates assume uniform distribution of wheat within Afghanistan, but the reality is quite different. While there are some areas with a wheat surplus, most areas are wheat-deficit and transport within the country is costly and sometimes even impossible. Second, even if there had been no shortfall of wheat, prices increased to levels at which many people could no longer afford to buy the necessary quantities.

The poor domestic harvest in 2008 was the primary reason for the sharp increases in wheat prices. The poor 2008 domestic wheat crop, in combination with large global food price increases50 and export restrictions (in particular Pakistan’s ban on private exports of wheat and wheat flour) led to unprecedented inflation in Afghanistan. On a year-to-year basis the index of consumer prices in Kabul increased by 33 percent in June 2008 (Figure A1.2) and 52 percent in August 2008. Inflation was mainly driven by food price increases: the increase in the domestic food price index (year-to-year) was 49 percent in June 2008 and 76 percent in August 2008. Among food items, year-to-year prices of bread and cereals increased by 92 percent in June 2008 and 145 percent in August 2008. Although the increase in food prices was a nationwide phenomenon, the magnitude of the increase differed across Afghanistan, mainly as a function of accessibility51, local supplies (i.e. whether a region had a surplus or a deficit in wheat) and transport and other transaction costs. For example, in Kabul, wheat prices increased by 193 percent from Afs 13.3 (US$0.26)/kg in May 2007 to Afs 39.0 (US$0.79)/kg in May 2008. In Mazar (northern part of Afghanistan) wheat prices increased by 259 percent to Afs 35.5/kg. At the national level the wheat price increase was nearly 160 percent (Table A1.3).

50 International price increases translated directly into food price increases in Afghanistan, given the latter’s free market and dependence on imports to meet a significant part of total domestic consumption.

51 Difficult mountainous topography, poor roads in many parts of the country, and the seasonal isolation of remote areas that are snow-bound in the winter make for substantial interregional price differences. Regional markets for wheat are often better integrated with markets in bordering countries (especially Pakistan) than with other markets in Afghanistan.
The share of food in total household expenditure increased by more than 50 percent during the food crisis. Before the food crisis the average Afghan household spent 40 to 50 percent of its income on food. Based on the 2007-08 National Risk and Vulnerability Assessment (NRVA) this percentage increased dramatically to above 70 in 2007-08 (figure A1.3).
The rise in food prices particularly hurt the poor. The increase in food prices had a significant negative impact on the poor and other vulnerable people. Purchasing power, as measured by the ratio between the daily wage rate of unskilled labor and the price of wheat, substantially declined due to a combination of significant wheat price increases and virtually stagnant nominal wage rates (figure A1.4). In Kabul, the daily wage of unskilled labor was enough to purchase 15 kg of wheat in January 2007, but barely enough to purchase 5 kg in May 2008.

The government reacted to the steep rise in food price inflation by facilitating imports and trying to stimulate a supply response. First, to lower the costs of wheat and wheat flour imports, the government lowered the import tariff on wheat and wheat flour from 2.5 percent to zero percent in February 2008. However, the impact of this measure was limited in view of the export bans.
imposed by neighboring countries (e.g. Pakistan) and the low tariff level to begin with. Second, the government of Afghanistan managed to secure 50,000 MT of wheat from the government of Pakistan despite that country’s ban on exports of wheat and wheat flour. Third, in cooperation with FAO, the Ministry of Agriculture, Irrigation, and Livestock (MAIL) in May 2008 started designing an emergency program (Government of Afghanistan 2009a). The main thrust of the program is to improve agricultural productivity and facilitate an agricultural supply response. To achieve these objectives a number of specific measures were undertaken as discussed below.

The government, in cooperation with FAO, embarked on a substantial wheat seed purchasing and distribution scheme. Use of improved seeds could potentially increase yields of irrigated wheat by about 1 MT/ha, and adequate fertilizer use may add another 0.5 MT. FAO estimates the total requirement of wheat seed in the country at 100,000 MT. In 2008, in cooperation with FAO, a total quantity of 10,000 MT of improved seed (certified and quality-declared) was produced by contract growers and purchased by private seed firms for distribution to farmers for the 2009 crop. This quantity increased to about 16,000 MT in 2009 for the 2010 wheat harvest.

The government in cooperation with donors established a substantial input voucher scheme. USAID and DFID are funding a program called Afghanistan Vouchers for Increased Production in Agriculture (AVIPA). The program is assisting approximately 200,00052 drought-affected farmers in a number of priority provinces selected by MAIL. It is mostly limited to the Northern and Western provinces53 because the prevailing security situation does not allow its extension to the Southern part of the country. Under the program farmers in targeted areas purchase a menu-type voucher which they can use to obtain agricultural inputs (seeds, tools, fertilizer, etc). The vouchers represent a value of US$165 each including a mandatory 10 percent own contribution (90 percent subsidy). Inputs purchased with vouchers are provided through private agricultural input dealers. The AVIPA program is continuing but at decreased subsidy rates.

The government has taken the first steps towards the establishment of a strategic grain reserve (SGR). With the help of technical assistance provided by FAO, the government is planning to establish a strategic grain reserve for emergency purposes. The planned size of the reserve is 200,000 MT. A proposal has been developed for the Japan Social Development Fund to

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52 Even though the current size of the voucher program is able to serve about 200,000 farmers, according to MAIL there exists a need to serve an estimated 800,000 additional farmers.

53 These provinces include Kabul, Balkh, Khost, Ghor, Kunduz, Sari-Pul, and Faryab.
rehabilitate existing storage facilities, construct limited new capacity, and develop options for an appropriate management structure of the SGR.

The desire to have a strategic grain reserve is understandable but the scope and size of the reserve should be limited. The key objectives should be to provide emergency food support for vulnerable households in case of man-made and/or natural calamities (i.e. helping to overcome transitory food insecurity) and to assist particular groups of households who cannot achieve food security even in times of good harvests. In addition, the SGR may play a role in smoothing regional food imbalances in areas that are seasonally inaccessible. The government should not let the size of the SGR exceed 200,000 MT since excessive public grain stocks could discourage the private sector import trade that traditionally has successfully augmented domestic wheat supplies in Afghanistan.

The government should pay careful attention to the management of the SGR. Rather than creating a potentially expensive and inefficient public grain procurement and distribution system, the government may want to rely on the private sector instead, for both procurement and distribution of wheat. Private sector efforts may be complemented by wheat distribution under the auspices of WFP since the latter would presumably concentrate its efforts on reaching geographical areas that are not of interest to the private sector. At times when public wheat imports would be required to meet national food security needs, part of these imports could also be channeled through WFP while auctioning off the remainder to the private sector. The latter would subsequently inject these imports into the domestic supply system, under a carefully designed public regulatory and monitoring system. It is important that the government maintain adequate incentives for private commercial imports of wheat.

The fiscal impacts of the SGR should be minimized. The burden of the SGR on the state budget should be kept to a minimum. Therefore government-owned wheat should be disposed of at prices as near as possible to prevailing market prices. In case the government opts to subsidize (part of) its wheat sales, the latter should be clearly targeted to the neediest populations. Before the SGR is established, a set of clear guidelines regarding pricing and targeting policies will be required.

Afghanistan does not have an operational safety net system. Protection of poor and vulnerable households during the food crisis and in case of future shocks is compromised by the virtual lack of an effective safety net system. The government has expressed interest in developing a basic safety net system

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54 The exceptions are two relatively small pension programs for public sector employees and minimal cash benefits for disabled people and survivors of martyrs.
adapted to its fiscal and administrative capacity and based primarily on a (conditional or unconditional) cash transfer program.

In the absence of a substantial safety net system, WFP and other donors played an important role during the food crisis. Well before the onset of the 2007-08 food crisis, WFP already had a food-for-work program in place, serving nearly 3 million people. As part of its regular program in Afghanistan and in cooperation with the government, non-government partners, and communities, each year WFP pre-positions approximately 25,000 MT of wheat in 75 snowbound districts. These programs were substantially scaled up during the food crisis and WFP also played a major role in acquiring and distributing imported wheat to areas that suffered most from the poor 2008 wheat harvest. In 2008 WFP distributed a total of 280,000 MT of wheat to cover the needs of 7-8 million people during the three most critical months. In addition to WFP, the European Commission’s Humanitarian Aid Office and USDA also had food aid programs.

Following the disastrous 2008 harvest, Afghanistan harvested a bumper wheat crop in 2009. At 5.06 million MT, the 2009 harvest was nearly double the 2008 harvest and enough to satisfy at least 95 percent of the domestic wheat demand of 5.3 million MT (Government of Afghanistan 2009b). The 2009 bumper wheat crop is mainly attributed to good rainfall (56 percent of the total wheat area of 2.56 million ha is rain-fed) but also to the donor-supported input voucher program. MAIL estimates that about one-quarter of the total increase in wheat production can be attributed to increased area under cultivation (which went up by 420,000 ha over 2008) and three-quarters to higher yields. Unlike the record wheat import requirements of 2008, Afghanistan imported less than 250,000 MT in 2009.55

Starting in the last quarter of 2008, wheat has become increasingly cheaper in Afghanistan, The price of wheat in Afghanistan started decreasing from September 2008 onwards, dropping from a high of up to US$700/MT in August 2008 to about US$330/MT a year later. Between October 2008 and April 2009 this trend largely reflected decreasing wheat prices in the global wheat market. As of May 2009 the continuing decreasing trend is more a reflection of the excellent domestic wheat harvest.

The domestic food price index has also significantly decreased. After an unprecedented rise of more than 75 points between July 2007 and July 2008 (from 134 to 210, or an increase of 57 percent), the national food price index decreased by 49 points between July 2008 and June 2009. However, the decrease was almost wholly due to the steep decreases in the prices of “bread

55 In this context it should be kept in mind that (1) certain regions may always receive imports because of their geographical proximity to wheat exporters; (2) significant regional imbalances in both wheat production and consumption remain.
and cereals” and (to a lesser extent) “oils and fats.” The price indices of most other food categories increased (Table A1.4).

**Table A1.4 Changes in consumer price indices** of different food categories

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>General food price index</td>
<td>+ 76.4</td>
<td>- 49.4</td>
</tr>
<tr>
<td>Breads and cereals index</td>
<td>+ 144.8</td>
<td>- 106.5</td>
</tr>
<tr>
<td>Meat index</td>
<td>+ 1.5</td>
<td>+ 5.7</td>
</tr>
<tr>
<td>Dairy products index</td>
<td>+ 17.8</td>
<td>+ 2.8</td>
</tr>
<tr>
<td>Oils and fats index</td>
<td>+ 47.1</td>
<td>- 46.1</td>
</tr>
<tr>
<td>Fruits index</td>
<td>+ 10.8</td>
<td>+ 17.7</td>
</tr>
<tr>
<td>Vegetables index</td>
<td>+ 40.6</td>
<td>- 6.6</td>
</tr>
<tr>
<td>Sugar index</td>
<td>- 0.7</td>
<td>+ 16.2</td>
</tr>
<tr>
<td>Spices index</td>
<td>+ 12.7</td>
<td>+ 18.6</td>
</tr>
<tr>
<td>Beverages index</td>
<td>+ 14.5</td>
<td>+ 7.4</td>
</tr>
</tbody>
</table>

Indices are based on March 2004 = 100.

*Source: Own calculations based on data in various issues of the Agricultural Commodity Prices Bulletin published by MAIL.*

The steep decrease in the price of wheat has improved food security. The average wage of an agricultural laborer in Afghanistan increased from Afs 198/day in August 2008 to Afs 227/day in August 2009. This implies that on average a day of labor now enables an agricultural worker to purchase 13.6 kg of wheat, as opposed to only 6.4 kg one year earlier.

**But wheat in Afghanistan remains relatively expensive.** Retail wheat prices in Kabul were rather stable at US$250-260/kg until mid-2007 but exceeded international prices (for US No.2, hard red) by 20-70 percent, depending on international prices (Figure A1.5). In August 2009, at US$332/MT the average price of wheat in Afghanistan still exceeds the world market price by about 45 percent. Wheat also remains more expensive in Afghanistan than in most other South Asian countries (Figure A1.6); for example, wheat in Pakistan, where per capita GDP is twice that of Afghanistan, is usually 20-30 percent cheaper than in Afghanistan (Figure A1.7). Finally and perhaps most importantly, the average domestic wheat price in Afghanistan during 2009 (Afs 21.75/kg) is still more than 60 percent higher than the average domestic wheat price during 2005-07 (Afs 13.50/kg).56 Whereas these price differences and variations can be attributed to a number of factors (transport costs, trade policies, conflict,) they probably would be more subdued if Afghanistan’s own domestic wheat production were higher and more stable.

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56 Average wheat prices had decreased further to about Afs 15/kg by the Spring of 2010.
Source: Based on data from WFP Afghanistan, International Grains Council, and USDA.

Figure A1.6 Domestic prices of wheat in South Asian countries, June 2009

Source: Based on FAO data.
Figure A1. 7 Wheat prices in Kabul and Peshawar

Source: Pakistan Bureau of Statistics (http://www.statpak.gov.pk) and FAO data.

To reconcile the twin objectives of consumer access to wheat at accessible prices and attractive economic returns to farmers, productivity increases in wheat are needed. Sustainable reductions in the retail prices of wheat and wheat flour can be achieved only by lowering the unit production costs of wheat. The obvious way to lower costs would be through yield increases, which in turn would require greater use of improved inputs (especially wheat seed and fertilizer) and better water management. Since the price elasticity of demand for wheat in Afghanistan is likely to be below unity, increased production resulting from higher yields would also benefit farmers’ incomes.

There exists plenty of unused potential to improve wheat yields in Afghanistan. Current average wheat yields in Afghanistan are below 2 MT/ha (about 3 MT/ha on irrigated land and 1-1.5 MT/ha on rain-fed land) but yields in a particular year greatly depend on weather conditions. There exists ample scope for productivity increases through improved production technologies and crop management practices. In this context the government’s ongoing efforts to provide farmers with improved wheat seed and fertilizer should be applauded. But achieving sustainable productivity increases for the medium and longer term cannot depend on handouts and/or subsidies from the government and donors. Rather, deliberate efforts and substantial new investments are required to strengthen the agricultural production base in Afghanistan, including improvements in input supply delivery systems and water use efficiency.

Irrigation rehabilitation is a key element in increasing agricultural productivity and improving food security. Because of the arid climate in Afghanistan, wheat yields in irrigated areas are up to three times higher than in rain-fed areas. Given this large differential the government assigns high
priority to the rehabilitation of irrigation schemes. As a result of the prolonged conflict, damaging floods, and neglected maintenance, Afghanistan’s irrigation infrastructure is in a serious state of disrepair. Irrigation schemes are operating at about 25 percent efficiency, compared to the norm of 40 to 60 percent in South Asia, and cover only about one-half of the pre-conflict area. River diversion structures feeding the canals are dysfunctional or of a temporary nature, and canal networks are damaged and partly or wholly dysfunctional. About 60 to 70 percent of karezes\(^{57}\) are damaged and out of use (Jansen and Qamar 2009).

**In irrigation, rehabilitation has quicker and higher economic returns than extension.** Rehabilitation is the quickest and most cost-effective means of restoring irrigation supplies to areas that used to receive water before but are currently out of command because of the dilapidated state of the system. Rehabilitation also improves the reliability of supplies to areas that currently do receive water. Irrigation extension is crucial for the long run but is relatively much more expensive, has longer gestation periods, and involves social, environmental, and trans-boundary water issues, since Afghanistan shares most of its rivers with neighboring countries. Recognizing that rehabilitation represents the “low-hanging fruit” in the present context, the government has appropriately assigned high priority to rehabilitating the traditional irrigation systems that constitute 90 percent of the irrigation system in the country. For irrigation expansion, closed river basins offer a good opportunity for investments in small dams and related water distribution systems without being hindered by trans-boundary water issues.

**The remaining needs for irrigation rehabilitation are still large.** Despite its significant achievements up to now, Afghanistan still has large needs for irrigation rehabilitation. The total irrigated area in the country prior to 1979 (pre-conflict) was about 3.2 million ha but in 2007 (a year in which water availability was good) it was only 1.8 million ha. Of this irrigated area, so far only about 0.6 million ha has been rehabilitated. More than one million ha of existing irrigated area remain to be rehabilitated. If the pre-conflict irrigated area is taken into account the rehabilitation needs are even larger. Furthermore, the rehabilitation investments undertaken so far have focused on the upstream ends of the irrigation systems (intakes, main canals, flood protection, etc) while the downstream ends of the systems closer to the end-users and on-farm have yet to be rehabilitated. Dove-tailing downstream and on-farm investments with the upper-end rehabilitation already carried out would yield major synergies and agricultural and economic benefits.

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\(^{57}\) *Karezes* are traditional underground water channels that tap subsurface water streams in foothills. These channels connect with surface water channels that irrigate the command area.
Appendix 2: Bangladesh

In Bangladesh, rice is the main staple food and about 50 percent of all households are involved in rice production. Food security is to a large extent associated with rice consumption and production. Therefore this Appendix focuses on rice.

Bangladesh managed to avoid shortages of rice during the food crisis but price increases were substantial. On average Bangladesh is nearly self-sufficient in rice. Between 1998-99 and 2007-08 the country imported an average of about 850,000 MT of rice per year, or less than 5 percent of total net availability. But geographical conditions make agricultural supply in Bangladesh especially sensitive to extreme weather events which greatly influence production levels from year to year. This became particularly obvious during 2007 when two monsoon floods (respectively in July and September) and Cyclone Sidr (in November) led to significant losses in the aman and aus rice crops. Losses were estimated at 1.8 million MT from the aman crop alone. In the last quarter of 2007, increases in the international price of rice started causing panic in the rice market. Market instability was aggravated by the export restrictions placed on rice by a number of countries, leading to steep price hikes in the world market. In Bangladesh a matter of particular relevance was that India, its primary source of rice imports, had set minimum prices for rice exports. Facing its own food grain problems, India had raised its minimum rice export price from US$425/MT in October 2007 to US$505/MT in December 2007. In March 2008, the Indian government placed new restrictions on rice exports, allowing shipments of coarse varieties of rice at US$650/MT or above, and a week later it raised the minimum export price to US$1,000/MT. With a thinly trading international rice market, domestic rice prices in Bangladesh started increasing as well. The price of coarse rice in Bangladesh peaked at Tk36 (about US$0.55) per kg in April 2008, double the price of January 2007 and about 50 percent higher than in October 2007. Around the same time the world market price of rice reached about US$850/MT or about Tk55/kg. It is worth noting that unlike in the food price crisis of 1974, when the price of rice in the world market reached US$540/MT and the domestic price in Bangladesh peaked at US$830/MT, this time the domestic price was kept well below the world market price.

58 For example, Bangladesh imported more than 3 million MT of rice and wheat during 1987-88, 1997-98 and 2004-05, each time in a reaction to the previous year’s flood.

59 Aman is the main monsoon season in Bangladesh (June to October) and aus is a short season (April-May) that follows the dry season or boro (November-December to March-April).